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## Utah State Engineer, Fall 2019

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Utah State | **ENGINEER**

**UtahState**University®





# Utah State | ENGINEER

*Utah State Engineer is the annual alumni magazine of the College of Engineering at Utah State University. For questions or delivery information, please contact [eng.marketing@usu.edu](mailto:eng.marketing@usu.edu). ©2019, Utah State University.*

On the Cover:

## Redefining Power

USU Assistant Professor Idalis Villanueva (center) was honored by the White House in July for her innovative research about unveiling and eliminating hidden curriculum. Her work will help level the playing field for students from all walks of life. Learn more on page 22.



**Elizabeth Howell**  
Midland, Texas  
Undergraduate,  
Computer Science



**Bikalpa Khatiwada**  
Itahari, Nepal  
PhD Student,  
Electrical Engineering



**Idalis Villanueva**  
Aguadilla, Puerto Rico  
Assistant Professor,  
Engineering Education



**Wesley Rivers**  
Lindon, Utah  
Undergraduate,  
Mechanical Engineering



**Yi He**  
Wuhan, China  
PhD Student,  
Transportation Engineering

Photos by Alise King

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[engineering.usu.edu](http://engineering.usu.edu)





## 2.6 Gigabytes

Colton Lindstrom, 2019 valedictorian, kept every textbook, homework assignment, lab report, exam, paper, quiz and notebook from this college experience. The 27-foot-tall, 810-pound stack of paperwork, he calculated, equates to 2.6 gigabytes of data.



### Colton Lindstrom

Hometown - Lehi, Utah  
BS - '19 Electrical Engineering  
Current Graduate Student

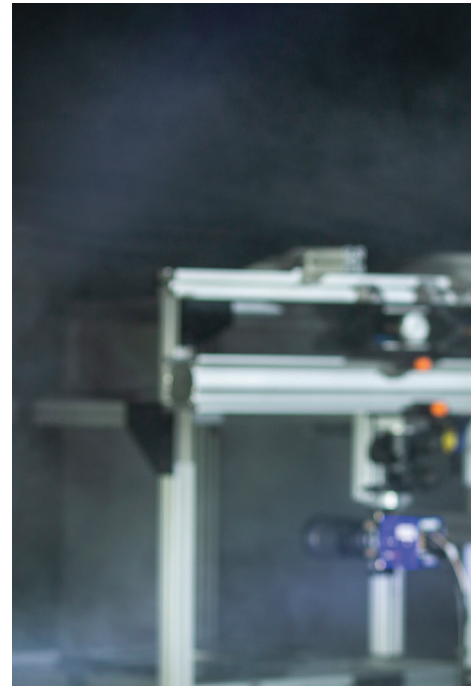


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*Celebrating 30 Years of  
Utah's Engineering Summer Camp*



## **Telling our Story**

These stories matter. They are stories about people confronting complex challenges with new ideas and innovative solutions. They are stories of social impact and meaningful change told from the perspective of our dedicated students, our world-class faculty and our outstanding alumni.



*USU Partners with Egyptian Universities  
for Water Resources Training*



*MAE's Dr. Barton Smith Takes a Swing at  
MLB's Home Run Problem*

*Electrical Engineering  
Alumnus Pays it Forward*



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Dr. Elizabeth Vargis



# Forging Ahead as an Engineering Research Leader

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It's an exciting time for our students, researchers, faculty and staff. The College of Engineering is experiencing record-breaking productivity in research outputs; we are increasing female enrollment across our departments; and our students are excelling in national design competitions. Our success is due in part to the legacy built by our alumni and the generous alumni-donors who contribute their time, talents and resources to our world-class research and academic programs. And now we are taking another big step forward.

To improve our programs and student experience, we are expanding our ties to industry and making more meaningful connections with alumni. Earlier this year we hired two experienced professionals to lead these efforts. Dixon Nielson is the new industry relations director, an exciting new role created to

attract more industry involvement in senior capstone projects. David Kunz is our new executive director of development who will oversee new fundraising and philanthropy initiatives that generate scholarships and other opportunities for students.

As we forge ahead as an engineering research leader, our goal is to be the premier engineering school in the Intermountain West. We ask for your help in reaching that goal and encourage you to connect with David or Dixon to explore the many ways you can help.

We thank our Industry Advisory Board members for their continued direction on how to better prepare our students for today's engineering workforce. Most importantly, we thank our alumni — our Utah State Engineer family. Go Aggies!



Jagath Kaluarachchi,

PhD | PE | D.WRE | F.ASCE | F.EWRI  
Dean, College of Engineering,  
Utah State University

# College at a Glance

126 Engineering Undergraduate  
Research Program Fellowships  
since 2010

16% Female  
Enrollment  
Fall 2019

7 Research Centers  
focusing on  
Electrified Transportation  
Waste to Bioproducts  
Water Resources  
Space

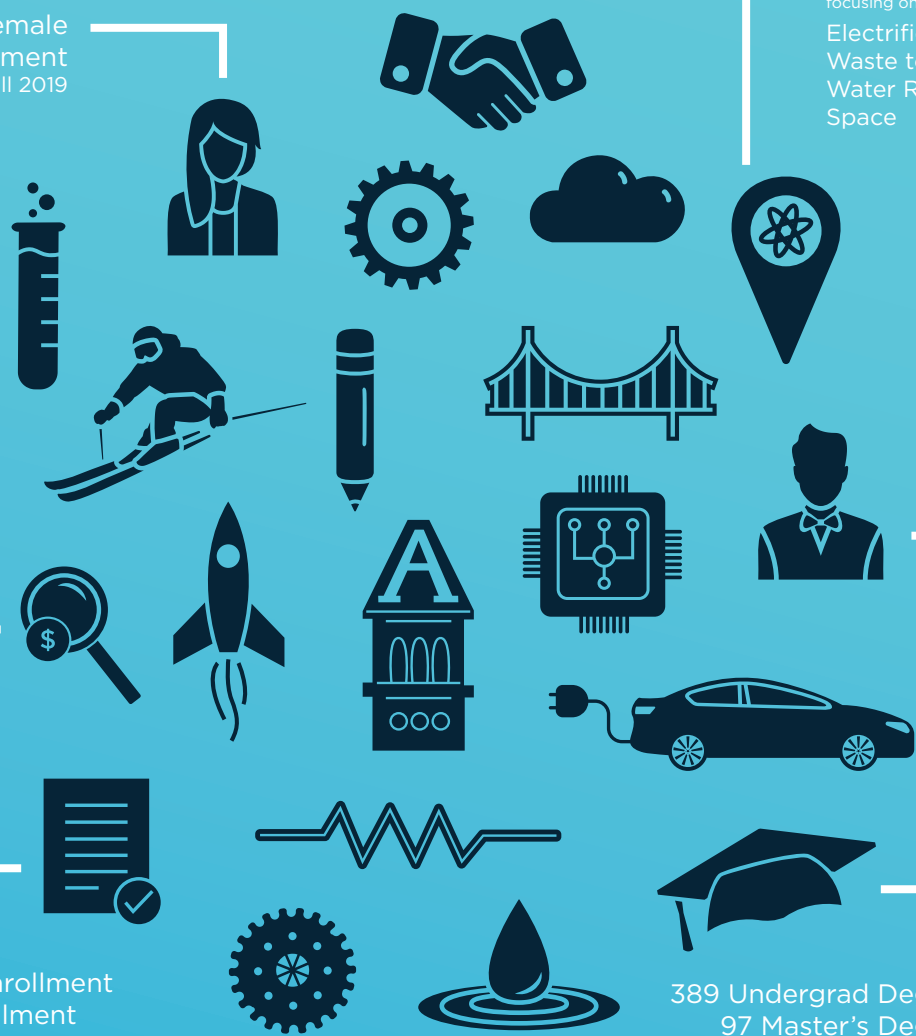
\$25 Million  
in Research  
Expenditures  
in 2018

110  
Faculty

1,898 Undergrad Enrollment  
265 Graduate Enrollment  
Fall 2019

389 Undergrad Degrees Awarded  
97 Master's Degrees Awarded  
32 PhD Degrees Awarded  
2018 - 2019

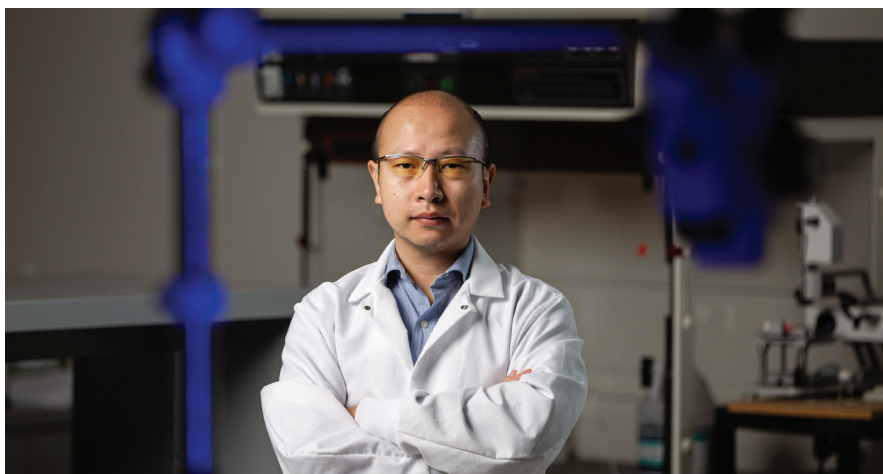
20 Academic Programs  
6 Bachelor's  
7 Master's  
7 PhD





# News & Events

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## The Link Between Blebbing and Brain Tumors

Biological engineering faculty Yu Huang is tackling one of the newest questions in cancer research: Is cellular blebbing associated with the development of brain tumors? Blebbing is the formation of a balloon-like protrusion that emerges from a cell membrane. In May, Huang received a \$435,000 grant from the National Institutes of Health to further define the connection between blebbing and glioblastoma, an aggressive brain tumor.



## USU Students Take 3rd in Robotics Competition

Mechanical engineering students placed third at the E-Fest Student Design Competition in Pomona, California. Students Madalyn Mayne, Christian Mayne, Eric Larsen, Jared Christiansen, Anya Nielson and Austin Southwick designed and built a robot that can pick up various sized athletic balls, contain them inside the robot and then place them in a designated area.



## Steel Bridge Team Places at Nationals

The USU Steel Bridge team placed 15th at the National Steel Bridge Competition in Carbondale, Illinois in May. Forty-one teams from top engineering programs competed in this year's event. After taking second at regionals, the team made improvements to decrease build time, weight and estimated cost.



## Faculty, Student Receive Robins Awards

Assistant Professor of Engineering Education Idalis Villanueva was named the Robins Award, Faculty Researcher of the Year. Professional Practice Assistant Professor Spencer Wendel was named the Robins Award, Undergraduate Faculty Mentor of the Year. And biological engineering undergraduate student Tayler Clegg received the Bill E. Robins Memorial Award.



### Talking Air Quality with Utah Business Leaders

Business and government leaders learned more about Utah’s air quality challenges from one of the state’s foremost experts. In February, Randy Martin, associate research professor in the Department of Civil and Environmental Engineering, spoke to a standing-room-only crowd about the effects of mobile emissions. It was the first presentation in USU’s Research Landscapes series.



### USU’s Val Potter Takes New Role

Longtime university development director Val Potter transferred to a new university development role in April. Potter will specialize in economic development and special projects for USU Extension. He joined the college in 2005 and cultivated many relationships with industry and alumni. He also established more than 100 new student scholarship endowments.



### Another National Victory for Wastewater Design Students

A team of undergraduates took third place at the 2019 Wastewater Design Competition in Chicago in September. Amy Carmellini, Jessica Cooper, Avery Holyoak, Kailey Jorgensen, Todd Keniry, Jade Snyder, Madeline Tennant, Nikki Vause, Andrew Walker and faculty advisor Ryan Dupont took part in the event. The win is USU’s third wastewater design victory. USU placed second in 2014 and 2018.



### USU Shines at National Engineering Education Conference

USU was center stage at the 125th annual conference and expo of the American Society for Engineering Education. It was attended by 4,000 professors, deans, university administrators and industry representatives. USU’s College of Engineering was the third in the nation to develop an academic department dedicated to engineering education.





### Tour de France Pelotons Governed by Sight, Not Aerodynamics

A study about the formation of Tour de France cyclists revealed that vision, not aerodynamics, is the key factor to the formation of a peloton. Mechanical engineering Associate Professor Tadd Truscott and colleagues published the findings in the *Journal of the Royal Society Interface*. The study helps engineers better understand how systems of individuals, such as autonomous vehicles or robots, can work together to perform complex tasks.



### New LADAR Technology Promises Sharper Aerial Views

Researchers at USU's Center for Advanced Imaging LADAR are developing a breakthrough technology that will enhance the quality of images acquired from LADAR sensors. They designed an inexpensive sensor and camera package along with a patented algorithm that enhances LADAR data.

### In Memorium

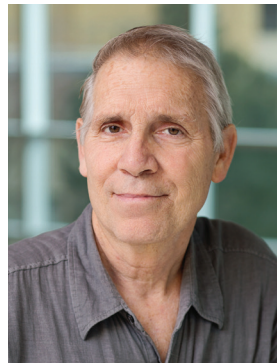
Professor Emeritus Wynn R. Walker



Professor Emeritus of Civil and Environmental Engineering Wynn Walker died June 29. He was head of the Irrigation Engineering Department for more than a decade and later served as associate dean. Colleagues say Walker had a good sense of humor, hard work ethic and sincere concern for students. He was a well-known expert on irrigation engineering

and graduated many local and international students who are scattered across the globe.

Professor Joseph Caliendo



Associate Professor of Civil and Environmental Engineering Joseph Caliendo died Aug. 15. He taught at USU for 27 years. He was named the 2017 College of Engineering Teacher of the Year and has a long list of accolades from universities and engineering organizations. Caliendo specialized in geotechnical engineering and was known nationally as the

organizer and director of the annual Professors' Driven Pile Institute. His namesake 'Marv 'n Joe' open-faced sandwich has been served at the Hub for over two decades.



### Civil Engineering Student Receives All-West Team Award

Civil engineering undergrad and USU hockey captain Josh Kerkvliet received the All-West Team award. Kerkvliet has played hockey since he was six years old. He is from Soldotna, Alaska. The All-West Team award goes to five players in the region.



### A Rising Star in Engineering Research

Assistant Professor of mechanical and aerospace engineering Ryan Berke was named the 2019 Undergraduate Research Mentor of the Year by the USU Office of Research. Colleagues say Berke is one of the most active engineering researchers. He recently received a major grant from the U.S. Nuclear Regulatory Commission and, to date, has acquired \$8.1 million in research funding as a principal or co-investigator.



### Congratulations A-Pin Recipients

College of Engineering Dean Jagath Kaluarachchi and department heads recognized 78 students in March for receiving the prestigious A-pin award for the spring and fall semesters of 2018. The A-Pin goes to students who achieve a straight-A grade point average while carrying 15 graded credit hours for two consecutive semesters.

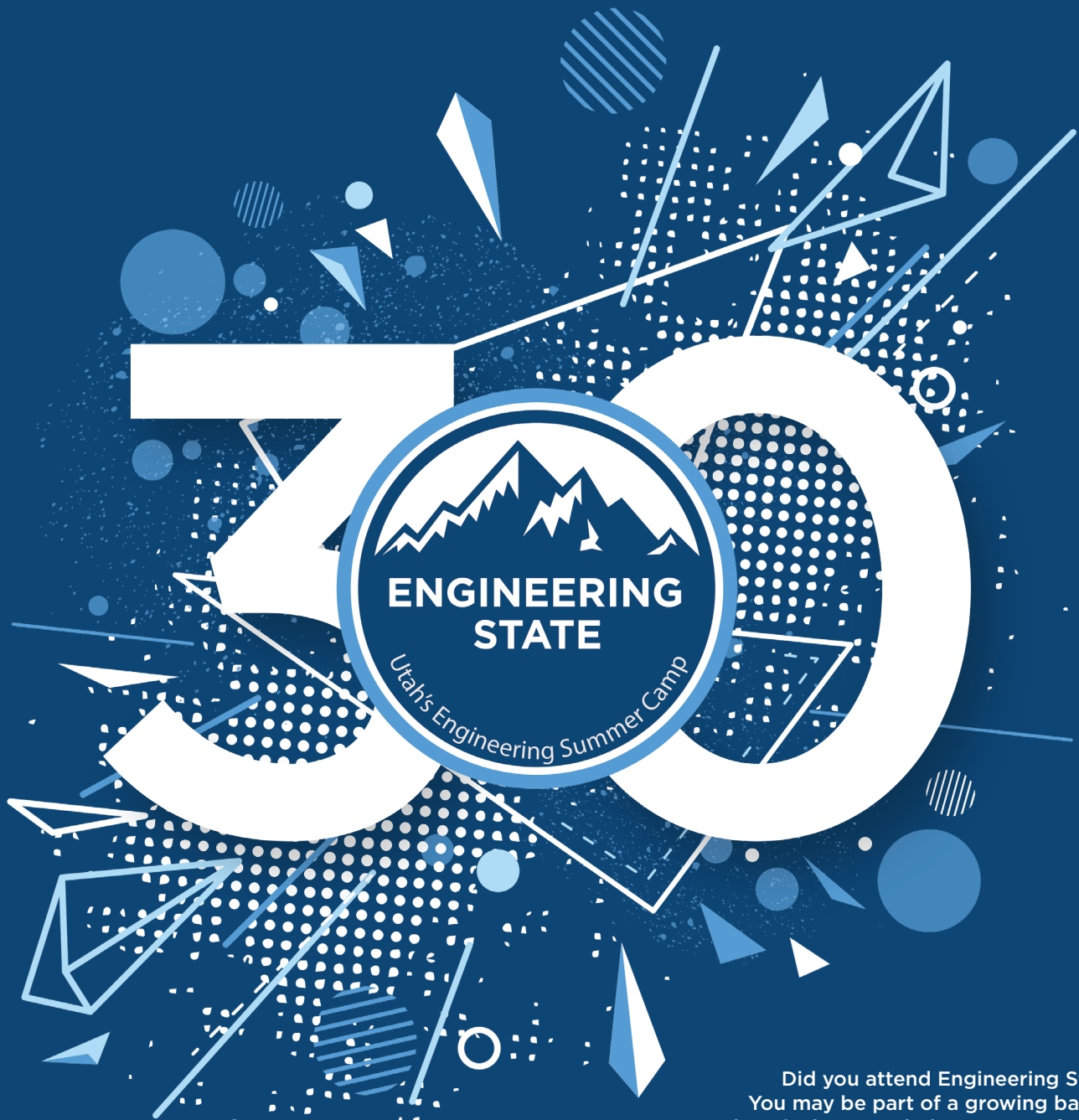


### College Ramps Up Engineers Week Celebrations

Engineers Week at USU is a big deal. Each February students and faculty organize a series of events to celebrate engineers and the engineering profession. Events include a cardboard boat race, talent show, awards banquet, community night and guest speakers. Engineers Week 2020 is February 18–21.

# 30 YEARS OF ENGINEERING STATE

Registration opens  
January 1, 2020



Learn more at  
[estate.usu.edu](http://estate.usu.edu)

Did you attend Engineering State?  
You may be part of a growing base of alumni who attended USU's now famous engineering youth summer camp which began in 1990. Thirty years later, high school students from across Utah and the U.S. still come to Logan each year for this inspiring four-day event.



# The Engineering Writing Center

*Preparing Skillful Technical Communicators*

By Alex Bullock



The tradition of technical writing is ancient, and the demand for engineers who are skilled technical writers has been constant. Employers consistently identify the ability to communicate in written and verbal form among the top skills required of new engineers. The College of Engineering at USU has taken an aggressive approach to meet this demand.

While it is common for engineering schools to require students take a technical writing course, most courses are offered through departments of English. In 2014, USU's College of Engineering began to require an in-house, customized technical writing course of its undergraduate students. The goal of the course is to prepare students with the individual and collaborative technical writing, presentation and verbal skills needed for success in their careers. Assignments include proposals, technical reports, abstracts, business correspondence and technical presentations that are audience centered, articulate and grammatically correct.

"Initially, student reactions to having to take a technical communications class centered on

'Engineers don't need to know how to write,' or 'Why are you making us take this class?'" said Melissa Scheaffer, a faculty member in the Department of Engineering Education who created the Engineering Writing Center.

"Today, with over 400 students enrolled annually, this sentiment is markedly different as students realize the importance of communication skills in landing their first job."

The Engineering Writing Center was established in January 2017. It is one of a handful of dedicated engineering writing centers across the nation providing engineering students access to quality writing assistance through one-on-one tutoring sessions. Staffed with highly trained student writing consultants majoring in engineering or technical writing, this peer interaction allows for feedback, personalized instruction and assurance.

Scheaffer says the stigma that engineers are poor writers can impact students' confidence in their writing abilities. Brienne Sorensen, a senior majoring in technical writing, says the most rewarding part of working as a writing consultant is seeing the progress students make.

"The first few weeks they come in with documents riddled with mistakes," she said. "By the end of the semester they have significantly fewer errors and feel more confident about their writing." Amy Carmellini, a senior in environmental engineering, echoed this comment. "The writing consultant was very good at taking my worries into account and tailoring the visit to addressing those concerns," she said.

Use of the center has grown significantly. Last year, over 1,500 engineering students visited the center for assistance, an increase of 54 percent from the previous year.

Faculty are also realizing the importance of reinforcing writing as part of their engineering curricula. "Students have a strong tendency to underestimate the importance of communicating technical information," said faculty Spencer Wendell. "In the instrumentation and measurements course I teach, I require students visit the Engineering Writing Center for at least three of their lab reports. Over the past few years, I have seen marked improvements in student technical communication."



## Research in the College of Engineering

Research activity in the college has ramped up considerably in recent years. According to the National Science Foundation, USU is ranked 25th in the country for engineering research expenditures during fiscal years 2014–2017.\*

\*Source: National Science Foundation/National Center for Science and Engineering Statistics



The number of funded proposals increased by

**19%**

from 181 to 217



Engineering research expenditures totaled

**25,176,994**

in the '18-'19 fiscal year



Assistant Professor Idalis Villanueva received the prestigious

**PECASE** award, a first for Utah State





The U.S. Nuclear Regulatory Commission Awarded USU Two Grants for Graduate Student Fellowships and Faculty Development

# Nuclear Know-How

## *USU Tops List for Nuclear Engineering Research*

USU is once again being recognized as a national leader in nuclear engineering research. In September, the U.S. Nuclear Regulatory Commission awarded USU two large grants totaling \$831,628. The purpose of the funding is to encourage careers and research in nuclear, mechanical and electrical engineering, health physics and related fields to meet workforce needs. The funding will support scholarships, fellowships and faculty development.

One grant for \$400,000 will provide graduate-level fellowships for up to two students per year. Program lead Ryan Berke, an assistant professor in the Department of Mechanical and Aerospace Engineering, says the funding will help attract top students to USU.

A second grant for \$431,628, under the direction of Professor Barton Smith, will support faculty development in nuclear engineering research. USU has long been a

prominent nuclear engineering research institution. USU engineering researchers are highly competitive at securing federal research dollars, and USU engineering students consistently outshine competing schools for nuclear-related scholarship funding. USU is also home to an active student chapter of the American Nuclear Society, and the university is home to the newly-formed Thermohydraulics and Material Properties Research Center.





## AggieAir Flies for NASA Airspace Study

In the skies above Reno, Nevada, USU engineers flew drones above the high-rise hotels and casinos, hopping from rooftop to rooftop. The flights were part of a NASA-led study to develop a new unmanned aerial traffic management system.

AggieAir, USU's premier unmanned aerial systems platform, flew 100 times over a 30-day evaluation period this summer.

The goal of the operation was to evaluate unmanned aerial vehicle traffic in a busy city environment during beyond-line-of-sight conditions. Flying drones beyond an operator's line of sight is an

important next step if drones are to be used for package delivery and newsgathering. Flying drones over populated areas is a complex challenge. Large cities, with their unique weather patterns and skylines, create unique challenges for safe flight.

"Beyond line of sight means operating drones without having the pilot's eyes on the aircraft," said USU's Cal Coopmans, a research assistant professor and director of the AggieAir program. "It's a big step forward in what has been years of unmanned systems research and testing."

## Mechanical Engineering Seniors Develop Low-Cost Therapy Tricycle

A group of mechanical engineering seniors developed a therapeutic tricycle designed for people who provide physical therapy for a child at home.

Students Liz Housley, Nathan Linville, Derek Scott, Connor Toone and Zachary Wilson built the tricycle with help from the Utah Assistive Technology Program and Intermountain Pediatric Rehabilitation Center. Therapeutic trikes are used to help children who have difficulty walking or crawling.

Similar trikes are available on the market but are expensive and less versatile than the USU prototype. "Families with special needs children are already going through a lot, and most of them are spending thousands in medical costs," said Wilson. "We wanted to create something affordable that works well."



From left, students Connor Toone, Zachary Wilson, Derek Scott, Nathan Linville and Liz Housley (not pictured) developed a low-cost therapy tricycle.



# Global Connections

## USU Partners with Egyptian Universities for Water Resources Training

Faculty at Utah State University are developing the latest educational tools to train the next generation of engineers in Egypt and the Middle East.

USU is a partner institution on an initiative to improve education and training for water resources engineering students. USU will receive \$2.8 million over five years to develop instructional tools and curricula focused on water.

USU Professors Kurt Becker, Ryan Dupont, Mac McKee and David



Stevens will lead the effort along with collaborators at the Utah Water Research Lab.

“This is a significant project in terms of potential impact in a region that needs improvement in educational tools,” said McKee. “Who better to participate in this than the

Utah Water Research Lab? Our faculty have had experience all over the world including the Middle East.”

As part of the five-year program, USU will invite Egyptian students and faculty to the Logan campus and send its own researchers to collaborate in Cairo.

## Predicting Space Weather

*USU Joins Brazilian Space Agencies to Study Ionosphere*

In Brazil and regions along the lower latitudes, GPS signals can be unreliable due to disruptions in the ionosphere. This space weather phenomenon presents a unique

challenge for electrical engineers.

Charles Swenson, professor of electrical engineering and director of the USU Center for Space Engineering, is leading a Joint NASA-Brazil small

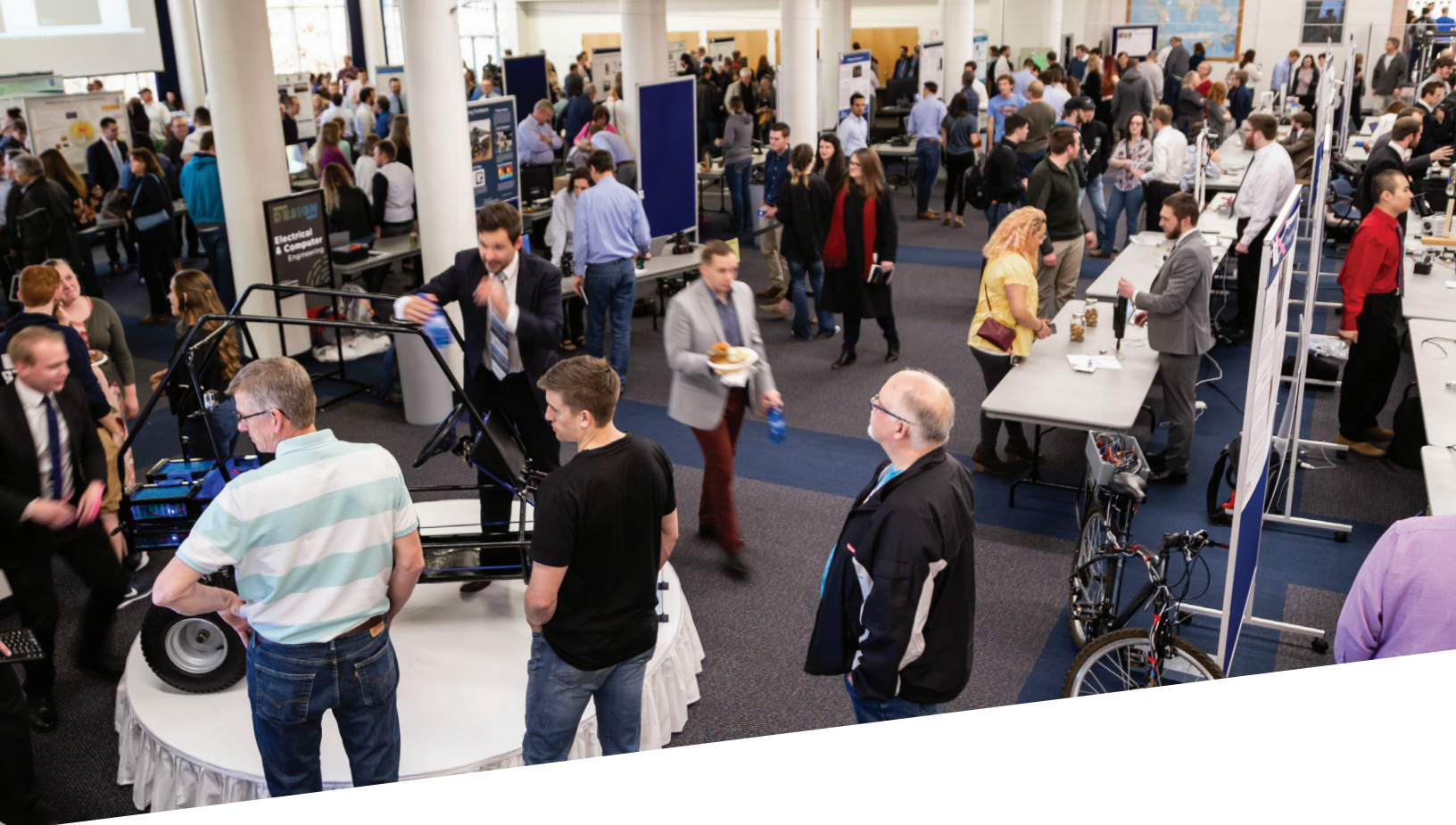
satellite mission to find a solution.

“Brazil is very interested to better understand why GPS navigation signals become corrupted by ionospheric weather conditions,” said Swenson. “And the U.S. scientific community would like to understand how to predict these space weather events in the future. This is the first joint U.S.-Brazil satellite mission, and it represents a coming together of our nations.”

Swenson says the mission will help engineers determine how to predict the phenomenon and ways to mitigate its effects. USU will provide a suite of science instruments for the mission, which is scheduled for launch in late 2020.







# Senior Design Night

*A New College of Engineering Tradition*

In a growing effort to engage with local industry partners, the College of Engineering welcomed hundreds of guests to its first-ever department-wide Senior Design Night. Students from civil, environmental, mechanical, biological, electrical, and computer engineering exhibited their capstone projects to family, community members and business leaders in May.

“The event was a huge success,” said Dean Jagath Kaluarachchi. “Our students had the opportunity to show off their hard work and innovative designs. We’re confident the event will generate more interest from industry partners.”





## Industry Advisory Board

**Todd Adams**

Utah Division of Water Resources

**Kathy Allman**

Northrop Grumman

**Richard Anderson**

Hewlett-Packard

**Marsha Bala**

Idaho National Laboratory

**Lori Belnap**

Northrop Grumman

**Vance Checketts**

EMC-Dell

**Greg Crane**

GE Health Care Systems

**Neil Holt**

Space Dynamics Laboratory

**George Humbert**

Rocky Mountain Power

**Larry Jacobsen**

Campbell Scientific

**Kent Jones**

Utah Division of Water Rights

**Ki Ho Kang**

Kihomac

**Colonel Jeff Kwok**

Hill Air Force Base

**Eva Nieminski**

Utah Division of Water Quality

**Jim Nottingham**

Hewlett-Packard

**Scotty Nowlin**

BAE Systems

**Rex Plaizier**

WesTech Engineering

**Mark Ripke**

Boeing

**Aurora Rojas**

L3 Harris Broadband Comm. Sector

**Steve Rowlan**

Nucor

**Mel Torrie**

Autonomous Solutions

## A Stronger Industry Connection

Dixon Nielson joined the College of Engineering in February 2019 as Director of Industry Relations. He will work with regional companies and government organizations to create a more synergistic approach to industry-student interactions. He will focus on strengthening and expanding student projects, sponsored research, internships, hiring and Industry Advisory Board programs. He joins committed faculty and staff who also believe industry involvement in higher education is a key aspect of student success.

Nielson has over 30 years' experience in telecommunications, IT, marketing, entrepreneurship and company management. Most of his career was in the Washington, D.C. area where he worked with companies and government agencies to improve their telecommunications systems and business processes. He helped create a first-of-its-kind company that pioneered the digital

delivery of music, video and data to thousands of locations in the U.S. and internationally. These systems are in use today by many of the world's news and entertainment companies and several governments. Prior to joining the dean's office, Nielson worked with the Mechanical and Aerospace Engineering Department,

developing industry relationships and as an instructor.

If you are interested in working with our students or our departments, please contact Nielson at [dixon.nielson@usu.edu](mailto:dixon.nielson@usu.edu) or 435-797-5548.







Photo: Matt Jensen

**Jorge Espinoza De Leon**

BS - '13 Law & Constitutional Studies

BS - '18 Civil Engineering

MS - Expected Dec. '19 Structural Engineering



# From Buildings to Boeing

*Civil Engineering Graduate Student Spans the Professional Spectrum*

Jorge Espinoza followed a lot of pathways in search of his future career.

The path started with a degree from USU in law and constitutional studies and an internship with U.S. Sen. Mike Lee in Washington, D.C. Espinoza met renowned lawmakers, attended the State of the Union Address and learned how to interact with constituents. The experience led to a job at an online university, but it also left him thinking about his future.

“I felt I could do more with my life,” he said. “Knowing my parents sacrificed so much for me to go to college, I felt like I owed it to them to do more.”

He considered law school or an MBA but ultimately decided on a degree in civil engineering. He started with the basics — math, physics and the often-dreaded statics course. “The first few weeks were an adjustment, but I was determined to push through especially since I had my parents and my wife in mind. I wanted to make them proud and show them I could do whatever I set my mind to.”

Espinoza got involved in campus life, served on the Latino Student Union and volunteered with the Black Student Union and Polynesian Student Union. Later, he joined the Society of Hispanic Professional Engineers, an organization that would ultimately set the stage for his success. At a career fair in 2017, Espinoza defied the odds and landed an interview with Boeing, an opportunity that nearly slipped away.

**“After waiting in line for three hours, the Boeing recruiter said they were not looking for any structural engineers. But I decided to stay in line. I trusted myself to give it a shot.”**

It worked. The fledgling civil engineer — an unlikely match for an aerospace firm — spoke with

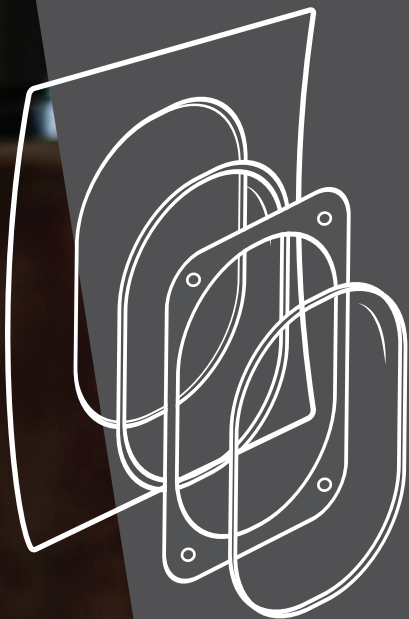
recruiters and was offered an internship just two hours after his interview.

Over the summer of 2018, Espinoza completed an internship with Boeing in Everett, Washington, where he worked on the 737 and 777x aircraft. He was assigned to a team to develop an improved window design for the 737 which will eliminate light leakage.

**“I was told they chose me for the project because of my research experience at USU, which I owe to a handful of professors who made a big difference.”**

Espinoza credits professors Wade Goodridge, Idalis Villanueva, Marc Maguire and Paul Barr. Looking to the future, he hopes to land a permanent job with Boeing and stay connected to USU and its Latino community.

“I want to see more Latinos attend USU, and I believe it’s important to get more diversity in the College of Engineering. More diversity provides new ideas that improve the field of engineering.”



# Redefining Power in the Engineering Classroom

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*White House Honors USU Professor for Research into Hidden Curriculum*

Secrets are not welcome in Idalis Villanueva's engineering classroom. She doesn't believe in withholding information or making assumptions about what students may or may not know. On day one, she asks students to refer to her as Dr. Villanueva or Dr. V; she clearly posts assignment due dates; she lists the objectives of each lesson; and she clarifies uncommon terms to make sure everyone is on the same page. This seemingly basic approach to instruction is nothing new, but emerging research suggests it is crucial to the success of would-be engineers.

The retention rate for engineering students is surprisingly low. Estimates show that nationwide about

half of first-year students drop out or change majors. Villanueva is looking at the problem in a whole new way, and her innovative research is drawing national attention. In July she received the Presidential Early Career Award for Scientists and Engineers, known as PECASE, the highest honor awarded by the U.S. government to scientists and engineers. Villanueva is the first faculty from Utah State University to receive the award since it began in 1996, and she is the only 2019 award recipient in Utah.

A native of Puerto Rico, Villanueva studies and develops methods to improve educational opportunities for engineers from diverse social and cultural backgrounds. Her work is focused on revealing and eliminating hidden curriculum in the engineering classroom. The term hidden curriculum refers to academic rules or social norms that are obvious to some but unknown to others. The effects of hidden curricula often impede the academic success of under-represented students.

**“Engineering has a culture, it has norms — things that are assumed to be effective because they’ve always been that way. But the assumptions behind those norms are never questioned,” she explained.**







### What is Hidden Curricula?

- This emerging term refers to academic rules or social norms that are obvious to some but unknown to others
- The effects of hidden curricula often impede the academic success of under-represented students

“If you are a first-generation student or come from a different cultural background, you may not be aware of the resources and opportunities that will help you succeed as a student. Many students and faculty who come from non-traditional backgrounds often struggle with making sense of the university environment. They struggle to understand the predominant culture, perspective and expectations. Without this understanding, how can they be expected to succeed?”

Villanueva says inadvertently withholding information creates a power imbalance between

student and professor. By revealing hidden curricula, knowledge becomes democratized and students know what is expected of them.

**“When hidden curriculum is revealed, it loses its power because it is no longer available among students or faculty who are in ‘the know,’” she added.**

Villanueva’s work has the potential to reach hundreds of engineering faculty across the country and increase students’ chances for earning their engineering degree.

“Engineering is a beautiful career,” says Villanueva. “It’s a needed career that has potential for enormous change. I see engineering as the next humanitarian career — one focused on collective impact and transformation.”

# Leave Your Legacy

What do you want to accomplish with your money that would be meaningful to you? When asked this question, generous engineering alumni often reflect on their desire to help students succeed, promote industry leadership, have an impact on innovative research or leave a legacy for their family or a loved one.

As a Utah State University alum, my years as a student can be summed up with one word: formative. It was a period of impactful decisions, learning and leadership. And for so many engineering students, the handful of years they spend on campus are formative for the rest of their lives, regardless of their career. You can have a direct impact on these critical years through the establishment of scholarships and strategic support of college priorities.

I serve as the College of Engineering's new development representative. Reconnecting with alumni and friends is a top priority. Hearing your stories and watching so many alumni act on their passion for the benefit of a future generation is inspiring.

Our development office would love to speak with you about your ideas for engagement with the College of Engineering and Utah State University. We are here to help you accomplish your philanthropic goals and provide gratifying gift and engagement experiences. Please contact us about your vision and let us help ensure your gift is awardable, impactful and provides meaningful return on your philanthropic investment. Go, Aggies!



A handwritten signature in black ink that reads "David Kunz". The signature is fluid and cursive.

David Kunz  
Senior Director of Development  
'00 Public Relations  
david.kunz@usu.edu  
435-797-8012



# It Pays to be a Utah State Engineer

In the '18-'19 fiscal year,

# \$537,627

was awarded to

# 249

engineering students



**Katelyn Parkinson**

Biological Engineering  
Seeley Hinckley Scholarship

“I am grateful for the scholarship I received because it gives me the opportunity to devote more time to my studies and getting involved in the College of Engineering. I’m so grateful for the opportunities I’ve had here at Utah State and this scholarship that has made it possible for me to attend.”



**Logan Voigt**

Electrical Engineering  
Lonnie and Cheryl Smith Scholarship

“This scholarship helps me be at ease with my financial situation. Both my wife and I are studying at Utah State, and we can only work part time. We are so grateful to receive this scholarship because it will help pay for my education while money is tight. This way I can support the family I dream of having in the future.”



**Becky Black**

Biological Engineering  
Rocky Mountain Power Scholarship

“Juggling 15+ credits along with homework, clubs, research and everything else expected to make us marketable to future employers can be overwhelming, especially when considering how to pay for it all. This scholarship helps me focus on succeeding in my classes and developing other skills necessary to be an engineer.”

# A Next-Generation Aerospace Pioneer

*Undergrad Shows What's Possible for Young Engineers*

By Matt Jensen

Early in her academic experience, Grace Graham learned the secret to success. The young aerospace engineering and economics double major from St. George, Utah, jumped into university life eager to get involved and meet new people. Her optimistic attitude and warm personality are a recipe for achievement that is already yielding positive results.

Earlier this year, Graham was selected from 250 worldwide candidates to receive the prestigious Brooke Owens Fellowship. The opportunity led her to a paid internship at The Aerospace Corporation in California where she worked in the Navigation and Geopositioning Systems department.

**“My internship at The Aerospace Corporation was above and beyond what I could have imagined,” she said. “I’ve been writing complex code in C++ and Python, and I had the opportunity to do research with the Small Satellite group and organize a website for the Position, Navigation and Timing group.”**

Graham says the Brooke Owens fellowship opened doors for her professional development.

**“I can’t count how many times I was emotionally touched by the powerful women in the 2019 class,” she added. “At the end of our annual four-day summit in Washington, D.C., each of the 37 fellows had left an impact on me. The program has changed my life and will forever be one of the greatest things I’ve experienced.”**

Back on campus, Graham excels in academics and leadership. She recently served as a vice president on the Engineering Council student government team, and she was responsible for launching a new student club focused on space. SEDS, or Students for the Exploration and Development of Space, is a national organization that encourages students and people from all walks of life to get involved in space-science and engineering.

“I see a lot of interesting things going on at Utah State University, but there weren’t any specific space-related student clubs on campus. I learned about SEDS through the Brooke Owens Fellowship, and I was intrigued by how many opportunities it provided.”

The organization connects members with networking, problem-solving and teamwork opportunities through student competitions and an annual conference. Graham says she’s excited about the new chapter as a way to build leadership and organization skills.

Mechanical and aerospace engineering was a natural fit for Graham. “I like the idea of taking static parts and putting them together to make something move. And I’ve always been fascinated about space, satellites, orbits and planets. The opportunity to learn about these things that have captured human imagination for eons evokes gratitude in me every day.”





**Grace Graham**

BS - Expected '21 Mechanical & Aerospace  
Engineering, Economics



# “I was an Aggie and Dang Proud of It”

*Electrical Engineering Alumnus Pays it Forward with \$100,000 Gift for New Scholarship Endowment*



Jim Nottingham was on the fence about whether college life was a good fit for him. He dreamed of playing football, but life as a newlywed and new father was quickly changing his focus.

“I had a decent job working construction, and a lot of my friends were getting good jobs at the Geneva Steel plant in Utah County,” he recalled. “I didn’t really consider myself a college kid, so I was thinking about skipping college and focusing on finding a better job instead.”

During a football recruiting visit at USU, Nottingham ran into a friend in the engineering building. On a whim, he ended up taking an aptitude test with the friend who offered free donuts to anyone who completed the test.

“I completely forgot I took the test, and then one day out of the blue my wife handed me a big envelope from Utah State University. Turns out I did well enough on the aptitude test that I was accepted to attend USU with a recommendation to consider the engineering program.”

He felt flattered but didn’t give much thought to the offer until a few weeks later when he came home from a long day at the construction site with a sore back. “I saw the envelope and told my wife I thought we should check it out,” he recalled. “She has always been infinitely supportive of whatever I wanted to do career wise and simply said ‘OK.’” Before long, Nottingham was on his motorcycle heading to Logan to explore his options in the College of Engineering.

He met with then-advisor Kathy Bayn, a first contact who outlined a life-altering journey that would take Nottingham to the top of a major U.S. corporation.

“Kathy and others at USU simply made me feel like I belonged there,” he said. “She told me I could have a degree in engineering in four or five years and made it look very do-able. For the first time ever I thought, ‘Hey I can do this.’ I went home excited and told my wife and said, ‘let’s move to Logan.’ Again, she simply said, ‘OK, let’s do it!’”

The Nottinghams settled in Logan and got accustomed to young student life. Even from the beginning, Nottingham said he felt right at home.



## Jim Nottingham

Vice President for Research and Development, HP

**BS** - '91 Electrical Engineering

**MS** - '93 Electrical Engineering

“I was an Aggie and dang proud of it,” he said. “Of course the workload was insane because I did not have a scholarship, but everywhere I went there were people guiding and helping me with financial aid, jobs, taking the right classes, connecting with tutoring sessions and study groups, and more. My wife got a job at Alphabet Delights making candy, and I worked various part-time jobs while taking classes. We both worked hard and spent time with our little girl, usually taking turns between work and school.”

During the next two years, the couple had a second child, and their routine was going well. “For the first time in my life I was actually working hard and doing well in school because I knew it was a path to a better life.”

By his junior year, Nottingham received a full academic scholarship which allowed him to focus on coursework. “It was all possible because of the support I received from everyone at USU — the staff, my advisor Kathy Bayn, the professors, and the admissions and financial aid office.”

Nottingham eventually graduated valedictorian with a degree in electrical engineering and later earned a master’s in electrical engineering. His early success led to a career at HP in Boise, Idaho, where he

became a vice president for research and development.

His unique Aggie experience culminated in the creation of the Jim and Sherry Nottingham Scholarship Endowment. The generous gift will fund scholarships for students studying electrical, computer or mechanical engineering.

**“My wife and I are passionate about this scholarship. It may sound trivial, but when you feel included and part of something special — like our Aggie family — it makes all the difference in the world. Because of all the opportunities and support we got from USU, I have always felt very compelled to return the favor.”**

## Powering Student Success

Rocky Mountain Power Foundation contributed a \$25,000 gift that will provide scholarships to undergraduate engineering students. The generous donation is one of dozens of gifts the organization has made to USU in the past decade.

“It’s important in our industry that there is a strong pool of qualified, prepared engineers to continue moving the industry forward,” said George Humbert, Rocky Mountain Power director of customer and community management. “Supporting education is one of Rocky Mountain Power Foundation’s core initiatives, and we value opportunities to support this great institution.”



# Evaluating the Pitch

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*MAE's Dr. Barton Smith Takes a Swing at  
MLB's Homerun Problem*

By Matt Jensen

Mechanical engineering Professor Barton Smith is best known for two signature characteristics: he's a baseball fan; and he's skeptical when someone claims to know something with absolute certainty. His Twitter handle, after all, is @NotRealCertain. Smith's reluctance to embrace what others consider final truth makes him an ideal candidate to study one of the most perplexing questions in sports science. It's one that has captivated fans and conspiracy theorists for months: What's behind the increase in home runs in pro baseball?

The "juiced ball" theory — with its double meaning — suggests either the ball itself has been physically manipulated or athletes are using performance enhancing drugs to hit it harder. For Smith and fellow researchers looking for solid answers, the truth is more difficult to pin down. He and colleague Lloyd Smith at Washington State University's Sports Science Lab have been

working together on the problem for about 18 months. So far, they agree on one fact: the overall drag on baseballs is down.

"The majority of drag on a baseball is due to its wake rather than friction on its skin," said USU's Smith. The size and shape of wake can vary substantially from pitch to pitch. As a ball travels through the air, its seam crosses the axis of rotation. In some pitches, the seam may cross the axis two or four times per rotation — the meaning behind the two- and four-seam fastballs. The position of the seam relative to the axis — averaged over the duration of the pitch — affects how air moves around the ball. By changing the orientation of the seam, an experienced pitcher can indirectly change the amount of wake generated behind the ball.

"The physics of a flying sphere are very complicated," said Smith. "Compared to other sports balls,

baseballs are even more complicated because of their raised seam. We're lucky the seam is shaped this way because it makes the game more interesting."

At the recent SABER Seminar in Boston, Smith presented his findings to a group of statisticians and baseball insiders. The takeaway was that seam height affects the formation of wake. Smith and graduate students Andrew Smith and Nazmus Sakib and undergraduate John Garret developed a study to test that theory. They used a specially designed cannon to launch hundreds of professional and collegiate balls into a test apparatus equipped with lasers and a high-speed camera. They found that baseballs used by today's professional teams have lower profile





Mechanical Engineering Professor, Bart Smith

seams compared to older collegiate balls.

Smith argues that baseballs with lower seams, on average, tend to generate smaller wakes compared to high-seam balls. And, reluctant to jump to conclusions, he says his theory isn't perfect.

"Seams can change the drag of the ball, but that effect happens over a narrow range of angles," he explained. "Most of the time, the major league ball and the high-seam ball will be the same. However in certain orientations, their drag characteristics will be very different.

Those orientations don't last very long, but they can still significantly change the aerodynamics of the ball."

Even as Smith presented in Boston, audience members were anticipating a major announcement from Major League Baseball. Just a week before the Boston event, *USA Today* published a story featuring Lloyd Smith, stating that scientists had discovered the "smoking gun" in the juiced ball mystery. The author

speculated that in the coming weeks the league may reveal what's causing the surge in home runs. For now, however, fans are still waiting at the edge of their seat.



# Poise Under Astronomical Pressure

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*Aerospace Composites Firm Relies on Utah State Engineers*

At Brigham City-based HyPerComp Engineering, USU alumnus Jake Walker can be found wrapping composite vessels in endless strands of black carbon fiber. His colleague Tucker Smith, also a mechanical engineering alumnus, is outside testing another vessel to its bursting point in an underground test chamber. Intern Colby Jones, a senior in mechanical engineering, is using what he learned in class to modify the hardware and software tools the team uses every day to build and test these high-tech, high-pressure tanks. The three USU alumni make up HyPerComp's engineering workforce.

The team specializes in designing and manufacturing filament-wound, high-pressure composite vessels for multiple applications with a focus on the aerospace industry. Company owner Daryl Thompson invited us to tour the facility on a day when his crew was wrapping a 14-inch-long plastic vessel designed to store hydrogen for a military drone.

"Battery powered drones work great, but with one of our lightweight tanks, a hydrogen-powered drone could stay aloft much longer," said Thompson. "In a moment of critical need on the battle field, the last thing we want is for an electric drone to run low on power." HyPerComp is revolutionizing the high-pressure vessel market. In the years before carbon fiber, steel tanks were capable of high pressure but at a prohibitive cost: weight. "Any tank can withstand 10,000 psi if it has thick steel walls," said Thompson. "But they weigh a ton! We're making vessels that operate at 10,000 and 15,000 psi that only weigh a few pounds."

HyPerComp even developed a method to wrap plastic vessels, a game-changing technology that was







Photo: Matt Jensen

**Tucker Smith**

BS - '14 Mechanical Engineering  
MBA - '18 University of Utah

**Jake Walker**

BS - '11 Mechanical Engineering  
MS - '17 Mechanical Engineering

**Colby Jones**

BS - '19 Mechanical Engineering

impossible just a few years ago. Once wrapped in the glossy carbon fiber, the finished vessels look like works of art, each with its own pattern of crisscrossing bands of carbon fiber. Filament-wound vessels are ideal for another important reason. If a vessel is struck by debris or bursts due to failure, it will not fragment or send shrapnel into neighboring vessels, a safety feature that makes HyPerComp vessels ideal for the aerospace industry. Tucker Smith, who joined the company in 2014 after an internship, says filament-wound, high-pressure vessels are an elegant solution to complicated engineering problems. "They allow us to store high density energy in a strong, lightweight container," he said. For months, Smith has been leading a project to design and build tanks for a new commercial space vehicle. On the day of our visit,

Smith was testing a vessel through a range of extreme temperatures and pressures.

"You wouldn't believe how many high-pressure tanks are on some of these spacecraft," said Smith. "This one will store nitrogen to re-pressurize critical systems on the launch vehicle. Other vessels serve as accumulators for nozzle steering, and others provide bursts of nitrogen for crew capsule reaction control."

The testing regime was a success thanks in part to intern Colby Jones who painstakingly managed the hot and cold tests for weeks at a time.

"It's amazing what these engineers are capable of," says Thompson. "Each task presents a whole new set of problems, but there's nothing they can't handle."





Amy Jo Moore is paving the way to empower and inspire future women engineers across the globe

## A Running Start: MAE Alumna Sees Early Career Success

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Mechanical and aerospace engineering alumna Amy Jo Moore is making strides at every turn in her career.

Last October she was honored by the Society of Women Engineers, and earlier this year she was the featured speaker at USU's 30th annual Engineering State summer camp.

She was one of 10 young engineers to receive the Society of Women Engineers Distinguished New Engineer Award. She received the accolade at a closing banquet at the group's annual conference and expo in Minneapolis.

Moore graduated from USU with a bachelor's degree in mechanical engineering in 2009 and earned a master's in engineering management from Ohio University in 2013. Today she's the mechanical department manager and a mechanical engineer at Northrop Grumman Corporation at Hill Air Force Base. SWE officials said Moore was chosen for the award for her dedication to the future of engineering through technical leadership in the workplace, her commitment to SWE's mission, and for working to increase female representation in the profession.

### Amy Jo Moore

BS - '09 Mechanical Engineering, Utah State University  
MS - '13 Engineering Management, Ohio University

Moore, a working mother, manages a group of 125 mechanical engineers in Utah and Southern California. She and her team specialize in missile systems.

"I'm excited to receive this award and be honored with nine other amazing women within the first 10 years of our careers," said Moore.

SWE president Penny Wirsing says innovative young leaders like Moore play an important role in the support and advancement of women in engineering.

"The men and women recognized today have broken boundaries in their careers and personal lives," said Wirsing, president of SWE. "They are leaders paving the way to empower and inspire future women engineers across the globe."



# Q&A with Dr. Elizabeth Vargis

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**Hometown:** West Hills, CA

**Position:** Assistant Professor of Biological Engineering

**PhD** - '12 Biomedical Engineering, Vanderbilt University

**MS** - '07 Biomedical Engineering, Vanderbilt University

**BS** - '04 Bioengineering, UC Berkeley

## What motivated you to pursue a career in biological engineering?

My father is a mechanical engineer and my mother is a microbiologist. I grew up working with my dad on projects around the house and learning about diseases and diagnostic tools from my mom. When I started college, I considered becoming a doctor but became more interested in making healthcare more effective and accessible. Now, I make models of the human eye and develop new methods to easily detect bacteria or biomarkers of cancer.

## What challenges have you faced as an Indian-American woman in a predominately white, male profession?

For me, it's a lot of microaggressions, like when my white, male, undergraduate TA is mistaken as the professor of the class or when someone says they'd prefer teaching the engineering courses that don't have as much math. Most of the time I think "I'm going to prove them wrong," but these comments definitely take their toll. Coming home to my kids, who don't currently have these biases, renews my energy to continue facing these challenges so they will face fewer of them in their careers.

## What do you do to push back on gender biases, and how do you recommend others to do so?

I promote myself as much as possible. I keep my website up to date and I'm active on social media professionally. When I accomplish something, I tell my department and college so they can promote it as well. I recommend finding a group of women in similar situations who can support you. You can find them in the Society of Women Engineers, other clubs, your dorm, your classes, workplace, etc.

## Why should women pursue careers in engineering?

Because we need you! We are trying to solve big problems and we need more ideas and better ideas. You already know about the job security and the compensation. But don't pursue engineering only because of that. Be an engineer so you can be a problem solver who helps society.



# Developing Solutions

## for Utah's Rising Water Management Crisis

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Photo: Matt Jensen

From left, USU graduate student Yesica Leon, Assistant Professor Belize Lane, and graduate students Jesse Rowles and Madison Alger. Lane and her team are studying the hydrological and ecological consequences of altering the flow of rivers and streams across the Western U.S.



## *Civil and Environmental Engineering Researchers are Developing Coupled Human-Natural Water Management Methods in Utah*

By Carson Wolf

According to a 2014 household survey, Utahns are expressing rapidly growing interest in protecting water resources for outdoor recreation and environmental benefits.

Limited freshwater resources in the Western U.S. are under increasing pressure and uncertainty from population growth, climate change and shifting societal values. To more efficiently manage these resources for humans and ecosystems, USU's Belize Lane is developing methods to measure, model and allocate scarce water resources during the dry summer dry season when water is most needed for humans and river ecosystems. Lane is an assistant professor in the Department of Civil and Environmental Engineering. Her focus is hydrology and river basin management and, most recently, the development of tools that support coupled human-natural water management. She has received multiple research grants in the last five years.

In California, Lane is leading a multi-million dollar, multi-university project to develop in-stream flow standards for California's rivers and streams. This research is informing reservoir operations and water withdrawals to better balance critical human water needs with sensitive aquatic ecosystems.

Building on that effort in Utah, Lane is now examining how water temperature and aquatic ecosystems respond to changes in streamflow from irrigation diversions and return flows in lowland agricultural streams. In June, she and a group of graduate students placed water temperature sensors and streamflow gauges along the



Blacksmith Fork River in Cache County. The data will help Lane and her team better understand how river diversions and irrigation efficiency projects impact water temperature and temperature-sensitive aquatic species during hot summer months.

Lane received two grants from the United States Geological Survey to fund the research. The grants also support intensive field-based pilot studies to help inform sustainable water management practices and systems in Utah. She says part of her objective is to work with municipalities, non-profits and water districts to develop science-driven local solutions to Utah's mounting water management challenges.

**“Western water management is fundamentally about trade-offs, but there are often ways to manage systems to benefit both humans and ecosystems,” she said. “This research also highlights the potential unintended consequences of irrigation efficiency projects that reduce summer critical return flows to streams.”**

By better understanding the ecological consequences of flow and water temperature alterations, Lane's research can more accurately assess trade-offs between water uses to support sustainable coupled human-natural water management.

# Leading by Example

*College of Engineering Welcomes Four New Administrators*

**Dr. Ning Fang,  
Department Head,  
Engineering Education**

Fang brings more than 20 years of industry, government and academic experience to one of USU's most active academic departments. He served as program director in the Division of Undergraduate Education at the National Science Foundation and, before joining USU in 2001, worked for the Ford Motor Company in Michigan.

**Dr. David Tarboton,  
Director, Utah Water  
Research Lab**

Tarboton first joined USU's Utah Water Research Laboratory and Department of Civil and Environmental Engineering in 1990. He is a renowned water resources engineer and hydrologist and has graduated 25 MS and PhD students at USU. He has authored more than 80 research manuscripts and is a Fellow of the American Geophysical Union.

**Dr. Keith Roper,  
Department Head,  
Biological Engineering**

A bio-industry veteran, Roper developed vaccines and anti-cancer drugs. He is a fellow of the American Institute for Medical and Biological Engineering and is president-elect of the Institute of Biological Engineering. He also served as program director for NSF's Engineering Directorate. He has published 89 manuscripts and holds three U.S. patents

**Dr. Zhongquan  
"Charlie" Zheng,  
Department Head,  
Mechanical and  
Aerospace Engineering**

Zheng leads one of USU's largest departments. He is a renowned expert in aerodynamics, computational fluid dynamics, aeroacoustics and biofluid dynamics. He has published 62 research studies and is a fellow of the American Society of Mechanical Engineers. Before joining USU, Zheng taught at University of Kansas.

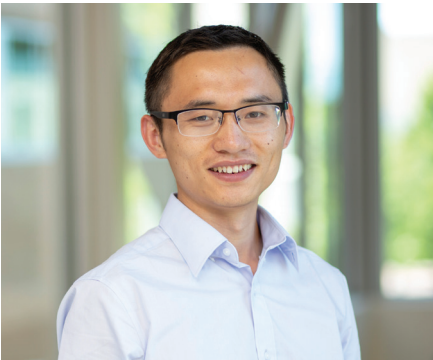




# New Faculty and Staff



**Abhilash Kamineni**  
Electrical and Computer Engineering



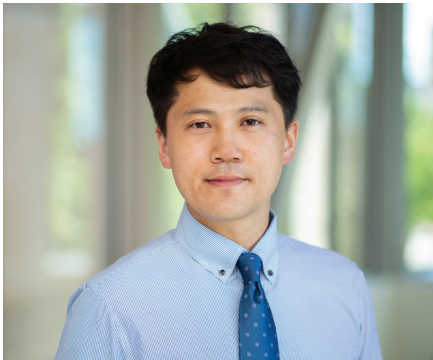
**Hongjie Wang**  
Electrical and Computer Engineering



**Som Dutta**  
Mechanical and Aerospace Engineering



**Matt Harris**  
Mechanical and Aerospace Engineering



**Juhyeong Lee**  
Mechanical and Aerospace Engineering

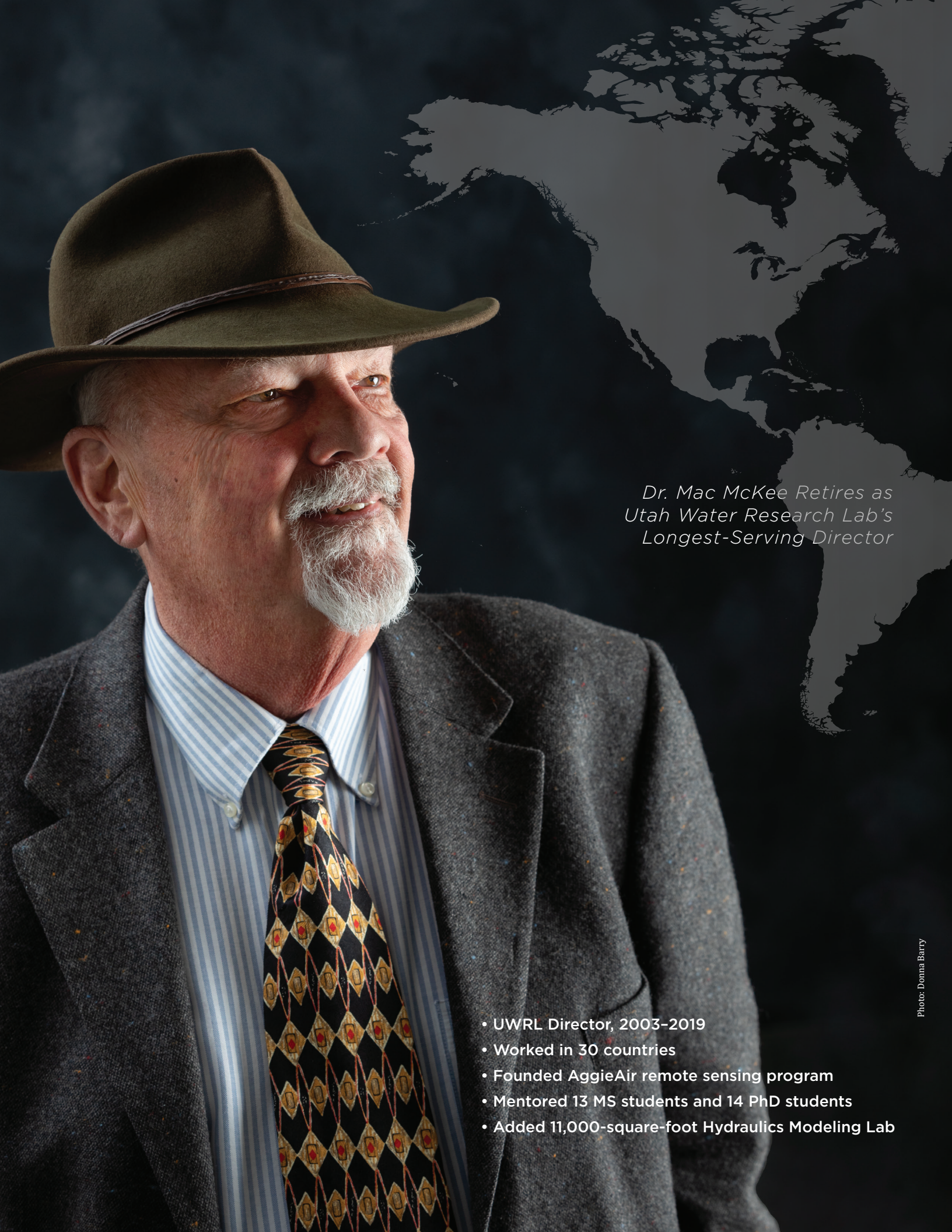


**Sierra Browning**  
Academic Advisor



**Valerie Daines**  
Academic Advisor





*Dr. Mac McKee Retires as  
Utah Water Research Lab's  
Longest-Serving Director*

- UWRL Director, 2003-2019
- Worked in 30 countries
- Founded AggieAir remote sensing program
- Mentored 13 MS students and 14 PhD students
- Added 11,000-square-foot Hydraulics Modeling Lab



# A Global Influencer

The people who work and study at the Utah Water Research Lab will remember outgoing director Mac McKee in many different ways.

Some will remember his famous email signature line — six bullet points that summarize the career of a water resources engineer. Number three on the list warns that time and resources available for most projects are usually insufficient. “So suck it up and deal!” writes McKee, his unmistakable sense of humor and administrative style coming through in every email he sends.

Others will remember McKee’s thoughtful consideration of Water Lab personnel and the way he offered help when trouble or tragedy struck.

**“He cares about people,” says longtime Water Lab staff member and McKee’s administrative assistant Jan Urroz. “He’s always been very fair. From the tenured faculty to the hourly custodians, you can tell he cares about people. He always offers a listening heart.”**

And others will remember McKee as a tireless champion of the importance of water resources to modern society. A self-described “concrete and rebar engineer” by training, McKee ushered the Water Lab through 16 years of change and growth. He led global research,

created new jobs and added 11,000 square feet of research space to the UWRL campus.

**“Mac has always been a forward-thinking person who appreciates new ideas and who pushes the boundaries to make things happen,” said fellow water resources professor and Dean of the College of Engineering Jagath Kaluarachchi. “He’s a confident leader who took a visionary risk to ensure the Water Lab’s position as a leading research institution.”**

McKee financed the construction of a second hydraulics lab without state or university funding and paid off the loan with money generated from new contracts.

“That was a bold move,” said Kaluarachchi. “He successfully paid off the loan ahead of time and demonstrated that unimaginable tasks are possible at this university.”

In addition to the hundreds of research efforts he directed at the lab and the work he performed in 30 countries, McKee will likely be remembered as the founder of AggieAir, USU’s premier unmanned aerial vehicle remote sensing program.

Today, AggieAir is one of the most prominent remote sensing platforms in the country. This summer AggieAir researchers teamed with NASA for a high-profile test of autonomous aerial

vehicle traffic in Reno, Nevada.

“By combining scientific data collection and processing with autonomous flight methods, Dr. McKee has made a substantial contribution to remote sensing,” said Cal Coopmans, assistant professor of electrical engineering and director of the AggieAir program. “He has shown how scientific aerial sensing can help improve farming and conserve water resources in the 21st century.”

Research played a central role in McKee’s career, but colleagues are quick to highlight his unwavering commitment to the success of his students.

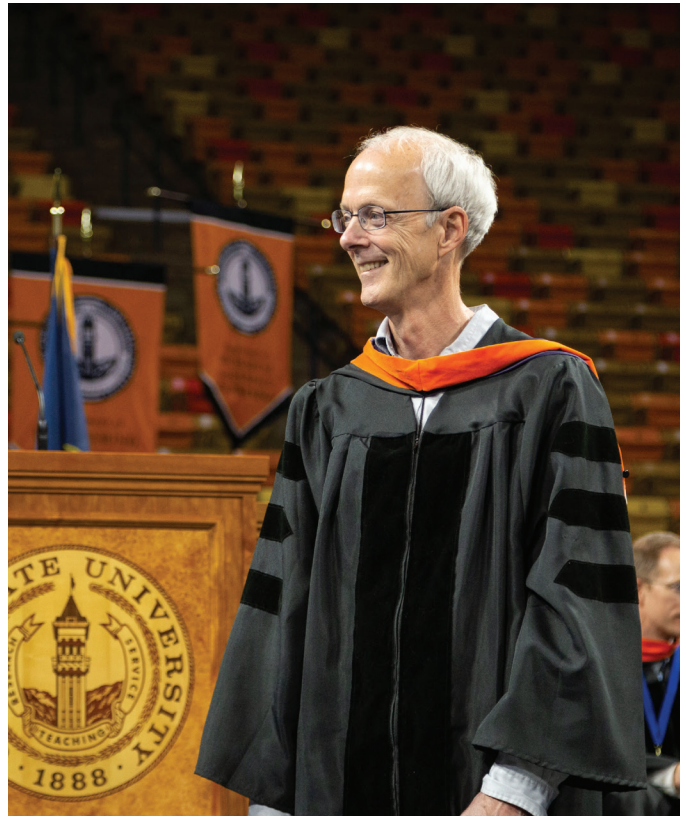
“He’s mentored students like I’ve never seen,” said Urroz. “There was a time when one of our faculty had to leave, and Mac took on all those additional students. All this while he had his own students and research program to take care of. Mac was the one who said, ‘I’ve got to be there for those students and I’m going to see them through.’ They all finished their PhDs and went out into the world and did wonderful things.

“I hear it over and over again: He makes everyone’s job easier because of his work ethic and his style of management. He makes everyone else’s job easier because he’s a man of his word. He follows up on everything he says he’s going to do.”

# A Farewell to Our Mentors

**Dr. Robert Spall,**  
Professor and Department Head,  
Mechanical and Aerospace Engineering

Spall joined Utah State University in 1996. He served as an associate professor, and was promoted to the head of the MAE department in 2013. Colleagues say Spall created a department where people could succeed. “The state of Utah has never had an individual guard the interest of the state and the university as well as Dr. Spall,” said Thomas Fronk, an associate dean in the College of Engineering. “He created a well-ordered, high functioning department, and he is well respected by all of the mechanical and aerospace engineering faculty.”



**Dr. Gilberto Urroz,**  
Associate  
Professor, Civil  
and Environmental  
Engineering

Urroz began his career in 1988 at a time when USU had 9,000 students. He taught many courses including fluid mechanics and hydraulic design and served as faculty advisor to the ASCE, SHPE, and TBP student chapters.



**Dr. Steve Folkman,**  
Associate Professor,  
Mechanical  
and Aerospace  
Engineering

Folkman departs with 29 years of service to USU. He devoted much of his research efforts at the Buried Structures Lab and Space Dynamics Laboratory. Colleagues say Folkman provided years of quality instruction throughout the hundreds of courses he taught.





## Society of Women Engineers

Utah State University's student section of the Society of Women Engineers, or SWE, started in 1976. Today the organization offers its nearly 70 members a range of opportunities in community service, outreach, mentorship and industry networking.

SWE encourages members to achieve their full potential as engineers and engineering leaders, expand the image of the engineering profession and demonstrate the value of diversity on campus and in the workplace.

Last fall, USU's section was center stage at SWE's annual national meeting and career fair at the Minneapolis Convention Center. The event is the largest conference and expo for women engineers.

An estimated 15,000 people were in attendance. Students attended guest speaker presentations and workshops on professional development, career advancement and team building. Participants also

connected with prospective employers at SWE's massive career fair. Companies including Boeing, 3M, Apple, Uber, BASF, Dow Chemical and other industry giants were on hand to review resumes and interview attendees.





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College of Engineering  
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## Sharing Her Story



The College of Engineering is proud to commemorate the 150th anniversary of women's suffrage in Utah and to recognize the accomplishments and leadership of its women alumnae, students, faculty and staff. Read their stories online.



YEAR OF THE  
**woman**