

FORESIGHT

UW COLLEGE OF ENGINEERING AND APPLIED SCIENCE

Fall 2017, Volume 43, No. 1

A Global *Reach*

Professors of Practice:
Going Back To School

A Shifting Landscape





COLLEGE OF
**ENGINEERING &
APPLIED SCIENCE**

UNIVERSITY of WYOMING

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“

I love that the college has so many opportunities to get involved in research and gain practical insight. I started participating in research my freshman year and I think it is really cool that students gain **TANGIBLE EXPERIENCE IN ENGINEERING CONCEPTS**, learned in and out of the classroom. ”

— Aisha Mohammed
Electrical Engineering '18

WHAT CAN A DEGREE FROM UW DO FOR YOU?

The College of Engineering and Applied Science is a nationally recognized institution of academic excellence and world-class research. Rewarding and dynamic careers await individuals who graduate from one of our areas of study. Find opportunities to learn alongside industry professionals and renowned faculty by developing real-world projects.

54%

of UW students graduate with **little to no debt.**

\$59K

average **starting salary** for our graduates



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On the cover: Computer Science Professor of Practice Mike Borowczak instructs students in a course about cybersecurity. He is one of several Professors of Practice in the college who are lending industry expertise to the curriculum.

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The University is committed to equal opportunity for all persons in all facets of the University's operations. All qualified applicants for employment and educational programs, benefits, and services will be considered without regard to race, color, religion, sex, national origin, disability or protected veteran status or any other characteristic protected by law and University policy.

Our Impact Spans The Globe

Something I've come to realize in my time working here is that the College of Engineering and Applied Science is about so much more than theory and classwork.

Obviously, the CEAS produces high-quality graduates. Thanks to a rigorous curriculum and top-notch faculty and staff who truly care, our students go on to achieve amazing things in industry and academic settings. But have you ever stopped to think about all the people in our state and nation whose lives are positively affected by our students, faculty, staff and graduates?

That's clearly hard to measure—yet it's quite evident, as you'll see in the pages of this magazine.

Our college does a great job of building relationships between other institutions, across state and even national lines. The connections span the globe as our graduates move on to work in nearly every major industry. Our alumni bring it full circle by giving generously to our enrichment funds for students, serving as mentors and by simply spreading the word about the amazing programs offered here.

And without fail, many of our former students return to the college for visits and opportunities to share their stories. A common thread among those visits is the powerful and lasting connections they made here at UW. That's one of the best legacies our college can offer.

Sincerely,



Andy Chapman
Editor, *Foresight Magazine*



Stay tuned for the winter issue of *UWyo Magazine*, a special edition devoted to the UW strategic plan!

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Message from Dean Michael Pishko

When I arrived in 2015, I wanted to ensure that our college would never stop striving to be better. I wanted to improve our facilities, educational opportunities, outreach and state connections. I'm pleased to say that we've worked hard in these areas and many others and have made great progress.

It has been an eventful time in the college over the last few months. I want to emphasize my appreciation for all the efforts of our staff, faculty and students. Before I took over, I had a feeling that Laramie and the University of Wyoming were special, and in my time as the leader of the CEAS, that has been proven true time and again.

There are so many things to which I look forward. I encourage you to check out the substantial progress that we've made on the Engineering Education and Research Building, which can be seen on page 23. The recently opened High Bay Research Facility and the Coe Student Innovation Center are more great examples of how we're moving forward with our Tier-1 goals.

The journey isn't over by any means, and we have to stay focused on providing world-class education and research for the benefit of our state and nation. But rest assured, the quest to be better is well under way.



Dean
Michael Pishko

First-place honors for alumnus



Stan Grad (front left, white shirt and white cowboy hat) poses for a photo with the Soderglen Ranches horse-pull team at the Calgary Stampede in July 2017. (Courtesy Stan Grad)

UW engineering alumni Stan Grad (petroleum engineering, 1968) and his Soderglen Ranches team took home first-place honors in July at the Calgary Stampede rodeo in the Heavy Horse Pull event. The Calgary Stampede Heavy Horse Pull is Canada's premier pulling

competition, with teams arriving from across North America to vie for top honors. Teams in three different weight classes pull more than five times their body weight a distance of 14 feet. Grad's horse team, Simon and Tommy Boy, won the middle-weight competition.

NEWS & NOTES

RMPF Provides Financial Support to Engineering Event



The College of Engineering and Applied Science (CEAS) Senior Design Symposium will once again be supported financially by the Rocky Mountain Power Foundation.

The Rocky Mountain Power Foundation (RMPF), the philanthropic arm of Rocky Mountain Power utility company, has generously pledged \$5,000 for the event at the University of Wyoming. In 2016, the foundation awarded more than \$1.2 million to

local nonprofit organizations. The CEAS has been supported by Rocky Mountain Power since 1991.

The annual design symposium, hosted every December, allows seniors in the CEAS to display their research and design projects for a panel of judges. The projects encompass areas of education and research in the CEAS including chemical engineering, civil and environmental engineering, electrical and computer engineering,

mechanical engineering and petroleum engineering.

"The college is so grateful for the continued support of our Senior Design Symposium by the Rocky Mountain Power Foundation," CEAS Associate Dean Steve Barrett says. "The symposium provides students the opportunity to present their capstone design work to faculty, staff, family and fellow students. It is the culmination of their entire undergraduate program."

Combustion Research Conference Features UW, Other Top Institutions

Faculty from some of the top universities in the nation were in Laramie for the fall 2017 technical meeting of the Western States Section Combustion Institute (WSSCI), hosted by Assistant Professor of Mechanical Engineering Erica Belmont at the University of Wyoming in October.

"This event brings together researchers in combustion and related fields to share their work, network and form collaborations," she says. "It's a wonderful chance to highlight UW's research in this area and showcase our university."

Representatives of institutions such as San Diego State, Caltech, University of Colorado, Oregon State and Brigham Young attended.



Assistant Professor of Mechanical Engineering Erica Belmont, left, and Ph.D. student Emily Beagle examine biomass materials.

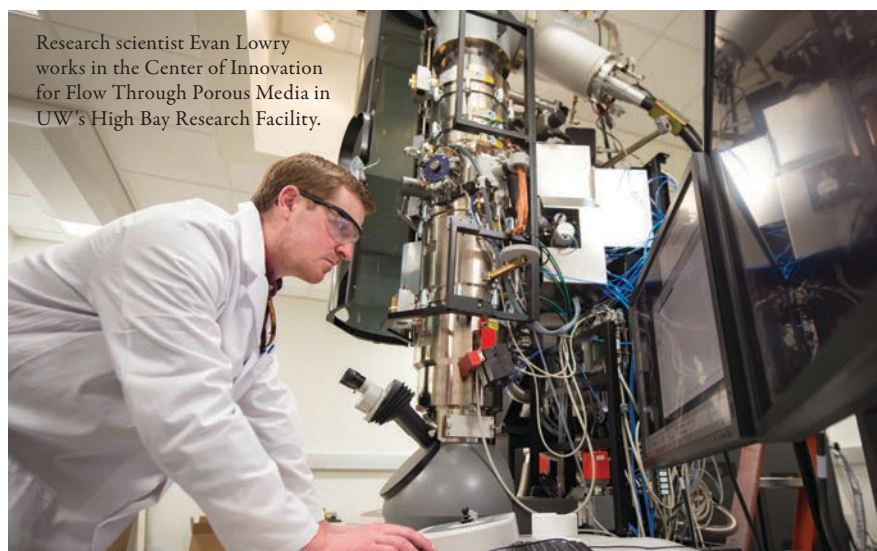
Sponsors for the UW event include Tri-State Generation and Transmission Association Inc.; Cloud

Peak Energy; School of Energy Resources; and the UW College of Engineering and Applied Science.

Petroleum Engineering Recognized for Excellence in Graduate Program

The Department of Petroleum Engineering at the University of Wyoming was recognized as one of the top institutions in which to pursue a master's degree in a recent article by a national publication. A story on the Huffington Post news website lists UW among its top petroleum engineering programs for graduate students. UW is among the best schools mentioned, including Stanford, Texas A&M and Penn State.

The article details how a drop in energy prices has reduced the



workforce around the globe. But with forecasts predicting a rise, drilling activity and employment in the energy sector soon will be on the upswing.

That means having more education will benefit job seekers, as institutions such as UW have connections to the major companies in the oil and gas market.

Civil Engineering and WYDOT Collaborate on I-80 Safety Research

Driving on Wyoming's Interstate 80 can often be precarious, but thanks to a pilot study conducted at the University of Wyoming, that journey could be safer in the near future.

The UW Driving Simulator Laboratory, housed in the College of Engineering and Applied Science, will be the proving ground for a study conducted by both the Wyoming (WYDOT) and United States Departments of Transportation. The research involves connected vehicle pilot testing for WYDOT snowplows and Wyoming Highway Patrol vehicles in an effort to make all vehicles safer.

I-80 is an essential east-west connector for commercial vehicles, carrying more than 32 million tons of freight each year, according to WYDOT. The technology installed in the vehicles will enable vehicles to communicate with one another and WYDOT, providing real-time information regarding weather, road conditions and hazards.

"The connected vehicle will just provide warnings to drivers. (Drivers) are still in full control," says Assistant Professor Mohamed Ahmed, who also serves as the director of the UW Driving Simulator Laboratory for the

Department of Civil and Architectural Engineering. "There is no automation in it, but it will provide a 360-degree situational awareness."

Before the technology can be deployed, it's undergoing testing at UW. In the lab setting, test subjects will be put in real-life situations to test their responses and reactions and gauge effectiveness of the connected vehicle technology.

Study personnel say that while the technology isn't yet widespread, drivers will benefit from the pilot study due to improved information for all vehicles on the roadway.

NEWS & NOTES

Engineering Summer Program Kicks Off 30th Year

For one week every June, high school students from across the country get to experience the world of engineering at the University of Wyoming. It's all made possible by the annual Engineering Summer Program (ESP).

The program is supported by the College of Engineering and Applied Science (CEAS), the J. Kenneth Kennedy and Patricia Powers Trelease Kennedy ESP Endowment, Kester Funding, Union Wireless and Halliburton.

"We've found that lots of students really have no idea what engineers do or what kind of careers and job opportunities exist," says Jeff Anderson, director of the Engineering Summer Program. "They often do not realize that engineering affects nearly all aspects of our lives, so we try to show them that."

Established in 1988, the program is open to high school juniors from anywhere in the nation. The state of Wyoming is well represented, and participants have come from Colorado, Nebraska, Minnesota, South Dakota, Arizona, Idaho, Maryland, Virginia, California, Montana, Pennsylvania, New Jersey and Utah in recent years. While participating in the program, students receive hands-on experiences in various engineering fields, stay in residence halls and eat at UW's Washakie Dining Center, making for an experience that prepares them for college life.

This year, 36 students attended

the program to learn about a wide range of subjects. Electrical engineering topics included microcontrollers, communications, electric motors and robotics. Students conducted experiments with a weather balloon to learn more about atmospheric investigations.

Classes are available in computer electronics and computer science, wherein attendees learn basic programming skills to create movies and simple video games with 3-D objects and characters. Classes are also offered in biomaterials, composite materials, solar energy and architectural engineering.

"When they participate in these classes, they see what engineers do," Anderson says. "They learn about many great career opportunities available for engineers. They enter college with a better focus on their studies and a better perspective of career goals."

Classes are taught by engineering faculty and graduate students. The attendees decide what they want to focus on and attend morning and afternoon sessions. In the evening, there are campus tours and visits to CEAS labs to talk to researchers.

While ESP doesn't feature specific petroleum and chemical engineering classes, students still learn about the industry. Thanks to support from Halliburton, a prominent oilfield



Engineering Summer Program students Spencer Swift (left) and Briley James examine technology in a UW lab.

service company, participants have the opportunity to tour Halliburton's equipment yard and laboratories.

"We are proud to support the Engineering Summer Program," says Cindy Bigner, Halliburton's senior director of corporate affairs and diversity initiatives. "It is important that we work closely with educators to introduce students to the many potential careers in engineering. Giving these students the opportunity to see engineers at work can only help them and the industry in the future."

Union Wireless has provided generous support for ESP. The company provides several scholarships for ESP participants, funding for classroom supplies and the closing reception breakfast for participants and their families.

"Quite honestly, the program wouldn't exist without the sponsors," Anderson says. "We extend our sincere thanks for the support because we really couldn't do it if any of the main sponsors pulled out. It would really hurt the program. We appreciate what they do and the sacrifices they make for us."

NOTABLE

UW Research Aircraft Showcased At Frontier Days

The University of Wyoming's research aircraft was a popular attraction for attendees of the Wyoming National Guard open house for the 2017 Cheyenne Frontier Days celebration.

UW's King Air was on display at the event July 26 at the 153rd Airlift Wing of the Wyoming Air National Guard. The King Air (tail number N2UW) is a specially instrumented Textron Beechcraft King Air 200T (twin engine turbo-prop) modified specifically to conduct atmospheric research.

The King Air was available to the public for tours, along with other research facilities supported by the National Science Foundation, with facility staff on hand to answer questions about the aircraft. There was a large turnout for the aircraft display, with attendees consistently interested in touring the King Air and learning about its research instrumentation, along with the university's involvement in the atmospheric science research community.

Attendees of the Wyoming National Guard open house event check out the UW King Air research aircraft. (Courtesy Sgt. 1st Class Jimmy McGuire)



University of Wyoming Assistant Professor of Civil and Architectural Engineering Kevin Befus

led a groundwater study that explored how Earth's groundwater resources contain water from the deep hydrologic past. Befus recently joined the Department of Civil and Architectural Engineering at UW and leads the groundwater hydrology group.

Befus and his collaborators calculated how much groundwater available today was replenished before the peak of the last ice age, more than 21,000 years ago, and how changing climate since then could cycle the groundwater storage. The title of the study is "The rapid yet uneven turnover of Earth's groundwater," published in the journal *Geophysical Research Letters*.

An accomplished teacher who has high expectations and the ability to raise students' performance to match those expectations is a recipient of a top teaching award

at the University of Wyoming. Paul Dellenback, an associate professor in the Department of Mechanical Engineering, is one of three recipients of the John P. Ellbogen Meritorious Classroom Teaching Award, established in 1977 by businessman John P. "Jack" Ellbogen to "foster, encourage and reward excellence in classroom teaching at UW." This year's other winners are Eric Moorhouse, a professor in the Department of Mathematics, and Yan Zhang, a senior lecturer in the Department of Modern and Classical Languages.

Dellenback regularly teaches "Thermodynamics I," "Thermodynamics II" and "Gas Turbine Engines," in addition to serving as the associate dean for advancement in the College of Engineering and Applied Science (CEAS).

The College of Engineering and Applied Science earned accolades as Ryan Kobbe and Len Lutz each were honored for outstanding first-year instruction.

Kobbe, an associate professional lecturer in the Department of Civil and Architectural Engineering program, and Lutz, an academic professional lecturer in the CEAS Dean's Office, each received the PIE award (Promoting Intellectual Engagement in the first year). The award recognizes faculty who inspire students intellectually in first-year courses and is sponsored by several programs within both academic and student affairs: the Ellbogen CTL, Advising • Career • Exploratory Studies Center, Residence Life and Dining, and the LeaRN Program.

students **in** action

Petroleum Engineering Student Lands Valuable Internship

Armed with the confidence that comes from a University of Wyoming education, Juan Acosta landed a valuable internship with an established company this summer.

Acosta, a petroleum engineering student, earned a hands-on education with a regional oil and gas technology company, Colorado Engineering Experimental Station Inc. (CEESI). It is the world's largest commercially available gas-flow test facility and is located in Nunn, Colo., about 80 miles southeast of Laramie. Originally from Bogotá, Colombia, Acosta will be a senior this year at UW and says he chose UW because of its excellent petroleum engineering program.

"So far at CEESI, I have gotten to learn a lot and it is incredible how people have been there for me to help me adapt to a new environment," Acosta says of the experience. "There are many skills that I have gained working here like managing my time, organization, improving my problem-solving skills, as well as working with different programs and projects."

CEESI's employees saw Acosta's potential almost immediately.

"Juan interviewed for the internship in May and immediately impressed us with his eagerness to learn and his eagerness to work," CEESI engineering staffer Eric Harman says. "His UW course load is impressive, and he has impressive grades to match. On the first day, Juan showed up ready to work."

His early impression at the company

was strong, as he developed a customized plotting program that can interface with the company's software. Throughout his time in the internship, Acosta says he improved his understanding of how gas and oil flow and function together.

"I think the biggest benefit of my UW education as it relates to this internship was strong time management," Acosta says. "As a student with a job, I always had to make sure I could handle both things and still have time for myself. My classes in chemical and petroleum engineering also were very important for this experience with a company that has a principal function of testing and

calibration of meters that work with oil and gas."

Thanks to a strong showing of work ethic and knowledge, Acosta will have the opportunity to do more work with the company in the future.

"If we can persuade Juan to work with CEESI this fall during his senior year, he will be a part of the team that is developing a physical model linking flow turbulence to ultrasonic metering errors in custody transfer measurement," Harman says. "We are lucky to have Juan, and I hope CEESI can hire more UW interns in the future."



New Mentoring Program For Women in Engineering, Computer Science



A program aimed at forming connections between experienced female engineers and student counterparts is under way in the University of Wyoming's College of Engineering and Applied Science (CEAS).

The CEAS Female Mentor Program was created by K-14 Outreach Coordinator Teddi Freedman. It features five mentors, all of whom are UW alumnae, who work in industry and will offer advice and guidance to CEAS students. The mentors in the program include Robin Hill,

Sherrie Merrow, Christie Roberts, Jera Schlotthauer and Amy Sharpe.

The mentees involved in the program are sophomore, junior and senior undergraduates, and include Eloise Fadial, Damiana Murdock, Reenu Paul, Hannah Vehige and Annaliese Fitzsimmons.

"It has been an exciting process to develop and now implement this program with support from the college," Freedman says. "I am especially grateful to our participating alumnae who have demonstrated outstanding leadership at UW and within their own communities. I look forward to supporting our mentees and mentors over the course of the year and to witnessing their success and growth together."

Outreach Ambassadors

The CEAS has announced the students who will serve as K-14 Outreach Ambassadors for the 2017-18 academic year. The students chosen for the program are Chris Rumble, Moriah Miller, Nicholas Whites, Sara Bashir, Mike Tran, Aisha Mohammed, Emily Beagle, Annaliese Fitzsimmons, Holly Beiko and Thomas Bruton.

The individuals will receive a scholarship of \$1,000 and are required to dedicate 30 hours of outreach per semester and 60 over the course of the academic year. Their duties are diverse, including visiting classrooms throughout the state, hosting student groups on campus and helping with competitions hosted by UW, including MathCounts, TEAMS and Engineers Week.

Accomplished Engineering Student Named Scholar Athlete of the Year



University of Wyoming College of Engineering and Applied Science student Audra DeStefano was named the 2016-17 Mountain West Conference

Women's Scholar Athlete of the Year.

DeStefano, a master's student in chemical engineering, capped an extraordinary athletic career for the Cowgirl track and field and cross country programs in 2017. A native of Gillette, DeStefano is the second Cowgirl to receive the prestigious award since the Mountain West incorporated in 1999.

"I was surprised, but honored, to win the award," she says. "There are a lot of exceptional student-athletes in our conference, so to be selected as the scholar-athlete of the year says a lot about the support systems and opportunities available to students at UW."

DeStefano stands as one of the most decorated student-athletes in UW

history. She was an eight-time selection to the Academic All-Mountain West team between track and field and cross country, and was named a MW Scholar Athlete eight times between two sports. She was a four-time U.S. Track & Field and Cross Country Coaches Association All-Academic individual and was named to the Collegiate Sports Information Directors of America 2016-17 Academic All-District® Women's Track and Cross Country First Team.

"It's her internal drive, hard work and top-notch time management skills that allow her to be successful," Chemical Engineering Assistant Professor Katie Li says. "From where I see it, she balances her academic and athletic career by simply putting in the hours, with a laser focus, driven by her ambition for both."

DeStefano has volunteered by reading to and mentoring children at elementary schools around the state, doing volunteer electrical work with Habitat for Humanity in her hometown

of Gillette, and assisting in various service efforts on campus and around Laramie. In 2016-17, she served as the Front Range Liaison for Tau Beta Pi. Her graduate-level research recently was accepted for presentation at the 2017 International Conference on Membranes in San Francisco, Calif.

The MW Scholar Athlete of the Year Award is annually presented to one male and one female who best exemplify the term 'student-athlete' by achieving excellence in academics, athletics and community involvement. Candidates must own a 3.5 cumulative GPA, demonstrate leadership, and display good character both in athletic competition and off the field.

"As far as success in the classroom and on the track, distance running and engineering school are very similar in that consistency in time management and a positive attitude go a long way, along with supportive peers and mentors and a little luck," DeStefano says.

faculty **in** action

UW Catalysis Research Featured In International Journal

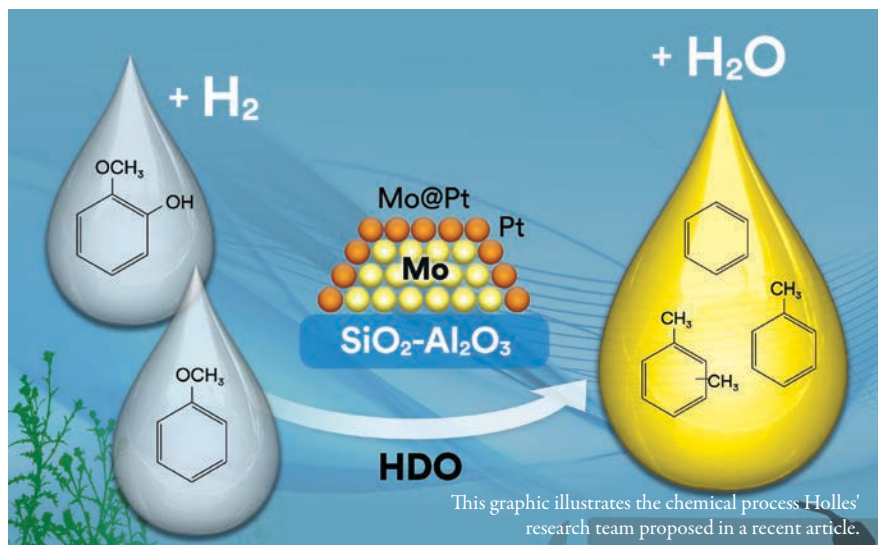
The research of University of Wyoming Associate Professor Joe Holles and his team was highlighted by an international scientific journal.

The article titled “Mo@Pt overlayers as efficient catalysts for hydrodeoxygenation of guaiacol and anisole” was featured in the publication and as the back-cover graphic in volume 7, issue 15 of the scientific journal, *Catalysis Science & Technology*. The publication is a leading international journal on cutting-edge developments across the catalysis science community, focusing specifically on fundamental science and technological aspects of catalysis.

Holles teaches in the Department of Chemical Engineering in the College of Engineering and Applied Science. The research was conducted by recent Ph.D. recipients Qinghua Lai and Chen Zhang.

“We are seeking to improve the process for converting plants into fuels,” Holles says. “The use of the bimetallic overlayer structure has been shown to predictably and controllably modify the electronic behavior of the catalyst for this reaction leading to more efficient fuel production.”

The broad focus of the work is improved catalysts for the production of fuels and chemicals from biorenewable sources. The research detailed in the article deals with developing improved catalysts for the hydrodeoxygenation (HDO)



of guaiacol and anisole to benzene, toluene and xylene (BTX). Guaiacol and anisole are two typical compounds produced via fast pyrolysis of lignin (from plants). Due to their aromatic ring and low oxygen content, these two compounds are attractive candidates for conversion into fuels and chemicals. However, the remaining oxygen must be removed from these molecules before they can be used as renewable fuels. In order to produce fuels, hydrogen is used to remove the oxygen from the molecules.

Lai, a postdoctoral researcher in the department and lead author of the publication, says a strong interaction between the catalyst metal site and the reactant (guaiacol or anisole) has been shown to block the reactive site and inhibit the activity for platinum (Pt) catalyzed HDO.

“Thus, our goal was to prepare well-designed catalysts with slightly modified Pt binding properties while retaining other desirable Pt properties,” he writes.

The research group has previously shown that bimetallic overlayer core shell catalysts are effective tools for small, controlled changes in catalyst binding behavior. For the guaiacol/anisole case, an overlayer of Pt approximately one atom thick is deposited on a molybdenum (Mo) base metal particle producing a Mo@Pt catalyst. The Mo will slightly withdraw electrons from the Pt and as a result, decrease the binding strength which should result in improved HDO activity.

When the experiments were complete, Lai reported the hypothesis was confirmed by the experimental results.

UW's Ogden Named Senior Scientist to National Water Center



Fred Ogden, left, sets up a water distribution system. (Courtesy Fred Ogden)

Two years ago, Fred Ogden took a sabbatical to conduct hydrology research at the National Water Center in Tuscaloosa, Ala. He received research and development funding in exchange for the center harnessing the University of Wyoming researcher's water management model.

For the 2017-18 academic year, Ogden will again work at the center, with the title of senior scientist. Ogden, a professor in the Department of Civil and Architectural Engineering, will be on unpaid leave from UW.

"I will advise and guide them on water model research development, training and education. They (National Water

Center) are paying my salary," says Ogden, who is UW's Cline Endowed Chair of Engineering, Environment and Natural Resources. "It's a great opportunity for a faculty member to go do something different and participate in an effort that will benefit the nation."

The water center—affiliated with the National Oceanographic and Atmospheric Administration (NOAA) National Weather Service—has used portions of the ADHydro Model developed by Ogden's research group at UW. ADHydro is a quasi-3-D, large watershed simulator. The model was developed for computer operations on massive parallel computing hardware to efficiently simulate large managed watersheds. ADHydro development was funded by the National Science Foundation and Wyoming's Established Program to Stimulate Competitive Research (EPSCoR).

Ogden's model is compatible with the WRF-Hydro model but provides higher resolution that will improve flood forecast modeling as storms move across the country. Unlike many other models, ADHydro includes water management capabilities. That is important to the water center, because it is running a water model over the entire U.S. and is looking for ways to improve it through Ogden's expertise and knowledge.

Ogden, who is working with a team of roughly 100 people, surmises his senior scientist appointment came as a result of showing the water center what he and his associates were able to do with the water model—and the relationships Ogden established during his sabbatical year at the water center.

"The thinking for this summer innovation program is that we want to offer a real-world opportunity," Ogden says.

Faculty Member Contributes to Research that Suggests Rainier Future

A University of Wyoming researcher played a key role in a new study that suggests that most global climate models may underestimate the amount of rain that will fall in Earth's tropical regions as the Earth continues to warm. That's because existing models underestimate decreases in high clouds over the tropics seen in recent NASA observations.

"Global climate models need to represent many complex processes in order to predict future climate," says Zhien Wang, a UW professor in the Department of Atmospheric Science and the Templeton Faculty Fellow. "Part of the processes control cloud and precipitation formation, which are not fully understood and represented in climate models; and introduce uncertainties in predicted future climate as the Earth continues to warm."

The new study, titled "Tightening of Tropical Ascent and High Clouds Key

to Precipitation Change in a Warmer Climate," was published in June in *Nature Communications*, an open access journal that publishes high-quality research in biology, physics, chemistry, Earth science and all related areas.

Hui Su, a scientist with NASA's Jet Propulsion Laboratory at the California Institute of Technology in Pasadena, Calif., was the paper's lead author. Wang was one of the paper's co-authors. Other contributing authors were from UCLA, Ewha Women's University in Seoul, South Korea, and the Division of Geological and Planetary Sciences at the California Institute of Technology.

Regional precipitation changes accompanying anticipated global warming could exert profound impacts on ecosystems and human society, making the need for more accurate global climate models crucial and necessary, according to the paper.



Professor Zhien Wang co-wrote a paper about global climate models.

"The study points an important research direction to improve climate model reliability by better representing microphysical and dynamical processes controlling tropical cirrus (clouds)," Wang says.


Wang plans to use the Cheyenne supercomputer to run high-resolution models to better understand related physical processes, together with observations.

"The improved understanding can be used to improve climate model representation in the future," Wang says.

A GLOBAL REACH

UW and its students
make an impact
across the world





Students from Universidad Autónoma de Yucatán stress test concrete-block walls over the summer in the High Bay Research Facility. The students came to UW via an exchange program.

By Andy Chapman

When Doug Cuthbertson talks to Canadian students about attending the University of Wyoming, he keeps it pretty simple.

He tells them they will graduate with a meaningful degree. The cost of attending UW is reasonable, and opportunities for internships and work experience while attending school are ample. He'll relay some amusing anecdotes about the small-town atmosphere and great opportunities to get outside and connect with nature, just minutes from campus.

Despite being a Professor of Practice in the Department of Petroleum Engineering for less than two years, he can tell them about what they'll

experience. There is good reason for that: He took the exact journey upon which the students are about to embark.

Cuthbertson graduated from the Southern Alberta Institute of Technology (SAIT), transferred to Laramie and graduated from UW in 1985. After a decades-long career in the petroleum industry, he began teaching at SAIT in 2011, which led him to become a visiting professor at UW in 2016.

He serves as a great example of what is possible with an education from UW's College of Engineering and Applied Science. While the campus is located in the southeast corner of Wyoming, connections from the college span the globe.

Canadian Pipeline

For close to four decades, a steady stream of talented students from two Canadian institutions have come to UW to finish their education.

The schools, SAIT in Calgary and the Northern Alberta Institute of Technology (NAIT) in Edmonton, and UW have had a strong link throughout recent years. Students from SAIT and NAIT transfer to UW after they earn course credit from a two-year program and attend UW to finish up their bachelor of science in petroleum engineering.

"Hundreds have completed the extra two to three years at UW to go on to successful careers in the oil and



A group of administrators from UW and Southern Alberta Institute of Technology signed articulation agreements in summer 2017 to ease the transition for SAIT students to transfer to UW. (Courtesy John Partington)

gas industry, as leaders and innovators alike,” Cuthbertson says.

In fall 2016, the College of Engineering and Applied Science (CEAS) featured 50 former SAIT students enrolled in petroleum engineering. Twelve students graduated in December 2016. Early numbers from the fall 2017 semester indicated that 70 students from SAIT and NAIT were enrolled.

The work to make the relationship between the schools stronger has picked up in recent years, with more emphasis from UW administrators to ease the transition between schools for students.

In July 2017, a notable group from UW traveled to Canada to visit both

institutions. The contingent included Cuthbertson, UW President Laurie Nichols, CEAS Dean Michael Pishko, UW Foundation Major Gift Officer Craig Russow and others.

“We had excellent visits at both institutions and, at SAIT, not only did we learn more about their engineering programs, but Dean Pishko and I signed articulation agreements for both petroleum and mechanical engineering,” Nichols says.

“The transfer of students from SAIT to UW is not new, but this process to formalize the relationship of SAIT and UW programs acknowledges our plan to grow the number of students who come to UW to continue their education. We hope

It creates a lot of opportunities for students. That’s what they’re after and that’s what we care about.

- Doug Cuthbertson, UW Professor of Practice

to establish a similar agreement with NAIT. This fall, we will have nearly 70 SAIT and NAIT transfer students at UW, which illustrates the strength of our relationship and the potential for growth.”

Senior Jon McGregor is one of the students who journeyed to the high plains to earn a degree. He transferred from SAIT after earning an associate degree in petroleum engineering technology.

“This was a great option for me to improve my options as I head into a competitive job market,” says McGregor, who expects to graduate in May 2018. “The engineering program at UW is diverse and practical. We explore a range of topics beyond oil and gas, such as electricity, the derivation of engineering equations and computer programming.

“In my opinion, some the best features of the college are found outside the classroom. There is a very strong career services department that works to prepare students for the workplace and build students’ marketability as they enter the workforce.”

David Reid can attest to preparation for the workforce. He is president and chief executive officer of Calgary-based Delphi Energy, and graduated from NAIT and worked in the oil and gas industry before earning his bachelor’s (1983) and master’s in petroleum engineering from UW in 1985.

“My experience at UW gave me the foundational education to recognize opportunity, to evaluate, and simply solve whatever problem was put in front of me,” Reid says. “I think it was the learning style of UW that made the difference: independent learning with very accessible professors, and student work groups fostered by the community atmosphere are key attributes of the school.”

With the push for Tier-1 status in full swing, bringing in talent from north of the border is an opportunity to increase enrollment of international students and diversify and grow. Many graduates have come back and donated and been incredibly generous with time and funding.

Cuthbertson, of course, believes the relationship between the institutions is beneficial. He points to the great

foundational education the students receive while at SAIT and NAIT, and with the recent MOU, the expanded opportunity not only in petroleum, but in mechanical, chemical, civil and architectural engineering.

“It works out as a win-win for both sides,” he says. “There’s a legacy to it. I did it; others before and after me did it. It keeps progressing. It’s an opportunity for students to come here and experience a great university. I taught at SAIT, and now there are record numbers of students who are coming down. The schools prepare them very well. They work in teams, they study hard and gain good habits and they end up excelling when they come here.

“After that, they can go work anywhere in the world. It creates a lot of opportunities for students. That’s what they’re after, and that’s what we care about.”

Summer Exchange Program

A new exchange program has brought some of the brightest young minds in Mexico to UW. A group from Universidad Autónoma de Yucatán

Universidad Autónoma de Yucatán students who Traveled to UW in Summer 2017

Eduardo Alexis Ramírez Sánchez


Gaspar Alberto Alcocer Gómez

Mildred Mariana Rivero Pérez

Wilmer Gabriel Canul Varguez

Luis Armando Pérez Jiménez

Ruby Gabriela Parra Cardaña



Students from Universidad Autónoma de Yucatán inspect a crack in a beam they constructed earlier in the week during an exchange visit in summer 2017.

in Mérida, Mexico, visited campus in the summer of 2017 for a civil engineering short class.

It was hosted by UW Associate Professor Jennifer Tanner, while Universidad Autónoma Dean of the Engineering College Luis Enrique Fernández Baqueiro and Professor Jorge Luis Varela Rivera helped organize the trip.

The students, along with graduate students from UW, used equipment in the new High Bay Research Facility. They constructed concrete walls for gravity-load testing, and learned about job planning and other technical aspects of a civil engineering education.

This is the first part of the planned two-part exchange. This year, the students from UADY come to Laramie and in 2018, UW students will travel to Mexico.

Tanner says she focused on creating a workshop that featured active learning.

“After setting up the beam, all the students said ‘Thank you,’” she says.

“They loved the opportunity.”

Count Eduardo Alexis Ramírez Sánchez among those who had a transformational experience.

“Everything was perfect,” he says. “We don’t have these facilities in Mexico. I would like to come here in the future if I can. All the people were very kind. I’m very happy and I would invite other students to come here. I want to be an example to others to say don’t be afraid to try new things.”

The students experienced campus life, and also saw some of the things that make Laramie a truly special place. They visited Vedauwoo and the Medicine Bow Mountains, even taking the time to make a snowman in the Snowy Range.

“It’s important to do this to break barriers and implement some mobility for our students,” Baqueiro says. “We have found relationships that are beneficial to all. The students get to come here and learn and develop their English skills. They were very excited.

The activities we got to do, both technically and culturally, made for a very rich experience.”

UW at Hochschule Mannheim

Six students from UW are in the midst of a six-month exchange program in Mannheim, Germany, at University of Mannheim. The students on the exchange are Jacob Kepler, Nathan Brown, Grady Craft, Kelly Ramaeker, Heath Richards and Austen Motily.

This exchange is geared toward UW mechanical engineering students at the junior or senior level. Participating students from UW join other American students from Iowa State University, Oakland University and the University of Maryland in upper-division technical elective courses appropriate for mechanical engineers taught in English. Students are also asked to enroll in four courses to remain full time, as well as a German course at the appropriate level.

Larry Willey, a UW Professor of Practice in Mechanical Engineering, talks to students during a class about his time in the power-generation industry.



GOING BACK *to school*

Industry experience for Professors of Practice leads to new educational opportunities

By Andy Chapman

When it came time to think about the next step in his already accomplished career, Lawrence (Larry) Willey had several options.

He worked in the energy generation industry for nearly 40 years, building a reputation as a man who got things done. But the new Professor of Practice at the University of Wyoming felt drawn to help aspiring new engineers who would follow in his footsteps.

Willey joined the Department of Mechanical Engineering in March 2017, and has been busy as an instructor of senior design and fluid dynamics, specifically in wind power generation.

Growing up in upstate New York, Willey enrolled at Hudson Valley Community College for his education. While there, he met with an on-campus recruiter for Pratt & Whitney, an aerospace manufacturer. He took the job located in Connecticut and attended classes at night, and during the day, worked as an engineering technician on aircraft gas turbines and propulsion systems. He then enrolled at the University of Hartford and Rensselaer Polytechnic Institute, where he earned his bachelor's and master's degrees respectively.

Shortly after graduating from RPI, he taught evenings at Hartford as an adjunct professor for five years.

"That gave me the initial spark to realize that I liked teaching," he says. "I love engineering, calculating things, drawing things and seeing them through to profitable execution."

After nearly a dozen years of service to Pratt & Whitney, Willey took a post for General Electric where he worked on gas and steam turbines to improve the efficiency of electric power production. His success was highlighted early in his career, as he and his team were featured in the GE Annual Report in 1994.

Computer Science Professor of Practice Mike Borowczak assists a student in a cybersecurity course.



Starting in 1997 and leading into the summer of 1998, he had an idea to build a research facility to support steam turbine sales. He got the green light but had to find funding. He succeeded, and ended up building a bigger facility than originally planned. Built for \$13 million in just 18 months, the efforts of his team resulted in more than \$250 million in sales for GE for the first year alone.

During his career, he also developed an intranet software system for industrial codes and standards for employees to use as a database for GE Power Systems, which saved the company millions.

In 2002, GE got into the wind power business. It invested in a company with major operations in California and Germany. Willey moved to California to help oversee the rapid expansion of utility-scale wind. Before he left in 2009, he was part of the phenomenal growth of the business to the tune of \$10 billion per year.

“That turned out to be one of the best success stories for GE in terms of acquiring a business and getting ever expanding results for putting capital into it,” Willey says.

After 20 years at GE, he received an offer to be the vice president of operations with a new start-up wind company, Clipper Windpower. It was a rapidly growing company that lacked organization, with 350 machines built, but very few were actually running

because of a blade-quality remediation program. Two years later, another company purchased Clipper and liquidated operations but asked Willey to stay on to oversee the production to after-market services transition into late 2012.

“They had grown so rapidly there was very little process or quality controlling workflows, and they needed some bigger-company thinking,” he says. “Whether it’s a checklist or a simple one-page process, you need order or else there will be chaos. It was a period of incredible dynamic growth and highs and lows.”

He moved on to a short stint in Pacific Northwest in the public power sector. The company was planning on losing \$1 million that year for budgetary reasons, but in six months, Willey turned it around into a \$1 million profit by streamlining operations and via resource consolidation.

His experience working with turbines lends itself to giving perspective to his students.

“In class, you tend to learn about the steady state operating conditions on a piece of equipment and design around that for things like air pressure, temperature and rotor speed. A real piece of equipment doesn’t always operate at those ideal conditions,” he says.

Sometime around 2007, Willey met Jonathan Naughton, a UW professor of mechanical engineering and the

director of the Wind Energy Research Center. They stayed in touch through the years and in 2016, an opportunity to teach at UW came available.

“I love wind, I love the equipment, I love engineering and coaching and mentoring,” Willey says. “The chance to do that was very appealing. Last Christmas, Naughton gave me a call and introduced me to (Department Head) Carl (Frick), who said ‘We’re looking for Professors of Practice and we need more realism in classrooms. You’ve had quite the career in engineering.’”

It’s still early in his career, but he’s seen results.

“I’m starting to see lightbulbs in the classroom. They’re seeing there’s more to it than equations, that there are real applications and issues,” Willey says. “I think I bring them a different viewpoint to see more things and understand how the equations and physics fit into it. That’s what I can bring here, the hands-on approach and not just trusting the calculation from the computer.”

Willey reflects back on his time at Pratt & Whitney, when he was studying engineering concepts in class and observing them at his job. The things he was working on during the day were presented in his classes at night. He sees the potential for bringing experiential learning into the classroom.

“This all fits together for me and that’s why there’s a push for more of these positions,” he says. “All the things in industry that are second nature can be brought here. The students will see this, so now they’ll have a better understanding of it.”

Mike Borowczak

As one of UW’s newest faculty members, Computer Science Professor of Practice Mike

Borowczak has a lofty goal. He wants to inspire students to think differently about the problems facing the world and how education can solve them.

"I think there's an incredible need in not just collegiate-level education, even in kindergarten through high school, to spark something in future generations and in our current student populations," he says. "A big question from students is 'Why does what we're learning matter?'"

"The advantage of coming in from industry and having practical experience is I can blend the theory with the practice. It's something I'm passionate about, connecting with students at any level. We're just trying to spark an interest."

Borowczak has been at UW since January 2017. He left his post in Boulder, Colo., at a start-up that dealt with data mining and data science. He brings years of experience in the computer science field. He worked at an observatory in West Virginia, for Texas Instruments, for Intel and a children's hospital to map genomes and work in DNA sequencing.

He got his undergraduate degree in computer engineering at the University of Cincinnati and earned a Ph.D. from there. Among his areas of expertise are data science, cybersecurity, large-scale integration and circuit-chip design. He never lost his connection to the youth, though, teaching in K-12 classrooms and introducing computer science concepts to children as young as 5.

"I treat my class similarly to any other faculty in terms of theoretical rigor," he says. "But my intent isn't just for students to get the right answer. I care about seeing the process. How did you get from the problem statement to the answer? The path is equally important, if not

more, than the destination."

The last few months have been packed with events and conferences. He taught two classes in the spring and has three this fall. But one of his main responsibilities is getting a new facility online this fall. The University of Wyoming Cybersecurity Education and Research (CEDAR) center, which is in an early stage of development, exists to provide centralized resources and communication to university, government, community and industry partners in all aspects relating to cybersecurity. New equipment will be used in curriculum and the center gives students the opportunity to test cybersecurity skills in a safe environment. Plans are in place for students to help local nonprofits with cybersecurity.

Borowczak has made connections with students already. He was nominated for the Rocky Mountain section of the American Society of Engineering Educators for a teaching award thanks to a former student. He believes in the power of bringing professors of practice into the fold, along with existing academic faculty.

"Having a well-blended faculty helps students have different experiences," Borowczak says. "Some of them are purely academic, and that has value for bringing rigor to theoretical foundations."

"But at UW, we are looking to create students who can go out and practice what they learn. We need to understand the theory, and develop it, but we need for them to be able to apply it. It enables faculty who might not have the academic credentials to contribute. The value of the Professors of Practice is you're enabling another pool of educators to come in as experts in their own right to teach students."

The Dean's Perspective

"It's no secret how much I value the contributions of all our faculty, but I think adding Professors of Practice to the mix in our college has really benefitted students," CEAS Dean Michael Pishko says. "The theoretical concepts they learn from our 'traditional' faculty are crucial to their college and professional career, but the added dimension of experiential learning from experienced professionals can be invaluable to an aspiring engineer."

A SHIFTING LANDSCAPE

Improvements to engineering facilities continue at a rapid clip

By Andy Chapman

Engineering at the University of Wyoming is rapidly improving, thanks to investment in updated facilities. Here's an update on the progress of those spaces.



2015

MARCH

Public groundbreaking for High Bay Research Facility

2016

OCTOBER

Public groundbreaking for Engineering Education and Research Building

2017

AUGUST

High Bay Research Facility opens

Topping out at EERB

OCTOBER

Coe Student Innovation Center opens

Drilling and Completions Simulation Laboratory announced

2019

OCTOBER

EERB open for research and student activities

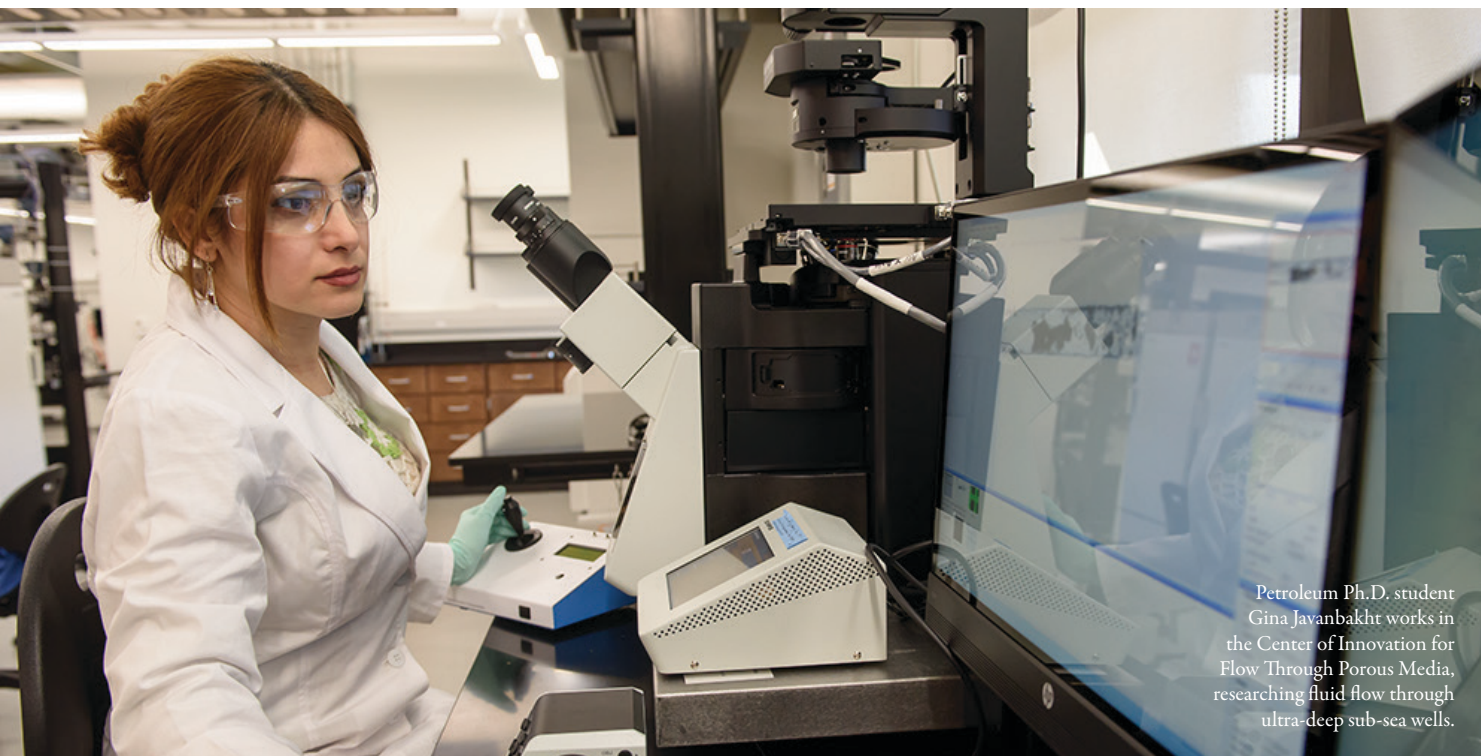


The EERB has made significant strides in recent months. (Courtesy GE Johnson)

Engineering Education and Research Building (EERB)

CONSTRUCTION MANAGER: GE JOHNSON CONSTRUCTION WYOMING LLC, CASPER

Slated for completion in spring 2019, the EERB has progressed rapidly. Structural steel erection is complete, and miscellaneous detailing remains. Exterior and interior metal stud framing is under way. Mechanical and electrical rough-in is under way.



Petroleum Ph.D. student Gina Javanbakht works in the Center of Innovation for Flow Through Porous Media, researching fluid flow through ultra-deep sub-sea wells.



The High Bay Research Facility came online in 2017 to solve major challenges in many engineering fields, including petroleum, civil and chemical.

High Bay Research Facility (HBRF)

The HBRF is complete and hosted a grand-opening event Aug. 17, 2017. Research has been under way for months in several areas. The HBRF contains more than 90,000 square feet of high-bay and traditional laboratory space, and affiliated office and meeting areas. The research spaces facilitate research into unconventional oil and gas reservoirs, part of UW's Tier-1 Engineering Initiative, and house the Center of Innovation for Flow Through Porous Media, Improved Oil Recovery Laboratory, and Geomechanical/Petrology Laboratory. The building also has a Structures Research Laboratory.



Students in the CSIC inspect the progress of a 3-D printer component. The center encourages innovation and entrepreneurship on the UW campus.

Coe Student Innovation Center (CSIC)

The newest facility for engineering students is the CSIC. It is a joint venture among UW Libraries, UW Information Technology and the Colleges of Engineering and Applied Science, Education, and Arts and Sciences.

Located on Level 2 of William Robertson Coe Library on the UW campus, it was designed as a top-of-the-line “maker space” lab to foster imaginative, collaborative and innovative design projects. It features four 3-D printers, 3-D scanning equipment, 3-D modeling software, robotics kits, circuitry kits, design and drafting software, electrical test equipment, Lego building materials and much more.

The center was designed to encourage and build upon project-based STEAM (science, technology, engineering, the arts and mathematics) learning at all levels, from K-12 through college.

The Drilling and Completions Simulation Laboratory will be the premier oil and gas center in the nation when it is complete. (Rendering courtesy Drilling Systems)



Drilling and Completions Simulation Laboratory

The CEAS will become one of the most technologically advanced institutions in the world thanks to an agreement with an international simulation company.

UW will partner with Drilling Systems, an internationally recognized provider of simulation technologies, to construct the Drilling and Completions Simulation Laboratory. The new facility will be featured in the Engineering Education and Research Building.

Prior to the opening of the EERB, the center's equipment will be assembled and housed in a research facility in Houston, Texas, and faculty can learn the technology beforehand. The UW's Shell 3-D Visualization Laboratory will be utilized to introduce new visualization techniques and computer and theoretical modeling, which includes the enhancement of downhole modeling as it relates to oil and gas.



Computer science students Shaya Wolf (left) and Rafer Cooley work in the newly established CEDAR Center in the Engineering Building.

Cybersecurity Education And Research Center

Opened in fall 2017, the University of Wyoming Cybersecurity Education and Research (CEDAR) center exists to provide centralized resources and communication to university, government, community and industry partners in all aspects relating to cybersecurity. CEDAR's primary objective is the development and support of cybersecurity education, research and outreach at UW with specific emphasis on undergraduate education and research. Finally, the center extends its community outreach objectives through a strong commitment to K-16 and continuing education initiatives.

The CEDAR center's primary goal is to provide high-quality education, materials and support to advance Wyoming's cybersecurity capabilities.

The initiative relies on revamped collegiate-level security coursework that includes corporate and government partnerships, outreach and university support. CEDAR will leverage partners externally (for real-world applications) and internal—such as College of Education secondary science/math to develop K-16 and general public outreach modules.

CEDAR's 18-month objectives:

- Graduate at least five Computer Science majors with a concentration in cybersecurity
- Establish a cutting-edge virtualized cybersecurity lab
- Achieve National Security Agency/Department of Homeland Security (NSA/DHS) Center of Academic Excellence designation

alumni **in** action

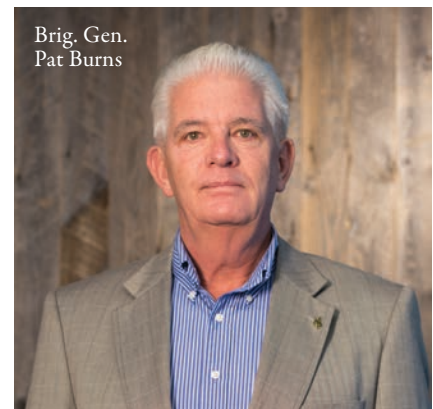
CEAS Graduate Inducted Into Rock Springs High School Hall of Fame

After a decades-long distinguished professional career, Brig. Gen. Pat Burns has been recognized for his many achievements. Burns, a notable alumni of the University of Wyoming College of Engineering and Applied Science, was inducted into the Rock Springs (Wyo.) High School Hall of Fame in May 2017.

Burns was inducted along with eight other individuals and one sports team for the RSHS Hall of Fame. His contributions to UW are numerous. He serves as a CEAS National Advisory Board member, a member of the Wyoming Governor's Energy, Engineering, STEM Integration Task Force, he was a 2005 recipient of the CEAS Distinguished Alumni award and was the 2011 CEAS spring commencement speaker.

Burns earned his UW bachelor's degree in mechanical engineering (1973) and later a master's in systems management from the University of Southern California. He was drafted in 1970 during the Vietnam War, and served four years enlisted duty with the U.S. Air Force Security Service prior to being commissioned at Officer Training School in December 1974. He commanded a base support group and civil engineer squadron, and served in a wide range of civil engineer positions.

Burns retired from the Air Force in October 2005 as a brigadier general, having served as the Director of Installations, Headquarters Air Combat Command (ACC), Langley Air Force Base (Va.) After retiring



from military service, he joined Mortensen Construction as vice president in its federal contracting group in Washington, D.C., working design-build projects across the U.S. Mortensen was the 25th-largest general contractor in the U.S.



From left to right: Wayne Baker, UW Civil and Architectural Engineering Professor Michael Barker and Lloyd Baker (BSCE '40) enjoy the 2017 Cheyenne Frontier Days rodeo. At 106 years of age, Lloyd is the oldest living UW engineering alumnus, followed closely by (not pictured) Phil Hirst (BSCE '38) at 102 years old.

Architectural Engineering Grad Wins Design Competition

Brett Drake grew up with a closet full of sneakers and a fondness for engineering and design. The combination of those two passions netted him some prize money and the chance to impact countless athletes.

Drake won the Nike Ease Challenge, a contest which called for innovative designs for sneakers for athletes of all abilities. A civil engineer in Cheyenne, Wyo., he works for RESPEC Consultants and is a graduate of the University of Wyoming's College of Engineering and Applied Science.

The Nike Ease Challenge competition was aimed at finding footwear ideas that help athletes put on, secure or take off their shoes, including athletes with disabilities.

"I started sketching the day I saw the competition announced," Drake says. "I went home that night and showed my wife my ideas. As an engineer, I work in concepts based around design and I've

always liked it. At some point when I was younger, I started collecting shoes and I always liked playing hoops."

He used a design program that he mastered at UW thanks to an architectural engineering focus—AutoCAD—to create the submissions, and in four weeks, sent them off to Nike and waited.

Drake's winning design was inspired by rear-entry snowboard bindings so the shoes could be slipped on rather than pulled on using a hinged heel. The system uses powerful, lightweight magnets to provide a simple, wide entry and exit area. Drake says his design was geared toward creating something that didn't interfere with the aesthetic and performance achievements of Nike's original design and enhance it with an entry and exit system that would be easy for anyone to use.

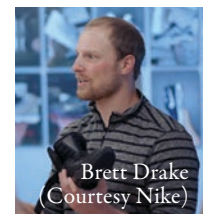
"I'm an athlete and know the passion and enjoyment I have gained from

sport, so the idea that I could use my passion, problem solving and engineering expertise to enable others to enjoy

movement and sport like I do became great inspiration for my idea," he says.

Nike designer Tobie Hatfield said Drake's design was the clear winner from all other entries when he was invited out to corporate offices to present his prototype. While there, he presented before a series of judges, including nine-time Olympic gold medalist Carl Lewis, WNBA MVP and Olympic gold medalist Elena Delle Donne and Tatyana McFadden, a 17-time Paralympic medal winner.

In addition to winning the \$50,000 first prize, Drake will collaborate with Nike in the prototyping phase and begin testing his innovation with athletes of all abilities.



Notable CEAS Alumnus Set For Antarctica Research Trip

Attending college in Laramie, Wyo., Rob Streeter grew accustomed to dealing with chilly days on the high plains. As it turns out, he'll need some of the cold-weather gear that got him through the winters at the University of Wyoming.

Streeter, a 2013 graduate of the Department of Electrical Engineering from Encampment, Wyo., will embark on a journey to the ends of the Earth to support scientific research. He'll be at Amundsen-Scott South Pole Station, a U.S. Antarctic Program (USAP) facility managed by the National Science Foundation (NSF). The station, at 9,301 feet in elevation, is located on the high polar plateau of Antarctica.

"I'll be one of two engineers at the Pole tasked with keeping the experiments running throughout the year, especially winter. We're called 'Beakers,'" he says.

In addition to providing engineering support to the research projects, he will

serve as a firefighter. He'll also learn how to drive a snow-cat ambulance and receive training as a weather observer.

"We're entirely self-sufficient in the winter, with no physical contact with the outside world for about eight months," he says.

The challenges will be immense. Mail takes four to six weeks to arrive, and the last flight for the eight-month winter season is in early February. The South Pole gets just eight hours of internet access each day. There are no cell phones and just one land line. Despite all that, he's excited for the opportunity.

"It's really a childhood dream come true," he says. "It illustrates that anyone can really pursue anything. Just because I graduated high school in a class of only 22, doesn't mean that I can't be one of less than 50 people to spend this upcoming winter season at the South Pole. I hope to learn from this opportunity. The station

will be a collection of highly educated, highly intelligent, multi-faceted and dynamic people. Each one will have skills and knowledge far beyond my own, and I'm really excited to learn whatever I can."

Streeter will leave for training in mid-October. He isn't daunted by the length of the journey or duration of the assignment. He spent three years applying for the position and now will get to see a place only a handful of people on the planet have experienced.

"I think (the opportunity) absolutely can serve as an inspiration to UW students," Streeter says. "I hope people realize that tenacity and hard work can open doors to worlds of new opportunities."



alumni **in** memoriam

Since our last issue, we regret to announce the passing of the following alumni. Our greatest sympathy is extended to the families of these valued friends.

Capt. William D. Barbee

BSCE '50 – Seattle, Wash.

Mr. Dave R. Bean

BSME '63 – Mountain Ranch, Calif.

Mr. Gene H. Binning

BSME '49 – Oklahoma City, Okla.

Mr. John H. Bliss

BSEE '50 – Cheyenne, Wyo.

Mr. Charles L. Conger

BSCE '49 – Medina, Wash.

Mr. Robert H. Day

BSCE '67, MS '74 – Cheyenne, Wyo.

Maj. Daniel G. Emdee

BSME '63 – Oldsmar, Fla.

Mr. Conrad N. Haug

BSEE '62 – Las Vegas, Nev.

Mr. Floyd E. Hawley

BSME '63 – Casper, Wyo.

Dr. Philip M. Hoyt

BSCE '57, MS '61 – Salt Lake City, Utah

Mr. E.R. Ted Layman

BSEE '53 – Lake Mary, Fla.

Mr. Harold M. McCaskey

BS '47 – Lander, Wyo.

Mr. Richard McQuisten

BSCE '67 – Laramie, Wyo.

Mr. James F. Read

BSCE '52 – Mesa, Ariz.

Mr. Robert T. Teegarden

BSCE '87 – Clancy, Mont.

Mr. Edgar W. Wayland Jr.


BS '57 – Las Vegas, Nev.

Mr. Larry K. Wester

BSCE '73 – Laramie, Wyo.

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ENGINEERING AND BUSINESS: A POWERFUL COMBINATION FOR UW GRADUATES

Austin Mivshek is an electronics engineer with Lockheed Martin, using a degree in engineering and business in his career path. (Courtesy UW College of Business)

**By Tanner Parmely,
MBA Program Coordinator**

In the competitive marketplace of today's landscape, demand for candidates educated in diverse segments of industry is at an all-time high. One avenue in which the University of Wyoming prepares its graduate students for success is to offer a dual degree in engineering and Master of Business Administration (MBA) program.

UW's College of Engineering and Applied Science and College of Business have worked together diligently to offer a degree program that prepares graduates to enter the job market, immediately differentiating themselves from others that may be pursuing the same or a similar path.

Students who hold technical undergraduate degrees oftentimes have tough questions to answer before entering the workforce. Does the job involve managing or forecasting a budget? Is there opportunity to move into a managerial position within the organization? Will management experience be the path to self-operation?

Austin Mivshek is a 2014 University of Wyoming graduate who achieved master's degrees in engineering and

business administration via the dual degree program. Currently working as an electronics engineer for Lockheed Martin, he highlights the importance of having a strong foundation of business operations.

"Engineers often work closely with the finance or accounting departments and have to present that type of information to management," Mivshek says. "Being an engineer who already had a good understanding of those accounting and operational concepts made it so that I could step right in and help with those tasks without any additional training."

There are many ways in which technical skill can no longer be fully separated from the operational perspective.

"At a minimum, employees need to be able to understand both sides so that they can have effective communication with finance, accounting and management," Mivshek says. "But often the engineers need to be able to wear multiple hats and not only communicate, but work on tasks that are more than just engineering."

Students who hold an MBA and an M.S. degree in engineering set themselves apart from others when entering the competitive marketplace upon graduation, because they not only speak

the technical language, but understand the overarching strategy and operational goals in their managerial or leadership role. The real value in obtaining a dual degree is that it inherently differentiates one candidate from another.

Leveraging technical skills with business understanding makes applicants incredibly competitive when entering the job market. Students in the UW dual degree program receive excellent classroom instruction, as well as a vast amount of hands-on experience with actual companies through real-world projects. An additional benefit is the networking opportunities students are able to leverage.

UW's MS/MBA dual degree can be earned in just two years in any department in the CEAS. Completing the dual degree at the University of Wyoming allows students a unique opportunity to receive two graduate degrees in approximately half the time it would take to pursue them both individually.

For more information about the program or how to apply, contact Tanner Parmely, MBA program coordinator, at tparmely@uwyo.edu or 307-766-2449.

UW CALENDAR OF EVENTS

NOVEMBER

- Nov. 1-3:** Registration for Spring 2018
- Nov. 4:** Cowboy Wrestling hosts Cowboy Open
- Nov. 10:** Last day to withdraw from classes
- Nov. 10:** Cowboy Basketball vs. Chattanooga
- Nov. 11:** Cowgirl Basketball vs. Adams State
- Nov. 17:** UW Women's Entrepreneurship Day
- Nov. 18:** Cowboy Football at Air Force
- Nov. 22-24:** Thanksgiving Break

DECEMBER

- Dec. 6:** CEAS Senior Design Symposium
- Dec. 11:** Last day of Fall 2018 semester
- Dec. 12:** Cowgirl Basketball vs. Colorado Christian
- Dec. 13-19:** Finals week
- Dec. 16:** CEAS Commencement Ceremony
- Dec. 19:** Cowboy Wrestling vs. Oklahoma State
- Dec. 25:** Christmas
- Dec. 27:** Cowboy Basketball vs. San Diego State

JANUARY/FEBRUARY

- Jan. 1:** New Year's Day
- Jan. 15:** Martin Luther King Jr. Day
- Jan. 22:** Spring 2018 semester starts

MARCH/APRIL

- March 9:** Midsemester
- March 12-16:** Spring Break
- March 26-30:** Advising week for Fall 2018
- April 13:** Tau Beta Pi Banquet



For the latest events and information, visit
uwoyo.edu/calendar.

UW Cowboys and Cowgirls:
gowyo.com

Fine arts:
uwoyo.edu/finearts



UNIVERSITY OF WYOMING

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“THIS IS A PLACE WHERE YOU
DON'T GET STUCK WITH A
PROBLEM FOR TOO LONG—

there is always someone willing to
help. (UW's) level of motivation,
creativity and problem-solving
ability is very high. Coming to UW
has been one of the best decisions
I have made.”

-Samuel Afari

Petroleum Engineering Ph.D. Candidate

