

2018 | 19



The University of Texas at Austin
Hildebrand Department of Petroleum
and Geosystems Engineering
Cockrell School of Engineering

ENERGY ONE

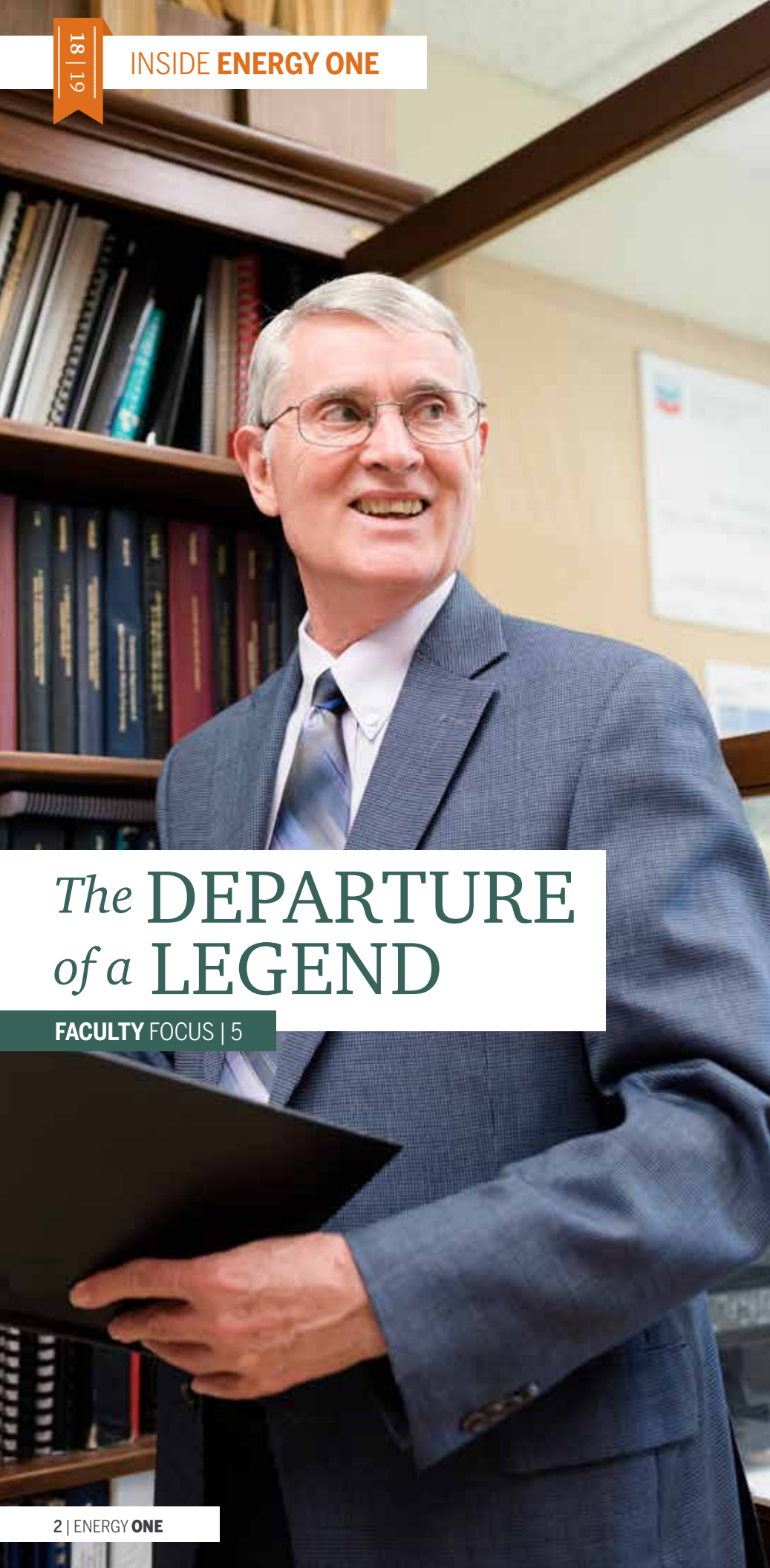
**A Proud Tradition.
A New Era.**

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The DEPARTURE of a LEGEND

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ENERGY ONE

2018 | 2019

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ABOUT ENERGY ONE

The University of Texas at Austin Hildebrand Department of Petroleum and Geosystems Engineering publishes stories and news about innovative research, student excellence, alumni accomplishments and leadership annually in magazine format.

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 The University of Texas at Austin
Hildebrand Department of Petroleum
and Geosystems Engineering
Cockrell School of Engineering



A NEW Era

In November of 2017, a transformative gift was made by the Hildebrand Foundation to support UT PGE. In recognition, the university named the department the Hildebrand Department of Petroleum and Geosystems Engineering. I am humbled that the Hildebrand family has trusted us with such a sizable investment in our future. This gift will enable us to further capitalize on our strengths of teaching and technology development and position us to continue attracting the top talent from around the world to tackle the energy challenges of the future.

This support will enable the Hildebrand Department to accomplish its bold vision through a five-year strategic plan. Our three key priorities include: 1) creating a global hub for oil and gas innovation, 2) advancing oil and gas education, and 3) shaping the energy narrative. With tremendous gratitude and enthusiasm, we are launching the plan this fall. To learn more about how this gift will provide significant resources to our students and faculty, check out the "A Proud Tradition. A New Era." article.

In the 2018/2019 edition of Energy One, you will see it is a true testament to honoring our past, present, and future. In anticipation of the

retirement of my esteemed colleague, Dr. Gary Pope, we look back at his extraordinary career accomplishments over the past four decades. We also revisit the impressive achievements of our Summer Undergraduate Research Internship (SURI) program as it celebrates 10 years.

Regarding the present, two professors provide their "experts' take" on how to use data to solve industry challenges and we recognize an alumnus who is receiving international recognition for his humanitarian work. Eyeing the future, we provide the latest update on the new state-of-the-art Energy Engineering Building (EEB) and highlight a \$5 million research partnership with India's national oil company.

These stories would not be possible without the support of our passionate alumni. I sincerely thank you for your commitment to enriching the Longhorn community.

Hook 'Em and Enjoy Reading!

Jon E. Olson, *Department Chair*

*Lois K. & Richard D. Folger Leadership Chair
Frank W. Jessen Professor*

Experts' Take:

USING DATA TO SOLVE INDUSTRY CHALLENGES



ASSOCIATE PROFESSOR **MICHAEL PYRCZ**

CHALLENGE:

In the energy industry we have been working with “big data” for a long time. Our seismic surveys rival the volumes of data acquisition by Google and NASA, but they are highly variable over time and space. Also, we have a wide variety of well, seismic, and production-based subsurface measures spanning many scales and each are limited in veracity and coverage. The question we face is: how do we use all this data to support billion dollar investment decisions?

SOLUTIONS:

In the presence of the big data, the following approaches are essential for the best possible integration to support development decision-making:

- (1) We must retain geoscience and engineering expert knowledge in all steps of subsurface modeling, and avoid the temptation of purely data-driven methods.
- (2) We should use established methods to “de-bias” and “impute missing data” to maximize the value of our available data.
- (3) We must use robust spatial statistical methods to integrate information from all data sources accounting for data location, scale, and accuracy, because the spatial context matters.
- (4) With appropriate geoscience and engineering context, we may leverage novel statistical learning or machine learning methods to infer and predict salient subsurface features and responses.



PROFESSOR **ERIC VAN OORT**

CHALLENGE:

The question for oil and gas companies is whether or not they want to embrace data analytics, which is radically changing the industry, or ignore it at the risk of being outcompeted by companies that champion the sophisticated use of data in all aspects of their business. There are excellent opportunities to use data to improve the time, cost, profitability, and safety of well construction. There will be a clear shift in required skill sets for petroleum engineers who will need data analysis and programming skills to effectively compete for jobs.

SOLUTIONS:

To help oil and gas companies in their goal to get (more) value from data, there needs to be facilitation of easy access to information effectively extracted from all types and sources of data (static vs. dynamic, structured and unstructured, old vs. new sensors, surface vs. downhole sensors, etc.). We can look to other industries and borrow tools such as spider bots, natural language recognition, machine learning, and artificial intelligence to make sense of the data and turn it into valuable information. This information then needs to be visualized and made easily digestible, such that companies can use it in their business control processes to help reduce costs and achieve a completely safe work environment for their employees.

Academia has an important role to play in this facilitation, with the added benefits that (1) there are great R&D discoveries to be made in analyzing industry data thoroughly; (2) data analysis allows academia to teach and train students in an entirely novel and superior way, while at the same time providing them with the essential skills needed for their future data-centric careers.

The DEPARTURE *of a* LEGEND

In January of 1977, a young, inspired assistant professor named Gary Pope walked through the doors of the petroleum engineering building. In August of 2019, more than 42 years later, he will retire from the UT PGE Department.



When Pope was hired in the mid-1970's, the department was a much different place than it is today. The UT PGE building was located about four blocks south on Speedway (next to Gregory gym), and there were only 10 faculty members in the department. Personal computers were several months away from becoming mass marketed and there was essentially no laboratory research in the old PGE building.

Throughout his tenure at UT PGE, Pope's strong leadership elevated the department. He ensured a seamless move into the department's current home in CPE, he became the director of the Center for Petroleum and Geosystems Engineering (CPGE), and helped hire many of the current professors – increasing the faculty roster to 20.

Pope's career has been profoundly successful. Despite growing up in a rural area and attending a small high school that taught almost no science or mathematics, Pope has made a global impact through his petroleum engineering teaching, research, and leadership roles. Pope has served as a catalyst for the department's growth, excellence, and innovation.

THE CLASSROOM MAN

Hoping for the best, Pope stood in front of his first class of students in January 1977 to teach "Fluid Flow in Permeable Media," without any prior teaching experience or a faculty orientation.

"It was an intimidating start to my teaching career, but Dr. Ben Caudle (UT PGE professor emeritus) made my first class a little less challenging as he provided me with his class notes and generous advice – his mentorship meant a great deal to me," Pope said.

The late Robert Schechter, former UT PGE chair, hired Pope to teach a rigorous thermodynamics course, so that became his specialty as he taught the subject to more than 1,000 undergraduate students during his first few years on the faculty. Early in his career he also began teaching graduate students advanced thermodynamics and phase behavior.

For several decades, Pope continued building upon his teaching craft becoming one of the best rated professors by the UT PGE students through teaching evaluations. He knew he would be training the next generation of petroleum engineers, so his teaching was tough but also well understood and respected by the students. His methodology ensured students could thrive in industry. He has also mentored more than 200 graduate students and postdocs with the same tough love approach.

"Gary taught petroleum engineering to many of today's oil and gas leaders," said UT PGE professor Larry W. Lake. "His students now serve in high positions in academia as well as industry – his knowledge and expertise has representation all over the world."

THE CHAIR YEARS

On the same day in 1985, Pope was promoted to full professor and appointed chair of the department. He immediately moved into his upgraded office and began making plans to transition the department into the new CPE building at the end of the year.

Once the faculty and students migrated over to their new home, Pope knew he had a lot of work to do with the department ranking No. 5 in the nation; only about 13 PhD students were enrolled, little research funding existed, and an undergraduate curriculum makeover was overdue.

Pope set the hefty goal of having 60 PhD students enrolled in the program. "The faculty were skeptical, but within two years we had 60 PhD students," said Pope. "With more PhD students and several new faculty members to mentor them, I knew we could increase our research funding – a critical factor in the rankings and in the success of the new faculty."

In 1982, Pope helped launch one of the department's first industry affiliates programs on enhanced oil recovery, which became a best practice in research partnerships. The department's research funding increased to \$5 million during the 1980s. All of those strategic decisions and big ideas led UT PGE to the No. 1 graduate ranking by 1989, a prestigious position maintained almost every year since then.

With the 21st century approaching, Pope knew the outdated undergraduate curriculum needed significant revisions to ensure the department was best preparing its future graduates for industry.

"I appointed an ad hoc committee and asked them to propose the ideal undergraduate curriculum," Pope said. "After a faculty vote approved the changes, it was implemented right away. One of the additions was starting a new BS degree in geosystems engineering and hydrogeology – it was one of the first approved interdisciplinary undergraduate degrees at UT Austin."

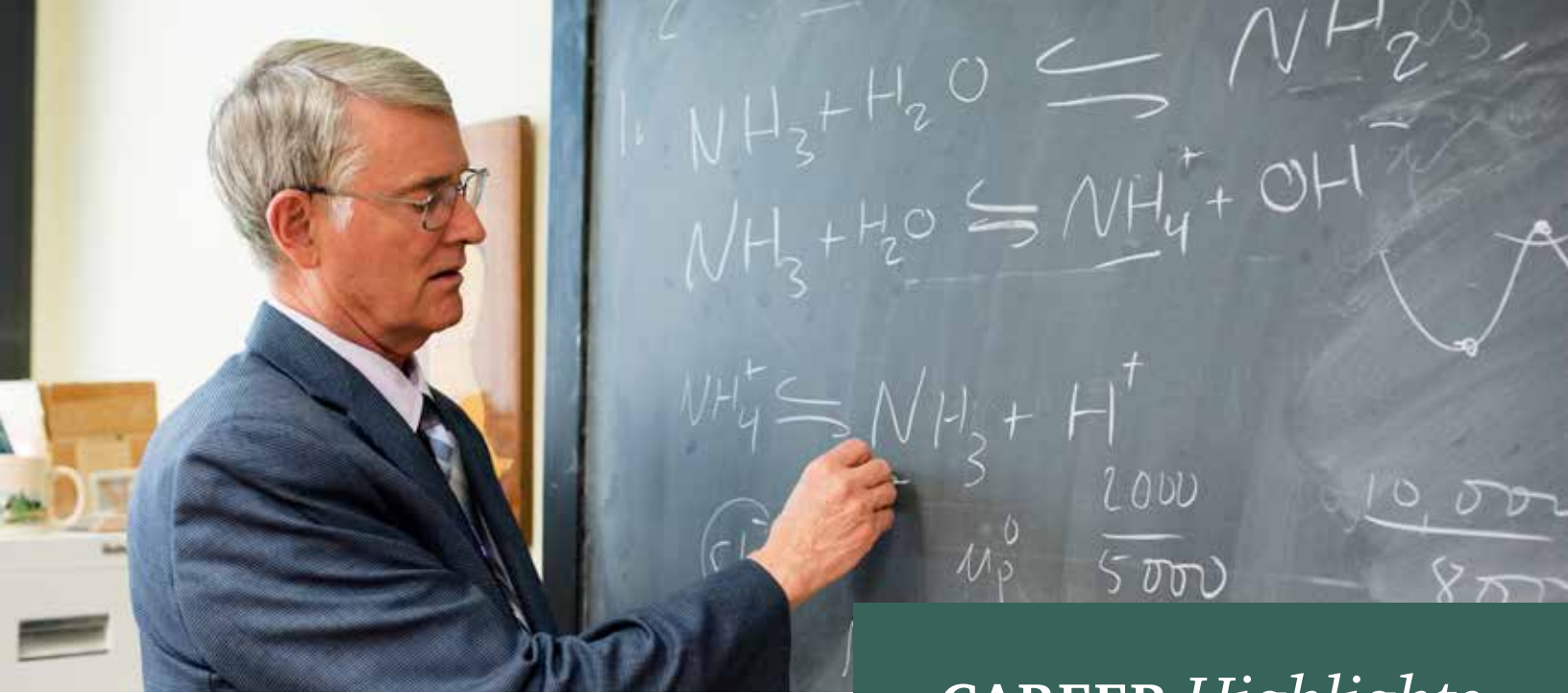
BUILDING A RESEARCH EMPIRE

After four years as chairman, Pope stepped down from the role and was appointed the director of CPGE – the research center of UT PGE. Over the next 25 years he developed CPGE into one of the largest research units on campus, with its research funding reaching \$23 million in his last year as director.

Promoting the value of interdisciplinary research, Pope worked with faculty from many areas of engineering and science and was especially active in subsurface environmental engineering. During the 1990's, almost half of the research in the department was supported by federal agencies such as the Environmental Protection Agency (EPA) and the Department of Energy (DOE). One of Pope's largest projects at the time was working with the U.S. Air Force and Navy to clean-up superfund sites.

"I worked with environmental engineers and hydrogeologists on about 40 contaminated field sites, mostly contaminated with toxic solvents that leaked into groundwater," Pope said. "My experience and expertise as a reservoir engineer was exactly what was needed to address some of the complex multiphase flow problems in contaminated aquifers."

Later Pope became the first director of an energy frontier research center funded by DOE to study geological storage of greenhouse gases in partnership with Sandia National Laboratories.



Pope is most recognized though for his work in reservoir engineering and enhanced oil recovery, especially chemical EOR. He developed a game-changing reservoir simulator called UTCHEM, which was one of his first research projects.

“The first code was a simple 1D code,” said Pope. “It was radical for its day though because it was a chemical composition model, which was new at that time.”

Over the years, Pope worked with professors Kamy Sepehrnoori and Mojdeh Delshad to make UTCHEM into the 3D code now used worldwide by oil and gas companies as well as universities and federal government agencies.

Gary taught petroleum engineering to many of today’s oil and gas leaders.

Mentoring his team of researchers has always been one of the most rewarding aspects of his career. From undergraduate students to graduate students to postdocs, they all played critical roles in producing results that helped the department become a trailblazer in its space.

“Dr. Pope taught me the art and science of research and has always inspired me with his scholarship and professionalism,” said Pope’s former student and Texas A&M University Distinguished Professor Akhil Datta-Gupta. “He is undoubtedly one of the top leaders in the field of EOR. His contributions, to chemical EOR in particular, will have a far reaching impact in the oil industry.”

Walking into Pope’s office today, the space is small but it holds tremendous history. Pope has large bookshelves that are lined with all the theses and dissertations of his former students and drawers that are still stacked with grading books from his classes. While his office will eventually be packed up, his legacy will always remain within UT PGE and those he has taught in and out of the classroom. His shared knowledge will continue serving as a beacon of light, guiding the Hildebrand Department for many years to come.

CAREER Highlights



Awarded ~ \$100 million in research grants*



Taught ~ 3,000 students



Served as chair of UT PGE and director of CPGE



Developed world-renowned reservoir simulator UTCHEM



Inducted into the National Academy of Engineering



Produced 400 research publications

* In today’s dollars

Energizing INDIA



The Hildebrand Department of Petroleum and Geosystems Engineering faculty signed a \$5 million deal over 10 years with India's Oil & Natural Gas Corporation (ONGC). This international collaboration will provide resources to UT Austin professors, who will share their specialized expertise with people on the ground in India. This partnership will fortify India's indigenous energy capabilities, which will hopefully lead to greater self-sufficiency.

The country may have significant oil and gas reserves of its own, but it lacks the requisite expertise in key areas to fully exploit them. UT PGE faculty will work alongside engineers with the Institute for Reservoir Studies of the ONGC, the nation's state-owned energy supplier, providing knowledge and expertise on how to most efficiently recover oil. It is innovative, technology-driven techniques that could liberate India's economy from an overreliance on imported energy.

Despite the best estimates suggesting 75 percent of India's oil and gas reserves are yet to be discovered, the country still imports approximately 80 percent of its energy needs to meet the growing demand of the country's more than one billion people.

Those fields that have been explored are yet to be fully exploited, which is where professor Kishore Mohanty, a UT PGE professor and director of the Center for Petroleum and Geosystems Engineering, and his research team come in. Mohanty is an expert in the

“

If we could get an additional 25 percent of the oil from these indigenous oil fields, then it would have tremendous benefits for India's economy.

”

Enhanced Oil Recovery (EOR) process known as alkaline-surfactant-polymer flooding, a method that can extract almost all of the oil in the swept reservoir. EOR techniques vary considerably, depending on the materials used and the approach taken. And although it may not be the most common method for oil extraction, it is one of the most efficient.

“Water flooding is one of the cheapest ways of extracting oil,” Mohanty said. “Although, it is not very efficient. About 20 to 40 percent of oil can be obtained successfully using water flooding, so more than 60 percent of your oil is left behind.”

There are a variety of EOR techniques in use — gas and thermal recovery are some examples — but they are applicable to specific reservoirs, e.g., deep reservoirs and viscous oil, respectively. Surfactant-polymer flooding is more flexible and can apply to a variety of reservoirs.

“Surfactants act like detergents, meaning oil can be extracted anywhere the floods reach,” Mohanty said.

The Texas Engineers will be sharing their expertise with their Indian counterparts so that they can develop their own indigenous skill set in alkaline-surfactant-polymer flooding.

The potential economic benefits to India, where current demand for energy is insatiable, are significant. “If we could get an additional 25 percent of the oil from these indigenous oil fields, then it would have tremendous benefits for India's economy,” Mohanty said.



A Proud Tradition. A New Era.

A little less than 30 years after Spindletop started gushing to ignite the Texas oil boom, a small, but significant petroleum engineering department was formed at The University of Texas at Austin. Since 1930, the department has been internationally recognized for excellence in oil and gas education, research, and innovation. With a community of award-winning faculty and staff as well as exceptional students, it has developed industry-defining technologies and launched generations of influential business leaders and entrepreneurs.

Looking to the future, a transformational gift of \$25 million, donated to the department in November of 2017, will serve as the catalyst for ensuring the department retains its position as a leading, global petroleum engineering program for decades to come.

The Hildebrand Foundation, led by The University of Texas System Regent and UT PGE alumnus Jeff Hildebrand (MSPE '85) and his wife Mindy Hildebrand (BBA '86), saw an investment opportunity for training the next generation of oil and gas leaders who will power the world. In recognition of the gift, the university renamed the department the Hildebrand Department of Petroleum and Geosystems Engineering.

During the Hildebrand Department naming ceremony last fall Hildebrand gave a motivational speech, reflecting back on his influential time as a student in the department, his inspiration for supporting UT PGE and the wisdom he has garnered throughout his impressive career.

"We are investing in UT Austin because liberating matter is crucial to the future of our country, and no one has more potential to contribute to that effort than the students and faculty of this university," Hildebrand said. "In business, capital magically flows to the best companies, assets, and people. UT Austin is simply the best at what it does, and our gift represents a doubling down on a proven winner."

To ensure the funding provides optimal outcomes for faculty and students, the department created a five-year strategic plan. Kicking-off in the 2018-19 academic year, the plan will enable the Hildebrand Department to launch several new initiatives and build on critical existing programs.

"This gift will create a new sense of excitement about our program, enabling us to further capitalize on our strengths of oil and gas teaching and technology development and positioning us to continue attracting the top talent from around the world to tackle the energy challenges of the future," said Hildebrand Department chair Jon Olson.

The Hildebrand Department has identified three key priorities for its five-year strategic plan: creating a global hub for oil and gas innovation, advancing oil and gas education, and shaping the energy narrative.

Creating a Global Hub for Oil and Gas Innovation

By recruiting top talent and hosting thought leaders and professionals from around the world, the Hildebrand Department will strengthen its position as the preeminent

We are investing in UT Austin because liberating matter is crucial to the future of our country, and no one has more potential to contribute to that effort than the students and faculty of this university.”

destination for energy research. The department will be a global hub for oil and gas innovation where breakthrough technologies are developed and new ideas are born. Two examples of initiatives that will fulfill this goal are Visiting Professors and a Grand Challenge Seed Grant.

The Visiting Professors, who will be faculty invited from world-renowned institutions to the Hildebrand Department, will heighten the

technical discourse and transfer technology for research and education. Among other responsibilities, the visiting professor will give a seminar and hold office hours to maximize opportunities for interaction with UT Austin students and faculty.

Through the Hildebrand Grand Challenge Seed Grant the department will continue to facilitate robust research in unconventional, enhanced oil recovery, data analytics, nanoparticle applications, and other emerging areas.

Innovators selected for this program will receive funding to support high-risk investigations for which faculty often struggle to acquire funding through other traditional channels.

These grants will not only provide crucial assistance to faculty but will also encourage a focus on unexplored areas with the potential for significant societal impact and matching funding.

Advancing Oil and Gas Education

The Hildebrand Department strives to have a tangible and lasting impact on the evolution of the oil and gas industry. By inventing and implementing new and exciting approaches to teaching, hands-on learning, and experiential energy education, the department will graduate future leaders who are willing to take risks and change the world. Two new significant programs in this area are Alumni-in-Residence and Professors of Practice.

The Alumni-in-Residence initiative will bring in experienced UT PGE alumni to mentor and teach students. Alumni from all areas of industry (law, business, consulting, technology, etc.) will come to campus for three to four visits during one semester to mentor a cohort of 15 students about real-world industry problems and processes, particularly in legal and business aspects that receive less coverage in standard curriculum.

Hiring Professors of Practice to teach courses on practical topics not currently covered by faculty members, will create attractive opportunities for academic and industry veterans to share their expertise with the next generation of energy leaders.

Shaping the Energy Narrative

Amidst the noise and competing voices that can impact the public perception of the energy industry, the Hildebrand Department will illustrate the value of oil and gas and serve as a champion for societal improvement.

By providing expert thought leadership and by actively engaging in the public discussion, the department can help shape the conversation and encourage future generations to pursue careers in energy. One initiative the department will be launching to support this goal is the Petroleum Science and Technology Institute for high school STEM Teachers.

Led by the department's faculty and staff, the program will bring high school teachers and administrators from around the country onto the UT Austin campus every summer to learn oil and gas fundamentals. The hope is that the knowledge gained on the Forty Acres will then be applied in the teachers' classrooms – showcasing that the oil and gas industry is a challenging, technologically advanced, and rewarding path to a great career. More exposure in the top high schools of Texas is expected to aid in the department's undergraduate student recruitment efforts.

“This plan will guarantee our students, faculty, and staff will always have the tools and resources to be the best, and that they will continue to elevate the standard of quality in the oil and gas industry,” Olson said.

The Road Ahead - The Hildebrand Department strategic plan features:

1 CREATING A GLOBAL HUB FOR OIL AND GAS INNOVATION

2 ADVANCING OIL AND GAS EDUCATION

3 SHAPING THE ENERGY NARRATIVE



CELEBRATING LEGENDARY LEADERS

2018 DISTINGUISHED ALUMNI CEREMONY

For nearly 90 years, UT PGE has educated leaders who have shaped the oil and gas industry. In 2009, the department created the Distinguished Alumni Ceremony to recognize the best among them — company executives, technological innovators, and shrewd entrepreneurs who display an extraordinary commitment to the industry and the Hildebrand Department. This year, we will recognize four Distinguished Alumni and two Rising Stars for their outstanding contributions.



UT PGE's Distinguished Alumni Ceremony Committee is proud to announce the 2018 award recipients:

DISTINGUISHED ALUMNI

Thomas Barrow* (BSPE '45, MAGEO '48)

Richard D. Folger (BBA '81, BSPE '84)

Autry C. Stephens (BSPE '61, MSPE '62)

Gary L. Thomas (BSPE '72)

RISING STARS

Steve S. Habachy (BSPE '00, MSPE '06)

Jillian Jopling (BSPE '04)

The honorees have built a number of successful companies and led production efforts around the world for some of the largest oil and gas corporations. Collectively, their insights and bold ideas have forever changed the industry. They have also supported the Hildebrand Department — through service and/or funding — providing UT PGE students with the tools to become the next generation of successful oil and gas leaders. The Distinguished Alumni Class of 2018 will join an elite community of industry legends, including Ernest Cockrell Jr., Jeffery D. Hildebrand, Scott D. Sheffield and W.A. "Tex" Moncrief Jr.

The ninth-annual event takes place on Friday, Nov. 2 at 6 p.m. at the Four Seasons Hotel in Austin. Visit bit.ly/pgeda18 to learn more about the event and read the honorees' full bios.

**deceased*



The HUMBLE
HUMANITARIAN

David C. Baldwin (BSPE '85) is a leader in recognizing the next rising star – he is like a “Shark Tank” judge of the oil and gas industry with his great intuition for which companies have the passion and persistence to make it big. Beyond his success in the industry, Baldwin has been recognized recently for his commitment to his community. In 2016, he and his wife led a 3,500 mile bike ride across the country, which raised \$13 million for supporting people with intellectual and developmental disabilities.

For his philanthropic efforts, he received the prestigious 2018 Hoover Medal. Administered by the American Society of Mechanical Engineers, it is an engineering prize for "outstanding extra-career services by engineers to humanity." Baldwin joins the ranks of the other impressive winners, including two U.S. Presidents: Dwight D. Eisenhower and Jimmy Carter. In addition, Baldwin received the 2018 SPE Public Service Award. We asked Baldwin about his recent accolades, his leadership philosophy, and what advice he would give to current students.

1. What did it mean to you to be a recipient of the Hoover Medal?

I was shocked and overwhelmed when I received the phone call with the news from former SPE president, Dr. Nathan Meehan. I was aware that I had been nominated, but thought winning the award was a longshot given the achievements of previous winners. After I hung up with Dr. Meehan, I went to the Hoover Medal website to further study the award - I immediately felt humbled and truly honored. I am proud to be both an engineer and someone who cares deeply about their community, but I have never felt that my individual achievements were particularly noteworthy. Now to be recognized alongside other great engineers and humanitarians is an honor that I will deeply cherish for the rest of my life.

2. As the co-president of SCF, how would you describe your leadership philosophy?

I really do not consider myself a great leader. Fortunately, I am surrounded by partners at our firm and executives and entrepreneurs within our portfolio companies who are fantastic leaders. I love learning from them, and I attempt to emulate certain parts of their leadership skills so that I can become a more effective leader. I also like to constantly challenge our portfolio companies and my colleagues to innovate, improve and grow.

I enjoy taking risks and trying new things, and I like to build teams that are inspired to accomplish big goals.

3. What are the common characteristics you see in the successful companies you invest in?

Our companies are almost always led by passionate and persistent entrepreneurs. They are driven to succeed and often are able to avoid obstacles that derail many competitors. We also

like to invest in niches where the growth outlook may not be apparent to others. We seek to have common goals and financial alignment with our management team and employees.

4. What inspired you to enter the investment side of the oil and gas business?

Early in my engineering career, I discovered that I enjoy finding solutions where others see obstacles. I also enjoy working with others and putting teams together to solve problems. Thanks to the entrepreneurial spirit at my first employer, Union Pacific Resources, I was able to deploy these interests. We built a great team that was an early pioneer in making horizontal drilling a commercial success. Later in business school, I met L.E. Simmons. I was highly impressed with his business and financial mind, so much that I went to work with L.E. after business school. He has now been my mentor and partner for 28 years. He taught me how to take my technical skills and match them with a financial and business framework.

5. What sets the oil and gas industry apart from other avenues of investment?

First and foremost, the oil and gas industry is the most cyclical and volatile industry in the world - what other business has commodity and activity declines of 60 percent to 80 percent over extremely short periods? I find the entrepreneurs to be amongst the most determined, innovative, and resilient leaders of any industry. It is also a truly global and intensely competitive business. For all of its challenges, the energy industry is an exciting and diverse community and is the backbone of economic growth all across the world - it is a great place to build a career and make lifelong friends.

6. Looking back at your days at UT PGE what are some of your favorite memories?

I struggled in my first three years at UT Austin while trying to both play baseball and keep up with my engineering studies. Frankly, I was not performing well as an athlete or a student so I decided that one of them had to give. By

then it was apparent that I would starve as a professional baseball player, so I needed to get my act together as an aspiring engineer. Fortunately, I loved my elective engineering courses over the last three semesters before graduation, had a great summer internship, and fell in love with the entrepreneurial nature of the industry. I also enjoyed forming relationships with many fellow classmates with whom I have remained friends throughout my adult life. I left UT Austin with a sense of pride that I could overcome setbacks and was excited to put my academic knowledge to work.

7. What advice would you give to our current students?

My strongest suggestion would be to not fear initial failure. Life can be difficult, and learning to overcome setbacks early in your life will provide confidence for dealing with future setbacks. Also, try to identify what you really enjoy doing and find a career path that allows you to exploit your strengths. There is nothing more rewarding in life than waking up every day energized and excited about the opportunities and challenges ahead - this only happens when you are doing what you love. Most importantly, find ways early in your career to be involved in your community and do activities that benefit others. Being ambitious is fine, but life is richer when you can help others overcome obstacles and reach their potential.

8. What are your passions outside of energy?

My wife Maire and I love to travel and pursue almost any outdoor activity. We have also spent our entire married life volunteering to help individuals with intellectual and development disabilities (IDD). We decided to step in where social services were not providing support. Shortly after marriage we decided not to have children, but we committed ourselves to filling that void by trying to help others in a meaningful way. Volunteering has yielded some of the richest and most rewarding times of our lives. In 2016, we founded "Pursuit," as a means of broadening our commitment to people with disabilities. It also led us to an adventure of a lifetime as we rode our bikes across the country championing support for the IDD community.



RIDE *for a* CURE

As a UT PGE student, Hannah Knaup (BSPE '18) signed up for the longest annual charity bike ride in the world – the Texas 4000. Knaup thought the 4,000 mile trek would be solely about pushing herself physically on a bike, but she learned the journey was much more about self-discovery - the person who left Texas is not the same person who rode across the finish line in Anchorage, Alaska.

After Knaup's grandpa passed away from cancer when she was in high school and seeing her two best friends' parents experience the illness, Knaup became motivated to get involved with Texas 4000. The organization cultivates student leaders and engages communities to promote cancer awareness.

In addition to the ride each participant is also required to raise at least \$4,500 and partake in 50 hours of community service. Knaup's dedication and passion for the cause helped her to raise \$6,000 that will go towards cancer research or cancer support activities.

There are three route options (Sierra, Rockies, and Ozarks) for the riders – Knaup took the Sierra route, which brought her west to California and then north through Oregon, Washington, and into Canada.

The major cities along the route include: Santa Fe, N.M.; San Francisco, Calif.; Portland, Ore.; Seattle, Wash.; and Vancouver, B.C. The UT Austin team, which included more than 60 students, left the Forty Acres on June 1 for the 70-day excursion.

"After getting out of Austin, it was cool traveling through West Texas as my teammates would always point out all the drilling rigs to me as they know I am a petroleum engineering major," Knaup said. "It was exciting to have my future career intertwine with the ride."

Heading into New Mexico, the group stayed in a rural area to provide support to people fighting cancer and to educate the rest of the community on the best methods for preventing the disease. Knaup and a teammate told those who are affected by cancer that they are riding for them and listened to their experiences with the disease. She also brought potentially life-saving information to the rest of the community with the goal of reducing the number of cancer patients in the area.

"The family that hosted us lived in an economically underserved area, but they were incredibly generous in taking care of us," Knaup said. "The Texas 4000 organization has

three pillars – hope, knowledge, and charity. Going into the ride I put a lot of emphasis on the knowledge pillar, but after visiting the different communities I realize the tremendous importance of the hope pillar."

Pedaling into California, Knaup knew she would be tested as she had to make it through the sweltering heat of Death Valley in the middle of summer. This would, by far, be the hottest part of the ride.

"On the first day, it was 122 degrees – the heat really took a toll on us," Knaup said. "Luckily that night we didn't have to camp outside as a UT Austin alumnus lives in the area as a park ranger. We stayed with him and a few of the medics in the area, which was a lot of fun."

Once the team made it out of the record 127 degree heat on the second day, which included a van ride after the first 25 miles due to concerns of heat exhaustion, the team made it to San Francisco with a surprise waiting for the Texas Engineering students. The Cockrell

School of Engineering Dean Sharon Wood met the students at the Golden Gate Bridge for a ride to the majestic Sonoma Coast State Park.

"Dean Wood is an incredibly fast rider, so I was struggling to keep up with her but she was super encouraging and inspired us to keep riding," Knaup said.

As Knaup rode north into Washington with continued elevation changes, she fell ill with a virus and had to spend four days in the SAG (support and gear) vehicle. After recovering, she got back out on her bike in Canada, wearing a much welcomed sweatshirt, and rode the last 10 days into Anchorage, Alaska. From heat waves to an illness to visiting many communities, Knaup learned a lot on the road.

"Starting the ride, I put a lot of emphasis on the biking, but it is not why we are here," said Knaup. "It is about listening to people's stories – everyone has been affected by cancer directly or indirectly – and most importantly it is about spreading hope."

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Hannah Knaup Texas 4000 Instagram Posts



We left Farmington, NM and biked 75 miles to Bluff, UT. We had to go into the SAG vehicle for 30 miles because of a storm that was rolling in and because of some smoke that was coming from the fires in Durango. I like my teammates. I like when the sun is hidden behind clouds. And I like downhill.



We rode 105 miles to Mammoth Lakes, CA. This ride was physically and mentally tough. We were on the bike for 14 hours and I have never been so happy to get off the bike at the end of the day. My ride group was fun, the scenery was beautiful, and I was even greeted at a rest stop by a little puppy named Bear.



We rode 45 miles into San Francisco. I was greeted by friends and family, which made me so happy! I had been feeling homesick, so it was nice to see some familiar faces. I spent that night eating dinner and relaxing at my relatives' house. I joined this organization for my Grandpa Bob, so to be able to bike through where he lived and see that side of the family really meant a lot to me.



We were supposed to ride 110 miles to Florence, OR, but we only rode 60 miles due to some host obligations. We were greeted by some of the most welcoming people. This community was so willing to interact with all of us, and I know so many of us riders appreciated their engagement. My teammate and I then went home with our wonderful host family. They let us lounge in their hot tub and gave us beds to sleep on. I hope my retirement looks like theirs!



Our legs brought us here!!! 70 days. 4000 miles. 10 states. 2 countries. \$600,000+ raised. I have been changed for the better because of the 23 people I spent the summer with.



A DECADE of GROWING *the* GRADUATE STUDENT PIPELINE

The Hildebrand Department Summer Undergraduate Research Internship (SURI) program is celebrating 10 years of providing critical lab experience to some of the brightest undergraduate students from UT Austin and prestigious universities across the country.

The program's goal is to increase the pipeline of talented domestic graduate students applying for UT PGE. Thanks to the support of our dedicated alumni and corporate partners, the initiative continues to be successful a decade after its implementation.

Students who have participated in the program have worked on a variety of important energy topics, including ways to reduce residual oil saturation, using nanoparticles to remove oil from water and looking at data analytics to make recovery processes more efficient.

"I have participated in the SURI program since its inception, supervising at least one student every summer," said UT PGE associate professor Matt Balhoff. "The students have conducted extraordinary multidisciplinary research, which has even led to publications in peer-reviewed journals. Post-graduate school, many of the students have gone on to successful careers in the oil and gas industry."

Program Highlights:



138 undergraduate students have participated in the program



32 universities around the country represented (ex. Yale, Cornell, Georgia Tech)



22 faculty have mentored the undergraduate students



17 participants attended UT PGE for graduate school

Excellence & Accolades

Jake McKenzie Named Academic All-American

Texas senior first baseman and UT PGE Class of 2018 graduate Jake McKenzie was named to the 2018 Google Cloud Academic All-America Division I Baseball first team, according to the College Sports Information Directors of America (CoSIDA).

McKenzie, who graduated with a 3.95 GPA in petroleum engineering last May, is the Longhorns' first Academic All-American since John Curtiss in 2014 and the 12th CoSIDA Academic All-American in program history.

Professor Carlos Torres-Verdin Receives Texas 10 Honor

Since 2011, the Alcalde has honored UT Austin professors with the Texas 10 awards. The publication asks alumni to nominate their favorite professor from their time on the Forty Acres; of the more than 100 UT educators selected by former students only 10 make the final selection. Dr. Carlos Torres-Verdin made the 2018 Texas 10 list.

As an instructor, Torres-Verdin says he never tries to reproduce his thinking in his students. Instead, he aims to facilitate their learning and serve as a guide, providing them with the tools they need to forge their own paths.

"When you empower students, specifically through research, the student begins to teach you," he says. "You begin by leading them, but at some point there is a magical moment where the roles switch and the student begins to lead the professor."

UT PGE Students Garner Numerous Awards at SPWLA Symposium

At the 59th annual SPWLA Symposium, which was held in London, Michael Wang and RunQi Han both took first place in the student paper contest. Wang received the top prize in the bachelor's division for his presentation "Quantifying Frac Hit Trends in the Eagle Ford" and Han won in the Ph.D. division for his presentation "A Novel 3D Cuttings Monitoring Sensor for Real-time Downhole Condition Monitoring."

In addition, the student chapter of SPWLA at UT Austin won the Outstanding Student Chapter Award for the 2017-2018 academic year.

UT PGE Alumnus Presented with Cockrell School of Engineering Distinguished Graduate Award

Established in 1957, the Distinguished Engineering Graduate Award (DEG) represents the highest honor that the Cockrell School bestows on its alumni. The award recognizes honorees as highly respected professionals, dedicated engineers and supporters of higher education.

UT PGE alumnus Gary L. Thomas (BSPE '72) is a part of the 2018 distinguished class. Thomas is president of EOG Resources Inc., one of the largest independent crude oil and natural gas companies in the United States. Thomas is a member of the Society of Petroleum Engineers and the Texas Independent Producers and Royalty Owners Association.

Dr. Hugh Daigle Wins Cockrell School of Engineering Teaching Award

Dr. Hugh Daigle won the Cockrell School Dean's Award for Outstanding Engineering Teaching by an assistant professor to recognize excellence in teaching. This award promotes and encourages exceptional teaching in a faculty member's early career.

Recipients must demonstrate effective teaching as reflected through mechanisms such as course/instructor surveys, show a warmth of spirit and a genuine concern for students, and exhibit the ability to impart knowledge while challenging students to conduct independent inquiry.

Two Faculty Members Receive Promotions

After both joining the Hildebrand Department in the fall of 2015 as assistant professors, Zoya Heidari and Ryosuke Okuno have been promoted to associate professors effective Sept. 1, 2018.

Prior to their UT Austin appointments, Heidari was an assistant professor in the Harold Vance Department of Petroleum Engineering at Texas A&M University and Okuno served as an assistant professor of petroleum engineering in the Department of Civil and Environmental Engineering at the University of Alberta.



To read more about the accolades visit: pge.utexas.edu/news

RACHEL SCOTT

Even though Rachel Scott (BSPE '18) grew up in College Station, Texas, she quickly developed a passion for the Longhorn community through her involvement in several organizations that focus on highlighting the benefits of engineering to society. In just four years as a UT PGE student, Scott not only had a significant impact on the Forty Acres, but also on the world.

Scott applied to several Texas schools and engineering majors but after attending the Cockrell School of Engineering's "Girl Day" on the UT campus, Scott knew UT PGE was the perfect fit for her. Tara Sharma (BSPE '15) served as her mentor during the event. Sharma told Scott all about student life, classes and research, but it was a visit to the SPE (Society of Petroleum Engineers) booth that sealed her acceptance letter.

"I helped the SPE group do 'cupcake coring,' which I thought was such a creative and fun idea to engage students in petroleum engineering," Scott said. "The best part though was when the current UT PGE students and the kids started singing a 'Frozen' song and I was like 'I can totally fit in here.'"

In her first-year as a UT PGE student, Scott wasted no time engaging in student organizations that enhanced her academic experience. She became involved with Women in Petroleum and Geosystems Engineering (WPGE), with a mission to highlight the amazing engineering opportunities to young girls.

"I participated in the Chevron Mentorship Program, because I was never exposed to engineering until high school," Scott said. "I became passionate about designing outreach activities, particularly on hydraulic fracturing, to kids and their parents."

When Scott was not teaching science to the next generation of engineering students, she served as a member of the department's SPE PetroBowl team. She competed in the 2017 regional spring competition in Denver, going head-to-head against other prominent petroleum engineering schools.

"It was cool to learn about the history of the oil industry – it is fascinating to see how highly intertwined it is with politics and economics and basically the development of the modern world, as a whole," Scott said.

This past summer, before beginning her career as a consulting analyst with Accenture, Scott flew to Oaxaca, Mexico to participate in the Projects of Underserved Communities Program – a joint UT partnership between the Cockrell School of Engineering, the International Office, and the Steve Hicks School of Social Work. Scott took her engineering knowledge into the small community to build up its economy.

The community produces a mesquite flower, which is a high protein and gluten-free flower making it a marketable product. It is a good alternative to regular sweeteners and has measurable amounts of key vitamins.

"The issue with the current production method of the flower is that the people do not have an effective drying process," Scott said. "We built them solar dryers, which from our experimenting appears to be a better method, so I am hopeful the community will be able to become more profitable."

While Scott wishes she could have spent more time in Mexico, she is excited about getting her feet wet in consulting and data analysis in her new job. In addition to working full-time, Scott's plan is to continue serving as a mentor for young women, encouraging them to see they have an important place in engineering.



JOHN GRIFFITH

Born and raised in The Woodlands, Texas by two lawyers, petroleum engineering was not an obvious major for Jon Griffith (BSPE '18). He made the decision to study engineering after his passion for math collided with his increased involvement in science classes his senior year of high school. By taking AP chemistry and environmental science he knew engineering would be the right fit for him, but he was not sure which field to select.

After observing his uncle's career in the oil and gas industry and knowing he had the desire to see the world and experience different cultures – petroleum engineering became the clear choice.

“Working in the petroleum engineering field seemed like an interesting life in the way my uncle traveled so often and lived in Alaska and Indonesia,” Griffith said. “Every well is different, every job could be entirely unique, even if you are in the same position. I could see myself doing that for an entire career and never getting bored.”

Making the transition into being a college student for Griffith meant getting involved as much as possible; from testing out different student clubs on campus to actively enrolling in as many general engineering courses that his schedule would allow. He knew staying busy would be the key to success during his college experience.

A couple of months into his freshman year, through conversations with fellow UT Austin students, Griffith would occasionally encounter pessimistic views of the oil and gas industry, specifically hydraulic fracturing.



With the help of some classmates — Leo Huang, Logan Nutt, Adhar Verma, and Sarah Wong — he created an organization called Frac Pac. Frac Pac sought to educate and inform students and community members about the benefits of hydraulic fracturing.

“We all truly felt like we could improve the way people perceive petroleum engineering,” Griffith said. “My dad always said there are two sides to every story, so we felt like we could really showcase the economic benefits of hydraulic fracturing. I think my dad allowing me to tell my side of the story in any situation gave me the confidence to address this topic.”

Throughout the duration of his time in the department and a leader of Frac Pac, Griffith and his team made an impact on the community by speaking at middle schools, high schools, and a few government organizations. The effort Griffith and his team put into establishing Frac Pac will continue as a new team has been set in place to carry on its legacy.

When Griffith was not dedicating time to Frac Pac, he was working as a part-time community ambassador for the off-campus dorm University Towers.

“I learned a lot about salesmanship,” Griffith said. “I have learned how to construct a narrative when talking to people to keep them engaged.”

Those skills will come in handy as Griffith starts his career at Schlumberger as a field engineer. Before heading to San Antonio, Griffith toured Europe for two months with friends stating, “How am I supposed to change the world if I haven't seen it?”

ENERGY ENGINEERING BUILDING

The University of Texas System Board of Regents has officially added the Cockrell School of Engineering's new Energy Engineering Building (EEB) to the Capital Improvement Program, a milestone that signals formal approval to proceed to the final design and planning stage in preparation for the facility's construction in 2019.

The EEB is a 183,000-square-foot facility and the next building in the Cockrell School's facilities master plan, and it will foster multidisciplinary collaboration and further establish the school as a world leader in energy education and research.

The space will be designed for students, faculty and researchers working and studying in multiple disciplines, including petroleum, chemical and mechanical engineering, bringing the Texas Engineering community together to share ideas and solve the most complex problems facing energy today.

