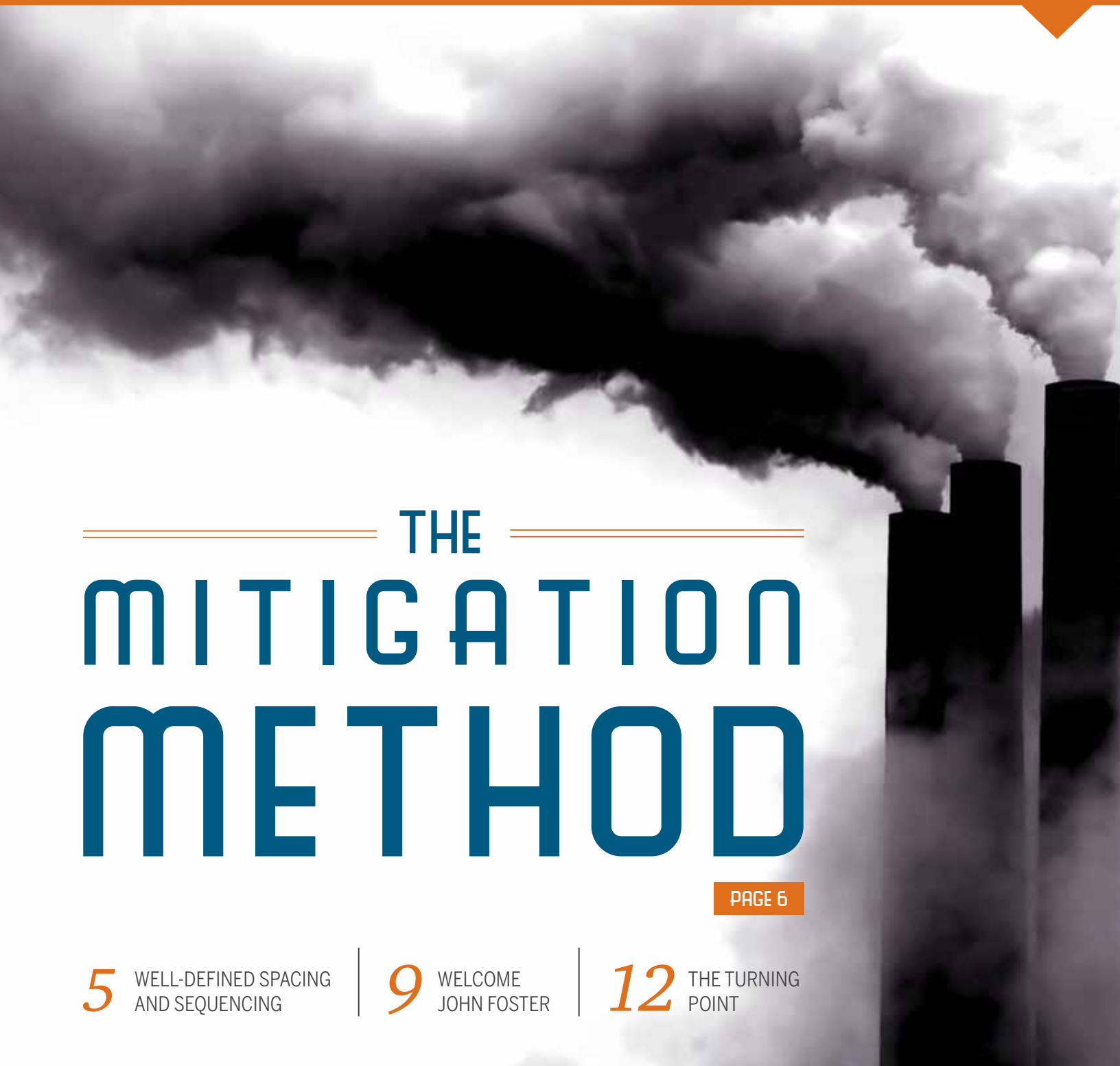
THE UNIVERSITY OF TEXAS AT AUSTIN
Cockrell School
Petroleum and Geosystems Engineering

2014 | 2015

ENERGY ONE



THE MITIGATION METHOD

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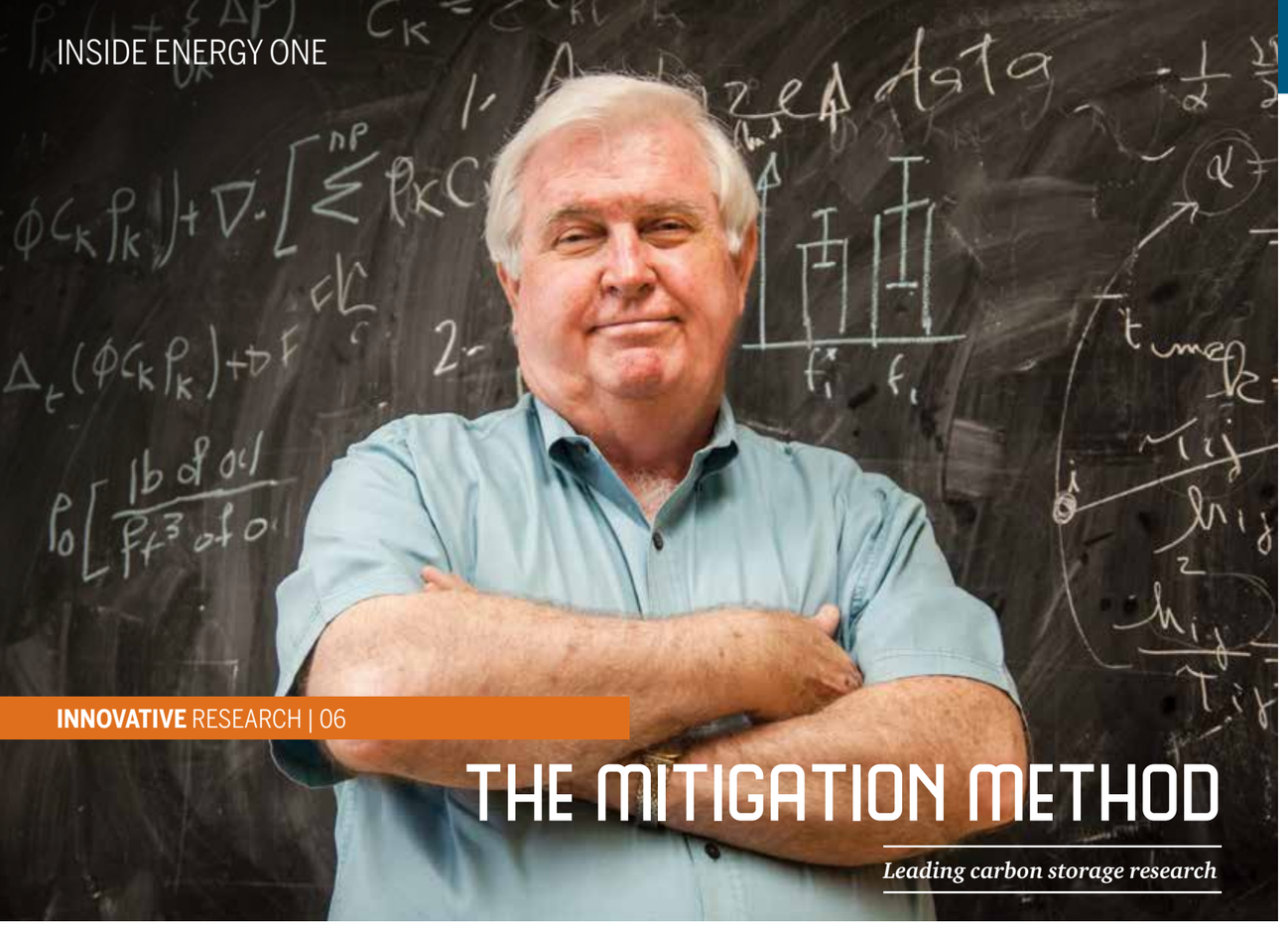
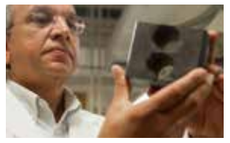


INNOVATIVE RESEARCH | 06

THE MITIGATION METHOD

Leading carbon storage research



ABOUT **ENERGY ONE**

The University of Texas at Austin 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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A digital version of the magazine can be viewed at ***pge.utexas.edu/news***

BY TAD PATZEK, CHAIR, UT PGE

The QUALITY CAMPAIGN

A resounding theme piping through the UT PGE Department this year is ***quality***. Throughout the pages of this magazine you will see we are conducting quality teaching and research and the faculty and staff are being recognized for their efforts through prestigious industry and university awards. We are producing quality students whose leadership and knowledge will advance our society's energy production. A large part of our success is due to our passionate alumni, who are committed to making UT PGE a world-class program.

Despite our overflowing classrooms and offices, we are producing quality work, but I know we can do better. A new home conducive to modern teaching and research is fundamental to our continued success. We need collaborative spaces so our students can work on sophisticated projects, technology-based classrooms for enhanced learning and a large all-purpose meeting room so SPE and AADE can host their meetings in UT PGE (not across campus). The new building will serve as a catalyst for top-tier student and faculty recruitment.

It's also critical to upgrade our labs, not only so our students are working in a safe environment, but so they can produce meaningful results meeting industry's key challenges. For more information on this subject, I encourage you to read William Beecherl's message on page 11. Without alumni support, big and small, this building won't be possible.

I will serve as a strong advocate for our new home, but not from the chair position. Effective December 31, 2014, I will step down as the UT PGE chair. After experiencing a serious health scare this summer, my family and I decided it's best for me to focus my energy on being a professor and researcher. I want to deeply thank the entire UT PGE family for its tremendous support over the past six-and-a-half years. It was a pleasure and honor to serve as the UT PGE chair – I will always cherish the memories and friendships.

> *"A new home conducive to modern teaching and research is fundamental to our continued success."*

The department's plan is to conduct an internal search for the next chair. We are committed to finding a replacement who will propel the department forward with a strategic vision.

So for the last time, I am excited and proud to share our stories from the past year. Here's a glance at what you will find in this edition of *Energy One*.

Diverse, Impactful Research - This past summer, the U.S. Department of Energy awarded the Center for Petroleum and Geosystems Engineering a $12 million grant to conduct carbon storage research in an effort to mitigate greenhouse gas emissions. In addition, Dr. Mukul Sharma shares best practices on a hot hydraulic fracturing topic, fracture spacing and sequencing, and Dr. David DiCarlo offers his innovative results from an enhanced oil recovery project using nanoparticles.

Faculty Expansion and Promotions – We are excited to add a new assistant professor to the faculty roster. Dr. John Foster brings with him strong academic and national lab experience. In addition, two staple faculty members in the department, Drs. Jon Olson and Sanjay Srinivasan, have been promoted to full professor. I know they will continue to do great things for UT PGE.

Passionate, Successful Alumni – The department noticed a trend among our alumni – they start their careers in big oil and then are bitten by the entrepreneurial bug and form their own businesses. We caught up with a handful of alumni who have followed this path to hear their stories. You will also find the list of this year's prestigious Distinguished Alumni honorees as well as a thank you to the 2013-2014 donors.

Farewell 2014, Welcome 2018 - This past academic year, we graduated 151 undergraduate and 52 graduate students who will start their journey changing the world through industry or academia. The department welcomed the 2018 class with its third annual Freshman Fall Retreat, which introduces students to the Longhorn spirit and pride.

Happy reading and Hook 'Em.

Dr. Tad Patzek
Professor and Chair

The Cockrell Family Chair in Engineering #11 and The Lois K. & Richard D. Folger Leadership Chair

A SOLID DISCOVERY ENHANCES OIL RECOVERY

The research coming out of the UT PGE labs aims to discover innovative solutions for how to improve current oil and gas recovery processes. The latest idea from Associate Professor David DiCarlo's lab is the application of nanoparticles during enhanced oil recovery (EOR) to pull a greater percentage of hydrocarbons out of the ground.

Nanoparticles, which are used across other industries including the medical field, are simply solid particles on the order of a billionth of a meter, i.e. nanometers. For perspective, a nanoparticle is one million times smaller than an ant. Due to their size, nanoparticles can be suspended in brine and are ideal to use during the recovery process.

"Usually, we only have the ability to work with fluids and solvents in EOR, because the holes in the rock are so small," said DiCarlo. "A solid works in this case, since the holes look like canyons to the nanoparticles. Due to this capability, you can engineer the nanoparticles to make them work in an ideal fashion; we are no longer limited to fluids."

Nanoparticles cannot stand alone as a recovery agent, but they enhance CO_2's ability to displace the oil. DiCarlo says, "CO_2 is an excellent fluid for EOR, but it has one fatal flaw - low viscosity - so we miss a lot of the oil." His team is attempting to remedy that issue with nanoparticles.

Second year M.S. student, Roy Wong, is working with DiCarlo in the lab to find an avenue for better contacting the reservoir.

"The commercial nanoparticles I work with are attracted to CO_2 and water interfaces, making the CO_2 more viscous during injection into rocks," said Wong. "When it is more viscous it can displace more oil, so I run core floods with nanoparticles, water, and CO_2 to quantify and optimize these effects."

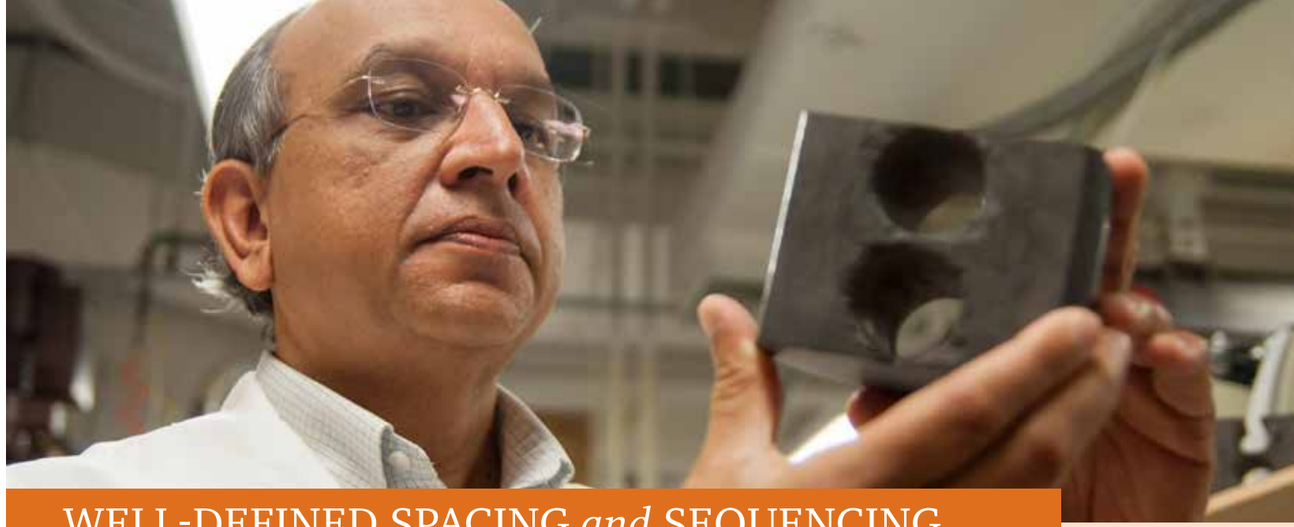
DiCarlo and his team are now working with a company in the field looking to pilot nanoparticles in its recovery operations. His goal is to see application of this method in areas focused on EOR, particularly in West Texas. His lab experiments suggest a positive outlook for nanoparticles in EOR. He has a nanoparticles supplier and fields to conduct the work, but first they are developing a model to better predict its success outside of the lab.

Another benefit of nanoparticles for this particular experiment, beyond EOR, is the positive implications on carbon storage. "The improved CO_2 viscosity with nanoparticles allows it to overcome reservoir heterogeneity and reach more places in the reservoir," said Wong. "Therefore, we can store CO_2 more efficiently in geologic formations and minimize our subsurface footprint. In addition, nanoparticles hold the CO_2 in a safer, more stable phase than a bulk gas. If there was a leakage pathway, the nanoparticles would prevent the CO_2 from rising to the surface."

The impact of nanoparticles in enhanced oil recovery is still to be determined, but DiCarlo and his team believe it could be a significant player in the process. Wong said, "The potential for this technology is truly exciting."

For more information on this project, contact Dr. David DiCarlo at dicarlo@mail.utexas.edu

"Due to this capability, you can engineer the nanoparticles to make them work in an ideal fashion; we are no longer limited to fluids."



WELL-DEFINED SPACING *and* SEQUENCING

The shale gas boom has become a game changer in our nation's energy landscape, pushing the U.S. towards energy independence. UT PGE Professor Mukul Sharma, who has been with the department for almost three decades, has been conducting research on the topic for more than 10 years – far before hydraulic fracturing became a household name. Sharma is addressing some of the largest hydraulic fracturing challenges, including how to increase the estimated ultimate recovery.

Sharma and Ph.D. student, Ripu Manchanda, are working to best understand the complex network of fractures.

"We are looking at optimizing the well and fracture spacing as well as the sequencing – all three variables are linked together," said Manchanda. "It's a three-pronged approach and we want to define how they impact one another in the subsurface."

Over the past few years, zipper fracturing (frac), has become an important industry term associated with hydraulic fracturing as it improves well performance and reduces the rig time. The two-well zipper frac technique fractures adjacent wells in sequence, enabling one well to hold fracture pressure while the adjacent well is being fractured. There was not a lot of science behind why this process works, so Sharma and his team used field data from the Eagle Ford shale and other plays to develop an accurate model for the process.

"Industry had a vague explanation for why zipper fracturing works, but we showed that it is the time between adjacent fractures in a well that controls things," said Sharma. "If you give yourself the most amount of time between one fracture and the next fracture in the same well there is a tremendous advantage. The stress shadow is time dependent and giving it more time between fractures causes this stress shadow to become much less important."

Manchanda is discovering a way to create a general model for better understanding zipper fracs that is applicable in all shale plays.

"If you can characterize the well by understanding the fluids and mechanical properties of the rock, then you can put those parameters into the model," said Manchanda. "3D simulation is important to view all wells; I want to model the processes, so people can simulate multiple fractures in multiple wells. We are defining the best option to optimize recovery."

Sharma and his team's goals are to help push the estimated ultimate recovery for these wells up by 10 to 30 percent by optimizing the fracture spacing and well spacing.

"I think what people are finding is if you put wells closer and closer you tend to get reasonably good production from infill wells," said Sharma. "The problem is that if you fracture these infill wells the fractures run into the old fractures, because they tend to go towards the part of the reservoir that has been depleted. You want fractures to go into a fresh part of the reservoir that has high pressure. Unfortunately, that's not where the fractures want to go."

Discovering a solution to this issue and providing a modeling tool that will help operators design fracture treatments, select well spacing and fracture spacing is at the top of Sharma's list.

Sharma's group is also in the process of building a downhole tool that is specifically designed for improving recovery in tight rocks.

"This tool will be of great interest to a lot of operators in the Bakken and maybe the Eagle Ford - any oil reservoir that is tight is a perfect fit," said Sharma. The development of this tool is so important because primary oil recovery factors are about six percent, according to Sharma. It is difficult to conduct improved oil recovery in extremely tight rocks by injecting into one well and producing from another. The oil migrates between wells at an incredibly slow rate, or it simply flows along fractures.

"What we are proposing is that you inject and produce from the same well at select locations to achieve first oil faster and that's never been possible before."

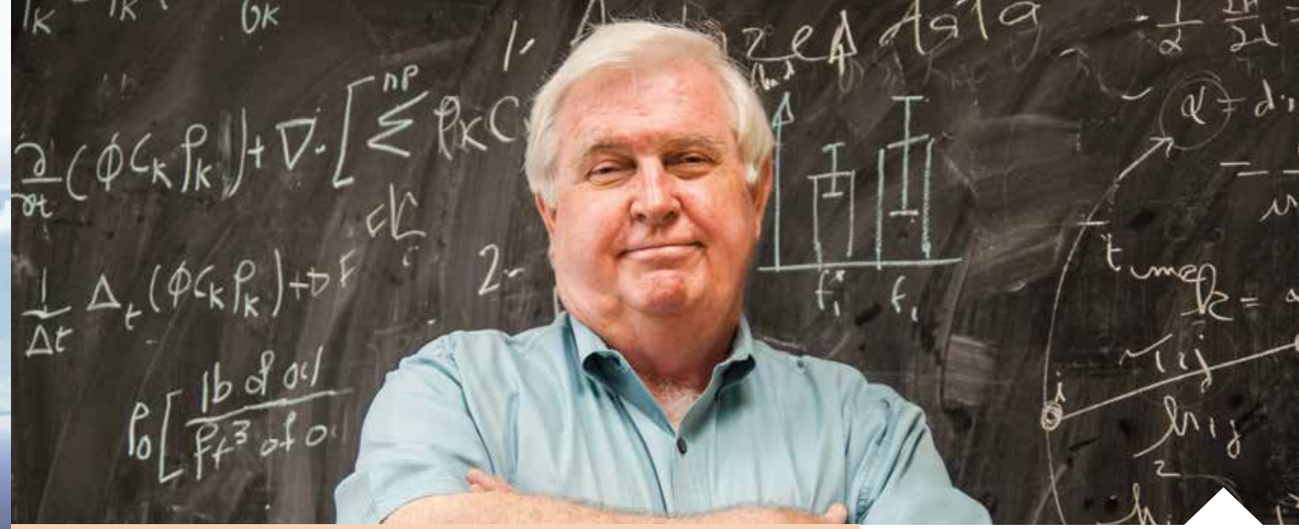
Learn more about Sharma's research program, by visiting his personal website featured in his faculty profile on the PGE website.

THE MITIGATION METHOD

Alongside improving oil and gas recovery, UT PGE is playing a significant role in advancing the important field of carbon storage research through a multi-million dollar government grant.

CO_2 STORAGE

5,000 to 12,000 ft



Coinciding with the White House's announcement earlier this summer to reduce 30 percent of carbon emissions from power plants by 2030, compared with the level in 2005, the U.S. Department of Energy awarded Dr. Larry Lake and the Center for Petroleum and Geosystems Engineering's Center for Frontiers of Subsurface Energy Security a four-year, $12 million grant to fund carbon storage research aimed at reducing greenhouse gas emissions.

The goal of the research is to improve geologic CO_2 storage, which is a key technology for mitigating greenhouse gas emissions from fossil fuel consumption — especially from coal and natural gas used to generate electricity.

A multidisciplinary team from the Cockrell School of Engineering and the Jackson School of Geosciences at the university and Sandia National Laboratories in Albuquerque, New Mexico, will collaborate on the project to devise a meaningful mitigation method.

The carbon storage process is taking carbon from the atmosphere after it is burned in a coal fire power plant and turning it into a super critical liquid that can be injected into the ground and stored either for future use or permanently.

U.S. Secretary of Energy Ernest Moniz announced in June that UT Austin's center is one of 32 Energy Frontier Research Centers (EFRCs) across the nation that will receive a total of $100 million in funding. UT Austin is the only university in Texas to receive the grant. According to Moniz, the purpose of the funding is to accelerate the scientific breakthroughs needed to build the 21st-century energy economy.

"Today, we are mobilizing some of our most talented scientists to join forces and pursue the discoveries and breakthroughs that will lay the foundation for our nation's energy future," said Moniz. "The funding will help fuel scientific and technological innovation."

This grant is a renewal of a five-year, $15.5 million research grant to the center in 2009. The previous grant, led by Drs. Steve Bryant and Gary Pope, discovered the significant limitations of effective CO_2 storage, including the restrictions in accessing the space in underground aquifers. The research was critical to this upcoming grant, which will incorporate more applied science, as that foundational knowledge will help address the next set of issues.

"UT Austin has become a leading university for addressing critical carbon storage challenges, including sustaining large carbon dioxide storage rates for decades, better using storage space and improving carbon containment," said Lake, who holds the Shahid and Sharon Ullah Endowed Chair in Petroleum and Geosystems Engineering. "This research has the potential to create a healthier environment and economy."

The goal of the multi-year project is to determine how to access all the pore volume in a reservoir. Currently, it is restricted because when CO_2 is injected the pressure rises quickly, blocking access to the space.

The research project, which includes 20 faculty members from across the university, begins fall 2014. In addition to Lake, seven faculty members within UT PGE will contribute to the research including: Hilary Olson (associate director), Sanjay Srinivasan (theme lead), Matt Balhoff, David DiCarlo, Nicolas Espinoza, Chun Huh and Mary Wheeler.

For more information on the carbon storage project, visit: www.utefrc.org

UT Austin is establishing itself as a strong global leader in carbon capture and storage research and education:

#GHGT12: On October 5-9, 2014, the university is co-hosting the GHGT-12 Conference, the premier international conference on greenhouse gas control technologies, at the Austin Convention Center. Almost 1,600 scientists, students, industry leaders and policy makers are attending the event, including U.S. Secretary of Energy Ernest Moniz, to exchange new knowledge, information and ideas and learn from 340 speakers representing 27 countries about carbon capture and storage.

CCS INTERNATIONAL SUMMER SCHOOL PROGRAM: UT Austin's Center for Petroleum and Geosystems Engineering hosted a prestigious International Program on Carbon Capture and Storage (CCS) this summer with 50-60 select graduate students from a variety of disciplines. The intensive, week-long course covered the full chain of CCS, including technical information on capture technologies, storage site selection, capacity and modeling, wellbore integrity and transport, as well as other issues such as regulations, health and safety, and public communication.

OLSON *and* SRINIVASAN *Promoted to* FULL PROFESSOR

UT PGE is pleased to announce the promotion of Drs. Jon Olson and Sanjay Srinivasan to full professor effective September 2014. Both professors have made a significant impact on enhancing the department's research, academics and outreach.

PROFESSOR **JON OLSON**

Olson joined the UT PGE faculty in 1995, after spending six years in industry working for Mobil (now ExxonMobil) in Dallas. A graduate of the University of Notre Dame, Olson earned his bachelor's in both civil engineering and earth sciences, before going on to pursue his Ph.D. at Stanford University in applied earth sciences. With an interdisciplinary background in both geology and engineering, Olson brought a collaborative approach to the department that was well suited for the newly created Geosystems Engineering and Hydrogeology (GEH) undergraduate program. Soon after joining the department, Olson was given the role of faculty advisor for the GEH degree, and later took on this role for the petroleum engineering degree as well.

Olson is the chair of the Undergraduate Studies Committee, and devotes much of his time to the freshmen both as an academic advisor, and in teaching the introductory PGE 301 class, which is taken by all petroleum engineering students in the spring of their freshman year. Olson's teaching philosophy is to engage students with the practical significance of engineering calculations and the intrigue of problem solving. He brings real world experiences to life for the freshmen, giving them an insider's view of what it is like to be in the industry.

Olson's research areas include reservoir geomechanics, hydraulic fracturing, naturally fractured reservoir characterization, and unconventional resources. He is the co-PI of the industrial affiliates program, Fracture Research and Application Consortium (FRAC), which includes 20 companies and raises approximately $1 million a year.

On his promotion to full professor, Olson said, "It's exciting is to be able to say that you've reached the highest recognition and position at the university, and it's good to have that recognition from your peers. I'm grateful to continue doing my work both with engineering and geology, in collaboration with the Jackson School of Geosciences. Hydraulic fracturing and unconventionals are really hot right now, so I have students working on some really interesting projects, and that is always stimulating and rewarding."

PROFESSOR **SANJAY SRINIVASAN**

A petroleum engineer to the core, Srinivasan earned his bachelor's of technology in petroleum engineering from the Indian School of Mines in Dhanbad, his master's in petroleum engineering from the University of Southern California, and his Ph.D. in petroleum engineering from Stanford University.

After a brief stint as an assistant professor at the University of Calgary in Canada, Srinivasan joined the UT PGE department in 2002. His research areas include integrated reservoir characterization, reservoir engineering, and unconventional resources.

During his time in the department, Srinivasan has devoted much of his energy to recruiting top candidates to the graduate program. He serves as the graduate admissions chair, and in 2007, initiated the Summer Undergraduate Research Internship (SURI). The program attracts prestigious undergraduate students from universities all over the country to come work alongside UT PGE faculty conducting high level academic research in an effort to build a pipeline to the graduate program.

Srinivasan maintains a large research group, and is excited about tackling the changing face of subsurface engineering and issues related to hydrocarbon production. "We are finding out that we need new technologies for injecting high volumes of CO_2 quickly into the subsurface," said Srinivasan. "It brings up a whole bunch of challenges, so I'm tasked with learning new areas, such as nanoparticles, which haven't been part of traditional petroleum engineering."

On his promotion to full professor, Srinivasan considers it a privilege to be counted among the ranks of the prestigious UT PGE faculty. "When I was a student in India, I always read books by Larry Lake, and papers by Gary Pope," said Srinivasan. "To then walk into this department and get to go to lunch with Larry Lake and Gary Pope, and meet all of these other innovators of the petroleum engineering field, that makes your professional life even better. How many people can say they went to lunch with Larry Lake and Gary Pope?"

Q&A

JOHN FOSTER

Dr. John Foster is joining UT PGE this fall as an assistant professor. He has already built an impressive résumé, which includes innovative and applicable research, excellent teaching skills and a pilot's license. He has a strong vision for what he hopes to accomplish in the department that will propel UT PGE forward. Learn more about Dr. Foster through our question and answer session.

1/ WHAT IS YOUR EDUCATIONAL AND PROFESSIONAL BACKGROUND?
I have a B.S. and M.S. in mechanical engineering from Texas Tech University and a Ph.D. from Purdue University. Prior to starting my academic career, I was a staff member at Sandia National Laboratories in Albuquerque, New Mexico, for seven years. I then moved to The University of Texas at San Antonio (UTSA) as an assistant professor in mechanical engineering, where I was for three years before joining UT PGE.

2/ WHY DID YOU CHOOSE UT PGE AS YOUR NEXT CAREER MOVE?
Two years ago, UT PGE Professor Mukul Sharma and I wrote a U.S. Department of Energy proposal together to develop a new generation of computer simulation tools to model hydraulic fracturing processes based on the peridynamic theory of solid mechanics (a generalized theory of continuum mechanics originated at Sandia that has shown great success in modeling complex fracture problems). The proposal was funded in October 2012 and since that time I made many trips to Austin to collaborate with Professor Sharma and his research group. During these collaborative visits, I came to know the high-quality of students UT PGE was attracting as well as the many interesting mechanics problems that the petroleum industry faces. The access to excellent students and interesting problems of high societal impact led me to pursue an opportunity to join the faculty.

3/ WHAT DO YOU HOPE TO ACHIEVE IN THE DEPARTMENT?
Because of my unique background and experience in using high-performance computing (HPC) to solve complex mechanics problems while at Sandia, I hope to bring this knowledge-base to the UT PGE students through instruction that will give them the confidence to tackle large-scale problems efficiently and with confidence using HPC. I hope to soon offer a course on "HPC for Engineers" as I have for the last three years at UTSA. Additionally, I hope to collaborate with the many excellent faculty at UT Austin on problems involving fracture mechanics, geomechanics, anomalous transport processes, and assist in HPC simulation code development efforts. In the long-term, I'd like to lead a joint industry program (JIP) focusing on one or more of these areas targeting applications of interest to the energy industry.

4/ WHAT DO YOU CONSIDER YOUR GREATEST ACCOMPLISHMENT?
Professionally (a caveat any father must make…), I believe my greatest accomplishment has been to become a respected leader in the growing field of peridynamics research. Several of my papers on this subject are among the most cited, and I am regularly called upon for my expertise in this area. This is an exciting and growing field that unifies generalized continuum and fracture mechanics theories and has the promise to explain and predictively simulate many complexities associated with pervasive crack propagation.

5/ WHAT ARE YOUR PASSIONS AND HOBBIES OUTSIDE OF THE LAB?
As a husband and father of two young children, most of my time away from work involves family. I do enjoy spending time at the lake with family and friends, traveling, and although, I have not been too active lately, I am also a private pilot and hope to be able to spend a little more time flying in the future.

Fifth Annual DISTINGUISHED ALUMNI PROGRAM & REUNION

UT PGE's Distinguished Alumni Program will honor six individuals on **FRIDAY, NOVEMBER 7, 2014,** for their outstanding contributions to the oil and gas industry, as well as their leadership in supporting the advancement of the petroleum engineering field. This year, the sixth honoree is a former faculty member whose vision for the petroleum engineering discipline helped define the UT PGE standard of excellence for the past four decades.

UT PGE's Distinguished Alumni Program Committee, composed of UT PGE alumni and faculty, is pleased to announce the prestigious 2014 Distinguished Alumni honorees:

JACK C. ZARROW*
BSPE '47

GAIL CHENOWETH
BSPE '82

GEORGE L. STEGEMEIER
MSPE '54, PHD PE '59

SHAHID ULLAH
BSPE '82

GEORGE H. FANCHER, JR.
BSPE '61, MSPE '62

ROBERT S. SCHECHTER
Professor Emeritus

*DECEASED

This year's Distinguished Alumni Reception and Dinner is set for November 7, at The Driskill Hotel in Austin, Texas. The reception will begin at 6:00 p.m., and the dinner at 7:00 p.m. The UT PGE Alumni Reunion will take place on Saturday, November 8, at the UT PGE Department. The time for the reunion will be announced at the beginning of November due to football scheduling.

A unique aspect of this year's alumni reunion is that it aligns with a special slate of Homecoming events taking place all across campus. UT Austin's Student Government is leading the charge to bring together students, faculty, parents and alumni to celebrate the traditions and school spirit that resonates among all Longhorns.

As of press time, sponsors of the UT PGE DA Reception and Dinner, include:
Underwriters: Anadarko, Chevron, Chief Oil & Gas; EnergyQuest II, LLC; ExxonMobil; Goldston Oil
Premier Supporters: Marathon Oil; Pinkston Energy, LLC; Carrie Colbert; John & Stephanie Broman; Jerry & Cherry Windlinger
Supporters: Discovery Operating, Inc.; I&GN Resources; Fancher Oil II, LLC; Folger Energy, LLC; C. Ronald & Kathie Platt; Stephen & Myra Skinner; Don Sparks and Jeff Sparks; Sunflower Oil, Inc.

The UT PGE Alumni Reunion is presented by Strand Energy, LC.

If you or your company is interested in sponsoring this year's exciting recognition of these alumni and their accomplishments, please contact Heath Hignight (512-471-3208; heath@mail.utexas.edu). Visit pge.utexas.edu/alumni for more information.

Message from the EAC CHAIR

You Can Help UT PGE Remain the Best PE Program

> *"The squeaky wheel gets the grease and grease is our byproduct, so let's use it to transform our department."*

It has been my pleasure to serve on the UT PGE External Advisory Committee (EAC) and witness the educational evolution manifested by the department. It continues to be a fiduciary steward of our public dollars, graduating well-prepared and educated students into the business community and conducting research for an expanding industry, which has been the engine for our strengthening economy. There is much to be proud of as alumni of this department since it has made significant contributions to our energy industry.

With that said, the EAC would like to make you aware of the limiting constraints created by our existing building. The department is in the process of adding eight new faculty members for the existing and future student populations. UT Austin is admitting more PGE undergraduates each year — this year 140 UT PGE applicants were admitted and 92 enrolled. By the year 2020, we expect to have up to 40 more freshmen enrolled annually as part of the broader expansion of UT Austin's undergraduate engineering enrollment. We continue to produce an exceptional product, but need to expand our facilities to maintain our excellence.

The challenges faced by local and global industry require smarter engineers and new solutions, both of which can be provided by a properly housed and funded UT PGE. Our existing building cannot meet the demand for more students, increased faculty to educate the students or increased lab space for industry research. Current lab space is limited by the building ventilation system and building codes. There is an immediate need for modern lab space to perform innovative research.

While a new building will take a large sum of capital, we first need your support through your political and professional relationships to garner support for our vision of a new building. The next time you are visiting with your state legislator, alumni business leader, or UT's leadership, please impress upon them your desire to make the UT PGE Department a top priority. Dean Wood is aware of our desires and there have been discussions with other Cockrell School departments regarding their needs, but I want to enlist the support of you and other UT PGE friends to support a building that first fulfills the needs of our UT PGE Department. The squeaky wheel gets the grease and grease is our byproduct, so let's use it to transform our department.

A personal request that I would like to place before our corporate research partners and sponsors is the consideration of a gift of sweat equity donated to the department as well as capital dollars. Corporations should consider enrolling B.S. major employees into the M.S. and Ph.D. programs as part of a sponsored research project. We need to invest in and plan for the future makeup of our faculty.

Let's not forget, passing through the university and being trained by our outstanding faculty are extraordinary bright young minds. Please consider supporting our students by providing summer internships and offering permanent positions to our graduates.

WILLIAM C. BEECHERL
President, Verdad Oil & Gas Corporation
Chair, UT PGE External Advisory Committee

The TURNING POINT

The UT PGE Legacy of Entrepreneurship in the 21st Century

The Travis Peak (Hosston) formation has been tackled by many companies going back to the 1940s. But when Jim Addison, BSPE '85, decided to leave an executive-track career with a prominent oil and gas company to form Travis Peak Resources, LLC in 2013, going into an East Texas and Louisiana gas play was the farthest thing from his mind.

"My wife, Meg, and I were driving west of Austin, not too far from our home on Lake Travis," said Addison. "We were talking about what it would mean for me to start a company, and we drove past a sign for the small, rural community of Travis Peak, Texas. I knew that day we would start a company and call it Travis Peak Resources."

Just under one year later, Travis Peak Resources has grown from four founders to a team of 12 — where half the company bleeds burnt orange. Co-founder Clint Calhoun, BSPE '99, and Acquisitions & Reservoir Engineer Greg Balash, BSPE '05, both worked with Addison at Newfield Exploration Company and knew that the launch of Travis Peak Resources was not just an opportunity, but a turning point.

"It was a distant dream in college — to start a company," said Calhoun, whose family recently welcomed a second child just prior to relocating to Austin from Tulsa. "First, I needed to gain a great deal of experience. After talking with Jim, I realized this was the opportunity for me and my family; it was the right time and the right team."

Balash knew it was the ideal next chapter for him as well.

"Travis Peak's pioneering attitude and positive mindset mirrored mine, so the decision to join was an easy one," said Balash. "We are creating our own culture and controlling our own destiny."

NEW GENERATION OF OIL AND GAS ENTREPRENEURS

Travis Peak Resources is just the latest in a long line of energy industry companies bootstrapped by Longhorn PGE's over the past eight decades. Many of the earliest alumni to graduate from UT PGE founded companies, such as Ernest Cockrell, Jr.'s Producer's Oil, Charles Grant's Grant Corporations, J. C. Anderson's Anderson Energy, and Joe Parsley's Parker and Parsley Petroleum Company. It is a tradition that includes consulting firms like Ronny Platt and Don Sparks' Platt, Sparks and Associates, and Autry Stephens's Big Dog Drilling and Endeavor Energy Resources, just to name a few. Every generation of UT PGE graduates has its fair share of entrepreneurs.

Today, a new generation of alumni who graduated at the beginning of the most recent industry upturn are starting to emerge as the next wave of entrepreneurs.

Among them are Oscar Torres, BSPE '99, who co-founded Tower Rock Oil and Gas with UT mechanical engineer Tim Holland, and Steve Skinner, BSPE '01, who co-founded Ursa Resources II, LLC. Both Torres and Skinner are classmates of Calhoun.

Clint Calhoun, Jim Addison and Greg Balash

For Torres, who began at a small mineral rights company, Royalty Clearinghouse, part-time right out of UT PGE, the turning point didn't come until after he became president. "A couple years ago, I started to realize there was a different way to approach the mineral acquisition and management business, and started talking with Tim about it," said Torres. "Royalty Clearinghouse was growing rapidly and doing well, but I wanted to head in another direction and start a company based on my own ideas. That's when we got serious about launching Tower Rock."

The market conditions that turn-of-the-millennium graduates faced played no small role, said Skinner. "When I got out, my fellow vintage and I were getting to do really unique things early in our careers because there weren't many students choosing to study petroleum engineering at that time; many more were going into mechanical and chemical engineering, and those of us who chose petroleum engineering talked often about starting our own companies. When we graduated, we were expected to perform right along with 30-year veterans as the shale resource plays got going. With all of those responsibilities early on, there was a lot of incentive to leverage that experience by going out on your own."

EXPERIENCE BEFORE INDEPENDENCE

While the undergraduate classes of the early 2000s are starting to produce a large number of new start-ups, a few core attributes still define the quintessential UT PGE entrepreneur.

Across the board, alumni who found companies say the key to becoming a successful oil and gas entrepreneur is experience, even in today's technology- and data-saturated environment. Unlike the computer software and hardware arenas, where a great idea in college can lead to a dorm-room startup, having a deep well of practical field and business management experience is essential.

Chuck Farmer, BSPE '80, co-founder of Saga Petroleum, advises recent graduates interested in starting a company to gain a breadth of experience first. Farmer acknowledges that unique opportunities exist for today's new entrepreneurs that were not applicable when he entered the industry, thanks in no small part to the unprecedented expansion in equity financing. Still, there is no substitute for practical experience. "It's great, for example, to immerse yourself in drilling engineering as a focus early in your career as I did, but in the long run you must become knowledgeable in all facets of our industry to be a successful independent," said Farmer. "You have to be alert, bright and interested. Ask questions of your peers in different disciplines and

Myra Dria

thoroughly understand their tasks. Spend quality time with land owners and regulators. Make sure you understand and acknowledge their needs and express yours in a pleasant professional manner when possible. Never forget, warmth and humor are powerful tools toward a successful outcome."

Myra Dria, Ph.D. PE '88, founder of Ristra Energy LLC, Pearl Resources, and Opal Resources, said, "To help me on my entrepreneurial path, I moved jobs to get exposure – I made that a mission." After starting her career at Sohio and Shell, Dria discovered her path to becoming a successful entrepreneur involved taking on risk and responsibility. "Always have P&L (profit and loss statement) responsibility, be in a leadership role, and be able to learn every aspect of the oil and gas business - make the most out of it."

PRINCIPLES PREVAIL OVER RISK

A breadth of experience will only get entrepreneurs so far towards founding and growing a successful business. Like many others, Wayne Greenwalt, BSPE '72, attributes a great deal of his success to adopting — and adhering to — clearly defined business principles. While every company goes through the process of developing a mission, vision and values, Longhorn PGEs distinguish themselves through setting a standard for professional ethics and responsible leadership.

"(UT PGE Professor Emeritus) Ben Caudle taught and lived by an exemplary philosophy that had a positive effect on my life and my role as a leader: first, give back, and second, how you treat a person is important," said Greenwalt. He credits his success with EnergyQuest and other ventures to his team of partners and all of his employees, stressing that starting and running a business also means Dr. Caudle's message applies to external stakeholders, too. "It's about people — employees and neighbors. When thinking about how we'll approach a project in a new community, the goal is to realize financial gains for investors, founders and employees, while mitigating risk and to accomplish this goal in a manner that's responsible and ethical."

"If we don't have enough pride in the project to put our sign on it, we don't want to do it," said Farmer, who often directs his colleagues at Saga to think deeply about the impact their business decisions today will have on the future. "I want to leave the properties the best they can be for the next guy, but it's more importantly about Saga's reputation, our relationship with land owners, regulators and within the business community. We never compromise our ethics and the decision to do the right thing."

REWARDS BEYOND RICHES

One of the hallmarks of being an entrepreneur is, despite all of the daily challenges, the benefits reaped go well beyond great income potential.

"I really enjoy having my own company; it's like having a family environment," said Dria. "It's more of a concentrated effort. And if you do well, you see the direct impact of what your work develops. That's the biggest reward."

Like Skinner, Calhoun and others who graduated in the early 2000s, Torres agrees with the UT PGE alumni entrepreneurs who came before him. "I love the challenge of holding myself accountable for the productivity that is necessary to succeed, and balancing it with the freedom to work under my own terms and set of circumstances. Achieving that balance is rewarding in and of itself."

A world of opportunity exists today for new companies like Travis Peak Resources. All the Longhorn PGE's there know that the road to success will be paved with many trials and challenges. But like the generations of entrepreneurs before them, Addison, Calhoun and Balash are focused. "We don't want to put our ideas on a shelf," said Addison. "We want to act on them."

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Welcome CLASS OF 2018

On paper, UT PGE is welcoming one of its best and brightest classes to date. More than 1,650 students from Texas and across the globe applied for a select number of coveted student spots in the department and less than 10 percent made the cut. From last year, the average SAT score went up almost 50 points to 1417 and the average high school rank went up two percentage points to Top 3 percent.

To officially introduce the Class of 2018 to UT PGE, the department hosted the third-annual Freshman Fall Retreat, which has become a signature department event that promotes inclusive community building. Incoming UT PGE students flocked to The Retreat at Balcones Springs in Marble Falls, Texas, prior to the start of classes to gain an introduction to the department and the Longhorn spirit and pride.

Sponsored by BP, the retreat enabled students to shake hands with professors and industry representatives in a casual setting. Students enjoyed team building activities, such as rock climbing, swimming and tennis, with their fellow classmates and upper-classman team leaders.

FRESHMAN CLASS KEY HIGHLIGHTS*

- 92 freshmen (**PE & GEH**)
- 62 males (**67%**)
- 30 females (**33%**)
- 84 in-state students (**91%**)
- 8 out-of-state students (**9%**)
- 4 Valedictorians
- 5 Salutatorians
- 1417 average SAT score (**Verbal + Quantitative**)
- Top 3% average HS rank

**excluding transfer students*

Deborah Hempel-Medina

TECHNOLOGY *in the* CLASSROOM

Mark McClure

Technology is the driving force of innovation and economic prosperity in our society. The oil and gas industry is using it in a variety of ways to enhance the recovery of hydrocarbons, which were thought to be unattainable. The technology upgrades have changed our recovery schemes, increasing efficiency and leading to potential energy independence for the U.S.

Technology is playing a large role in our research labs with state-of-the-art equipment from an innovative drilling simulator to a MMR scanner, but it's also strategically incorporated into UT PGE classrooms, increasing students' learning and better preparing them for careers in industry. UT PGE faculty, Deborah Hempel-Medina and Mark McClure, have integrated the tools into the curriculum from technical and communications standpoints.

UT PGE students are experiencing the best of both virtual and physical worlds; they have face-to-face interaction in the classroom, but also gain an understanding for how technology can improve their overall knowledge of a subject as well as their careers.

"The main technology tool I use is the Windows Surface Pro – it's a tablet PC that comes with a stylus," said McClure, a UT PGE assistant professor who teaches Theory and Application of Reservoir Transients. "I prepare detailed PowerPoint slides in advance, but constantly write on it to answer student questions and further explain my slides. I have found it to be an extremely useful tool."

McClure is not incorporating technology for the sake of it. He wants it to make sense and positively impact the learning experience.

"The students really like it," said McClure. "They don't want me to just go through a PowerPoint deck, so this makes it more interactive. I think it makes me more effective as a teacher, which translates to better student learning."

Beyond the benefits of removing the need for the whiteboard and creating a one-stop-shop for students that is in real-time, the students are connecting to the tablet. Unlike the doc-cam, the tablet is much more flexible as it allows for erasing and a high-resolution image.

Joshua Bautista Anguiano, a UT PGE graduate student, took Dr. McClure's class during the spring 2014 semester. He is happy with the way technology is being fused with the curriculum.

"The stylus is great as it allows Dr. McClure to write down examples that we can always go back and reference since the changes are saved within the PowerPoint that he shares with us," said Baustista Anguiano. "You can't turn the whiteboard into a PDF, so it gives us a big advantage."

McClure also takes his students into the newly renovated computer lab, so they can engage in active learning and solve real-world examples.

"We use commercial well test analysis software," said McClure. "For the final class project, I ask students to investigate a novel question involving well test analysis and build a numerical reservoir simulation. By doing the investigation they see how it affects pressure transient."

Another example of how McClure incorporates technology into the classroom and the computer lab is by recording Microsoft Excel tutorials instead of writing out the instructions.

"I think a written document is very hard to follow as a graphical user interface, so the tutorial video shows exactly what it looks like on the screen," said McClure. "It's more intuitive for the students and it allows them to learn at their own pace, which is important."

> *"When the industry talks about communications, they are referencing how to communicate one's ideas effectively, so I hope my students leave the class with this understanding."*

McClure wants his students to walk away from his class with practical knowledge and the ability to think critically beyond the textbook.

Hempel-Medina (UT BSPE '93), the Engineering Communication class lecturer, dedicates a series of her classes to mastering videoconferencing. UT PGE students take the class during their sophomore year, so it generally occurs right before the start of their first internships.

"Our students will encounter more technology than we did in the workforce," said Hempel-Medina. "From a communications standpoint, I see a trend in videoconferencing and telecommuting."

Hempel-Medina incorporates different styles of communication, so technology has been a part of that mix. Her class is the first one in the Cockrell School of Engineering to incorporate videoconferencing.

"I want to teach our students how to present in teams over videoconference," said Hempel-Medina. "We meet in two adjacent buildings on the UT campus, however the students are clever enough to understand it could be a building half-a-world away. Videoconferencing can feel like a boring TV show, so I remind them that there are two roles: a presenter and an active listener."

Hempel-Medina believes it is important to shake up the traditional presentation style – in today's world, meetings are not all conducted in person or over the phone. New technology is allowing better communication, but it takes practice. Students are providing her with positive feedback.

"The students are glad they are having this experience now and not for the first time at an internship," said Hempel-Medina. "There is a big difference between face-timing your friends from the phone and conducting a meeting through videoconferencing. The technology is similar, but now it's within a professional setting."

Undergraduate student Sameer Sahi took Hempel-Medina's class during the 2014 spring semester. He valued the opportunity to practice videoconferencing.

"Almost all oil and gas companies have international operations, so communicating via videoconferencing saves the company's money and the employee's time," said Sahi. "The university is meeting the students' expectations too - our generation grew up with iPhones so we feel very comfortable with this technology."

Meeting the needs of three audiences, Hempel-Medina creates curriculum that will benefit the students, professors in the department who will have her students and will expect a certain level of communication skills, as well as employers.

"When the industry talks about communications, they are referencing how to communicate one's ideas effectively, so I hope my students leave the class with this understanding," said Hempel-Medina.

Technology tools may come and go, but technology itself is here to stay. It is in the professors hands now to discover what should be incorporated into the classroom to enhance the course curriculum and student learning.

SUMMER INTERNSHIPS *in* SHALE PLAYS

*Map courtesy of PacWest Consulting Partners

Hydraulic fracturing is currently one of the hottest recovery methods within the oil and gas industry making it no surprise that UT PGE students flock to internships that introduce them to the discipline. Texas offers many opportunities for students to engage in the real-world situations presented in the field, providing lessons that can't be learned in the classroom. Trey Dupree, a UT PGE student, who interned with EOG Resources, spent the summer working in Midland's Permian Basin Shale play.

A junior, Dupree hopes of one day becoming a production engineer for an oil company, so he hit the ground running with his internship. "It's exciting to be around people who are interested in moving the company forward," said Dupree. "The oil industry has people that are super proactive and I've really enjoyed the environment they have created."

Without previous oil and gas related internships or jobs, Dupree was not sure of what to expect when starting with EOG Resources and said working in the field is vastly different from learning in the classroom.

"I'm amazed at how much goes into drilling even before we start drilling, and that was not something I had really understood before starting this internship," said Dupree.

With the current and expanding hydraulic fracturing production, the Permian Basin alone has more than 500 operating rigs. Dupree finds it important to be involved in an internship that works closely with shale plays this early on in his career.

"It makes me enthusiastic about petroleum engineering and the oil business," said Dupree. "There is such a huge boom going on from fracking and it is exciting to be a part of it."

To offer a more hands-on experience, EOG Resources assigns projects related to specific interests and fields of study for each intern to complete by the end of the summer, supervised by an assigned mentor. As a production engineer in training, in order to complete his project, Dupree was required to compile pump data to later provide to drilling companies as well as discover ways to optimize the company's drilling.

"A lot of things can get in the way of the well, so I looked at pumps and how long they have lasted to see what works better than others," said Dupree. "It's a pretty hefty gathering of data."

Dupree recalls one of his first days on the job learning to install communication boxes and solar panels to wells, "By the end of the day I got to say, 'Wow. That's something I did,'" said Dupree. "It's awesome to have a responsibility that affects the company, however small that responsibility may be."

Dupree is excited for his junior year, knowing that his internship will affect his understanding of petroleum engineering and hydraulic fracturing in the classroom.

"What I most hope for is that I can take wealth of knowledge that the company has invested in me and bring that to campus and fuel my passion for petroleum engineering."

RYAN PARKER
Classification: Junior
Internship: Completions Engineering Intern, Swift Energy Company

"This summer I worked with the completions team on wells in the Eagle Ford Shale. At the end of my internship I had the chance to travel out to the field with my mentor to observe the hydraulic fracturing well I worked on over the summer."

BRENDAN FLORES
Classification: Senior
Internship: Drilling Engineering Intern, EOG Resources, Inc.

"I found that going out to a rig and actually watching the operation occur was the best way to understand what's happening out in the field. During my internship, I traveled all over Colorado, Wyoming, and North Dakota in the Bakken Shale to watch different rigs. I even planned a well (with the help of my mentor, of course), and got to see it drilled from start to finish."

ERIC SEVERSON
Classification: Sophomore
Internship: Reservoir Engineering Intern, TransAtlantic Petroleum, Ltd.

"As an intern at TransAtlantic, I compiled well logging, stimulation and production data from numerous oil wells and shale formation reservoirs located in Turkey and inputted this data into Well View Completion Software. In addition, I visited different drill sites in the Woodford Shale play in Oklahoma to witness horizontal drilling, well completion and multiple hydraulic fracturing jobs with Schlumberger to maximize well production."

DiCarlo and Daigle SPE Regional Award Winners

The Society of Petroleum Engineers (SPE) honored two UT PGE faculty members in the spring of 2014 in Midland, Texas, with its 2014 regional awards. The prestigious awards recognized Dr. David DiCarlo for his work in reservoir engineering and Dr. Hugh Daigle for his formation evaluation research. According to SPE, the awards recognize exceptional contributions to the society at the regional level and honor singular devotions of time and effort to various areas of technical expertise.

DiCarlo joined UT PGE in 2007, and his research includes chemical enhanced oil recovery, gas enhanced oil recovery, and geological CO_2 storage. Daigle, an assistant professor, began teaching in the department last spring. His research areas include: drilling, well completions, and rock mechanics; integrated reservoir characterization; and unconventional resources, to name a few.

M.S. Student Wins East Meets West Paper Contest

M.S. student Daniel Sanchez-Rivera had the opportunity to compete in the fifth annual East Meets West International Student Petroleum Congress and Career Expo, hosted by the AGH University of Science and Technology, located in Krakow, Poland. Sanchez-Rivera placed first in the Expo's student paper contest, which was comprised of participants from 20 colleges and universities from all over the world.

> *"Arletta is an outstanding 'mother' to our undergraduates, many of whom say they would not have made it through college if it had not been for her."*

2014 SPE Regional Paper Contest Winners

UT PGE students competed in the 2014 SPE Gulf Coast Regional Paper Contest, held at the University of Houston. The paper contest is an annual event that brings together undergraduate and graduate students who each present on a topic of their choosing to a panel of industry judges. During the regional contest, UT PGE had two students competing in each division (B.S., M.S. and Ph.D.). This is the second year in a row that UT PGE students have accounted for five of the nine awards. ***The students who placed in the contest, include:***

B.S.
Jason Camacho—2nd place
Kellyn Schmitz—3rd place

M.S.
Joseph Tansey—1st place
Mahmood Shakiba—2nd place

Ph.D.
Yashar Mehmani—2nd place

"I'm very proud to have been able to represent our department at the SPE regional paper contest," said Tansey, who placed first in the M.S. division. Tansey will travel to the Netherlands this fall to compete at the international contest at the SPE Annual Technical Conference and Exhibition (ATCE), held in Amsterdam.

Tompkins Receives University's Outstanding Staff Award

Arletta Tompkins, the department's long-standing undergraduate academic advising coordinator, has been awarded the University's Outstanding Staff Award. The award honors staff members who have a significant impact on the university and demonstrate a commitment to the university's core purpose and values.

"Arletta is an outstanding 'mother' to our undergraduates, many of whom say they would not have made it through college if it had not been for her," said Sandy Taylor, UT PGE executive assistant. "We are extremely pleased that Arletta's service and dedication to our students is being justly rewarded."

> *Papers selected were chosen from more than 3,800 research articles that appeared in the journal last year and represent the six broadly defined classes under which NAS is organized.*

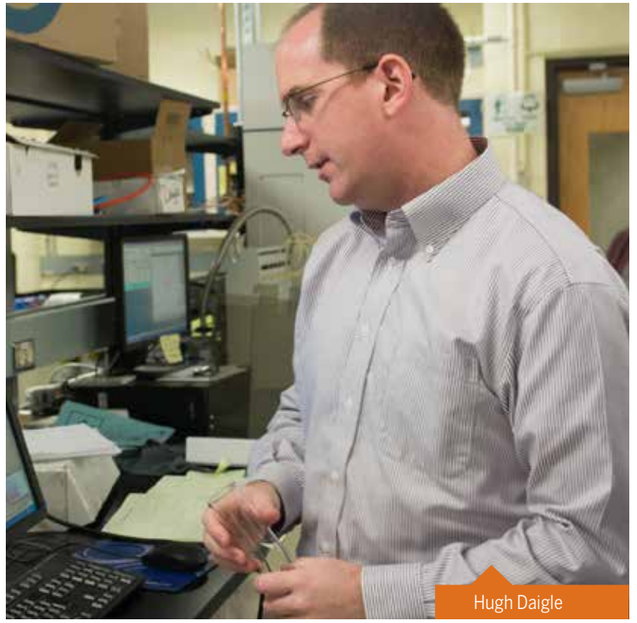
Patzek Receives PNAS Cozzarelli Prize

The Proceedings of the National Academy of Sciences (PNAS) Editorial Board selected Tad W. Patzek, Frank Male, and Michael Marder's paper "Gas production in the Barnett Shale obeys a simple scaling theory," published by PNAS in 2013, to receive the Cozzarelli Prize. This highly coveted award recognizes outstanding contributions to the scientific disciplines represented by the National Academy of Sciences (NAS). Papers selected were chosen from more than 3,800 research articles that appeared in the journal last year and represent the six broadly defined classes under which NAS is organized.

Ekwere J. Peters Scholarship Established

To honor retired Professor Ekwere Peters, his former students created the Ekwere J. Peters Scholarship, which will provide annual scholarships to UT PGE undergraduate students. If Dr. Peters inspired you as a student, contribute to the dedicated scholarship by contacting Heath Hignight at heath@mail.utexas.edu or 512-471-3208.


David DiCarlo


Hugh Daigle


Daniel Sanchez-Rivera

Torres-Verdin SPWLA Award Winner

UT PGE Professor and Associate Department Chair Carlos Torres-Verdin received The Society of Petrophysicists and Well Log Analysts' (SPWLA) 2014 Gold Medal for Technical Achievement Award, a prestigious and international recognition, at the 55th Annual Logging Symposium in Abu Dhabi, United Arab Emirates.

Torres-Verdin is the youngest person ever to be selected for this award, and he is the first University of Texas at Austin professor to receive it. Torres-Verdin is now among a select group of scientists who have changed the formation evaluation field, including: H.G. Doll, Monroe Waxman, E.C. Thomas and G.E. Archie.

Prodanović Receives the InterPore Procter & Gamble Award

Assistant Professor Maša Prodanović received the InterPore Procter & Gamble Award for Porous Media Research at the 6th International Conference on Porous Media in Milwaukee, Wisc.

Prodanović's extensive research and advancements in the field of flow and transport in porous media, especially within the areas of modeling multiphase interfaces in porous media, multiscale simulation, pore-scale imaging, and modeling of microporosity in carbonates and unconventional reservoirs led her to earn this award.

Bommer Recognized by Board of Regents

Senior Lecturer Paul Bommer's leadership, mentorship and instruction were recognized through the prestigious 2014 Board of Regents' Outstanding Teaching Award.

Offered annually in recognition of faculty members at the nine academic and six health University of Texas System institutions who have demonstrated extraordinary classroom performance and innovation in undergraduate instruction, the Regents' Outstanding Teaching Awards are the Board of Regents' highest honor. The Regents' Outstanding Teaching Awards are among the largest in the nation for rewarding outstanding faculty performance. Given the depth and breadth of talent across the UT System, the awards program is likewise one of the nation's most competitive.

With the $25,000 monetary award, Bommer has graciously decided to use the funds to support UT PGE students by establishing the Dr. and Mrs. Paul Bommer Endowed Scholarship in Petroleum and Geosystems Engineering. If you are interested in contributing to the scholarship, please contact Heath Hignight (heath@mail.utexas.edu).

SPWLA Awards

Torres-Verdin is the youngest person ever to be selected for this award, and he is the first University of Texas at Austin professor to receive it.

Four Faculty Receive SPE International Awards

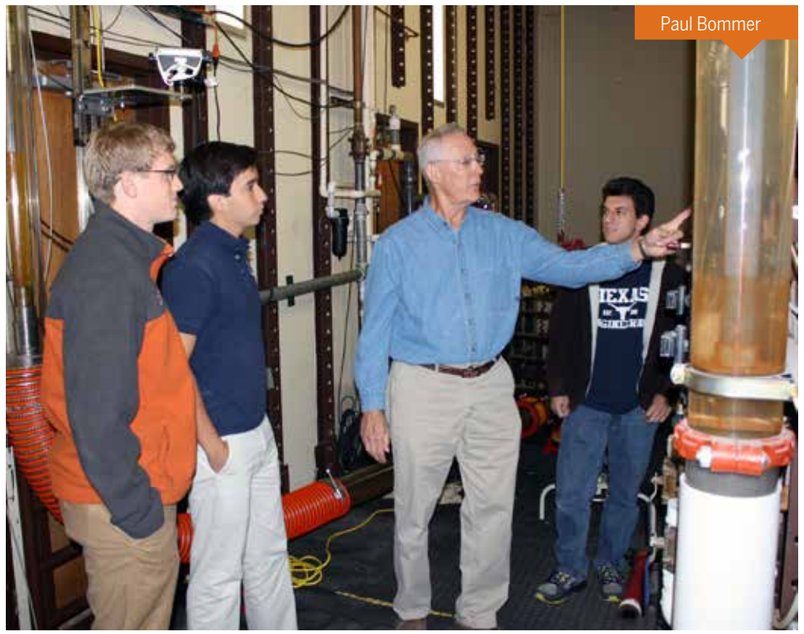
Four UT PGE faculty members will be awarded 2014 International SPE awards at this year's Annual Technical Conference & Exhibition in Amsterdam.

Drs. Kamy Sepehrnoori and Mojdeh Delshad will receive the SPE Distinguished Member award. This award recognizes SPE members who achieve distinction deemed worthy of special recognition and acknowledges members who have attained eminence in the petroleum industry or the academic community, or who have made significant contributions to SPE.

Dr. Matt Balhoff will receive the SPE Young Member Outstanding Service Award. This award recognizes contributions to and leadership in public and community matters, the Society, the petroleum engineering profession, or the petroleum industry.

Dr. Mary Wheeler will garner the incredibly prestigious title of SPE Honorary Member. Honorary Membership is the highest honor that SPE presents and is limited to 0.1 percent of the SPE total membership. This elite group represents those individuals who have given outstanding service to SPE or have demonstrated distinguished scientific or engineering achievements in the fields within the technical scope of SPE.


Maša Prodanović


Paul Bommer

Honorary Membership is the highest honor that SPE presents and is limited to 0.1 percent of the SPE total membership.

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

A remembrance by David Dewitt (BSPE '08)

CARY DOUGLAS BROCK (BSPE '85), 53, passed away on March 26, 2014, in Houston. Cary is survived by his father, Howard Brock (BSChE '50), wife MeiLien Yeh (BSPharm '90), and brother H. Kent Brock (BSPE '80).

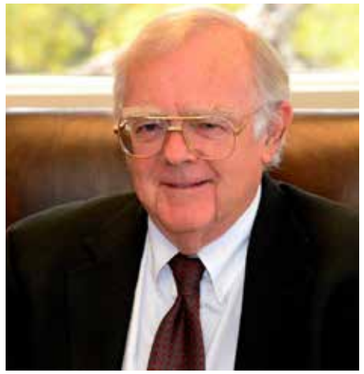
I was a sophomore in mechanical engineering at UT Austin when I met Cary during the 2005 Rose Bowl. At the Texas Exes tailgate, I learned about Cary's eclectic interests: oil business, traveling, even playing in a punk rock band called "The Delinquents" when he was a UT PGE student in the early 1980s. That spring Cary set me up with internship interviews at several Houston oilfield service companies; I could not believe his effort and generosity.

In one day, Cary indoctrinated me into the upstream oil business. Cary showed me a water flood he managed from idea to water breakthrough. He even had photos of him helping build a tank battery. I was so impressed and excited by Cary's love for petroleum geology, production, and project economics that I wanted to do the same. The next day I drove to Austin and changed my major from mechanical to petroleum engineering. Over the years I learned Cary had this effect on many people: he met no strangers. Cary was selfless with his assistance, friendship and motivation. He was a great mentor, and I will strive to make him proud.

MeiLien Yeh has pledged to establish the Cary D. Brock Memorial Endowed Scholarship in Petroleum and Geosystems Engineering. We encourage you to contribute to the endowment by contacting Heath Hignight at heath@mail.utexas.edu or 512-471-3208.

WILLIAM "BILLY" MAYNARD III (BSPE '51) passed away on January 24, 2014, at his home in Bastrop, Texas. Born April 7, 1924, Billy graduated from Bastrop High School and received an associate degree from Shriner College in 1949 before graduating from The University of Texas Austin in petroleum engineering. Billy established Maynard Insurance in downtown Bastrop in 1965, which he owned and ran until 1991. **Source: Austin-American Statesman**

WILLIAM HAYDEN WALL (BSPE '12) passed away in Dallas, Texas on March 1, 2014, his 24th birthday. A dedicated scholar throughout high school, Hayden graduated Summa Cum Laude in 2008 from Jesuit College Preparatory School with many awards and scholarships. His love of math and science led him to pursue a bachelor of science in petroleum engineering at The University of Texas Austin in 2012. Soon after, Hayden began his position as production engineer for Endeavor Energy Resources in Midland, Texas. He had a passion for playing the piano and was a member of the Sigma Phi Epsilon Fraternity. Hayden's classmates created the WHW Oilmen Scholarship in Petroleum Engineering in his honor to establish a $25,000 endowed scholarship for UT PGE. If you are interested in giving please visit: http://giving.utexas.edu/EN/HaydenWall



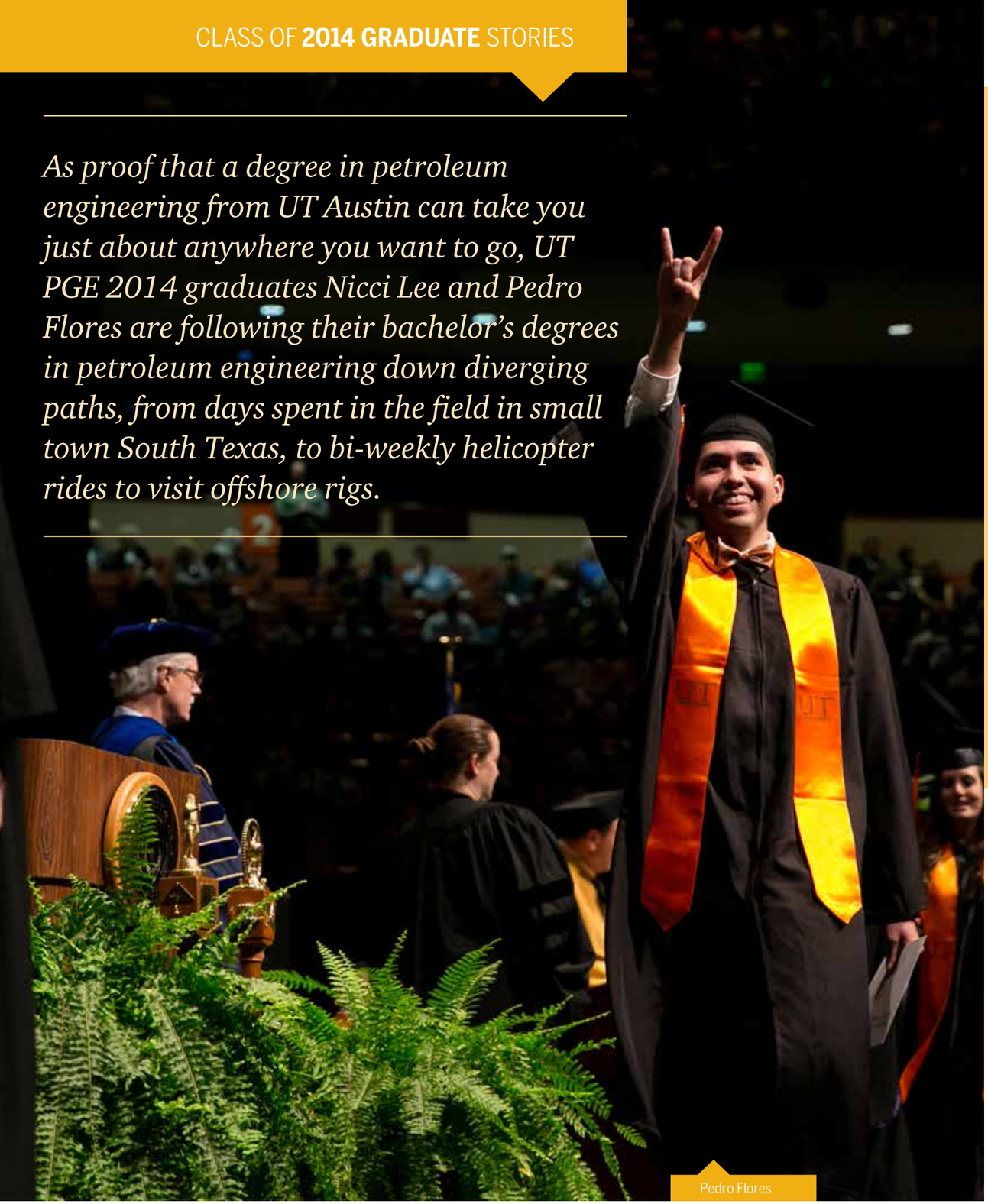
ROBERT (BOB) CLAUDE MACDONALD (MSPE '70) passed away June 20, 2014. Born July 6, 1941, in Detroit, Mich., Bob went on to graduate with a degree in chemical and metallurgical engineering from the University of Michigan in 1963. Bob spent five years as a reservoir engineer for Michigan Consolidated Gas Company before obtaining a master's of science in petroleum engineering in 1970 and a doctorate in philosophy in 1972, both at The University of Texas Austin. Bob continued his career in oil and gas as a petroleum engineering consultant for Intercomp, Inc. in Houston, Texas. Bob joined PGE faculty at The University of Texas Austin and held the position of adjunct associate professor until 1999. Bob, in cooperation with colleague Charles Tutt, started Intera Petroleum Technologies and joined Platt, Sparks and Associates in 1988. Bob was a member of SPE, American Associates of Petroleum Geologists, National Society of Professional Engineers, and American Institute of Chemical Engineers. Donations in Bob's memory may be made to The University of Texas Cockrell School of Engineering Friends of Alec, 301 E. Dean Keeton, C2104, Austin, TX, 78712

OTTO ROSS HARRISON (BSPE '59) passed away on June 1, 2014. Otto graduated as Valedictorian from Santa Fe High School and went to Schreiner College in Kerrville. After serving in the military, he graduated from The University of Texas Austin and earned a degree in petroleum engineering in 1959. Upon graduation, he began his career in oil with Humble Oil Company in Refugio, Texas. After his 37-year career with Humble/Exxon, Otto was promoted to GM of Alaskan Operations to lead the clean-up of the Exxon Valdez spill. At the time of his retirement in 1996, Otto was the President of Exxon Pipeline Company. In 2000, Otto was honored as a Distinguished Graduate of the Cockrell School of Engineering at UT Austin.

Bob G. Agnew

BOB G. AGNEW (BSPE '53) passed away on June 3, 2014. Bob attended The University of Texas Austin, graduating magna cum laude with a degree in petroleum engineering in 1953. While at UT Austin, he played baseball for two years and was a member of Phi Gamma Delta social fraternity. He began his career as a roughneck for Humble Oil and Refining Company. During the Korean conflict, he took a two-year leave serving in the U.S. Army Quartermasters Petroleum Headquarters and later resumed his work with Humble Oil. Bob later took on the role of Deputy Manager of the International Drilling and Exploration Department in Houston. In 1986, he became head of Worldwide Drilling and retired after 41 years with Exxon Corporation. Bob was a long-standing member of SPE and API and served as Director of the Permian Basin Oil Show, as well as Chairman of the SPE International Drilling Conference in Amsterdam. Bob and Betty Agnew created an Endowed Excellence Fund in Petroleum and Geosystems Engineering that supports a variety of programs, including the Summer Undergraduate Research Internship (SURI).

As proof that a degree in petroleum engineering from UT Austin can take you just about anywhere you want to go, UT PGE 2014 graduates Nicci Lee and Pedro Flores are following their bachelor's degrees in petroleum engineering down diverging paths, from days spent in the field in small town South Texas, to bi-weekly helicopter rides to visit offshore rigs.



Pedro Flores

Nicci Lee – BSPE '14

Editor's Note: Lee passed away unexpectedly in early fall, shortly before this magazine went to print. The UT PGE community is deeply saddened by the loss of such a vibrant and smart young alumna. We believe this story serves as a nice tribute to Lee's enthusiasm and passion for life and petroleum engineering.

When Canadian native Nicci Lee entered her freshman year at the Colorado School of Mines majoring in mechanical engineering, she never imagined that a brief stint working in the school's career center would ultimately lead to an exciting profession in the oil industry. Through this job, Lee met a number of people who worked in the energy industry and began to develop a strong interest in the field of petroleum engineering. She followed this interest south, transferring into the UT PGE Department the following year. "My experience in the department was great," said Lee. "I felt like they really want you to succeed, and that was a great feeling."

After landing a field internship with Baker Hughes in pressure pumping in Houston, Lee was offered a full time job as a field engineer with the company, and is thrilled to be joining the Baker Hughes team. "What appealed to me about Baker Hughes was they were so nice to us, and pushed us to perform better," said Lee. "Everyone was approachable even if they weren't my direct mentor."

This fall, Lee is relocating to the Baker Hughes office in the small town of Alice, Texas. With only 20,000 residents, life in Alice will be a big adjustment for Lee, who grew up in Toronto, one of the most populous cities in Canada. Situated midway between San Antonio and Brownsville, Alice earned its nickname 'The Hub City of South Texas' due to its ideal proximity to other major cities in the oil industry, making it an easy center for distribution. A sleepy small town whose only claim to fame is "The Birthplace of Tejano," Alice has long been a player in the oil industry. However, with the recent rise of horizontal drilling and hydraulic fracturing, domestic production has soared, especially in South Texas with the Eagle Ford Shale. There are currently more than 100 oil companies located around Alice, comprising a significant part of their economy, and acting as a large draw for petroleum engineers looking to get their bearings in the industry.

Lee is excited to be a part of this boom in Alice, working with the cutting edge technology that has revitalized the oil industry in the past few years. "I can't wait to start getting real hands-on experience in the field," said Lee. "I know being a field engineer is sort of a rite of passage into the industry, so I'm eager to get started."

Nicci Lee

Pedro Flores – BSPE '14

Following graduation, Pedro Flores began working with the Bureau of Safety and Environmental Enforcement (BSEE), a government agency that is part of the United States Department of the Interior, in its regional office in New Orleans.

Flores first heard about BSEE his junior year at UT EXPO from one of the agency's recruiters and was immediately drawn to the idea that BSEE sounded like an interesting and challenging place to work. BSEE was created in the fall of 2011 after the BP oil spill and its main purpose is to regulate offshore activities in an effort to ensure safety and reduce risk (UT PGE is a partner of BSEE's Ocean Energy Safety Institute in Texas). Should another oil spill occur, BSEE will assemble the taskforce necessary to promptly and effectively oversee clean up.

"I've always been environmentally conscious and I felt like this is a place where I could really make a difference," said Flores of what initially attracted him to BSEE as a potential career path after graduation. "BSEE doesn't get many petroleum engineers and they really need them. Plus, if I ever want to move to the private sector, companies love BSEE guys because you know all the regulations so you are a valuable commodity."

Though his work fits within the typical 8-5 workday, Flores' days in the office are anything but typical. Twice a week, he flies out by helicopter to inspect offshore rigs and checks to make sure they are following all federal regulations from a safety standpoint. If a rig is not following all the regulations, he issues citations or even shuts down the rig until the issues are resolved.

"There is a steep learning curve," said Flores of his new position, "but, I feel like it's going to be a fantastic learning experience. I am working with everybody—from BP to Chevron to ExxonMobil on a weekly basis."

Flores attended a training program before he started his job with BSEE, where he had to pass the "Dunker Test," a simulated training where participants are submerged in a pool of water while strapped into a helicopter and have to unbuckle themselves and swim out. Keeping a clear head under pressure is one of many skills Flores needs to draw on in his job with BSEE. "It is serious stuff, making sure these companies are following safety regulations," said Flores. "We don't want anyone to get hurt, so I need to be very strict and thorough in everything I do."

Growing up in San Antonio and attending college only an hour-and-a-half away from his hometown, Flores never considered leaving the state after graduation. Now that he has landed in New Orleans, he is thrilled at the prospect of starting all over in a new city. "I love fishing and photography, so I know there are a lot of opportunities for that in New Orleans, plus the food is amazing," said Flores. "I am excited to call this city home!"

CONGRATULATIONS GRADUATES

Jenna Salamah

BSPE GRADUATES DECEMBER 2013

Alawar, Rawad Ayman
Arredondo, Christian Ivan
Beasley, Colin Mario
Benditz, Bradley Thomas
Brown, Christopher James
Burg, Brian Michael
Callender, Edward Taylor
Garan III, Ronald John
Hernandez II, Richard Gilbert
Houlette, Tesia A.
Hyde II, Scott Alan
Li, Yuxiang
Little, Bryan Austin
Liu, Sijia
Mabry, Tyler Christian
McMaster, Douglas Joseph
Michael, Andreas
Mustafin, Sanzhar Kazhirakhimovich
Neufeld, Erik Thore
Nguyen, Vu Quoc
Pomerantz, Jonathan Max
Razo, Wilbur Smith Buerano
Rosen, Michael Alexander
Ruffin, Hunter Bryant
Teague, Sarah Jayne
Trevino, Julio Cesar
Wadman, Andrew Travis
Walter, Patrick Hammond
Zolkovski, Claire Elise

MSPE GRADUATES DECEMBER 2013

Ajayi, Oyinkansola
Bekmakhanbet, Darkhan
Ehrenfried, Daniel
Hampton, Travis
Huynh, Uyen T.
Lee, Hyung Joo
Ortega Chacon, Edwin

PHD PE GRADUATES DECEMBER 2013

Gu, Ming
Hadibeik Nishaboori, Abdolhamid
Mohebbinia, Saeedeh
Rahmani, Amir
Shabro, Vahid
Torskaya, Tatyana

BSPE & GEH GRADUATES MAY 2014

Adam Leong, Jasman
Adame, Oscar Adrian
Alafifi, Afif Luay
Anderson, Conner Taylor
Arredondo, Zachary Conrad
Arteaga, Colten Cecil
Ayoubi, Reda
Baker, Scott Ryan
Bamgbose, Olubusola Mercedes
Baum, Ashlyn Whitney
Beck, Kaylen Ashley
Bernhard, Alexander Michael
Bhakta, Vikash Shailesh
Bowling, Jay Emerson
Casto, Cy Madison
Cavender, Derek Jason
Cervantes III, Artemio Colin
Chyrk, Magdalena
Collins, Anne Catherine
Cui, Alexander
Dillon, Michael Gary
Donnell, Cameron Clayton
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Durham, James Kenneth
Elkady, Youssef Magdy
Filaroska, Lauren Elizabeth
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Foote, Nathan M.
Franke, Stephanie Morgan
Fryer, Barnaby Padraig
Fuller, Samantha Dobbs
Gaskin, Michael Richard
George, Christopher Mason
Gibran, Zeff Khalil
Ginger, Allison Leigh
Gritte, Christian Raymond
Hall, Tyler Andrew
Hamilton, Sam Pickard
Hays III, Joseph Ardell
Herrington, Christian James
Hysi, Edion
Iqbal, Cyrus Ahmad
Johnson, Jake Eads
Jones, Jacob Grant
Kelkar, Ryan Mohan
Lee, Daniel Travis
Lee, Nicci Wing Yee
Lee, Philip Heng Soong
Lehardi, Samuel
Lehman, Eric Russell
Li, Shane
Liu, Kejia
Lupton Jr., Mark Alan
Marsh, Patrick Talley
McDaniel, Christopher Thomas
McDonnold, Cole Craig
Meller, Michael Alan
Metzler, Raymond Joseph
Miller, Cory James
Minello, Vincent Ryan
Murray, Daniel James
Mussin, Nurtas Nurlanovich
Myers, Zachary Lee
Nelson, Kyle Matthew
Nelson, Lauren Ann
Nguyen, Jeffrey Minh-Chau
Nguyen, Katherine Q.
Odawa, Stephen Odhiambo
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Owen, James Dallas
Pan, Zhong
Pfeil, Joseph Charles
Pritchard, Joseph Carey
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Rizzuti, Michael Anthony
Rolland, Tony J.
Salamah, Jenna Majid
Salinas Vela, Cesar Francisco
Sanchez, David Andres
Shaw, Dylan Glenn
Sioco, Christopher Jay
Sivapiromrat, Poonperm
Smith, Chad Michael
Song, Xinting
Strong, Anna Marie
Tanzharikov, Arman
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Thannisch, Clark Travis
Trogus, Michael J.
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Turner, Trevor Riley
Van Howe, Tyler Daniel
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Wilson, Robert Peter
Winata, Samuel A.
Wolz, Christian Michael
Woodard, Sarah Beth
Woodbury, Matthew Douglas
Woodiel IV, John William
Xie, Lucy Menghua
Yang, Hee Yun
Young, Dylan Patrick
Yuan, Yang
Zhou, Edward Jia
Zisman, Blake Allyn

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Dashti, Ghazal
Ferreira, Elton
Fu, Yao
Gabel, Scott
Kumar, Dhananjay
Lee, Hunjoo
Mehmani, Yashar
Naseem, Kashif
Olukitibi, Dipo
Patterson, James
Schulz, Eric
Shor, Roman
Song, Dong
Sun Yuhao
Wang, Weiwei
Zhou, Junhao

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Chen, Peila
Darabi, Hamed
Ganjdanesh, Reza
Jain, Lokendra
Kong, Xianhui
Ortega Chacon, Edwin
Taghavifar, Moslem
Venkatraman, Ashwin

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Baron, Jonathan Jay
Broce Perez, Jean Guillermo
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Fahham, Abdulfattah
Harrison, Rachael Davis
Karnos, Hayden Nicholas
Kazenas, William Joseph
Luu, William
Ramsey, Collin Michael
Sanchez, Jr., Ramiro G.
Sofjan, Dani
Walker, Wylie Todd

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Alabbab, Emad
Altubayyeb, Abdulaziz S.
Arronsri, Archawin
Aybar, Umut
Carter, Kyle M.
Ji, Hongyu
Sanchez Rivera, Daniel
Taksaudom, Pongpak
Van Bramer, William C.
Victor, Rodolfo A.
Vitter, Cameron A.

PHD PE GRADUATES AUGUST 2014

Frooqnia, Amir
Lu, Jun

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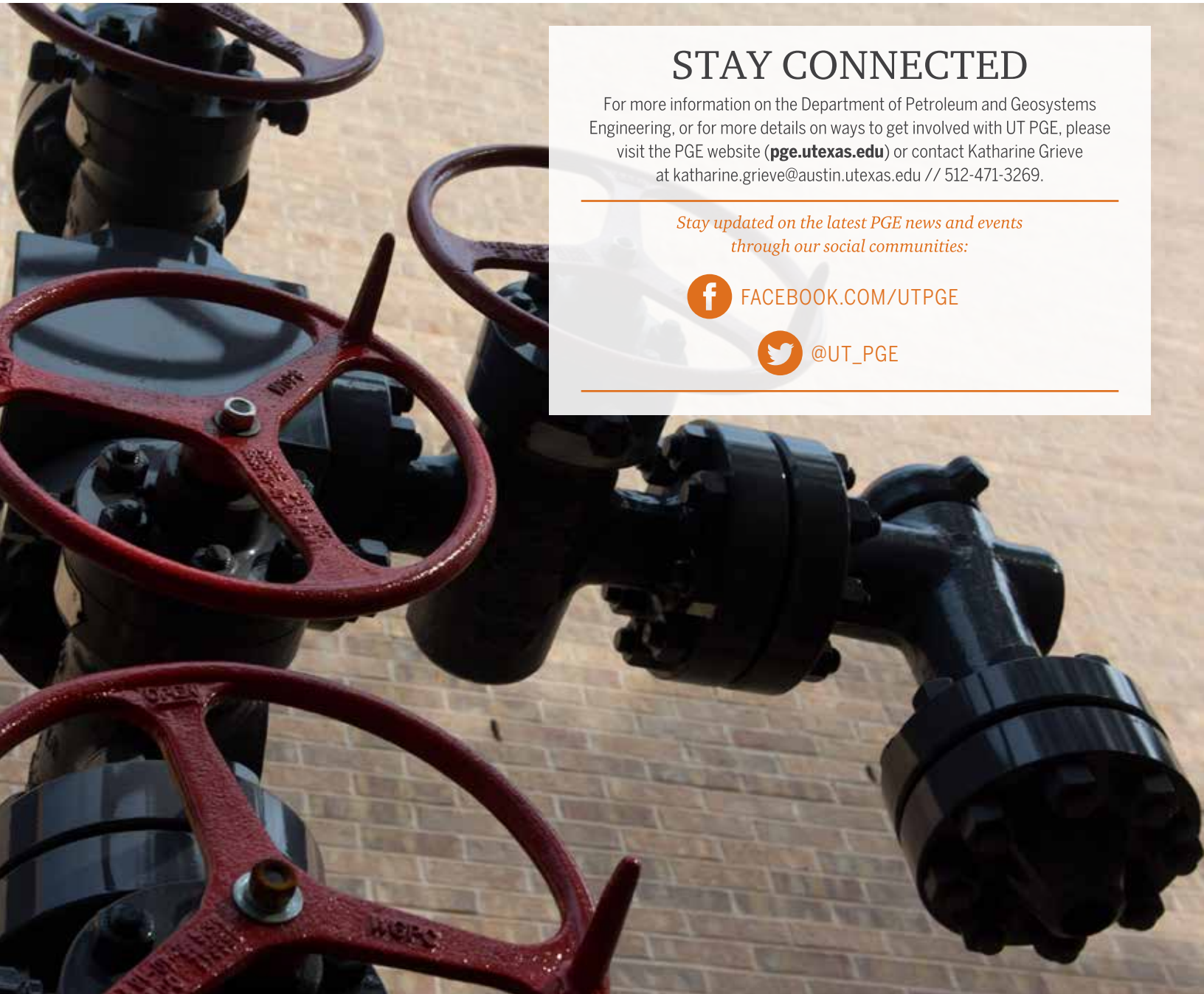

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For more information on the Department of Petroleum and Geosystems Engineering, or for more details on ways to get involved with UT PGE, please visit the PGE website (**pge.utexas.edu**) or contact Katharine Grieve at katharine.grieve@austin.utexas.edu // 512-471-3269.

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