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

ENERGY ONE



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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 JON OLSON, CHAIR, UT PGE

I stepped into the chairman role in January 2015 and it has been a humbling, rewarding experience. During the 20 years I have been a faculty member at UT PGE, I served under five chairs – Larry Lake, Ekwere Peters, Mukul Sharma, Bill Rossen and Tad Patzek. They all made unique, profound and lasting contributions. I look forward to building on the legacies of the previous chairs by focusing on innovation in teaching, hiring and retaining world-class faculty, and fostering research that will enable affordable, reliable and sustainable energy.

Innovative Teaching

The bread and butter of our department, and a great source of pride, is the 150+ students who we send into the workforce each year. When I teach the freshman introductory course, I go to great lengths to impress upon them how oil and gas is the lifeblood of our economy, and that as engineers, they are tasked to exercise their technical skills in service to society. To help our students meet the challenges of the future, we as faculty need to continuously improve and make sure our curriculum keeps pace with the world's advances in technology and learning.

BUILDING *our* **LEGACY**

The fundamentals of science and engineering never change, but we need to be innovative in engaging our students to maximize their learning potential. UT PGE is emerging as a leader in this area. A member of our faculty has won the SPE Faculty Innovative Teaching Award for the past three years (Balhoff, Prodanovic, and Foster), and one of our new faculty hires starting in the fall, Zoya Heidari, won the award for her work this past year as an assistant professor at Texas A&M. As chairman, I hope to propagate some of the latest ideas in pedagogy across the entire faculty.

World-class Faculty

Speaking of the faculty, you will be introduced to our two new assistant professors in this issue – the aforementioned Zoya Heidari, and Ryosuke Okuno. They both received their Ph.D. in petroleum engineering from our department, but went out and proved themselves through academia and industry before returning to Austin to pursue the next phase of their careers.

Sustainable Research

Research has always been our strength, but budgets are being squeezed with the current state of the industry. I joined six other petroleum engineering department chairmen in a visit to Washington, D.C. in the spring of 2015, to discuss the critical need for a sustainable federal funding program for oil and gas technology. We impressed upon the congressmen that the shale revolution benefited greatly from university-based research and collaboration with industry, facilitated by federal agencies such as the U.S. Department of Energy (DOE) and Research Partnership to Secure Energy for America (RPSEA). Industry has been incredibly generous in funding our work, but there is still a role for federal funding with regard to fundamental discovery and sustainability in times of industry retrenchment.

We also visited the U.S. News and World Report office while in D.C. to encourage the publication to reinstate its ranking of petroleum engineering programs in their annual rankings editions, as our discipline is clearly relevant and central to the U.S. energy future.

Let me close with a heartfelt thank you to all of you for your participation in the UT PGE family – current students, faculty and staff who make things happen on campus and beyond; UT PGE alumni and friends who are changing the world with your accomplishments in industry and academia; and industry for supporting us in our wide array of activities, which are paramount to the department's excellence.

We strive to be good stewards of the UT PGE name you all have established through your hard work and dedication. I hope to see you at a UT PGE event soon.

Hook 'Em and Enjoy.

Dr. Jon Olson, Professor and Chair

Frank W. Jessen Professorship and The Lois K. & Richard D. Folger Leadership Chair

“I look forward to building on the legacies of the previous chairs by focusing on innovation in teaching, hiring and retaining world-class faculty...”

We will be actively recruiting again this coming year, looking for established leaders from academia or industry to add to the tenure-track faculty. We will also seek inspiring lecturers who can translate their practical work experience into captivating classroom instruction and student mentorship.



EOR: ENHANCING *Our* RESEARCH

On the second day in his new position, UT Austin President Greg Fennes wrote an op-ed about his vision for the university. One of his main points hit on the value of “innovating excellence by strengthening UT Austin as a place where undergraduates routinely interact and collaborate with faculty members, graduate students and researchers who are making important discoveries.” UT PGE Professor Gary Pope could not agree more with the importance of this statement. Pope has been a trailblazer for undergraduate research in UT PGE for almost three decades, leading the largest group in the department.

Pope, whose undergraduate research program began with two students and has now grown to more than 15, began the initiative to better prepare undergraduate students for the oil and gas industry. The program offers a means for students to apply the information they garner in the classroom into hands-on, meaningful lab application. The benefit to Pope’s research team is incredible as well.

“The impact of these students helped to double my research program’s productivity – the students have made a tremendous impact,” said Pope. “They work hard and are willing to come on the weekends or nights to help us oversee experiments. They have strong initiative as well, taking on projects by themselves or working directly with me on some projects.”

The structure of the program pairs undergraduate students one-on-one with graduate student mentors. The goal of the program is having undergraduates working close to – or at – a graduate level by the time they graduate from the department. Ideally, students contribute to the program for at least two years since it takes months to learn basic laboratory research methods and techniques.

Acceptance into UT PGE’s largest undergraduate research program is no easy feat. Less than half of the students who apply are accepted. All candidates are interviewed for the position and most of the students have a GPA above 3.5.

“It’s a coveted position,” said Pope. “The largest benefit is the opportunity to understand experiments and data on a higher, more in-depth level by working with leading researchers. The students do not receive this type of experience sitting in a classroom or behind a computer in an office.”

UT PGE Senior Travis Pitcher, who has been working in Pope’s labs for more than a year on surfactant floods for chemical enhanced oil recovery, appreciates the undergraduate research experience. In the spring of 2015, he took Dr. Mohanty’s Reservoir II class. After class he would head up to the fourth floor labs to conduct experiments using materials from real oil reservoirs from all over the world. “I feel better prepared for my career as the research is a nice complement to the classroom knowledge,” said Pitcher.

The undergraduate research assistants working in Pope’s labs come from several engineering and science disciplines, but most of them are petroleum engineering students. Pope strategically made that organizational decision, since the graduate students and post docs mainly come from other disciplines. The researchers benefit from the interdisciplinary interactions as they address challenges from different lenses.

Lauren Churchwell, a senior in the Biochemistry Department at UT Austin, who will spend two years in the group by the time she graduates in May, enjoys working with petroleum engineers and bringing a strong chemistry background to the project.

“I have a different way of looking at experiments,” said Churchwell. “You receive a different set of important skills in engineering and natural sciences. The projects I have worked on in Dr. Pope’s group are highly chemical based, so the petroleum engineers know a lot about the rocks and reservoirs and I know a lot about the chemistry side.”

Not only do students receive coveted research knowledge, but one of Pope’s priorities is teaching the importance of effective communication through strong verbal and written skills. Pope is an advocate for his students producing quality reports. “Every experiment has a written plan that is vetted with up to 15 iterations before the experiment starts and then once a report is compiled, it will have several iterations,” said Pope. If a paper or patent comes out of the report, students will receive credit if they have contributed an original idea.

Pope foresees the interest in his undergraduate research program continuing to grow through word-of-mouth and advertising. As more professors in the department develop robust undergraduate research programs because they see the value established by Pope’s program, more students will start using their time outside of the classroom inside of the lab.



Lauren Churchwell



A New Age of Rock

Recent advances in high-resolution imaging techniques have provided a wealth of 3D datasets that reveal the microstructure of rocks and soil, which in turn serve as the basis for sophisticated computer modeling of fluids moving through pore networks. This emerging research can inform important decisions in petroleum, environmental and civil engineering while addressing key geological questions. However, there is not yet a large, highly organized platform for sharing and downloading this valuable data.

UT PGE Assistant Professor Maša Prodanović and a team of leading UT Austin scientists are looking to change the way researchers distribute data. On Sept. 1, 2015, Prodanović, Dr. Maria Esteva (Texas Advanced Computing Center) and Dr. Richard Ketcham (Jackson School of Geological Sciences), received a two-year, \$600,000 National Science Foundation (NSF) grant to build a Digital Rocks Portal utilizing the latest technologies in data storage.

"This grant is a part of a larger NSF project, the EarthCube initiative, which aims to create a strong infrastructure for pulling all available earth system data together to make it more easily accessible and useable," said Ketcham.

Modern 3D datasets of pore networks are typically several gigabytes in size, leading to significant challenges for researchers seeking to store and share them. There is also a lack of standardization for characterizing image types and associated information. Even when they are made available, data sets only typically

live online for a matter of months before they are cleared due to space issues. This impedes scientific cross-validation of the simulation approaches and limits the development of studies that span length scales from a micrometer (a millionth of a meter, the size of individual pores and grains making up a rock) to a kilometer (the level of a petroleum reservoir, geological basin or aquifer).

"The current setup for data management has a lot of friction," said Prodanović. "Friction being, 'OK I have to figure out how to post 25 gigabytes of data' – it's not something you can email someone."

Downloading and uploading large data sets is just one piece of the portal. Another goal is developing a social aspect by visually presenting the information, encouraging communication and interaction among scientists. Prodanović says she thinks of the interface as a "Dropbox meets Facebook."

Each of the three groups involved brings a different set of skills, ensuring expert knowledge is applied to all aspects of the portal.

"I'm interested in the data and modeling it," said Prodanović. "Richard is on the production end because his lab outputs large amounts of data and his research is analyzing the data. Maria is interested in the information science aspect of the web-based portal's development: organizing a large datasets platform so it is easy to search and researchers are inclined to use it."

The Texas Advanced Computing Center is a natural home for the large data sets since it already has the infrastructure in place and the CT lab in the Jackson School, which Ketcham directs, is one of the largest academic imaging facilities in the nation.

Another benefit to the portal is the creation of a platform that will inform researchers of their data downloads. When researchers want to know how many times their papers have been viewed or cited they can use Google Scholar, but there is not a reliable tool for data tracking. By assigning a digital object identifier to each data set, researchers will now have a means for seeing where their data has been reutilized.

The official project launched Sept. 1, but Prodanović and Esteva have been periodically working to develop a portal for about two years.

"The first mistakes have already been made, so we have a good prototype," said Prodanović. "Within two years we will have the ability to make it operational at a high level, particularly in terms of speed."

Once the project is complete, the hope is that federal rules will evolve to ensure that data sets are shared for the benefit of the entire scientific community. Agencies such as the U.S. Department of Energy (DOE) and NSF currently require data management plans for all projects, but have not mandated distribution of data due to the lack of infrastructure. "This is paving the way for a formalized management plan for this type of data," said Ketcham. "The next big thing is people demanding public repositories."

Longhorn Loyalty

TWO ASSISTANT PROFESSORS JOIN UT PGE

This fall, two award-winning assistant professors are joining UT PGE. After receiving their doctorate in petroleum engineering from UT, they began their impressive careers in academia and industry. Heidari, a leader in the formation evaluation field, has published more than 60 papers and Okuno brings seven years of industry experience to UT PGE. Both were recognized by SPE for their junior faculty research initiative at their respective institutions. We are proud to have members of the Longhorn family educating the next generation of petroleum engineers.



ZOYA HEIDARI, ASSISTANT PROFESSOR

Zoya Heidari served as an assistant professor and the Chevron Corporation faculty fellow in the Harold Vance Department of Petroleum Engineering at Texas A&M University in College Station, Texas from September 2011 to August 2015. Heidari founded and directed the Texas A&M Joint Industry Research Program on "Multi-Scale Formation Evaluation of Unconventional and Carbonate Reservoirs" from 2012 to 2015.

She received a Ph.D. ('11) in petroleum engineering from The University of Texas at Austin. Heidari is one of the recipients of the 2015 SPE Faculty Innovative Teaching Award as well as the 2014 TEES Select Young Faculty Fellows award from the College of Engineering at Texas A&M University.

Heidari was selected as one of the distinguished speakers of the Society of Petrophysicists and Well Log Analysts (SPWLA) in 2014. She is also one of the recipients of the 2012 SPE Petroleum Engineering Junior Faculty Research Initiation Award to develop her research

program on formation evaluation of unconventional reservoirs.

Heidari has supervised 15 graduate students since 2011 and published more than 60 papers in peer-reviewed journals and conference proceedings.

Her research interests include petrophysics, borehole geophysics, rock physics, inverse problems and reservoir characterization of unconventional reservoirs. She currently serves on the technical committee for the SPWLA annual symposium, SPWLA education committee, the local organizing committee of the Society of Engineering Science (SES) conference and the steering committee for unconventional reserves task force summit.

RYOSUKE OKUNO, ASSISTANT PROFESSOR

Ryosuke Okuno served as an assistant professor of petroleum engineering in the Department of Civil & Environmental Engineering at the University of Alberta from 2010 to 2015. His research and teaching

interests include enhanced oil recovery, thermal oil recovery, numerical reservoir simulation, thermodynamics, multiphase behavior and applied mathematics.

With seven years of industry experience as a reservoir engineer with Japan Petroleum Exploration Co., Ltd., Okuno brings a vast knowledge of the most pressing oil and gas challenges to UT PGE. Okuno is a registered professional engineer in Alberta, Canada.

He holds B.E. and M.E. degrees in geosystem engineering from the University of Tokyo and a Ph.D. ('09) in petroleum engineering from The University of Texas at Austin. He is a recipient of the 2012 SPE Petroleum Engineering Junior Faculty Research Initiation Award.

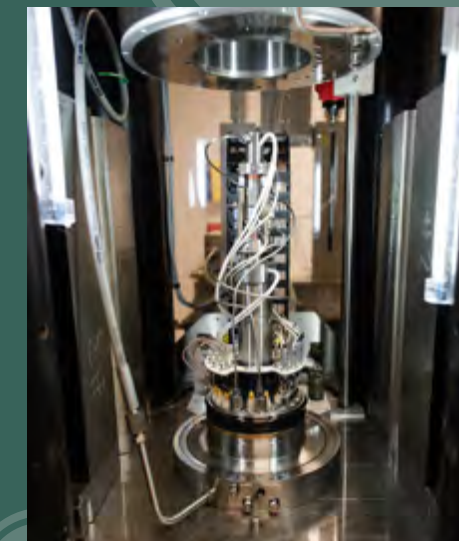
He is currently an associate editor for the Journal of Natural Gas Science & Engineering.

The Portal's Purpose

1 Organize the images and related experimental measurements of diverse porous materials

2 Improve access to porous media analysis results for a wider community of geoscience and engineering researchers who may not be trained in computer science or data analysis

3 Enhance productivity, scientific inquiry and engineering decisions founded on a data-driven basis



Stage of Triaxial Cell – State-of-the-art machine produced by Terratek/ Schlumberger measures the mechanical and transport properties of the rock in-situ pressure and stress for ultra-deepwater drilling and hydraulic fracturing



Control Panel of the Triaxial Frame – Controls pressure and stress with several hydraulic intensifiers and collects geophysical information in real-time such as ultrasonic velocity



Pressure Reactor – Exposes rock samples to temperature, pressure and chemical conditions representative of CO₂ geologic storage to measure the mechanical stability of rock minerals



Lab Launch: DR. NICOLAS ESPINOZA

In March 2015, Assistant Professor Nicolas Espinoza launched a million dollar lab – the Energy Applied Geomechanics Laboratory. Supported by Schlumberger, Statoil and the U.S. Department of Energy, the purpose of the lab is to study geomechanical-coupled processes with applications to improve HPHT drilling, advanced completions methods, fluid injection and reservoir management. Training UT PGE students on these cutting-edge applications better prepares them for careers in industry.



Where in the World

UT PGE caught up with three alumni, representing three decades and continents, who are making a significant impact on petroleum engineering activities throughout the world. We asked about the UT PGE knowledge they have brought with them across the globe as well as their favorite UT PGE memories and passions beyond petroleum.



LUIZ OTAVIO SCHMALL, PHD '13
Position: Reservoir Engineer - Technical Adviser, Petrobras
Location: Rio de Janeiro, Brazil



KAREN HAGEDORN, BSPE '86
Position: UK/Netherlands Asset Manager, ExxonMobil
Location: London, United Kingdom



GABE MUONEKE, BSPE '01
Position: Executive Director, MTX Resources Limited in Nigeria (Matrix)
Location: Lagos, Nigeria

What knowledge have you brought from UT PGE to your position in Rio de Janeiro?
The doctorate experience and all the classes taken at UT PGE gave me a strong technical basis, but in my opinion, the most valuable knowledge was the spirit of teamwork. At UT PGE, we always had meetings with the larger research group. This provided us the opportunity to share our results, which made the whole group stronger.

What is your favorite UT PGE memory?
I really miss all my friends from UT (professors, staff and graduate students). Since graduation, I have visited UT PGE three times. I always have this feeling of being back home. I think this is a quality of Texans – their friendliness makes you feel welcome and right back at home.

What knowledge have you brought from UT PGE to your role in London? The technical fundamentals I learned at UT pretty much follow me wherever I go. The good thing about STEM is that it is pretty universal. It was also at UT that I was initially exposed to a group of colleagues with very diverse backgrounds. Learning how to recognize what we had in common while also valuing what we didn't has always served me well.

What is your proudest career accomplishment? Being recognized as a Distinguished Member of SPE.

What is your passion beyond petroleum engineering? Travel. Fortunately, my job has allowed me to see a lot of fascinating places. Although, I like best when I turn off my devices and travel on my own.

What is your favorite UT PGE memory?
The first time I met (Professor Emeritus) Dr. Peters, I knew he was of the same ethnic group as me from Nigeria. When he finished introducing himself to the class, I raised my hand and excitedly told him, I too was of Igbo ethnicity. He looked at me with a friendly smile and gentle confusion and said, "So?" I knew from that day, I'd have no favors and in all likelihood, I'd set myself up to have it harder than the rest of the students.

What is your passion beyond petroleum engineering? Testing the limits of human capacity through languages, martial arts, food and biology. I speak five languages and I am learning my sixth language. I am a brown belt in Jiu Jitsu. I love biochemistry and how it has affected my diet. I am a vegetarian and study biology in my spare time.

UT PGE HOSTS

6TH Annual DISTINGUISHED ALUMNI WEEKEND

DISTINGUISHED ALUMNI CEREMONY



For 85 years, the growth and stature of the UT PGE department is largely due to our dedicated and passionate alumni. Many of our graduates have changed the oil and gas industry with their significant leadership – one out of ten alumni currently serves in executive level positions.

To honor our alumni, UT PGE hosts a Distinguished Alumni Ceremony. **The sixth-annual event will take place on Friday, November 6 at the Driskill Hotel**, honoring six outstanding alumni for their key contributions to energy production, the Texas economy and higher education.

UT PGE's Distinguished Alumni Program Committee, composed of UT PGE alumni and faculty, is pleased to announce the prestigious 2015 Distinguished Alumni honorees:

- JOE M. **PARSLEY** – BSPE '51 // C. RONALD "RONNY" **PLATT** – BSPE '62
- MARGARETHA "PEGGY" C.M. **RIJKEN** – PHD PE '05 // FRED KERWIN **FOX** - BSPE '49, MSPE '50
- SCOTT D. **SHEFFIELD** – BSPE '75 // DON L. **SPARKS** – BSPE '62

As of press time, sponsors of the UT PGE DA Ceremony include:

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ALUMNI TAILGATE

Every fall UT PGE hosts an Alumni Tailgate, coinciding with the Distinguished Alumni weekend, in front of the CPE building on the UT Austin campus. This year's event, presented by Strand Energy, LC., will be held on **Saturday, November 7** three hours prior to the UT vs. Kansas football game. Guests will enjoy a Texas-sized tailgate with food, drinks and Longhorn giveaways as well as the opportunity to mingle with former professors and classmates.
Please RSVP to bit.ly/PGETailgate





2014-2015 DONORS

UT PGE supporters power our success. We are thankful for more than 40 percent of alumni donors who give back on an annual basis and to our dedicated partners who invest in the next generation of oil and gas trailblazers. Your generous support enables us to recruit talented faculty and students whose leadership and innovation starts here and changes the world.

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 Mr. James S. Addison
 Dr. Mohabbat Ahmadi
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 Greater Houston Community Foundation
 Hess Corporation
 Hilcorp Energy Company
 Kinder Morgan Foundation
 Lake Research Partners
 Linn Energy
 Marathon Oil Company Foundation
 Motorwise Inc.
 Newfield Exploration Company
 Occidental Petroleum Charitable Foundation
 Occidental Petroleum Corporation
 Penn Virginia Corporation
 Permian Basin Area Foundation
 Pinkston Resources Limited Partnership
 Pioneer Natural Resources Company
 Repsol USA Holdings Corporation
 Rice University
 RWE Dea AG
 Schlumberger Limited
 Schlumberger Technology Corporation
 Schwab Charitable Fund
 Sempra Energy
 Shell Oil Company
 Shell Oil Company Foundation
 Silver Lining Foundation
 Society of Petroleum Engineers
 Society of Petroleum Engineers, The
 Strand Energy
 Sunflower Oil Inc.
 SunTrust Mid-Atlantic Foundation
 The United Methodist Children's Home
 Thompson Technologies Inc.
 TomCO2 Systems
 UBS Foundation USA
 UTG Solutions
 Vanguard Natural Gas LLC
 Yokogawa Electric Corporation
 The Maxine and Jack Zarrow Family Foundation

Trust

Robert Hinkel Charitable Lead Annuity Trust



Passions BEYOND PETROLEUM ENGINEERING

"Reading music is similar to picking up a different language, which has helped my attention to detail academically. Engineering is learning how to think through things efficiently. It is a lot like noticing patterns in music, because you can't read every note at the speed you are playing." - Henry Mersch

Students (l to r): HENRY MERSCHAT (BSPE '17), SHUB CHANDRASEKARAN (BSPE '17), ROHAN LIMAYE (BSPE '17)

Passion: UT LONGHORN BAND





Student: KRISTEN SIEGELE (BSPE '16)

Passion: VOLUNTEERING AT THE TEXAS SCHOOL FOR THE BLIND AND VISUALLY IMPAIRED

“I love being able to communicate a highly visual branch of math to someone who is visually impaired. I like the challenge of communicating as much as the students enjoy the challenge of understanding.”

“Running and biking a city truly helps you get to know the city - that’s how I fell in love with Austin. Also, studies show exercising regularly enhances cognition, so I think it has been helpful in de-stressing my brain and compartmentalizing information so I can think about it from a fresh perspective.”

Student: MICHAEL NOLE (PHD '17)

Passion: IRONMAN



Former UT President Bill Powers, UT PGE students Tanner Bryant, Taylor Lopez-Huebner, Alex Shih, Pioneer Natural Resources CEO Scott Sheffield and current UT President Greg Fenves



On the Forty Acres: PIONEER NATURAL RESOURCES VISIT

Last spring AADE President and UT PGE junior Taylor Lopez-Huebner invited the Dallas-based Pioneer Natural Resources team, including CEO Scott Sheffield, to UT Austin.

The visit provided UT PGE students the opportunity to receive an insider perspective on the state of the oil and gas industry and advice on how to become a successful petroleum engineer.

“With the current price downturn, it was encouraging to hear from someone who has

“...his story is one that all of us admire and aspire to achieve one day.”

been through industry cycles,” said Lopez-Huebner. “It’s incredibly humbling to think that a few years ago he was in the same shoes as us, and now he is the leader of one of the largest independent companies in the U.S. — his story is one that all of us admire and aspire to achieve one day.”

While on campus, Sheffield toured the state-of-the-art UT PGE drilling labs, gave a presentation to more than 300 undergraduate and graduate students in a packed classroom and shook hands with former UT President Bill Powers and current UT President Greg Fenves in the Tower.



Welcome CLASS OF 2019

This year, UT PGE welcomes its 85th class to the Forty Acres. The class, comprised of 96 students, was officially introduced to the UT PGE department on August 23-24 during the fourth-annual Freshman Fall Retreat sponsored by BP. During the retreat, students built a sense of community and Longhorn pride. We talked to a few members of the incoming class during freshman orientation about why they joined the department and their passions beyond petroleum.



JACKSON TRCKA
Hometown: San Antonio, TX // **Major:** GEH
What excites you the most about attending UT Austin?
UT's rich tradition has always excited me. I can't wait to be a part of the program.



CHARLES WANG
Hometown: Mansfield, TX // **Major:** PE
Why did you choose petroleum engineering?
I want to help make extracting petroleum a more clean, effective and efficient process.



DANIEL HUYNH
Hometown: Dallas, TX // **Major:** PE
Why did you choose petroleum engineering?
I joined the program because I have a strong desire to be an integral part in powering our society and the world.



ALEX GIGLIOTTI
Hometown: St. Louis, MO // **Major:** PE
What are your passions beyond petroleum engineering?
I love basketball, science and frisbee golf.



Dr. Carlos Torres-Verdin and Shaina Kelly

Class of 2019 STATS:

96 FRESHMEN



65 MALES (68%) // 31 FEMALES (32%)



85 IN-STATE STUDENTS (89%)



11 OUT-OF-STATE STUDENTS (11%)



1376 AVERAGE SAT SCORE
(VERBAL + QUANTITATIVE)



TOP 5% AVERAGE HS RANK

*excluding transfer students

Professor and Team Receive SEG's Honorable Mention in Best Paper Category

Dr. Carlos Torres-Verdin and his research team received honorable mention in the Best Paper category for the Society of Exploration Geophysicists' (SEG) 2015 Honors and Awards. The paper, titled "Pore-Scale Modeling of Electrical Resistivity and Permeability in FIB-SEM Images of Organic Mudrock" was published in SEG's journal, Geophysics, in May 2014. The piece earned the second-place designation for its description of a new pore-scale method to quantify petrophysical properties of hydrocarbon-bearing shale.

Vahid Shabro, Shaina Kelly, Dr. Kamy Sepehrnoori and Dr. Andre Revil (professor, Colorado School of Mines) co-authored the paper.

2015 Spring Graduate Receives Cockrell School Outstanding Scholar-Leader Award

Tara Sharma was one of two students who received the Cockrell School of Engineering's Outstanding Scholar-Leader Award during the 2015 spring graduation ceremony. Graduating UT PGE with honors, Sharma has served as president of the UT SPE student chapter, treasurer of the Women in Petroleum and Geosystems Engineering student group, and as a member of various other student organizations.

Sharma helped develop the Women in Petroleum and Geosystems Engineering group into a registered student organization. But she left her biggest mark on the Society of Petroleum Engineers (SPE), where she led several initiatives to improve SPE's impact on students and

transform the organization's presence at UT Austin. Extending far beyond the Forty Acres, Sharma's leadership has led efforts to actively engage high school students inspiring them to pursue careers in the STEM fields.

...Sharma left her biggest mark on the Society of Petroleum Engineers, where she led several initiatives to improve SPE's impact on students...



Undergraduate Student Wins BASF Team Chemistry Challenge

Team "Array of Sunshine," petroleum engineering major and AADE President Taylor Lopez-Huebner and chemical engineering majors Kush Muzumdar, Teresa Wu and Bradley McCoy, won first place for their idea to harness the sun's rays to power UFCU Disch-Falk Field—the home of Texas baseball—utilizing solar panels. They also suggested the installation of industrial fans to reduce the temperature in seating areas.

The team's funding plan proposed a temporary UT Athletics Green Fee on ticketed sporting events coupled with a revolving loan fund, which would serve to help fund other sustainable projects on campus. The annual event is hosted by BASF, the world's largest chemical company, and Texas Athletics awards a total of \$25,000 to the top three teams or individuals who submit winning proposals.

Three Professors Win 2015 SPE Regional Awards

UT PGE continues a streak of excellence as three faculty members, Drs. Ken Gray, Kamy Sepehrnoori and Mark McClure, were announced SPE regional award winners. Regional awards recognize members who contribute exceptional service and leadership within SPE, as well as make significant professional contributions within their technical disciplines at the SPE regional level.

W.A. (Monty) Moncrief Centennial Endowed Chair in Petroleum Engineering and Professor Sepehrnoori was awarded the Reservoir Description and Dynamics Award. McClure, assistant professor, won the Completions Optimization and Technology Award. Gray, professor, was awarded the Regional Distinguished Achievement Award for Petroleum Engineering Faculty.

Two Students Place First in SPE Regional Paper Contest

UT PGE students Yogashri Pradhan and Wei Yu placed first at the 2015 SPE Regional Paper Contest in the B.S. and Ph.D. divisions, respectively. The paper contest is an annual competition that brings together undergraduate and graduate students who each present a topic of their choosing to a panel of industry judges. Pradhan placed first in the B.S. division for her evaluation of the Beaver Creek Unit Reservoir. Yu placed first in the Ph.D. division for his paper titled "A Comprehensive Model for Simulation of Gas Transport in Shale Formation with Complex Hydraulic Fracture Geometry."

Both Pradhan and Yu are competing in the SPE International Paper Contest held during SPE's Annual Technical Conference and Exhibition (ATCE), Sept. 28-30.

UT SPE Chapter Hosts Symposium in Houston

On Feb. 4-6, 2016, the UT SPE chapter will host the 5th annual SPE Student Symposium for North America at the Chevron Towers in downtown Houston, Texas. The Student Symposium is the largest SPE student conference in the world and is completely student planned and executed. This year, UT was selected to host the event at Chevron's facilities in Houston.

The SPE Student Symposium gives students an opportunity to enhance their knowledge of the oil and gas industry through the insights and experiences of industry leaders and advocates. In past years, top leaders including Fortune 500 CEOs, SPE Presidents and other top executives have attended the symposium. The event brings close to 300 university students from around the world, enabling students to form global industry relationships prior to graduation. Students will attend panel sessions, technical presentations, social functions, site visits and keynote speeches from industry experts.

Two Professors Named SPE Distinguished Members

Professor Carlos Torres-Verdin and Research Professor Chun Huh have been named Distinguished Members of the Society of Petroleum Engineers. Candidates are nominated by 16 international award committees because of their outstanding and significant technical, professional and service contributions to SPE and the petroleum industry.

Dr. John Foster Receives SPE Faculty Innovative Teaching Award

Assistant Professor John Foster is one of five recipients of the 2015 Petroleum Engineering Faculty Innovative Teaching Award. This is the third year in a row a UT PGE faculty member has been recognized with this honor. The award recognizes excellence in commitment to academic research and student supervision. Foster's classroom utilizes many technological tools to maximize his students' learning potential. Fellow faculty and former students nominated Foster for his modernization of the classroom beyond the blackboard.

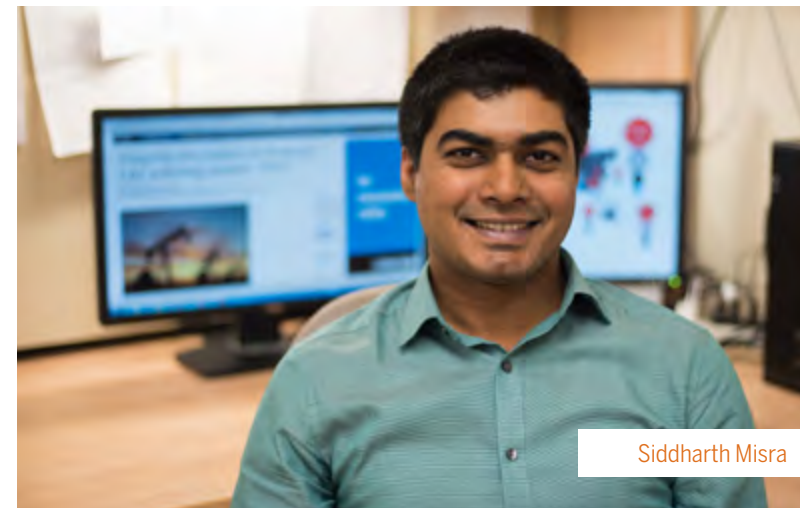
UT PGE's new assistant professor, Zoya Heidari, who starts this fall, is also receiving the Faculty Innovative Teaching Award for her work at Texas A&M. Foster will be recognized, along with Heidari, at SPE ATCE.

Graduate Student Featured in Prominent Oil and Gas Publications

In 2013, Siddharth Misra took Dr. Krishan Malik's course titled Oil and Gas Finance. He spent his free time post-class researching concepts of entrepreneurial finance in oil and gas to become highly knowledgeable on the subject. In 2015, his findings were published online through Penn Energy. His article was then picked up by Oil and Gas Financial Journal's (OFGJ) monthly magazine.



Wei Yu accepting his first place award



Siddharth Misra



Team "Array of Sunshine"

The two-part series in OGFJ is titled "Financing New E&P Technology Ventures." Part one includes sources of financing and teaches readers how to raise capital for their new venture. Part two focuses on private equity and private placement. Misra has since published additional articles in Hart Energy's E&P magazine and DEW Journal India.

Hart and Nygaard were chosen from 200 nominees...

Hart and Nygaard Honored with President's Outstanding Staff Awards

Graduate Program Coordinator Frankie Hart and Scientific Instrument Maker Daryl Nygaard, who is also a part of the Center for Petroleum and Geosystems Engineering, were announced as recipients of the prestigious 2015 President's Outstanding Staff Award.

Hart and Nygaard were chosen from 200 nominees "in recognition of the positive effect" they have had within the department and

campus-wide, according to the announcement letter sent to each recipient from former President Bill Powers. The award, given to 30 of the 21,000 staff members campus-wide, honors staff who actively demonstrate a significant impact on the university, contribute to the university's core purpose and values, foster collaboration and communication and perform at a level beyond normal job requirements.

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



Robert L. Parker, Sr.: ALLIES IN OIL

Without UT PGE Distinguished Alumnus Robert L. Parker's leadership and petroleum engineering background, the world we know today could look a lot different. His time on campus was short, but his global impact is immeasurable. Parker, who recently celebrated his 92nd birthday, captivated audiences in the department documentary "The Hunt," but it only told a sliver of his incredible story. Since this year marks the 70th anniversary of the Allies winning World War II, we are sharing a more complete and detailed version of his impressive life.

Parker's father did not have a college education, so he reluctantly sent his son off to the petroleum engineering program at UT Austin. Due to the need for army personnel, students agreed to study constantly, skipping their summer vacations to complete their degree plans in three years before heading overseas to join the war effort.

Campus during the 1940's had a much different atmosphere than today. The Forty Acres was designed to accommodate the war with The Reserve Officers' Training Corps (ROTC), so most students on campus were in military uniform—not the typical shorts and Longhorn t-shirts of today. Parker was in a fraternity, but had to give up his house as did all the other fraternities and sororities so ROTC students could live on-campus.

"Some of the Longhorn football games had to be played up in Georgetown, because the administration didn't want to have the stadium tied up during the war in case it needed to be used for other purposes," said Parker.

A Date Which Will Live in Infamy

Parker vividly remembers sitting in a small math class at UT Austin on Dec. 7, 1941, when a friend pulled him out of the classroom and asked him if he had heard the news.

"I said 'yes,' but thought it was unusual, as everyone had heard the news of the Pearl Harbor bombing," said Parker. "I went back to my work, but, when I met up with my friend later that day, he clarified he was trying to tell me my brother had become a casualty of the war. After that moment, going to school and focusing on my degree was the only thing that kept me from returning home at night and crying."

The Only Thing We Have Left to Fear is Fear Itself

After completing his degree in 1944, he was immediately shipped from Austin to Germany, where he worked under U.S. General George S. Patton.

"The minute I landed, the U.S. Army said, 'good, we have been looking for a petroleum engineer that knew all the answers,'" said Parker. "I had just graduated from Texas and I did not know if I had any answers, but I was promptly given the role of handling all of the petroleum products, and it was a busy job."

Parker was assigned to serve as a quartermaster, a senior soldier who supervises, stores and distributes supplies and provisions, in the 941st quartermaster unit positioned at the submarine pens in Bremerhaven, Germany. His unit's role was to unload the U.S. oil tankers and put them in five-gallon cans since they had no pipeline. Parker's engineering skills came into play when he built the plants to make the cans.

"I was in charge of about 4,000 German prisoners who helped me construct the plant," said Parker. "I also worked with Czechoslovakian prisoners, who were the best engineers I have ever been around."

The final stage of logistics was devising a plan to keep a constant convoy of trucks speeding up and down the Autobahn ensuring oil got into the hands of U.S. generals, including Patton. Both the Allied and Axis Powers recognized they could not win the war without oil—naturally, it became both sides' lifeblood.

Not only was Parker responsible for the energy supply efforts, but another part of his job was taking over the German-built quartermaster depot, the then-largest underground storage system for products in the world. The U.S. military took a keen interest in the systems the Germans had developed underground, particularly in terms of the engineering.

The depot included a 20-mile tunnel system connecting bunkers and oil plants. Individual plants in the depot were pre-marked by the Germans for post-war victory use; one East Texas oil and another Oklahoma oil.

"There was no doubt about it, Mr. Hitler had plans of capturing the United States and using all of our oil for his different needs," said Parker.

Parker would descend into the dark tunnels, driving from one bunker to the next to check valves and connections, trying to understand which way the oil was going to flow—a hard task, considering there was no oil movement since Hitler's army was running low. Trips into the tunnels carried a lot of danger, as members of the Waffen-SS, the armed wing of the Nazi party, were often present. In the darkness, bullets would whiz by Parker and without the modern technology of night vision glasses, Parker could only rely on luck.

"We were being shot at all the time—it was thrilling, but you couldn't see what you were shooting and neither could the Germans," said Parker.

To obtain fuel, the German army had to attack, but Parker said smart leadership from Patton and good soldiers kept the depot in the United States' possession.

To Reach a Port, We Must Sail—Not Drift

Since Parker returned from Germany, he has continued to play a significant role in providing the U.S. and the world affordable energy. His life has many noteworthy chapters, including roughnecking in Mississippi and West Texas and taking over his father's company, Parker Drilling Company, in 1954. He ran the company until 1991. Parker proudly flew a UT flag over the office, much to the dismay of local Oklahoma fans.

Parker established himself as a pioneer in the construction of helicopter rigs, capable of operating in remote locations, as well as the development of Arctic drilling techniques on the North Slope of Alaska. In 1981, Parker received the U.S. Secretary of Energy's Distinguished Service Medal. In 2007, he was inducted into the Petroleum Hall of Fame.

Parker's time spent at UT PGE influenced his life's trajectory and furthered his love and passion for the petroleum engineering discipline.

As a petroleum engineer, you always feel like you are needed," said Parker. "You feel like you can provide answers to a lot of today's problems in the world—and energy is certainly right on top of the table."



The UT PGE Class of 2015, comprised of 111 talented students, is setting out on a journey to change the world. Get to know two students who are both passionate about petroleum engineering, but will be taking their knowledge and expertise in two different and interesting directions.

CAMERON MCCLENDON – BSPE '15

Over the last decade, booms have occurred in both the oil and gas industry with the wide-spread use of hydraulic fracturing and in the technology industry with the rapid development of software and apps. Technology has infiltrated how business is conducted in almost every industry, including oil and gas. So when Cameron McClendon began to pursue a career, he found his calling in a tech start-up for the oil and gas industry.

The RigUp office is reminiscent of a scene out of the new HBO series "Silicon Valley" - from the bare bones office space with basketball hoops to the young, motivated staff. The company aims to increase efficiency of E&P companies through a one-of-a-kind industry software platform. The Austin-based company is a mobile app and online resource connecting E&P

companies to service providers. RigUp's goal is to help companies find service providers in a more efficient manner with cost saving benefits. McClendon applied for an internship with RigUp the spring of his senior year after receiving an email from UT PGE's Undergraduate Academic Advising Coordinator, Arletta Tompkins.

"I was skeptical at first of working for a start-up, but there is just so much potential," said McClendon. "RigUp is the product of merging industries – computer science meets oil and gas meets communications."

Experience with garnering service quotes from previous industry internships sold McClendon on the value of RigUp. He says what used to take him weeks can now be accomplished within a day using their system.

The team, consisting of previous Google employees and top UT Austin computer science graduates, may not seem like a fit for a petroleum engineering graduate, but McClendon says his petroleum engineering intuition and knowledge is a huge asset to the company. In return, RigUp has provided McClendon exposure to business development, product management and sales.

"The most beneficial knowledge I gained while at UT PGE was being encouraged to think outside the box," said McClendon. "I was challenged my entire college career and this is another challenge for me to get people to embrace the available cutting-edge technology." As Millennials move into industry and leadership positions, technology will likely continue to play a vital role in enhancing efficiency and revenue. The RigUp team is

small, but growing. Mike Meller, UT BSPE '14, was hired alongside McClendon after gaining valuable field experience with Halliburton.

"Cameron and I look at the RigUp software from a petroleum engineering perspective to give advice on how we would use the system," said Meller. "It's exciting because no one else out there does this service specifically for the oil and gas industry."

McClendon says RigUp is excited to recruit students from UT PGE next year. He says you don't have to follow a traditional route after graduation to find success — he found his in a tech start-up.

PATRICIA RENYUT – BSPE '15

Patricia Renyut was destined for a career in petroleum engineering. Everyone knew it, except for her.

The daughter of Fransiskus Renyut (MSPE '94), Patricia grew up on a Chevron subsidiary production camp, Caltex, in Duri, Indonesia, where her father worked. Surrounded by the industry her whole life it made sense for her to take the petroleum engineering route, but when the time came for her to select a major she went with biomedical engineering.

"My entire childhood was centered on oil and gas, but I wanted to try something else," said Renyut.

As a biomedical engineering student Renyut couldn't completely stay away from the oil and gas sector, so she began attending SPE meetings on campus. After speaking with professional representatives in industry, Renyut eventually realized that the Department of Petroleum and Geosystems Engineering was where she belonged.

"My parents never pushed me toward this field, but they were probably just smart and knew I'd end up here eventually," said Renyut. After telling them she was going to switch majors, her father reacted by "smirking."

At one of the SPE meetings, Renyut met Sue Park. Park is a member of the Chevron recruitment team and a UT PGE alumna (BSPE '07). After listening to the presentation, Renyut approached Park as she connected with the Indonesia projects Park was discussing in her presentation.

"Patricia was extremely energetic and when we talked about the projects going on around the world, her eyes lit up," said Park. "It was easy to tell she was genuinely interested in the information we were sharing."

This connection helped Renyut land an internship with Chevron after her freshman year. She went abroad to intern in Sumatra, Indonesia, close to the city where she grew up. She was part of the production team, and, on several occasions, visited rigs that she described as being "way out in the middle of the jungle."

For Renyut, the experience allowed her to connect what she was learning in the classroom to what was going on in the real world. She had a total of three internships with Chevron including last summer where she worked on Perdido, a joint venture with Shell and one of the world's deepest offshore oil drilling and production platforms, which is 8,000 feet in depth.

Renyut stayed with Chevron because the company shares her same priorities, particularly: outreach and communication initiatives with females. Renyut plans to stay involved with outreach post-graduation and wants to encourage more females to pursue a career in engineering.

Starting full-time with Chevron in Covington, La., Renyut is thrilled about the opportunity to be reservoir engineer. She's sad to leave Texas and her favorite foods behind, but she is happy to continue working with Chevron and directly across from her mentor.

"I really respect her as an engineer," said Park. "I'm excited to see her grow into her potential."





CONGRATULATIONS GRADUATES

BSPE GRADUATES

DECEMBER 2014

Allen, Brien Foster
 Bairalova, Jamilya
 Blaies, Alexander M.
 Davidson, Michael Robert
 Dean, Taylor Patrick
 Egboga, Nkemakonam
 Jakhina, Nuriza A.
 James, John Frederick
 Kassenova, Malika
 Lizama, Anthony David
 Minor, Brednon Maxwell
 Mowrey, Andrew Fischer
 Neutzler, Charlsie L.
 Patel, Deepali Deepak
 Rahman, Rowan
 Sagbini, Carlos Elias
 Saliyev, Ilyas
 Shariatmadar, Bebegol
 Shi, Stephen
 Sobey, Kyle Edward
 Strickland, Gibson Todd
 Suleimenov, Bakhtiyar
 Umlang, Brian S.
 Varghese, Jobin Thomas
 Westmoreland, Sarah G.
 Zuazua, Sarah
 Gonzalez, Alexander R.
 Reyes, Michael
 Savage, Jack

MSPE GRADUATES

DECEMBER 2014

Aitkulov, Almas
 Al Tammar, Murtadha
 Apiwatcharoenkul, Woravut
 Carey, Michael A.
 Chang, Leonard
 Eftekhari, Bahzad
 Elahi Naraghi, Morteza

Gips, Jameson P.
 Kannan, Krupa
 Lee, Kwangjin
 Liang, Yu
 Liu, Xiangyu
 Minor, Jesse E.
 Misra, Siddarth
 Salas Porras, Ricardo
 Shakiba, Mahmood
 Taylor, Jacob M.
 Verma, Rahul

PHD PE GRADUATES

DECEMBER 2014

Afsharpoor, Ali
 Al Shalabi, Emad
 Cao, Fei
 Hwang, Jongsoo
 Kazemi Nia Korrani, Aboulghasem
 Lashgari, Hamid Reza
 Mehmani, Yashar
 Singh, Gurpreet
 Singh, Harpreet
 Tavassoli, Shayan
 Wu, Kan

BSPE & GEH GRADUATES

MAY 2015

Al Farsi, Khalid H.
 Alexander, Audrey Noelle
 Antkowiak, William R.
 Arnold, Christopher R.
 Assale, Diane Emmanuella
 Balsara, Joshua
 Barrera, Zach Wayne
 Bian, Zheng
 Bilby, Michelle Leigh
 Bledsoe, Travis C.
 Blough, Joseph Daniel
 Bolus, Brett Wilson
 Butler, Dean Scott Robert

Camacho, Jason Neal
 Campbell Jr., William J.
 Caram, Lindsay Alexis
 Carstensen, Grant Douglas
 Casey, Ryan Michael
 Caudill, Austin Bradford
 Cervantes, Danny
 Chatila, Omar Tarek
 Chen, Kevin
 Clark, Brea Elizabeth
 Clay, Matthew Walter
 Connery, Madison Eloise
 Cozby IV, Raymond Wilson
 Craig, Ryan P.
 Daly, Patrick Mikel
 Dao, Duy-Tue V.
 Dean, Victoria Denise
 Delaney, Jennifer Marie
 Deshazo, William Kyle
 Doan, Tony
 Dunlap, William Richard
 Entremont, Jacob Paul
 Feng, Kevin
 Flores, Brendan Timothy
 Franks, Austin Milton
 Frye, Mark Joseph
 Giese, Andrew Philip
 Gray, Jeremy Tyler
 Hahn, Michael Blake
 Hahnenkamp, Grant Andrew
 Hilts, Brandon Benson
 Hopkins, Tucker Danial
 Howard, Christopher J.
 Huddleston, William H.
 Keel, Kameron Ashby
 Khalifa, Ali Abdulhusain
 Khayami, Abdulla Omran
 Kim, Yong Do
 Klem, Brooke Mackenzie
 Krolczyk, Tyler Steven
 Lacamu, Jeremy Allen
 Lamond, John Taylor

Lewis, Rachel Elaine
 Li, Tianyu
 Lilienfeld Asbun, S.N.
 Lilly, Devon James
 Mahoney, Reuben Peter
 Martakov, Danil S.
 Martin, Michael C.
 Mize, Kevin Austin
 Moldvaer, Marius
 Moma, Jerry Emeka
 Morris, Jordan Alex
 Nissen, Derek Robert
 Perozo, Alejandro Edgardo
 Pham, Viet Quoc Che
 Pourghaffar, Arsha
 Pradhan, Yogashri Umesh
 Ramussen, Gregory Scott
 Renyut, Patricia Mentari
 Richardson, Marcus Henry
 Rios, Arturo A.
 Rose, Darin Michael
 Rubinos, Leticia C.
 Sandwith, Christopher P.
 Schmitz, Kellyn Porter
 Schopper, Adam John
 Sekhon, Chetandeep Singh
 Seymour, Michael Scott
 Shambulov, Mustafa
 Sharma, Tara
 Shih, Alex
 Stewart, Matthew Joseph
 Tan, Johnny
 Torres, Carlos
 Tran, Nathan Nhan
 Tran, Tony Bao
 Treistman, Jordan Wynne
 Tucker, James Scott
 Turnage Jr., John Chris
 Vela, Brian Christopher
 Weatherl, Michael Harris
 Wilkerson, Kristin Gail
 Xu, Zhen

Yang, Andrew
 Zheng, Dandan

MSPE GRADUATES

MAY 2015

Abouie, Ali
 Ahmad, Muneeb
 Chitsiripanich, Soros
 Chiu, Kit-kwan
 Ezidiegwu, Sandra
 Gao, Shuang
 Hightower, William J.
 Jasso, Marisa
 Jung, Hojung
 Kathel, Prateek
 La, Natalie-Nguyen
 Leheta, Amr
 Li, Zhitao
 Ma, Yiwei
 Mehmani, Ayaz
 Murugesu, Mayuri
 Nizamidin, Nabijan
 Nole, Michael
 Sayar, Paul
 Tansey, Joseph
 Yang, Lin
 Yang, MInguan
 Yue, Kaimin

PHD PE GRADUATES

MAY 2015

Doorwar, Shashvat
 Enayatpour, Saeid
 Huang, Shan
 Koh, Heesong
 Kopriva, Wynn
 Lotfollahi Sohi, Mohammad
 Ogunyomi, Babafemi
 Rezaveisi, Mohsen
 Yu, Wei

BSPE & GEH GRADUATES

AUGUST 2015

Blonkvist, Brady O'Neil
 Elharim, Faical
 Guenther, Michael Paul
 McClendon, Cameron Scott
 Novelli, Rebecca Ann
 Reinking, Alex Mark
 Sapon, Byron Roberto
 Suresh Kumar, Adithya
 Vargas, Jose L
 Thompson, Matthew C

MSPE GRADUATES

AUGUST 2015

Ahmad, Yusra K.
 Alghamdi, Abdullah A.
 Alsulaimani, Thamer A.
 Gandomkar, Arjang
 Griffith, Christopher A.
 Hahn, Ruth E.
 Johnson, Andrew C.
 Kelly, Shaina A.
 Lee, Vincent B.
 Mehta, Prachi
 Nwachukwu, Chiazor
 Saint-Martin de Abreu Soares, Fernando
 Soares, Cesar M.
 Stewart, Jeffrey R.
 Tandon, Saurabh
 Wallace, Scott P.
 Wung, Roy M.

PHD PE GRADUATES

AUGUST 2015

Mehmani, Ayaz
 Misra, Siddharth
 Zhou, Junhao

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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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