



Engineering Our Future

Summer 2013

Texas Tech University - Edward E. Whitacre Jr. College of Engineering



The Maddox Chairs

The Texas Tech University Whitacre College of Engineering welcomes National Academy of Engineering members Dr. Danny Reible and Dr. Chau-Chyun Chen



Dr. Fazle Hussain

National Academy of Engineering member Dr. Fazle Hussain has been named the President's Distinguished Chair in Engineering and Science, a Senior Adviser to the President, and a professor in the Department of Mechanical Engineering.

Inside

- 6 Faculty Receive Two NSF CAREER Awards
- 7 Rentz Establishes Hall of Honor
- 12 Seven Distinguished Engineers Named



Engineering Our Future

Summer 2013 Issue

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Dean's Report

I am pleased to announce the Whitacre College of Engineering is now the home of four members of the National Academy of Engineering. In addition to our long-time faculty member and National Academy of Engineering member **Dr. Kishor Mehta**, a professor of civil and environmental engineering, we welcome National Academy of Engineering members **Drs. Chau-Chyun Chen, Fazle Hussain, and Danny Reible** to the college. These three men are highly respected in each of their fields, and their research expertise and knowledge will help the Whitacre College of Engineering reach new heights.

These new hires would not have been possible without the generous support of the J. F Maddox Foundation and the endowed chairs that were established in honor of Jack and Donovan Maddox. **Dr. Chau-Chyun Chen** will hold the Jack Maddox Distinguished Engineering Chair in Sustainable Energy and will serve as a professor of chemical engineering. **Dr. Danny Reible** will hold the Donovan Maddox Distinguished Engineering Chair and will serve as a professor of civil and environmental engineering. I encourage you to read more about the J. F Maddox foundation's contributions to Texas Tech on page 8. You can learn more about Dr. Chen's research and career on page 9 and Dr. Reible's research and career on page 10.

National Academy of Engineering member **Dr. Fazle Hussain** has been named the President's Distinguished Chair in Engineering and Science, a Senior Adviser to the President, and a professor in the Department of Mechanical Engineering. The President's Distinguished Chair in Engineering and Science is unique at Texas Tech — no other faculty member holds a chair of such prestige. You can learn more about Dr. Hussain's research and career on page 11.

Enrollments within the college are up this fall, and our students are drawing national attention for their projects and scholarship. **Sean Miller**, a senior mechanical engineering student, is the recipient of the McAuley Distinguished Engineering Student Award. He has completed four internships at NASA — a place near to my heart — and has been a good ambassador of Texas Tech and the strong work ethic that our students and alumni show every day. (page 3) **Jeevan Maddala**, who recently graduated with a Ph.D. in chemical engineering, received a \$225,000 grant from the National Science Foundation (NSF) to commercialize his doctoral work on microfluidic devices. (page 3) Our student MEMS team took first place again at the Sandia MEMS competition; this is the seventh time in the last nine years that a Texas Tech team has won. (page 4) Construction engineering students competed at the 2013 Associated Schools of Construction Region 5 Student Competition held in Dallas and won the Commercial Building Division. (page 4) Electrical engineering doctoral student **Changzhan Gu** won two awards, (page 4) and mechanical engineering graduate student **Aimee Cloutier** received a significant fellowship from NSF (page 5)

Our online programs have enjoyed recent national attention, including our Systems and Engineering Management (SYEM) program, which was ranked 17th by SuperScholar.org. (page 5)

Faculty members in the college continue to receive recognition for their research and scholarship, as **Drs. Micah Green** and **Changzhi Li** received \$400,000 NSF CAREER Awards, the highest profile awards that are given by NSF to young faculty members. (page 6) **Dr. Annette Hernandez** recently received two awards of recognition for the promise that her career shows.

I am also pleased to announce **Dr. Hong-Chao Zhang**, a professor of industrial engineering, has been named the interim chair of the Department of Industrial Engineering. (page 5)

In April, we recognized seven new **Distinguished Engineers** at our annual luncheon. (page 12) These individuals stand out in industry and academia and we are proud that they are Red Raiders. In an effort to recognize our Distinguished Engineers and those individuals and organizations that have given to the college, and through the generosity of 1974 mechanical engineering graduate and Distinguished Engineer Jack Rentz, the college has established the new RENTECH Boiler Systems Hall of Honor in the Livermore Center. (page 7) I encourage you to visit the campus and see this new addition.

Construction continues on our new **Petroleum Engineering Building**, and we plan to begin offering classes in the building in the spring semester. Look for more information on the building in the next issue, or follow the progress with our live construction camera at www.pe.ttu.edu/building

If you are in the Dallas, Houston, San Antonio, or Austin area in October or November, look for our billboards along the major interstates.

We have recently expanded our career placement efforts to include job postings for both current students and alumni. This new feature, called **Alumni Job Grid**, is available to all Whitacre College of Engineering alumni. Find out more at www.TTUeoc.com

As always, feel free to share your career news us at www.TTUEngineering.com and enjoy reading about the successes of your fellow alumni. (page 15) We look forward to hearing from you!



Dean Al Sacco Jr., Ph.D.



In This Issue

Student News	3
News	4-6
New Hall of Honor	7
Maddox Chairs	8-10
New Faculty: Fazle Hussain	11
Distinguished Engineers	12-13
Alumni News	14-15





Miller Named 2013 McAuley Distinguished Engineering Student

The Whitacre College of Engineering has named Sean Miller the recipient of the McAuley Distinguished Engineering Student Award for 2013. He will graduate in December 2013 with a Bachelor of Science in mechanical engineering.



Miller

The choice to attend Texas Tech and study engineering was not a difficult one for Miller, as he grew up in Floydada; his father and grandfather attended Texas Tech. He had an interest in aeronautical and aerospace engineering from an early age.

Arriving at Texas Tech, he immediately began expanding his learning opportunities beyond the classroom. He became involved with student organizations and community outreach opportunities right away. During his sophomore year, he began the first in a series of four internships and co-ops at the NASA Johnson Space Center in Houston.

While in Houston for each of his internships and co-ops, he worked with the Clear Lake Church of Christ Homeless Ministry, serving as an overnight host to homeless families staying in the church building as well as collecting and distributing clothing and hygiene items to homeless individuals in downtown Houston. He also had an internship with Baker Hughes in Midland, during the summer before his senior year.

In Lubbock, he has been a member of the Texas Tech American Society of Mechanical Engineers (ASME) student chapter, served as the banquet chair, the internal vice president and currently serves as the external vice president. In this role, he has solicited senior design project proposals from engineering corporations and led the ASME chapter in sponsoring and organizing the annual South Plains Math and Science Competition.

His enjoyment of aeronautical and aerospace engineering has continued and increased through the concepts and skills he has learned in the classroom and in his hands-on experiences at NASA's Johnson Space Center. Miller hopes to secure a full-time position with NASA after graduating this fall. **E**

Maddala Receives NSF STTR Grant for Commercialization

Jeevan Maddala, a recent graduate with a Doctor of Philosophy in chemical engineering, has been awarded a \$225,000 National Science Foundation Small Business Technology Transfer (NSF STTR) grant to commercialize his doctoral work, performed under the supervision of Dr. Raghunathan Rengasamy.



Maddala

Maddala came to Texas Tech with the hopes of developing new technology and commercializing it through a startup company. Working in faculty members' laboratories, including Drs. Siva Vanapalli and Rengasamy, he developed an interest in microfluidic devices, which are like tiny plumbing systems with "pipes" that are the size of human hairs.

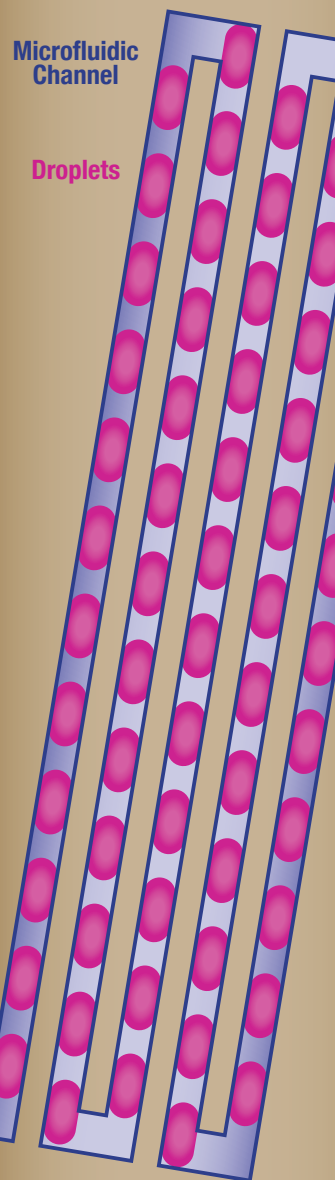
Building on his experiences in the lab, Maddala proposed the development of simulation and design software for droplet-based microfluidic devices. His idea was to use a rational design approach to develop intricate and powerful devices through computational tools and simulations on the computer, as opposed to traditional trial and error physical mockups and devices. The development of these algorithms and software could allow a designer to virtually construct a device to meet specific needs for a particular chemical composition and concentration with high precision.

The grant, known as STTR Phase I, will allow Maddala to focus on the development and demonstration of a software system that would receive inputs from the user and deliver a CAD device design. If successful, Maddala will move forward with further enhancements to the software system and the development of prototypes and eventually an automated system that will design and physically construct droplet-based microfluidic platforms using either three-dimensional printing or xurography, starting from just a design concept of a user.

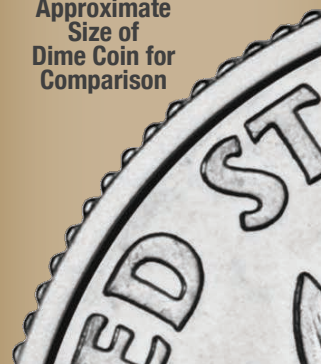
Through the flexibility and the customization that is available through this approach, these new devices could facilitate the discovery of materials for pharmaceutical and biomedical applications including protein crystallization, stem cell growth, and drug screening. **E**

Microfluidic Network

Microfluidic networks are constructed on microfluidic devices to control the flow of tiny droplets of chemicals and other fluids. The channels are often as small as human hairs.



Approximate Size of Dime Coin for Comparison

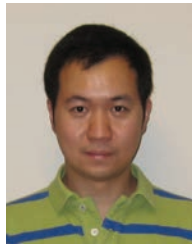




News

Gu Wins Horn Professor Graduate Achievement, Chinese Gov't Awards

Changzhan Gu, an electrical engineering doctoral student has been named a recipient of the Horn Professors Graduate Achievement Award. This award was established by the Paul Whitfield Horn Professors at Texas Tech University to recognize and reward outstanding research or creative activity performed by graduate students while at Texas Tech.

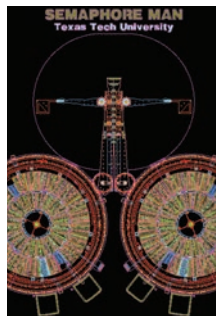


Gu

He also was granted the 2012 Chinese Government Award for Outstanding Self-Financed Students Abroad. This award recognizes the academic excellence of the Chinese students studying abroad without government-funded scholarships. He received \$6,000 plus travel support to Houston to receive the award. **E**

ECE Students Win Sandia MEMS Design Competition

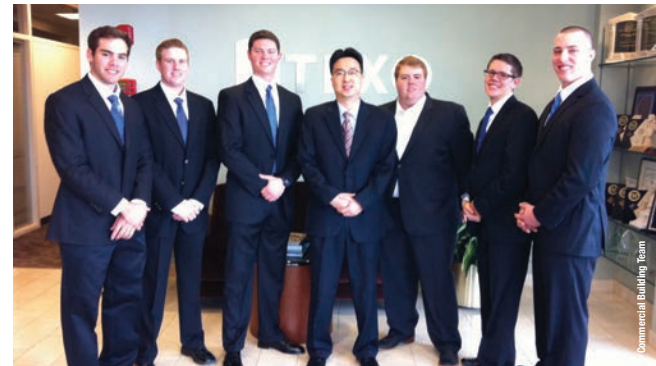
Texas Tech electrical and computer engineering students won the "Educational Design" Category at the 2013 Sandia National Laboratories MEMS University Alliance Design Competition. Led by lead designer Bryan Kahler, team members Courtney Pinnell, Steve Mani, and Philip Henry designed the Semaphore Man, an interactive educational tool that teaches STEM concepts. The group was advised by Dr. Tim Dallas, associate professor of electrical and computer engineering.



Semaphore Man

Semaphore Man can be used to teach number systems, variable bit rates, and the transmission of unique signals via multiple signaling schemas. The Semaphore Man is 687 μm tall and has a wingspan of 903 μm . The entire device is only 1.7 mm wide and 1.8 mm tall. Texas Tech students have won the contest in seven of the last nine years. Nine other schools participated in the Educational Design Category of the competition this year. **E**

CEET Students Place in Associated Schools of Construction Competition



Texas Tech Commercial Building Team (L-R) Joseph Khaled, Kyle Hoelting, Matthew Fisher, Dr. Sangwook Lee, Eric Van-Dusen, Dan Graf, and Joseph Schattle

The Texas Tech Commercial Building Team won first place in their division during the 2013 Associated Schools of Construction Region 5 Student Competition held in Dallas in February 2013. The team competed against 11 other teams from college construction programs located in Texas, Louisiana, Oklahoma, and Arkansas. The competition required each team to complete a written solution to a construction management problem statement in 16 hours and then develop and execute a 40-minute presentation defending their written solution to a panel of judges. The panel of judges was composed of engineers, architects, owners, and contractors personnel who were directly involved in the actual project.

The Texas Tech Design-Build Team won second place in their division. The team competed against six other teams from college construction programs located in Texas, Louisiana, Oklahoma, Arkansas, Ireland, and Australia. Team members included Caleb Lightfoot, Jake Maxton, Phillip Hamilton, Stephanie Bunt, Zach Sienkiel, Dr. Tewodros Ghebrab (Coach), and Marshall Clark.

Two Texas Tech construction engineering students received recognition as Outstanding Individual Presenters. In each competition division, each school's six-person team was required to make a 40-minute presentation supporting and defending their written proposal. During these presentations, a special group of judges were designated to judge and identify the top three individual speakers from each division. Marshall Clark was awarded first place in the Design-Build Division of the competition and Joseph Khaled was awarded third place in the Commercial Building Division of the competition. **E**



Cloutier Receives NSF Graduate Research Fellowship

Aimee Cloutier, a graduate student in the Department of Mechanical Engineering under the supervision of Dr. James Yang, has been selected to receive a 2013 NSF Graduate Research Fellowship Program (GRFP) Fellowship.



Cloutier

She was selected based on her outstanding abilities and accomplishments, as well as her potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise. She will receive a \$30,000 per year stipend for the next five years. **E**

Online Programs Ranked Highly by SuperScholar.org, U.S. News & World Report

Texas Tech's Online Systems and Engineering Management (SYEM) program has been ranked 17th in SuperScholar.org's first annual Smart Choice ranking of the top 25 schools for online engineering management degree programs. Programs were evaluated based on accreditation, academic quality, student satisfaction, reputation in the field, and cost.

SuperScholar's Smart Choice ranking of the best universities for online engineering management degrees was designed to help students make a smart choice about where to pursue an engineering management degree online.

The online master of engineering degree is ranked 50th in the nation, according to the 2013 edition of U.S. News & World Report's Best Online Graduate Programs.

Texas Tech is among 293 institutions offering a master's degree in engineering and housing at least one program that was ABET accredited at the bachelor's level or higher.

The ranking is based on a survey conducted through the fall of 2012, U.S. News said. Respondents were then ranked based on student engagement, faculty credentials and training, student services and technology, and admissions selectivity. **E**

Zhang Named Interim Chair of Industrial Engineering

Dr. Hong-Chao Zhang, a professor of industrial engineering, has been named the interim chair of the Department of Industrial Engineering.



Zhang

He earned a Ph.D. in manufacturing engineering from the Technical University of Denmark in 1989, a master of science in mechanical engineering from the University of Aalborg-Denmark in 1986, and a bachelor of science in mechanical engineering from the Tianjin University of Science and Technology in 1976. He has received approximately \$5 million in research funding from NSF, Texas ATP, NIST, SME and other government and industry agencies. **E**

Hernandez Wins Teaching Award, Named Rising Star

Dr. Annette Hernandez, an assistant professor of civil and environmental engineering, has been named a recipient of a American Society of Civil Engineers (ASCE) ExCEED New Faculty Excellence in Teaching Award.

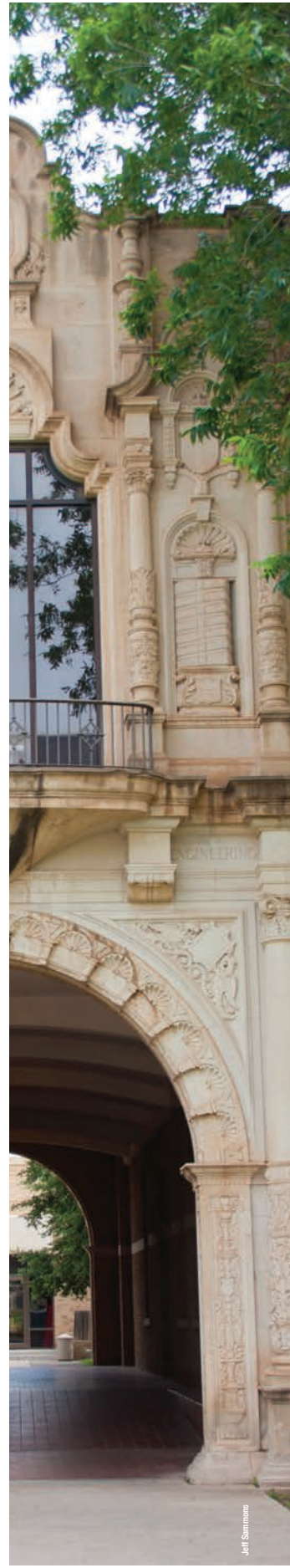


Hernandez

This award was established by ASCE's Project ExCEED (Excellence in Civil Engineering Education) and the Committee on Faculty Development to recognize and reward outstanding new faculty.

Hernandez was specifically selected because of her outstanding teaching record as a new faculty member, her contributions to the academic and surrounding community, and her proven commitment to education.

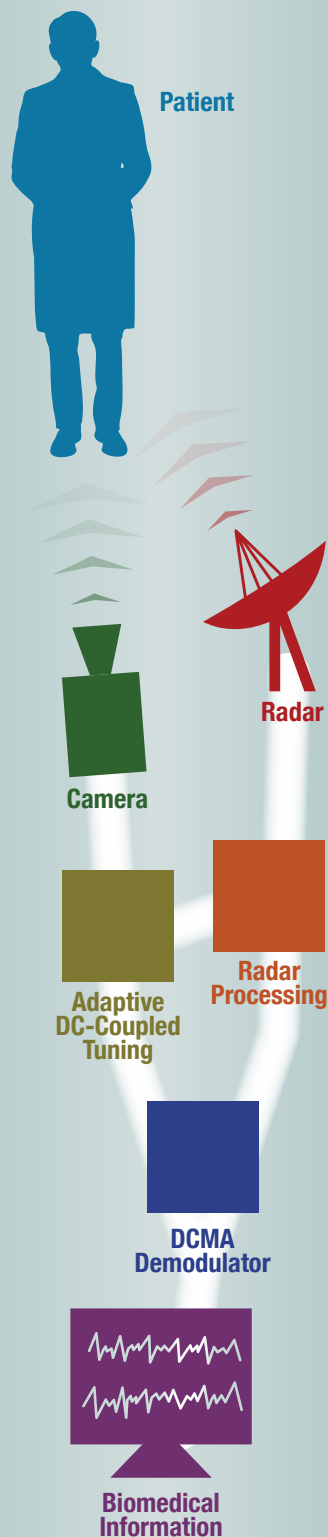
She has also been named a recipient of the Rising Star Award from the Texas A&M University-Kingsville Javelina Alumni Association. The Rising Star Award recognizes graduates of the university who have experienced professional success early in their careers. **E**





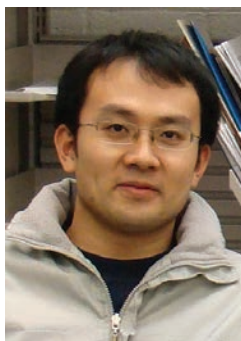
Faculty News

Remote Detection of Biomedical Information Using a Smart Radar Sensor



Li Receives \$400,000 NSF CAREER Award for Work on Smart Radar Sensors

Dr. Changzhi Li, assistant professor of electrical and computer engineering, has received a \$400,000 CAREER Award from the National Science Foundation.



Li

Recently, scientists and healthcare providers have developed new advances in tracking a patient's physiological motions such as respiration and heartbeat by using small portable Doppler radars. These advances, specifically devices that employ microwave Doppler radar phase modulation, can be monitored remotely by healthcare providers without anything attached to a patient.

This technology is ideal for health monitoring over extended periods of time because it does not confine or inhibit a patient and it does not cause discomfort or skin irritation as other devices, like electrodes and straps. Additionally, it may achieve what other devices can not through fast and remote identification of vital signs in patients. In this way, the technology could be used in remote diagnosis, search and rescue of victims after a natural disaster, or even remote monitoring and surveillance.

Recent integration of this technology with radiation oncology imaging processing by Li's research group has offered a very promising solution in tracking mobile tumors in lung cancer patient during radiotherapy.

This technology has the potential to replace chest-strap or fingertip monitors, but random body motion could cause problems for accurate readings. Li's group aims to resolve the problem of motion detection by using a 'smart' portable biomedical radar sensor that combines radar and camera solutions. In this way, the system could 'ignore' random motions that are observed by the camera. If successful, this research can be directly used for the monitoring and treatment of conditions like sleep apnea or even incidents like sudden infant death syndrome.

This project will benefit from collaboration with National Instruments on both research and education. **E**

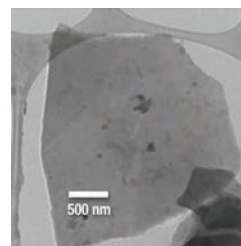
Green Receives \$400,000 NSF CAREER Award for Work on Graphene

Dr. Micah Green, an assistant professor of chemical engineering, has received a \$400,000 CAREER Award from the National Science Foundation.



Green

The CAREER Award is one of the most prestigious grants from the National Science Foundation, and Green is the fifth current faculty member in chemical engineering to receive this award following in the footsteps of Drs. Karlene Hoo, Siva Vanapalli, Mark Vaughn, and Brandon Weeks.



Magnified Image of Graphene

Green's award focuses on single-atom-thick sheets of graphite, termed graphene. These sheets display extraordinary mechanical strength and electrical conductivity, and have a wide range of applications ranging from solar cells to aerospace composites. In recent years, Green's group has developed a variety of techniques to produce graphene sheets without damaging them.

The work funded by the CAREER Award focuses on scalable production of these sheets and the ability to understand their surface properties as a function of processing techniques.

Education and outreach are also a major component of this award. Green will expand his successful "Science and Science Fiction" flex course at New Deal High School while initiating new efforts to educate undergraduate students about graduate research in engineering.

Green is an alumnus of the Texas Tech Department of Chemical Engineering. He earned a Ph.D. in chemical engineering at the Massachusetts Institute of Technology, after which he served as an Attwell-Welch Postdoctoral Research Fellow at Rice University. He returned to Texas Tech as an assistant professor in 2009. **E**



Rentz Establishes RENTECH Boiler Systems Hall of Honor

Jack Rentz was born and raised on a small family farm near China Spring, Texas. Following his high school graduation in 1970, he applied and was accepted to Texas Tech. After working through high school on the farm, he vowed that his farming days were over. His goal was to “venture off to Texas Tech and get one of those ‘engineering degrees’ and see how far it would take him.”

In the 40 years that followed, his degree in mechanical engineering took him and his influence very far. Rentz is the founder, president, and CEO of RENTECH Boiler Systems, Inc. The company designs and sells a wide variety of custom designed and manufactured industrial steam boilers that are used by the refining, power generation, and chemical industries worldwide. RENTECH also designs and sells heat recovery steam generators. He is also a co-founder and vice president of RENTECH Boiler Services, Inc. and Frontier Welded Products, Inc. In 2011, he was named a Distinguished Engineer by the college in recognition of his accomplishments.

Despite his success, he never forgot his roots and just how important his education has been in his career. As a way of expressing his gratitude to the university, he has made many philanthropic commitments to the college over the years. Through his generous gifts, his past professors will be honored and future generations of students will have some of their financial burdens lifted.

(L-R) Dr. James and Jane Lawrence, Becky and Jack Rentz, and Pat and Dr. Duane Jordan



Jack Rentz and his wife Becky stand at the entrance to the new RENTECH Boiler Systems Hall of Honor.

Until recently, there has been no central public recognition within the college's buildings for alumni and friends of the college who have given generous gifts like Rentz, or created endowments or endowed scholarships. Rentz saw an opportunity to further honor those that support the school that he and his wife Becky love.

Now located in the Livermore Center, the new RENTECH Boiler Systems Hall of Honor prominently displays the names of endowments within the college, the names of the Distinguished Engineer Award Winners, and a recognition of donors that have given more than \$1,000,000 to the Whitacre College of Engineering.

The visual impact of the RENTECH Boiler Systems Hall of Honor is something special for Rentz and his wife, but they received even greater joy by being able to give back to two of Rentz' favorite professors through supporting and establishing scholarships in their honor through his personal gifts and estate plans. Dr. James Lawrence and Dr. Duane Jordan, retired professors of mechanical engineering, were humbled by his kind words and honored by his desire to financially support the college. “It doesn't get any better than to be able to personally thank your professors after nearly 40 years and tell them just how much of a difference they made in your life,” said Rentz. “I want their legacy to live on for generations to come and if it will encourage others to give too, well then that's even better!” **E**





The J. F Maddox Foundation

J. F Maddox Foundation, A Lasting Legacy at Texas Tech University

Jack and Mabel Maddox moved to Hobbs, New Mexico in 1931, where Jack began a lifelong business career in the utility industry and pursued additional interests in real estate development, gas pipeline operations, and banking. He was a civic leader throughout his life, with special interest in youth programs and higher education.

Together, Jack and Mabel established the J. F Maddox Foundation in 1963 to serve the residents of southeastern New Mexico. Practicing philanthropy throughout their lifetimes, the Maddoxes perpetuated their philanthropic activities through the J. F Maddox Foundation, the beneficiary of their estates.

Education was a high priority for Jack and Mabel. One of the first programs developed by the foundation was a student loan program. Although the student loan program is no longer in existence, it was replaced with a competitive scholarship program that was initiated in 1996 called the Jack Maddox Distinguished Scholarship Program. This program annually awards five scholarships to high school students in Lea County. Since the program's inception, 14 Maddox Scholars have attended Texas Tech University, including one current engineering student, who received a full ride scholarship as a part of the program.

Donovan Maddox, Jack's brother, served as personal representative of their estates and led the foundation as its president from 1978 to 1990. Donovan had

a long and successful career as a textile executive, primarily in Gastonia, N.C. Donovan was selected by the Texas Tech Alumni Association to receive the Lauro F. Cavazos Award in 1988.

During its history, the foundation has made grants to a wide variety of non-profit organizations and governmental entities. Grants have been made to organizations involved in education, social programs, and community development for projects which have generally sought to enhance the lives of those living in Lea County, New Mexico.

Jack and Donovan Maddox both majored in textile engineering at Texas Technological College, both served as Student Government Association presidents, and were recognized as Distinguished Engineers and as Distinguished Alumni.

Proudly, two significant investments have been made to Texas Tech University and the Whitacre College of Engineering in the establishment of the Jack Maddox Distinguished Engineering Chair and the Donovan Maddox Distinguished Engineering Chair. These two endowed chairs, each valued at more than \$9,000,000, are among the largest in the world.

With the hiring of National Academy of Engineering members Dr. Chau-Chyun Chen and Dr. Danny Reible, it is evident that the investment made by the J. F Maddox Foundation will pay off in dividends for the Whitacre College of Engineering. **E**

(At left) Jim Maddox announces the hiring of Dr. Chau-Chyun Chen as the new Jack Maddox Distinguished Engineering Chair.
(Below: L-R) Jim Maddox, Sue Maddox, Susan Maddox, and Don Maddox.



The Maddox Chairs



Chen Named Jack Maddox Distinguished Engineering Chair

Texas Tech University System Chancellor Kent Hance has announced the appointment of Dr. Chau-Chyun Chen as the new holder of the Jack Maddox Distinguished Engineering Chair in Sustainable Energy and a professor of chemical engineering.

“On behalf of the Board of the J. F Maddox Foundation and the Maddox family, I would like to express my great appreciation to the university, Dr. Schovanec and Dean Sacco, for their commitment to excellence in the search process to attract Dr. Chen to Texas Tech,” said Jim Maddox, of the J. F Maddox Foundation of Hobbs, N.M. “Jack Maddox (’29), our founder, would be extremely pleased to know the chair named in his honor will be held by such an outstanding researcher and leader in this field.”



Chen

Chen is now one of four National Academy of Engineering members on the faculty in the Whitacre College of Engineering. Election to the National Academy is considered one of the highest professional honors among engineers. Chen was elected in 2005 for his contributions to molecular thermodynamics and process modeling technology for designing industrial processes with complex chemical systems.

“I am extremely proud to add another National Academy member to the Texas Tech University faculty,” Hance said. “This is one of numerous examples of the outstanding progress being made at our university, and I look forward to Dr. Chen’s contributions to our already esteemed engineering program.”

Chen received his bachelor’s degree in chemistry from the National Taiwan University in 1973, and his master’s and doctoral degrees in chemical engineering from the Massachusetts Institute of Technology in 1977 and 1980, respectively. He has published more than 100 scientific articles, book chapters and patents.

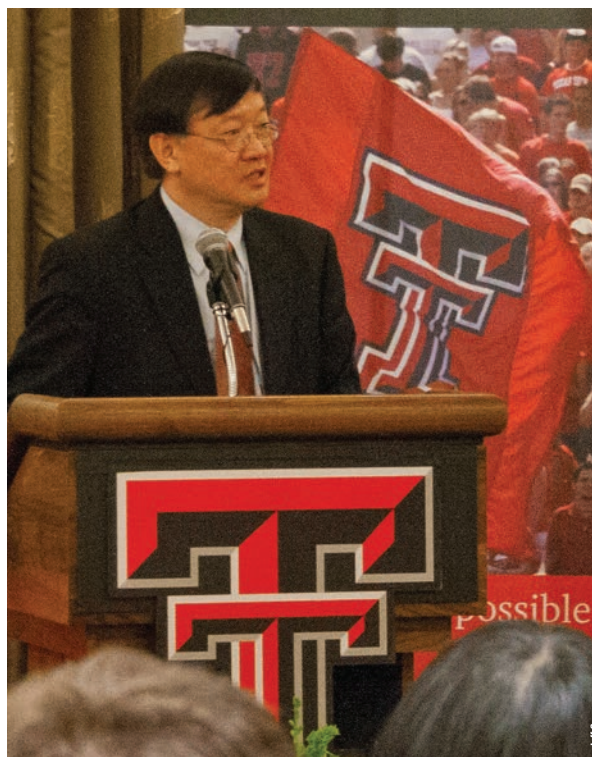
Previously, Chen served as vice president of technology at AspenTech. One of the founders of AspenTech in 1981, Chen was instrumental in developing the innovative first-principles modeling approach AspenTech brought to the chemicals

industry. He also pioneered process modeling techniques for difficult chemical systems such as those that include electrolytes, as well as those that include large, complex molecules such as polymers and pharmaceuticals. Most recently he was responsible for science and technology innovations in AspenTech’s process modeling business area. He is best known for his development of the electrolyte NRTL activity coefficient model widely used for modeling electrolyte solutions.

Awards for Chen include the 2001 Computing Practice Award, Computing and Systems Technology (CAST) Division of the American Institute of Chemical Engineers (AIChE), and the 1984 Ted Peterson Student Paper Award also from CAST Division of AIChE.

“I am looking forward to the extraordinary opportunity ahead of me and ahead of us,” Chen said. “By joining this community of scholars at Texas Tech University, I look forward to discovering and also sharing new knowledge for the goodness of humanity.” **E**

Chen expresses his thanks to the J. F Maddox Foundation at a news conference in March 2013.





The Maddox Chairs

Reible Named Donovan Maddox Distinguished Engineering Chair

Dr. Danny Reible has been named the inaugural holder of the Donovan Maddox Distinguished Engineering Chair. He will also serve as a professor of civil and environmental engineering.

Reible is now one of four National Academy of Engineering members on the faculty in the Whitacre College of Engineering. Election to the National Academy is considered one of the highest professional honors among engineers. He was elected in 2005 for the development of widely used approaches for the management of contaminated sediments. He holds a bachelor of science in chemical engineering from Lamar University and master of science and doctor of philosophy degrees in chemical engineering from the California Institute of Technology.

His work has been focused on maintaining water of adequate quality and quantity to meet current and future needs. Reible states that much of his work “has been focused on managing the unintended consequences of our activities that have endangered our water supplies. The need to maintain our water resources has been increasingly recognized as we face our current drought.” Reible has led both fundamental and applied efforts in the assessment and management of risks of hazardous substances, especially as they apply to contaminated sediments and surface water. His work includes the development of in-situ sediment capping and he led a large demonstration of active capping technologies in the Anacostia River in Washington, D.C. He has evaluated the applicability of capping technology to a wide range of contaminants and settings including PAHs from fuels, manufactured gas plants and creosote manufacturing facilities, PCBs, and metals. He has also advised both industry and regulatory groups on the applicability and design of capping for remediation at a variety of specific sites.

His research has also focused on the natural attenuation processes of contaminants as a result of a variety of processes in the environment. These processes are biological, chemical and physical in nature and thus the research has encouraged the development of interdisciplinary teams focused on understanding and manipulating these processes. Among these processes are bioturbation, the

contaminant migration associated with the normal life-cycle activities of sediment-dwelling organisms, physico-chemical desorption resistance leading to reduced availability of contaminants, the evaporation of volatile contaminants from soils and sediments, and facilitated sorption and transport associated with the presence of colloidal organic carbon pore-waters. While much of this work has been associated with managing water quality, he has also been increasingly focused on water availability to meet the current and future needs of Texas and the nation. He is working to devise methods of better managing water for hydraulic fracturing for oil and gas as well as to meet the energy needs of our fast growing economy.

He has coauthored six National Research Council committee reports on risk assessment and remediation of contaminated sites, is the author of the textbooks “Fundamentals of Environmental Engineering” and “Diffusion Models of Environmental Transport”, and has authored more than 150 refereed technical papers and book chapters. Reible has served on the National Research Council Board of Environmental Studies and Toxicology. He is an associate editor of the Journal of the Air and Waste Management Association, the Journal of Environmental Forensics, and the Journal of Environmental Engineering. He is a fellow of the American Institute of Chemical Engineers and the American Association for the Advancement of Science. He is a Board Certified Environmental Engineer, and a Professional Engineer in the state of Louisiana.



Reible

Reible was awarded a New Engineering Educator Excellence Award by the American Society of Engineering Education in 1986 and named an Environmental Science and Engineering Fellow by the American Association for the Advancement of Science in 1987. He is the recipient of the Lawrence K. Cecil Environmental Division Award of the AIChE for 2001 and the Charles E. Coates Award of the Baton Rouge Local Sections of the ACS and AIChE for 2002. He is also the 2011 recipient of the Malcolm Pirnie Frontier in Research Award from the Association of Environmental Engineering and Science Professors.

He has been married to Susanne for 34 years and is the father of two daughters, Kristin and Monica, who live with their husbands, Olivier and Joe, in Plano and San Antonio, respectively. Susanne is a retired registered nurse. Reible is an avid sailor and always spends part of the summer sailing in Michigan where Susie maintains a family cabin. **E**



Hussain Named President's Distinguished Engineering Chair

The Whitacre College of Engineering is proud to welcome an additional member of the National Academy of Engineering to its faculty. Dr. Fazle Hussain has been named the President's Distinguished Chair in Engineering and Science, a Senior Adviser to the President, and a professor in the Department of Mechanical Engineering.

Hussain is now one of four National Academy of Engineering members on the faculty in the Whitacre College of Engineering. Election to the National Academy is considered one of the highest professional honors among engineers. He was elected in 2001 for fundamental experiments and concepts concerning important structures in turbulence, vortex dynamics and acoustics, and for new turbulence measuring techniques.

Hussain received his bachelor's degree in mechanical engineering from Bangladesh University of Engineering and Technology in 1963, and his master's and doctoral degrees from Stanford University in 1966 and 1969, respectively.

After earning his doctor of philosophy in mechanical engineering, he was a post-doctoral fellow at Johns Hopkins University, before joining the University of Houston in 1971. There he was promoted to full professor in 1976, University Distinguished Professor in 1985 and Cullen Distinguished Professor in 1989, until he was awarded in 2010 the Cullen Distinguished University Chair. He also served as the director of the Institute of Fluid Dynamics and Turbulence in the Department of Mechanical Engineering.

Hussain, a fluid dynamics expert, was one of the first to recognize that the organized motion underlying the seemingly random motion of turbulence is the key to understanding turbulence and to controlling turbulent flows for technological benefit.

His research expertise is in vortex dynamics, turbulence, and measurement techniques, and he is most known for his pioneering contributions through experiments, theory and numerical analysis to coherent structures in fluid turbulence.

He has also researched in solar energy, holography,

flow noise, flow control, cardiovascular dynamics, modeling cancer growth, nanomedicine and nanotechnology.

He is now interested in fuel saving by drag reduction, wind turbine aerodynamics and aeroacoustics, offshore wind farms, cancer drug delivery, and microseismology.

He has received all four of the highest awards in fluid mechanics: the Fluid Dynamics Prize of the American Physical Society (APS) in 1998, the Freeman Scholar Award of the American Society of Mechanical Engineers (ASME) in 1984, the ASME Fluids Engineering Award in 2000, and the Fluid Dynamics Award of the American Institute of Aeronautics & Astronautics (AIAA) in 2002. Hussain is the only person to receive all four of these awards.

He served as the chair of the Fluid Dynamics Division of APS and is a fellow of APS, ASME and AIAA. The University of Houston awarded him in 1999 the Sigma Xi Award, and in 2007 the Esther Farfel Award for combined excellence in teaching, research and service.

He was the 2009 Moore Distinguished Scholar at Caltech, and is an Honorary Professor for life at the Peking University in Beijing, China; the Satish Dhawan Visiting Professor at the Indian Institute of Science in Bangalore, India; and the Dean of Engineering of The Methodist Hospital Research Institute in Houston.

He recently served as the chair of the Mechanical Engineering Section of the National Academy of Engineering, the committee to select the NAE president and the Draper Prize Committee. He has been active in The Academy of Medicine, Engineering & Science of Texas (TAMEST) from its founding, having served on its Board of Directors for 2009-12.

Hussain's research expertise adds significantly to research thrusts within the college and greatly complements existing research projects in wind, water, petroleum engineering, bioengineering, and many other areas. **E**



Hussain





Distinguished Engineers

Seven Distinguished Engineer Award Winners Named

The Texas Tech University Edward E. Whitacre Jr. College of Engineering named Kelly J. Beierschmitt, Ben A. Calloni, Joe D. Gamble, Tom Jacobs, Jack L. McCavit, Scott P. Moore and James Thompson as recipients of the 2013 Distinguished Engineer Award on April 19 at a luncheon at the Overton Hotel in Lubbock.

The Distinguished Engineer Award was established during the 1966-67 academic year to recognize the most outstanding alumni of the college. Since that time, 212 former students have received this honor.

Recipients of the award must be distinguished in their profession, an inspiration to their peers and have demonstrated a continuing interest in areas outside the field of engineering.

"The Distinguished Engineer Award is the highest honor we at the Whitacre College of Engineering can bestow on our alumni," said Al Sacco Jr., dean of the college, "Our community of scholars: students, staff, faculty and administrators, are very proud of all the accomplishments of our fellow Red Raiders, but are especially delighted to recognize the best of those among us as Distinguished Engineers. These individuals have excelled in their chosen fields of business, science, engineering, education and public service. They represent the best of what a Texas Tech education can become. We are honored to be able to recognize their achievements in this way."

Dr. Kelly J. Beierschmitt

Beierschmitt graduated in 1992 with a doctorate in industrial engineering. He began his career at Pantex, where he held several key roles ranging from providing leadership in efforts to enhance the safeguards and security program to the responsibility for high explosives production, storage and disposal efforts. In 1996, he left Pantex for the Pacific Northwest National Laboratory, where he provided support to the Department of Energy's International Nuclear Safety Advisory Group's Chernobyl evaluation. He joined the Oak Ridge



Beierschmitt

National Laboratory in 2000 and is currently the associate laboratory director of neutron sciences for the Oak Ridge National Laboratory. He is responsible for the management of the neutron sciences research and development portfolio, including the operation of the Spallation Neutron Source, the world's most powerful pulsed neutron source. He also is responsible for the operation of the HFIR, an 85 megawatt research reactor dedicated to neutron scattering, materials irradiation and isotope production.

Dr. Ben A. Calloni

Calloni graduated in 1992 with a master of science and in 1997 with a doctorate, both in computer science. He is highly regarded as a subject-matter expert in software and security engineering by senior system architects of the world's aerospace and defense corporations, as well as in the U.S. government. He has performed research in the security and safety critical domains with the Department of Defense, Department of Homeland Security and the National Security Agency. He is a Lockheed Martin Corporate Fellow, an honor given to only one percent of the corporation's 60,000 technical employees worldwide.



Calloni

Joe D. Gamble

Gamble graduated in 1962 with a bachelor of science and in 1963 with a master of science, both in civil engineering. After graduation, he accepted a position at the NASA Johnson Space Center in Houston with the group responsible for the aerodynamics and flight mechanics analysis for human spacecraft. He supported the Gemini and Apollo programs, and was a member of the team responsible for development and verification of the Space Shuttle Orbiter entry flight control system. He later worked as NASA's chief engineer for the Assured



Gamble



Crew Return Vehicle. After his retirement, Gamble was a member of the Guidance and Control Team for the Columbia Accident Investigation Board. He is a consultant with MEI Technologies in Houston, where he continues to support the Johnson Space Center. He is currently helping NASA's Orion Program to develop a vehicle to transport astronauts to the space station and for deep space exploration.

Tom Jacobs

Jacobs graduated in 1987 with a bachelor of science in engineering technology. He has more than 24 years of experience in all facets of residential construction and development, in addition to experience in commercial construction project management.



Jacobs

Since his career in home building began in 1988, Jacobs has served in virtually every capacity within the industry and has participated in the startup of two divisions from the ground up. He has been recognized as an innovator in the industry and is active in the development and implementation of electronic scheduling systems, electronic work order systems, and many programs related to quality and process improvement. Jacobs is president of the Houston Division for Ryland Homes, where he is in charge of all land acquisition and development, product development, sales, field operations and customer service.

Jack L. McCavit

McCavit graduated in 1970 with a bachelor of science in chemical engineering. He worked for Celanese Chemical Company for 35 years before retiring in 2005. Most of his career at Celanese was spent in operations and technical management at three different plant sites, including serving as operations manager at the facility in Pampa. From 2000 until his retirement from Celanese in 2005, McCavit provided strategic process safety management direction for Celanese as the company manager of process safety. He is president of JL McCavit Consulting, LLC,



McCavit

a consulting company specializing in improving process safety management systems and reducing process safety incidents.

Scott P. Moore

Moore graduated in 1982 with a bachelor of science in electrical engineering. He has worked for American Electric Power for more than 30 years, beginning as a substation engineer in Abilene, and working his way up to vice president in 2007.



Moore

His leadership and drive led to the development of innovative engineering solutions, most notably standardized and prefabricated substations and modular control buildings. Moore is vice president of transmission engineering and project services for AEP Transmission, a part of American Electric Power. He directs the capital service function for AEP Transmission, the nation's largest electricity transmission system, comprising more than 39,000 miles of transmission line and 3,500 substations in 11 states.

Dr. James Thompson

Thompson attended Texas Tech and received a bachelor of science in 1968, a master of science in 1970, and a doctorate in 1974, all in electrical engineering. He has worked in academia as a faculty member and most recently as an engineering administrator. His areas of technical specialization include high voltage, electro-optics, electrical breakdown phenomena, pulsed power systems and devices, lasers, fast electrical and optical diagnostics, high power switches and dielectric materials. As an administrator, he has initiated and grown college programs to increase engineering enrollment, student graduation rates, improving classroom success and learning. Thompson is the dean of the University of Missouri College of Engineering, and has served in that capacity since 1994. He was previously the dean of the College of Engineering at the University of New Mexico. **E**



Thompson





Alumni News

Whitacre College of Engineering Alumni Updates

1962

Claude "C.A" Perdue, P.E., a 1962 graduate with a B.S.C.E., lives in Overland Park, Kan. with Charlotte, his wife of 50 years. He retired from HNTB Corporation in Kansas City, Missouri in April 2010 after a career of 48 years in bridge design engineering.

1970

Dan Mustarde, a 1970 graduate with a B.S.P.E., is retired and lives in Fort Worth, Texas.

1971

Antonio V. "Tony" Almeida, a 1971 graduate with a B.S.C.E., was awarded the "Most Valued Professional" award by Underground Constructions Technology (UCT) at the international conference. He lives in Allen, Texas and is employed by Half Associates.

Thomas Ryan, a 1971 graduate with a B.S.C.E., retired in 2012 after 38 years with the U.S. Army Corps of Engineers. His last position was working as a civil engineer with emergency management in the Albuquerque District. He lives in Albuquerque, N.M. with his wife.

1975

Massoud Ebrahim, P.E., a 1975 graduate with a B.S.C.E., has been appointed by the city council as interim city manager for the City of Greenville, Texas.

1981

John Cornelius, a 1981 graduate with a B.S.P.E., earned a M.S.P.E. from the University of Houston and is a Texas-licensed Professional Engineer for Phillips Energy Partners in Shreveport, La.

1984

Khalil Hasan, a 1984 graduate with a B.S.C.E., was recognized for "Engineering Excellence" by the Department of Civil and Environmental Engineering and was elected as a member of the CEE Academy in April 2013. He lives in Islamabad, Chak Shehzad, Pakistan.

1990

Abd Rahman Harun, a 1990 graduate with a B.S.P.E., is a reservoir engineer senior advisor for Chevron and lives in Minas, Riau, Indonesia.

Julio Espeche-Uray, a 1990 graduate with a B.S.E.T., lives in Miami, Fla.

Enrique Garza, a 1990 graduate with a B.S.M.S., is a regional manager for reliability engineering for Enterprise Products Company and lives in Houston, Texas.

1994

Oscar Garcia, a 1994 graduate with a B.S.E.E.T., works for ccrd Partners and lives in Magnolia, Texas.

1995

Frank Griffin, a 1995 graduate with a B.S.C.E., works for PT&C Forensic Consulting Services, P.A. and lives in Arlington, Texas.

Michael Voigt, a 1995 graduate with a B.S.M.S., is a project pilot for the Citation X upgrade for Cessna Aircraft Company and lives in Wichita, Kan.

1999

Sheldon Burleson, a 1999 graduate with a B.S.P.E., worked at ExxonMobil Production Company for more than 12 years in various engineering and supervisory positions the U.S. and abroad. He is now engineering manager of business development for Samson Resources, and lives in Tulsa, Okla.

Douglas Husen, a 1999 graduate with a B.S.Ch.E., is a production unit manager at the Port Arthur Refinery for Motiva Enterprises LLC and lives in Port Neches, Texas.

Jaime Husen, a 1999 graduate with a B.S.Ch.E., is a production unit manager at the Port Arthur Refinery for Motiva Enterprises LLC and lives in Port Neches, Texas.

2002

Karem Briceno, a 2002 graduate with a B.S.C.S., works for the Federal Electricity Commission and lives in Cancun, Quintana Roo, Mexico.

2003

Bruce Isett, a 2003 graduate with a B.S.E.T., is a senior estimating manager for Berry Bros. General Contractors, Industrial Division and works in Shreveport, La.

2005

Michael Phillips, a 2005 graduate with a B.S.M.E.T., works for Huitt-Zollars and lives in Fort Worth, Texas.

Ferhat Yavuz, a 2005 graduate with a M.S.P.E., works for Energie Beheer Nederland and lives in Utrecht, Netherlands.

2010

Jayanth Srivatsa, a 2010 graduate with a M.S.P.E., works for McDermott International and lives in Houston, Texas.

Tyler Thompson, a 2010 graduate with a M.S.S.E.M., is a manufacturing manager for Cameron and lives in Houston, Texas.



2011

Sessouh Akowanou, a 2011 graduate with a B.S.Ch.E., works for Dow Chemical and lives in Lake Jackson, Texas.

Matthew Herbstritt, a 2011 graduate with a B.S.C.E., works for the Texas Department of Transportation and lives in Childress, Texas.

2012

Gregory Bradley, a 2012 graduate with a B.S.M.E., works for BWXT Pantex and lives in Amarillo, Texas.

Hiron Fernando, a 2012 graduate with a M.S.C.E., is a traffic/transportation engineer for Kimley-Horn and Associates and works in Dallas, Texas.

Bassem Hraki, a 2012 graduate with a B.S.Ch.E., works for Halliburton and lives in San Antonio, Texas.

Thomas Lombardi Jr., a 2012 graduate with a B.S.C.E., was hired by Doucet & Associates and lives in Austin, Texas.

Harpal Singh, a 2012 graduate with a B.S.I.E., is a material data engineer for Cameron and lives in Houston, Texas.

Robel Sintayehu, a 2012 graduate with a B.S.P.E., works for Halliburton and lives in Hobbs, N.M.

Dennis Thomas, a 2012 graduate with a M.S.I.E., is a quality engineer at the Iowa Plant for DENSO Manufacturing Michigan, Inc. and lives in Urbandale, Iowa.

Jay Whitaker, a 2012 graduate with a B.S.Ch.E., works for DCP Midstream and lives in Midland, Texas.

2013

Rathish Cholarajan, a 2013 graduate with a M.S.C.S., now lives in Round Rock, Texas.

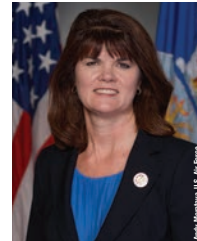
Ryan Nunley, a 2013 graduate with a B.S.Ch.E., works for Eastman Chemical Company and lives in Cleburne, Texas.

Donny Torres, a 2013 graduate with a B.S.Ch.E., works for Samuel Engineering Inc. and lives in Glendale, Colo.

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Endsley Appointed Chief Scientist of the U.S. Air Force

Dr. Mica Endsley, a 1982 graduate with a bachelor of science in industrial engineering, has been appointed as the U.S. Air Force's first female chief scientist.



Endsley

"I know this is a tremendous opportunity to help the Air Force excel in its goal of maintaining the critical technological edge that gives our airmen a strategic advantage," Endsley said.

From 1990 to 1997, Endsley joined the industrial engineering faculty at Texas Tech, first as an assistant professor and then as an associate professor, teaching in the area of human factors and expanding her work on situation awareness to other areas including air traffic control, driving, and military command and control.

Endsley received the Distinguished Engineer Award from the Texas Tech Whitacre College of Engineering in 2010. **E**

Kyle Womack Named to Texas Board of Professional Engineers

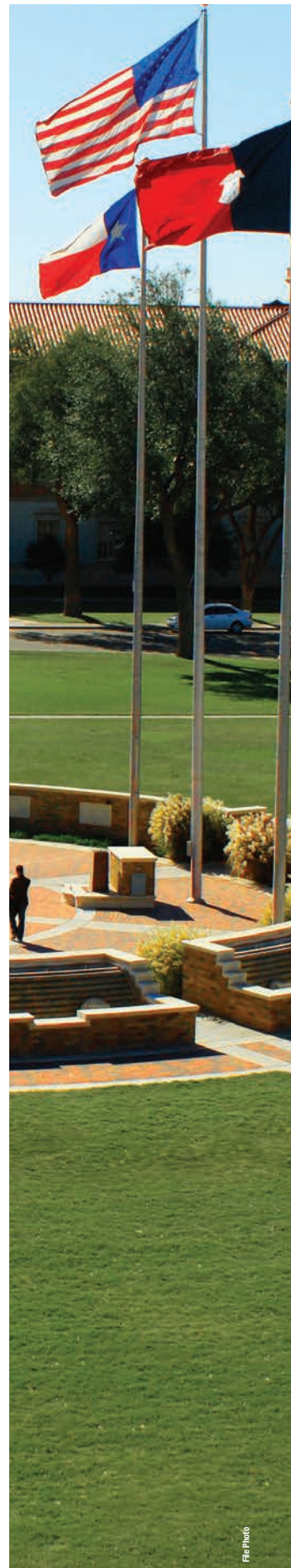
Kyle Womack, a 1975 graduate with a bachelor of science in civil engineering, has been named to the Texas Board of Professional Engineers. He is appointed for a term that will expire in Sept. 2017.



Womack

A resident of Horseshoe Bay, Womack is a licensed professional engineer and vice president of business expansion at Parkhill, Smith and Cooper Inc.

He is a member and former director of the National Society of Professional Engineers, member and past president of the Texas Society of Professional Engineers, and a member and past board member of the Texas Council of Engineering Companies. He is also a member of the Texas Tech Civil Engineering Academy. **E**





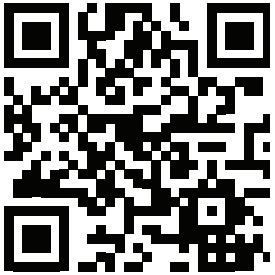
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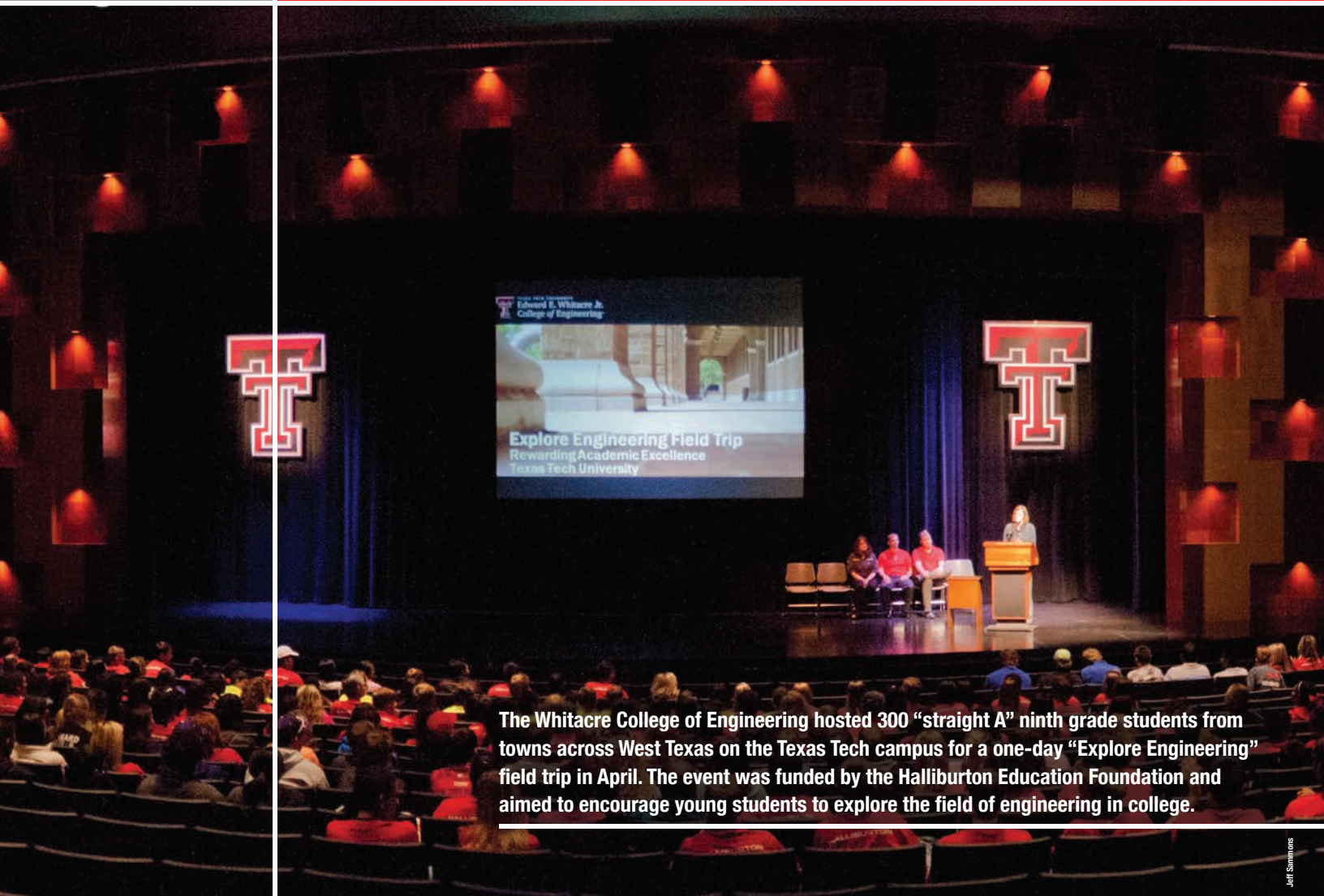
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Summer 2013



The Whitacre College of Engineering hosted 300 “straight A” ninth grade students from towns across West Texas on the Texas Tech campus for a one-day “Explore Engineering” field trip in April. The event was funded by the Halliburton Education Foundation and aimed to encourage young students to explore the field of engineering in college.

To receive an electronic version of this newsletter or to send us your updated information, visit www.TTUengineering.com.