



Engineering Our Future

The newsletter of the Texas Tech University College of Engineering

NOVEMBER 2007



“While we accrue national recognition for our excellent research, we haven’t lost touch with our core mission: to transform the lives of young people.”

**Texas Tech University
College of Engineering**
Pamela Eibeck, Ph.D., P.E., Dean

The College of Engineering celebrates nearly 4,000 students this fall, tangible evidence of the college’s increased enrollment of 35 percent since 2001. Mechanical engineering has almost doubled its enrollment over the past eight years, and petroleum engineering has more than quadrupled its enrollment in the last seven years. We are well on the way to contributing toward Chancellor Hance’s goal of 40,000 students at Texas Tech by 2020.

Our faculty numbers are growing along with our enrollment as we hire some of the best professors and researchers in the nation. The university has invested in the college, giving us 17 new faculty lines in the past three years resulting in 140 faculty positions in the college. This past year brought several exceptional faculty members to campus. **Dr. David Wyrick**, the Bagley Regents endowed chairholder, brings his unique experience in the private sector and in academics to offer business and entrepreneurship studies to our engineering students; **Dr. Donald Lie**, the Keh-Shew Lu Regents endowed chairholder, arrives with research experience from the University of California, Santa Barbara, Electrical and Computer Engineering department, as well as with small high-tech companies, to transfer his research program in analog/digital IC design to TTU. **Dr. Alan Jankowski**, our Wright Endowed Chair, arrived last January from the Lawrence Livermore National Laboratory to bring his experience in nanolaminates and material characterization to the mechanical engineering program.

The new Electrical and Computer Engineering department chair, **Dr. Vittal Rao**, brings his leadership experience as a research center director at the University of Missouri-Rolla and as a program director

at the National Science Foundation to the college. Dr. Rao’s research interests include biomedical signal processing, hardware-software co-design of systems, embedded intelligent systems, Terahertz technologies, cyberengineering systems, and data fusion/mining.

Take a moment to read in this newsletter about the new Wind Science and Engineering doctor of philosophy degree and the significant nanophotonics research initiative support from AT&T. And not one but two of our faculty in the Chemical Engineering department, **Dr. Lenore Dai** and **Dr. Brandon Weeks**, received National Science Foundation CAREER Awards, one of the few departments in the nation that boasts two award recipients.

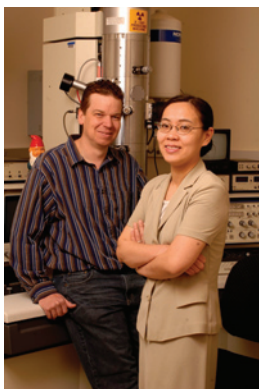
U.S. News & World Report is just out with its undergraduate rankings, and lists TTU’s College of Engineering at 85, up from 87 last year.

While we accrue national recognition for our excellent research, we haven’t lost touch with our core mission: to transform the lives of young people. It is the dedication of all of our staff, from world-class research faculty to custodians who take pride in keeping our classrooms well maintained, that makes TTU such an exceptional place for our students. Just recently, I met an alumnus who relayed how a staff member had gone the extra mile in assisting his son’s transition to the college. He went on to say that this small action made a huge difference in his son’s life and his experience at TTU. It is this exceptional team at Texas Tech’s College of Engineering that makes the difference.



National Science Foundation CAREER Award Winners

Chemical Engineering Associate Professor **Lenore Dai** and Assistant Professor **Brandon Weeks** have recently received a distinguished honor of recognition from the National Science Foundation (NSF) by securing the prestigious CAREER award. The award represents exceptional recognition from external peers as well as from the NSF. The National Science Foundation established the CAREER program



Dr. Brandon Weeks
Dr. Lenore Dai

in 1994 in recognition of the critical roles played by new faculty members in integrating research and education, and in fostering the natural connections between the processes of learning and discovery. Competition for the award is limited to assistant professors in a tenure-track position, and the success rate is approximately 15 percent. Chemical Engineering Professor/Associate Vice President of Research **Dr. Karlene Hoo** received the NSF CAREER award in 1997 and Associate Professor **Dr. Mark Vaughn** received it in 2002.

Dr. Lenore Dai's \$400,000, five-year award titled "CAREER: Heterogeneous and Competitive Self-assembly at Liquid-Liquid Interfaces," focuses on integrating research and education centering on heterogeneous and competitive self-assembly at liquid-liquid interfaces. She will investigate the self-assembly of heterogeneous colloidal lattices using Pickering emulsions as an experimental template. The two-dimensional colloidal lattices will contain colloidal particles of different wettability, size, and charge. She will also expand the concept of Pickering emulsions and use solid particles to stabilize double emulsions (self-assembly of single species solid particles at heterogeneous interfaces). Finally, she will study the heterogeneous or competitive self-assembly of nanoparticles and surfactants

at liquid-liquid interfaces using molecular dynamics simulations.

Dr. Brandon Weeks received a \$400,000, five-year award titled "CAREER: Understanding Nanoscale Properties of Energetic Materials." This award focuses on the science required to design energetic materials whose performance critically depends upon nanoscale structures. While use of energetic materials is widespread through the resource and manufacturing industries, there have been few new materials developed in the last 100 years. The stated goals of this research are to determine properties of energetic materials experimentally at the nanometer scale, to link these findings with bulk properties, and to use them to develop new energetic materials.



New Engineering Technology Chair Named

Dr. Randy Burkett has been named chair of the Engineering Technology department. He has his B.S., M.S., and Ph.D. in civil engineering from Lamar University, Texas A&M, and the University of Texas, Austin, respectively. Burkett joined the Engineering Technology department in 1993; he joined the graduate faculty of the Civil Engineering department in 1994, and has served as the construction engineering technology coordinator for 13 years. Burkett took **Dr. Larry Masten's** place when he retired on May 30. Dr. Masten contributed most of his professional life to TTU. His years of service to the College of Engineering and TTU are greatly appreciated, and we wish him well in retirement.



Dr. Randy Burkett



AT&T Support of College of Engineering Initiative

In recognition of **Ed Whitacre's** 17 years of leadership as chairman and chief executive officer of AT&T, its Board of Directors announced a \$5.35 million contribution to TTU's College of Engineering. The funds will be used to support the nanophotonics research initiative and match the Texas Emerging Technology Fund grant to hire three world-class researchers. In addition, the funds will support scholarships.

Two endowed chairs in electrical and computer engineering will be named for Whitacre, and the Edward E. Whitacre Jr. Endowed Scholarship will help to recruit outstanding undergraduate and graduate students to major in engineering. A portion of the funds will expand the nanophotonics lab. **Dean Pamela Eibeck** said, "Through AT&T's support, Texas Tech will strengthen the international recognition of the research quality in emerging research fields in the College of Engineering."



AT&T Retired Chairman and CEO Edward E. Whitacre, Jr.

Wind Science and Engineering Offers Unique Doctorate

At an August 16 gathering of wind energy engineers and scientists on the Texas Tech campus, **Chancellor Kent Hance** announced approval by the Texas Higher Education Coordinating Board of the Wind Science and Engineering Research Center (WISE) Doctor of Philosophy degree in wind science and engineering. **Senator Kay Bailey Hutchison** (R-TX) was pleased to be present for this announcement.



Chancellor Kent Hance and Senator Kay Bailey Hutchison

This multidisciplinary program, originally funded in part by the National Science Foundation's Integrative Graduate Education and Research Traineeship Program (IGERT), spans the Colleges of Engineering and Architecture, as well as Arts & Sciences, and will be administered by the TTU Graduate School. The degree will be

implemented immediately.

Researchers at WISE describe the new doctoral degree program as unique in the world. The IGERT program facilitated the creation of a graduate degree that involves a variety of educational and research fields including wind-related science, engineering, economics, and statistics. One of the primary objectives of the program is to adequately prepare students to face problems dealing with the adverse effects of wind as well as to learn how to utilize the beneficial aspects of natural wind.

Dr. Kishor Mehta, Horn professor in the department of Civil and Environmental Engineering and a member of the National Academy of Engineering, was one of the key players in developing the new doctoral program. He states that the IGERT program served as the catalyst that provided impetus to develop the new degree program. "The stimulant for putting the program together is that wind is a natural environment we cannot escape," Mehta says, "and we have been working with wind and wind disasters for 35 years. When you combine the beneficial and detrimental aspects of wind, it made sense to our faculty to have a multidisciplinary program in wind science and engineering."

Petroleum Engineering Launches \$20 Million Campaign in Houston

The past seven years have seen a rapid growth in enrollments of students seeking petroleum engineering degrees to meet the high demand in the industry. Even though faculty demand to educate students is increasing, companies are taking faculty out of academe with high salaries and signing bonuses. Across the nation 55 of the 201 petroleum engineering faculty positions are vacant. This scenario is leading to an industry crisis.

Texas Tech University's College of Engineering and Texas energy leaders met at the Petroleum Club of Houston to address oil and gas industry manpower and workforce demands on November 1st. In addition, the college announced the launch of a \$20 million campaign to underwrite the vision for filling these demands.

Michael Williams, chairman of the Texas Railroad Commission, highlighted global and national workforce issues surrounding the oil and gas industry and discussed the future demand for qualified petroleum engineers.

Dean Pamela Eibeck addressed the department's plan of action to support the future of the industry, focusing on the need for additional faculty numbers to continue to produce quality petroleum engineers.

Without a sufficient number of faculty members, Texas Tech, as well as other petroleum engineering programs across the country, cannot educate the workforce or future faculty critical to the nation and world's oil and gas industry.

With these needs in mind, the Petroleum Engineering Department will launch the aggressive \$20 million capital campaign to acquire the financial foundation to support



Lloyd Heinze, Michael Williams, Pamela Eibeck

current faculty members and attract future faculty to the program. Components for successful faculty growth and retention include competitive salaries, research infrastructure, graduate student fellowships, start-up packages, and industry research opportunities.

Texas Tech, with approximately 2,000 alumni in the field, is one of the largest producers of petroleum engineering graduates in the world. The petroleum engineering program, one of only 16 accredited programs in the nation, has been in the top four undergraduate programs for the past two decades.

John Walker, Lloyd Heinze, and Pamela Eibeck address questions at the November 1st campaign kickoff





Faculty Awards

Dr. Jordan Berg, mechanical engineering associate professor, has been selected as a 2007-2008 Fulbright Scholar. This honor represents the flagship academic exchange program of the U.S. government, supporting about 800 U.S. faculty and professionals annually to lecture and conduct research in a foreign country.

Dr. Berg will spend the spring 2008 term based at the University of Ruhuna in Galle, Sri Lanka. His teaching activities will center on the development and implementation



Dr. Jordan Berg

of an undergraduate robotics competition, while his research will address novel modeling and control techniques applied to thermal behavior at the nanoscale. While in Sri Lanka, Dr. Berg will work closely with **Dr. Sanjeeva Maithripala** of the University of Ruhuna, who received his Ph.D. from the TTU Mechanical Engineering department in 2003.

Dr. Stephen Ekwaro-Osire, mechanical engineering associate professor, also will be a Fulbright Scholar in 2007-2008. The Fulbright program is sponsored by the U.S. Department of State with an objective of promoting mutual understanding



Dr. Stephen Ekwaro-Osire

and benefit through contributions to overseas host countries. Dr. Ekwaro-Osire will lecture and conduct research in the Mechanical Engineering department of Bosphorus University (Bogazici University) in Istanbul,

Turkey. He will teach design classes to undergraduate students as well as graduate students. His research with colleagues and students in Turkey will be based on probabilistic techniques in design and material failure. Dr. Ekwaro-Osire also plans to make invited presentations at several major universities in Ankara, Istanbul, Bursa, and Trabzon, Turkey during his stay in the country.

Civil and Environmental Engineering Assistant Professor **Dr. Chuck Newhouse** is the recipient of the 2007 American Society of Civil Engineers' ExCEED New Faculty Excellence in Teaching Award.

Dr. Valery Levitas, a professor in the Department of Mechanical Engineering, has been elected as a Fellow in the American Society of Mechanical Engineers (ASME). Approximately 2 percent of ASME members reach this distinction.



Dr. Valery Levitas

Levitas' career spans 30 years.

He is internationally recognized for his development of basic theories and material models as well as performing computational modeling for various material processes and engineering applications.

Levitas earned his Master of Science with honors from Kiev Polytechnic Institute, Kiev, USSR; his Doctor of Philosophy degree at the Institute for Superhard Materials, also in Kiev; a Doctor of Sciences from the Institute of Electronic Machinebuilding in Moscow and a Doctor-Engineer habilitation from the University of Hannover, Germany.



Staff Awards

Civil and Environmental Engineering Advisor **Glenna Andrews** was named one of the recipients of the second annual President's Excellence in Academic Advising Awards at a ceremony on April 25. The purpose of the award is to encourage, recognize, and reward

excellence in academic advising by faculty and staff at the undergraduate and graduate levels. **President Jon Whitmore** and **Provost William Marcy** extended congratulations for the excellent service she and other advisors provide to students and to the university.

Student Awards

The Texas Tech American Institute of Chemical Engineers (AIChE) student chapter has been recognized as an Outstanding Student Chapter by AIChE for the 2006-2007 academic year. The chapter received the award at the AIChE National Student Conference on November 4th in Salt Lake City, Utah.

Senior electrical and computer engineering major **Bryce Bradford**, together with his wife, **Stefanie Bradford**, a mass communications senior, won the 2006/2007 Texas Instruments Analog Design

contest. Their paper covered the development of a lossless digital audio link between a personal computer and a high fidelity home stereo system.

Senior petroleum engineering students **Nicholas Eaton**, **Justin McBroom**, and **Maanisaad Shahriar** are recipients of scholarships for the 2007/2008 academic year from the Dallas section of the Society of Petroleum Engineers (SPE). TTU students received more scholarship dollars from SPE than any other university.

Donations

The Chesapeake Energy Corporation of Oklahoma City has pledged \$100,000 in scholarships for petroleum engineering students classified as sophomores and higher, payable over a five-year period. Scholarships are currently available.



The Engineering Job Fair was held on September 27th, 2007 at the Lubbock Memorial Civic Center and was the largest ever, with 211 companies and 537 recruiters participating. The next Engineering Job Fair will be held on February 13, 2008





New Engineering Faculty and Staff

Civil and Environmental Engineering

Jerry Guynes, Ph.D.
Research Faculty

Lianfa Song, Ph.D.
Associate Professor

Cynthia Barbosa
Administrative Business Assistant

Amanda Newsom
Administrative Business Assistant

Elizabeth Paulk
Coordinator

Sonie Pinkert
Senior Business Assistant

Electrical and Computer Engineering

Vittal Rao, Ph.D.
AT&T Professor and Chair

Klaus Frank
Visiting Professor

Donald Lie, Ph.D.
*Keh-Shew Lu Regents Chair
and Associate Professor*

Ranadip Pal, Ph.D.
Assistant Professor

Erin Flanagan-Betts
Senior Business Assistant/Advisor

Petroleum Engineering

Mohammad Rafiqul Awal, Ph.D.
Assistant Professor

Denise Aguirre
Senior Business Assistant

Mechanical Engineering

Kathy McNeill
Advisor

Engineering Technology

Mostafa El Shami, Ph.D.
Instructor

George Gray
Instructor

Michael Helm, Ph.D.
Instructor

Leon Shturman
Instructor

Mary Reignier
Business Manager

Industrial Engineering

Jennifer Farris, Ph.D.
Assistant Professor

Shiren (Edward) Wang, Ph.D.
Assistant Professor

David Wyrick, Ph.D.
*Bryan Pearce Bagley Regents Chair
and Professor*

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Alumni Recognition

Marsha Reed (’88 BSCE)

Marsha, formerly Lubbock’s assistant city engineer, has been named the new director of public works. Her responsibilities include traffic engineering, storm water management, and street maintenance. Reed graduated from Texas Tech with a Master of Public Administration and a Bachelor of Science in Civil Engineering. She was named 2006 engineer of the year by the South Plains chapter of the Texas Society of Professional Engineers.

(Courtesy of the *Lubbock Avalanche-Journal*).

Aubrey Spear (’85 BSCE)

Aubrey has been named assistant water utilities director for the City of Lubbock. He is responsible for the operations of the city’s water treatment facilities, distribution system, sewer collection system, wastewater treatment plant, and wastewater reuse. Spear earned a Bachelor of Science in Civil Engineering from Texas Tech, and a Master of Business Administration from Brigham Young University. He is a registered Professional Engineer, and an officer and board member of the South Plains chapter of the Texas Society of Professional Engineers.

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