TU dedicates Stephenson Hall

The University of Tulsa honored generous donors Charles and Peggy Stephenson and others with an evening reception on October 4 and a building dedication ceremony on October 5 for TU’s newest building, Stephenson Hall. The $16.1 million facility houses the McDougall School of Petroleum Engineering and the Department of Mechanical Engineering.

“Tulsa has many success stories, but this one is one of the most important,” said President Steadman Upham. “The Stephenson family has given so much to TU, and we are delighted to see this new building in their honor.”

Charles and Peggy Stephenson joined other members of the Stephenson family during the October 4 evening reception.

The two-story, 38,600-square-foot building features 16 integrated classrooms and teaching/research laboratories, 34 faculty and graduate student offices, four student commons areas, a conference room and an office for student organizations.

“What you are seeing tonight is truly an ongoing story,” said Jim Sorem, dean of the college. “The story of how we learn to bring people and resources together and get things done.”

The evening concluded with music, dancing and a fireworks show.
Students compete in ribbon-cutting design challenge

More than 50 teams participated in the ribbon-cutting design challenge on September 21 in preparation for the dedication of the college’s new Stephenson Hall. Freshman teams of three students and senior teams of two competed to find the most effective device to assist the building’s namesakes, Charles and Peggy Stephenson, in the ceremonial ribbon cutting.

Design standards required a device that could hold scissors in place and activate the cutting with the press of a button. The entire operation was limited to 30 seconds or less.

The winning design was constructed by mechanical engineering seniors Adam Bremerkamp and Will LePage and mechanical engineering freshman Luke Hembree.

On October 5, students, faculty, staff and donors gathered to watch the dedication of Stephenson Hall during a special ribbon-cutting ceremony. With the assistance of a machine designed by TU mechanical engineering students, the Stephensons cut the ceremonial ribbon, marking the building’s official opening on campus.
Texas honors Kermit Brown

Former TU petroleum engineering faculty member James Brill accepted a 2012 Distinguished Alumni award from the University of Texas Petroleum and Geosystems Engineering Department in honor of the late Kermit Brown on November 9. Brown earned bachelor’s and master’s degrees in petroleum engineering from UT before joining the TU faculty as chairman of the petroleum engineering department in 1966. He served as associate dean of TU’s College of Engineering and Natural Sciences and retired in 1988. Brown passed away on December 10, 2009. Brill honored Brown at the Driskill Hotel in Austin in front of 200 guests.

Sorem named dean of the College of Engineering and Natural Sciences

The University of Tulsa has named James R. Sorem, Jr. the new dean of the College of Engineering and Natural Sciences (ENS). Sorem has served as senior associate ENS dean for 17 years and was appointed the college’s interim dean in February 2012 after the passing of Steven J. Bellows, who had led the college for more than 16 years.

A registered professional engineer, Sorem joined TU in 1983 after working as a design engineer for GASO Pumps in Tulsa. He is an alumnus of the University of Kansas, where he earned his bachelor’s, master’s and doctoral degrees in mechanical engineering. Sorem has served on several state boards, including the Oklahoma Experimental Program to Stimulate Competitive Research. Also known as OK EPSCoR, the organization promotes Oklahoma’s research efforts and competitiveness in science, technology, engineering and mathematics. Sorem’s other professional affiliations include the American Society of Mechanical Engineers, the American Society for Engineering Education, the American Pilots Association, Tau Beta Pi and Pi Tau Sigma.

Sorem’s appointment follows an historic period of growth for ENS. Since 1994, the college has increased research funding by $11 million and added 13 full-time faculty members. In the past year, ENS has opened two new buildings on campus and introduced state-of-the-art field equipment into its student labs.

Sorem said his academic and industry experience will help provide a smooth transition to his new position as dean.

“I look forward to advancing the College of Engineering and Natural Sciences as we build upon our solid foundation and prepare our talented students to become successful alumni,” Sorem said. “Generous donors, passionate faculty and supportive graduates have all contributed to the growth of this premier college that I am proud to lead.”

Thriving North Campus receives upgrades

Just a few miles from the heart of TU’s campus there is a diverse mix of machine shops, laboratories, and petroleum drilling and production equipment at 2450 E. Marshall. TU’s North Campus, unknown to many TU students, is home to some of the university’s top research projects.

Originally the Jersey Production Research Lab, the 20-acre research center was donated to TU by Humble Oil and Refining Company in 1965. The gift was estimated at a total value of $3 million, and TU officials saw it as an opportunity to accommodate the growth of its College of Petroleum Science and Engineering.

“The college was bursting at the seams, so it was moved to North Campus,” said Professor Emeritus Jim Brill, a petroleum engineering faculty member from 1966 to 2001.

All engineering, geosciences, chemistry, physics, and math courses were taught at the satellite location, with students traveling by bus between the two campuses.

“In 1966, the petroleum engineering program had three faculty members, 50 undergraduate students and no research funding — that was our starting point,” Brill said.

Over the next 18 years, the college established itself as a flagship program of the university, attracting students, adding faculty members and garnering significant research funding.

North Campus served as the college’s home until it returned to main campus and the new Keplinger Hall in 1983. That year, the college was renamed the College of Engineering and Applied Sciences. Soon after, Jersev Hall and the westernmost part of the original Jersey research facility were sold to Tulsa Job Corps, which remains open today.

“We kept all of the land and buildings used to house our experimental flow loops, and the area became a research campus closely connected to the petroleum industry,” Brill said.

The historic buildings of North Campus are still a thriving center of study and research.

“A lot more than graduate research takes place on North Campus,” said James R. Sorem, Jr., dean of the college. “Undergrads work on various research projects, automotive design projects are ongoing, and many senior design projects take shape in the machine shop.”

The on-site equipment and multiple resources of North Campus are responsible for a unique industry dynamic that engineering departments at other universities cannot duplicate.

“The majority of the funded research on North Campus are either joint industry projects or research consortia,” Sorem said. “The first consortium, Tulsa University Drilling Research Projects, began in the late 1960s and is still operational.”

The location currently houses more than 15 research projects, most focused on the oil and gas industry. As more projects and pilot programs come online, TU officials are upgrading the location and working to strengthen its connection to main campus. In recent years, TU has accelerated several North Campus maintenance projects — updating wiring and network systems, installing a new security fence, painting, and laying new carpet and tile in one of the buildings.

Two new buildings were added to the North Campus in the 1990s, and Sorem said the goal now is to maintain and improve the location’s existing structures. Valued between $30 and $40 million, North Campus is an important facility that the College of Engineering and Natural Sciences plans to use to its fullest potential.

“That’s a lot of what this college is about. We trace our roots back to the petroleum industry, and the pilot-scale research that we do is not available in very many places around the world,” Sorem said.

Next on the agenda, TU plans to implement an improved paving system of new parking lots, driveways and sidewalks. Although the physical characteristics of North Campus may change, its mission of research and industry partnerships remains the same and unites many engineering and science graduates.

Present day North Campus
NSA cyber designation promotes CS Department

TU’s Tandy School of Computer Science continues to draw much attention in the world of cyber security. In May 2012, TU was named one of only four universities to receive designation as a Center of Academic Excellence in Cyber Operations.

Selected by the National Security Agency, TU was chosen to administer a new cyber-ops program that will help expand U.S. cyber expertise required by secret intelligence operations to fight computer network criminals. Although the official designation is new for the university, F. P. Walter Professor of Computer Science and Professor of Chemical Engineering Sujeet Shenoi said TU students are already familiar with this highly specialized type of coursework.

“We’ve had these programs for years, but this is the first time a government agency has formalized it,” Shenoi said.

The cyber-ops curriculum provides a basic education for jobs in intelligence, military and law enforcement requiring such high levels of security that students and faculty are required to pass security clearance.

TU’s courses offer training in a variety of cyber security areas including malware analysis, cryptography and cloud security. Other classes teach students how to dumpster-dive for evidence, reconstruct destroyed phones and develop a Stuxnet-type worm.

In recognition of its efforts to improve the value and effectiveness of college cyber security education programs, TU received the 2012 U.S. National Cyber Security Innovation Award jointly with the U.S. National Security Agency Associate Directorate, Dakota State University, the Naval Postgraduate School and Northeastern University in Boston, Massachusetts.

Nominated by senior U.S. government officials, the award recognizes initiatives administered by companies and government agencies that contribute to significant cyber risk reduction.

TU honored at World Oil Awards

The University of Tulsa was honored as an education supporter committed to preparing qualified global oil industry professionals during the 2012 World Oil Awards, held on October 18, in Houston.

TU joined India’s University of Petroleum and Energy Studies in receiving university program support from the annual World Oil Awards.

“It was an honor to attend the World Oil Awards ceremony where The University of Tulsa and the McDougall School of Petroleum were praised amongst their peers,” said TU alumnus Allen Sinor (BPE ’02), vice president of Global Accounts at Baker Hughes.

“This recognition reinforces TU’s value, not just to our local community but also to our global community as we develop world leaders.”

Sponsored by Saudi Aramco and Valentino Vin Bar Houston, the World Oil Awards recognizes individuals and organizations for their leading contributions to the petroleum industry.

Published for nearly a century, World Oil magazine is a top oil and gas trade journal that serves more than 37,000 readers worldwide.

Tulsa hosts annual HAPS conference


With a mission to promote excellence in the teaching of anatomy and physiology at the college level, HAPS is open to anyone interested in the field and includes more than 1,700 members from colleges, universities and medical schools from around the world.

McMahon served as conference coordinator and organized a variety of events and activities for participants. Held at Tulsa’s Hyatt Regency hotel and the TU campus, the conference included 55 informational seminars, 80 workshop presentations and 80 vendor exhibits. The 473 attendees also enjoyed a fun run down Riverside Drive to raise funds for the HAPS Foundation, a float trip down the Illinois River, which included a visit to the Cherokee Heritage Center, an annual banquet and various art and culture field trips including an evening at Gilcrease Museum.

Dr. Ricki Lewis, one of the featured speakers, signed copies of her book, ‘The Forever Fix: Gene Therapy and the Boy Who Saved It.’

In addition to the many classes and workshops available during the conference, a CPR/AED Red Cross certification course and HAPS Institute classes were offered.

“We received a lot of positive feedback from the event,” McMahon said. “The conference workshops and speakers covered a wide range of areas, and participants enjoyed seeing the campus and spending time in Tulsa.”

For more information about HAPS, visit http://wwwhapsweb.org
Marshak presents guest lecture during Earth Science Week

In celebration of Earth Science Week (October 14–20), the Department of Geosciences hosted University of Illinois Geology Professor Stephen Marshak for two guest lectures on October 17.

Marshak is the director of the School of Earth, Society and Environment at the University of Illinois, Urbana-Champaign and has taught structural geology, tectonics and field geology for 30 years.

After a noon lecture on “The Origin of Map-View Curves in Fold-Thrust Belts,” Marshak gave an evening presentation on the topic of “What’s Happening Deep Beneath the Middicontinent?” and discussed tectonics, earthquakes and the EarthScope Project in North America’s Interior.

Because of Oklahoma’s notable earthquake activity in the last year, research into the earth’s crust has become even more relevant. In an effort to detect earthquake activity, the National Science Foundation has launched a project branded EarthScope. This long-term project consists of hundreds of densely populated seismometers that slowly migrate across the country measuring seismic waves passing through Earth.

“These differences are interpreted to represent changes in the character of the Earth at each location,” Marshak said. “With EarthScope, geologists can produce CALs—scan-like images of Earth’s interior.”

As the EarthScope seismometer array moves through the Midwest, geologists, including Marshak and others from the University of Illinois, Indiana University, Purdue University and two state geological surveys are studying seismic activity and major characteristics below the Middicontinent’s surface.

TU seminar offers inside look into new Egyptian Museum

Professor Mohamed Saleh, one of the world’s foremost authorities on the history and civilization of ancient Egypt, presented a lecture at the University of Tulsa on October 16.

Saleh, who was a director of Cairo’s Egyptian Museum for 17 years, discussed “Archaeological Content of the New Egyptian Museum at Giza.”

Recent burglaries at the original Egyptian Museum have sparked the public’s interest in protecting and preserving the museum’s treasured artifacts.

Saleh provided valuable insight into the establishment of the new Grand Egyptian Museum, now under construction near the Great Pyramids in Giza. He currently works for the museum as the director of Egyptology and a consultant on museum organization and administration. Saleh also teaches ancient history and civilization at Ain Shams University Women’s College in Cairo and serves as a consultant for cultural heritage documentation at the Center for Documentation of Culture and Natural Heritage of Egypt.

Heartland Gaming Expo planned for April

The Tandy School of Computer Science will host its first-ever Heartland Gaming Expo, April 27-28, 2013 in the university’s Allen Chapman Activity Center.

Cosponsored by the Departments of English and Communications and the School of Art, the expo will include a game design contest, game playing competition and a 24-hour game hack-a-thon. Students from any Oklahoma college or from any high school in the greater Tulsa area are welcome to participate.

Registration is free and open from February 1 to April 15. For more information or to register, please contact Roger Mailer, TU assistant professor of computer science, at roger-mailer@utulsa.edu.

Tulsa Research Day features new supercomputer

Officials from TU’s Tandy School of Computer Science participated in Tulsa Research Day, November 6 at One Technology Center, to learn the latest in regional computer research and celebrate the launch of Tulsa’s supercomputer.

Sponsored by Tulsa Research Partners and the Oklahoma Innovation Institute, the daylong symposium was the first collaborative research day among regional universities, the community and Tulsa’s business sector.

Speakers presented research that will be enhanced by the new Tulsa Community Supercomputer and highlighted innovative research ongoing in the region.

“Tulsa Research Day demonstrates the potential of the supercomputer to drive research and collaboration among universities and the private sector in support of high impact jobs and economic development in Oklahoma,” said TU Vice President of Public Affairs and Economic Development Susan Neal.

Tulsa’s supercomputer is expected to be one of the top 25 academic supercomputers in the nation and the largest community supercomputer in the nation. The nonprofit Tulsa Research Partners developed the project at a cost of $3 million and will maintain its daily operations.

Information stored in hundreds of small computers housed in large racks at One Technology Center will be accessible to businesses, universities and other entities for a fee.

Officials with TU’s Institute for Information Security initiated the idea a few years ago and began investigating the possibility of a supercomputer. TU soon consulted with other universities and businesses about the prospect of collaborating on a project. Electrical Engineering Professor Peter LoPresti said much of the current research on campus could be performed more efficiently with the help of a supercomputer.

The complexities of environment simulations we’re doing are getting to a point where a supercomputer is the only practical system that can produce results in a reasonable time,” he said.

The Tuba Community Supercomputer is expected to store information about the city’s demographics such as health care, jobs, and technology and consumer products — all for the benefit of improving the quality of life for Tulsa citizens.

“In order correctly, the computer should have the ability to crunch numbers and data and predict where resources should best be allocated for the coming years,” LoPresti said.

The overall unit will house up to 600 small, high-speed computers working together as one machine.
TU students take Golden HurryCar to national competition

A team of chemical and mechanical engineering undergraduate students competed in the 2012 National Chem-E-Car Competition on October 28 in Pittsburgh, Pennsylvania. The annual competition requires students to build and design a shoebox-sized car that is completely powered by chemical reactions. Entries were required to haul a specified amount of water for a certain distance within two minutes.

After winning regionals last March, the group spent the summer tweaking settings and making adjustments to its Golden HurryCar.

Team leader Moustfa Moursy said changes for this year’s event included a more accurate iodine clock and a lead-acid battery.

“We felt like we were more prepared this year, and we all enjoyed working on the car every week,” he said.

“Even though we didn’t win first place, at least we did the project together.”

The Golden HurryCar team included chemical engineering seniors Umaiz Butt, Victor Fan and Amadeu Neto, chemical engineering sophomore Anne Himmelberg, chemical engineering junior Jasmine Hoon, chemical engineering/mechanical engineering senior Moustfa Moursy, and adviser Tyler Johannes, Chemical Engineering Assistant Professor.

Iota Sigma Pi initiates new members

TU’s Iota Sigma Pi sorority held its annual initiation ceremony on October 26 in the Chouteau Room of the Allen Chapman Activity Center.

A national honor society for women in chemistry and related fields, ISP welcomed into the chapter six students from TU and five from Oral Roberts University. TU inductees included psychology/pre-med senior Claire Atkinson, biochemistry junior Alaina Hamilton, biology junior Jordan Hendrickson, biology junior Kelly Lacey, biochemistry junior Beatrice Olorunnaiye, biochemistry junior Lindsey Schroeder and chemical engineering junior Devin Stanford.

The event also featured a presentation by Dr. Diane Heaton, medical director of Oklahoma CyberKnife, along with Meghan Hall, TU law school alumna and site administrator of Oklahoma CyberKnife. Heaton was the first doctor in Oklahoma to use CyberKnife technology, a service of Hillcrest Medical Center.

EE Department unveils train during Evelyn Nienhuis visit

The students and faculty of the Department of Electrical Engineering welcomed a special visitor on October 18. Approximately one year after the dedication of Rayzor Hall, Evelyn Rayzor Nienhuis spent the afternoon meeting the students and faculty who are benefiting from her family’s support of The University of Tulsa. Nienhuis and her late husband, Dr. Lester Nienhuis, established the lead gift for Rayzor Hall in memory of Evelyn’s father, J. Newton Rayzor, an accomplished attorney and businessman.

Nienhuis met with students and took a tour of the vintage equipment on display under the building’s west staircase. Department Chair Gerald Kane said the program anticipates an increased number of Rayzor Hall visitors with the future addition of a robot display.

“We’re doing a lot of things with exhibit space here in the building,” said Kane.

“Examples of electrical engineering will help attract prospective students to our department.”

Space initially designated as a reception area in Rayzor Hall was reconfigured to a study lounge and teaching area for small group tutorial sessions. The space is often referred to as The Depot because a G-scale train is suspended from the ceiling. Known as the J. Newton Rayzor Railroad (JNRRR), the train was dedicated during Nienhuis’s visit.

The JNRRR honors the people and companies that were instrumental in establishing the Department of Electrical Engineering’s new home. Those interested in supporting the electrical engineering program are encouraged to contact ENS Director of Development Lisa Smith at lisa-smith@utulsa.edu and learn more about adding their names to the JNRRR cars or right of way.
Student Spotlight

Oliver Wilson

Like many of his peers in the College of Engineering and Natural Sciences, petroleum engineering senior Oliver Wilson is an ambitious student who is making the most of his college career.

Wilson was awarded first place in the Undergraduate Division Student Paper Contest at the Society of Petroleum Engineers Conference in San Antonio, Texas, in October. His paper, “Water Handling and Disposal for a Rapidly Developing Field,” explored the growing need for water handling and disposal methods in the oil and gas industry, a topic of great interest for Wilson, who studied the project as an intern at Newfield Exploration.

“The goal for this project was to reduce the cost of water handling, bearing in mind the spreading of sulfate reducing bacteria,” he said.

As a student in the McDougall School of Petroleum Engineering, Wilson recently served as president of TU’s Society of Petroleum Engineers chapter, an organization that has more than 104,000 members worldwide.

“We’re constantly growing, and this year we were recognized as a Gold Standard Chapter,” he said.

Wilson’s travels as a student have introduced him to many areas of the petroleum industry, but he said his international experiences began long before enrolling at TU.

“I’ve lived in five different countries for at least two years each,” he said. “My family traveled quite often, so it gave me a lot of cultural exposure. It’s something I’m blessed to have.”


“I got up at 4 a.m. and drove to Oklahoma City for the test,” he said. “They ask you a series of 10 questions out of a possible 100, and you have to get six correct.”

Wilson expects to participate in a formal U.S. naturalization ceremony within the next couple of months.

A graduate of the Marine Military Academy in Harlingen, Texas, Wilson learned the discipline and drive required to succeed in every arena of life. His hard work as a student is already paying off, and he is grateful for the Chevron job offer he accepted this fall.

“I’ll be working in deepwater asset development in Covington, Louisiana, for the Gulf of Mexico, and I’m really excited,” he said.

Wilson said there’s no doubt his TU education helped him find what he was looking for in the oil and gas industry. The professors he now knows on a first-name basis are contacts he’ll have for life, and the scholarships provided through SPE and ConocoPhillips made his college experience possible.

“As a student, I’ve found choosing TU was one of the best decisions I could’ve made,” he said.

Kirby Smithe

TU senior Kirby Smithe began his college career as a physics/pre-med major, but it didn’t take him long to realize he was interested in other areas of physics.

“My second year, I added a double major of mathematics, but I decided that wasn’t for me, so I moved into EE 3143 (Electronics I),” he said. “It turned out to be my favorite class of all that I’ve ever taken at TU.”

Now, Smithe is preparing to graduate with his bachelor’s degree in engineering physics and a deep appreciation for applied science.

“I wanted to understand how the universe works, and now I do to a much greater extent,” he said.

A graduate of Broken Arrow High School, Smithe said TU’s engineering reputation convinced him to enroll, and now with his undergraduate degree nearly complete, he plans to attend graduate school and research nanoelectronic technology.

“I’m hoping I’ll get an internship at a local engineering firm sometime soon, so I can gain some summer experience before graduate school,” he said. “After obtaining a terminal degree, I’d like to work for Intel, IBM or a similar company.”

A Goldwater Scholar with a 4.0 grade-point average, Smithe is on the right track to meeting that career goal. In addition to carrying a heavy class load of 17 hours a semester and conducting research projects, he has spent his summers studying abroad. In 2010, Smithe traveled to Yokohama, Japan, to participate in the NanoJapan Program, funded by the National Science Foundation.

While working at Keio University, he learned the basics of several advanced techniques such as molecular beam epitaxy and scanning tunneling microscopy.

“My research, titled ‘Characterization of Phosphorus Deposition onto Silicon (111) 7x7 Nanostructures for Applications in Quantum Computing,’ was a small, multi-year project to make an all-silicon quantum computer,” Smithe said.

The following summer he worked in the experimental physics department at the University of Duisburg-Essen in Duisburg, Germany. Made possible through a Research Internship in Science and Engineering scholarship, Smithe’s research used electrochemical etching to produce high-quality scanning tunneling microscopy tips.

“This internship not only gave me a second taste of international camaraderie, but also provided me with a sharp contrast to the experience I had in Japan,” he said.

More recently, Smithe has applied for the NSF Graduate Research Fellowship and will receive results sometime in March 2013. As his days at TU student draw to a close, he said the fundamentals he learned at TU are now the basis for his future career.

“The breadth and high quality of material I’ve been exposed to, as well as the research experience I’ve had, have prepared me very well to pursue graduate degrees and a career in nanoelectronic device fabrication,” he said.

Petroleum engineering graduate student Yahya Hashemian of Isfahan, Iran, earned third place in the PhD Division of the Society of Professional Engineers Paper Contest on October 18. Hashemian is a student leader in TU’s McDougall School of Petroleum Engineering and submitted an entry based on his area of study.

Hashemian’s paper, titled “Prediction of Bivariate Sag in Horizontal Annular Flow,” investigates the undesirable fluctuation of drilling fluid density, both experimentally and numerically. Hashemian said bivariate sag can lead to a number of drilling problems including well control, or blow out, and stuck pipe.

Jonathan Detwiler Endowed Chair Professor Stefan Miska is Hashemian’s adviser and professor of petroleum engineering. Mengjiao Yu serves as his co-adviser.
EWB completes solar water heater project in Bolivia

TU’s Engineers Without Borders chapter traveled to Cotani, Bolivia, in May 2012, to construct solar water heaters and educate a group of families about the heaters’ functions. Trip participants included Applied Associate Professor of Chemical Engineering Christi Patton Luks, Oklahoma East Professional EWB-USA chapter member Tony Agostino, engineering physics senior Timothy Brown, mechanical engineering sophomore Zachary Bunnell, computer science sophomore Nicole Coppola, chemical engineering juniors Sarah Edenfield, Maria Posada Eslava and Homer Madden, and chemical engineering senior Weston Kightlinger.

In preparation for the trip, students put their research into practice by building a solar heater with a sink and shower at the Troop House for the Girl Scouts of Eastern Oklahoma. In Bolivia, each family received a heater, shower kit, sink and lessons in construction and use for 100 Bolivianos ($7).

“The community has reliable safe water, but they don’t use it for washing or sanitation,” said Kightlinger, student project manager. “The idea was to promote hygiene and sanitation through heating the water.”

Kightlinger and his colleagues successfully installed 15 solar water heaters and educated community members on how to assemble additional units. The group also conducted informational sessions with local children on germs, proper hand washing and the benefits of solar energy.

“Very few people in the village wash their hands because water at 45 degrees is just too cold,” Patton Luks said. “None of the kids were willing to try washing their hands in warm water, but once we convinced one to try, they were pushing and shoving to get to the sink.”


“The education was almost as important as installing the heaters,” Kightlinger said.

In other EWB news, TU’s chapter is currently in the process of designing a system to reduce waste in the bagging of bulk food items. Also, students are working on an evaporative water cooler design, similar to a swamp cooler, intended for farmers, farmers’ markets and mobile grocery stores. The cooler would keep fruits and vegetables at lower temperatures, ensuring the freshness of more perishable foods.

ENS Celebrates Homecoming

Annual chili cook-off fun for all

Alumni, faculty, staff and students from the College of Engineering and Natural Sciences took part in an annual tradition during Homecoming week by participating in the chili cook-off competition. Judged by Arnold Brown (BSPE ’50), Jerry Dees (BSGEOPHY ’62), Kyle Smith (BSME ’05) and Wayne Rumley (BSCHE ’60), the following ENS entries were selected as category winners.

Traditional: Team Geoscience
Chili Name: Holy Schist!
Een Garvin, geosciences graduate student; Cassie Bridge, geosciences graduate student

Nontraditional: Duck Dynasty
Chili Name: Rule of Two Chili
Judy Price; Geoffrey Price, chairman of the Department of Chemical Engineering

Best Presentation:
Engineers Without Borders
Chili Name: Chilis Without Borders
Jasmine Htoon, chemical engineering junior; Nicole Coppola, computer science sophomore; Grant Gates, chemistry senior; Weston Kightlinger, chemical engineering senior; Sarah Edenfield, chemistry junior
Three ENS students named Outstanding Seniors

College of Engineering and Natural Sciences students Claire Atkinson, Audrey Buxton and Rick Shipley were among the 10 Jess Chouteau Outstanding Seniors recognized during 2012 Homecoming festivities. Claire Atkinson is the daughter of Dr. Dean Alan Atkinson and Mrs. Julie Denise Atkinson of Edmond, Okla. A psychology/pre-med major, Claire is president of Delta Delta Delta sorority, vice president of membership for Order of Omega, Mortar Board membership chair and secretary of Alpha Epsilon Delta. Claire is a volunteer at Good Samaritan Health Services, a mentor at Big Brothers Big Sisters and has worked as a counselor at Diabetes Medical Camp. Upon graduation, she hopes to attend medical school and eventually practice pediatric endocrinology in Oklahoma. Audrey M. Buxton is the daughter of Phil and Joyce Buxton of Springfield, Mo. A biochemistry major, Audrey is a member of Kappa Alpha Theta sorority, Mortar Board, Iota Sigma Pi National Honor Society for Women in Chemistry and TU University Ambassadors. She volunteers at Tulsa’s Neighbor-for-Neighbor Dental Clinic and has donated her time to Ronald McDonald Care Mobile of the Ozarks, Habitat for Humanity and Children’s Miracle Network. In the future, she plans to attend dental school and work as a dentist in the military. Rick Shipley is the son of Scott and Amy Shipley of St. Louis, Mo. An electrical engineering major, Rick is executive director of the TU Student Association Information Services, president of the Eta Kappa Nu Honor Society, vice president of IEEE and peer minister of the Newman Center. He is a member of Mortar Board Honor Society, Tau Beta Pi Honor Society and Eta Kappa Nu Honor Society. He volunteers with Habitat for Humanity and the Newman Center and serves as a U.S. Secret Service student researcher. Upon graduation, Rick plans to earn a master’s degree in electrical engineering and work in TU’s nationally recognized Cyber Corps program.

Each year, TU recognizes up to 10 students with the Jess Chouteau Outstanding Senior Award for their exceptional achievement in both academic and service endeavors.

ConocoPhillips names 2012-2013 SPIRIT Scholars Program mentors

The College of Engineering and Natural Sciences recognizes the alumni who currently volunteer as mentors to students participating in The University of Tulsa ConocoPhillips SPIRIT Scholars Program. SPIRIT Scholars are a select group of students in the College of Engineering and Natural Sciences and the College of Business who plan to pursue careers in the energy industry. The ConocoPhillips Scholars Program provides scholarship funding as well as enrichment funding for educational opportunities, professional and personal development, cultural experiences and community service.

Of these alumni, Kelly Allen-Luelf, Mikki Jo Bennett Taylor, Allan Hurstig, Shane McCracken, Hassan Siddiqui, Garrett Stein, and Reed Stiles are former SPIRIT scholars. As mentors, the group serves as advisers to current SPIRIT scholars to ensure a meaningful college experience and a successful transition to a career in the energy industry.

Jarvis receives Distinguished Alumnus Award

Roger Jarvis (BSPE ’76) was honored as a University of Tulsa Distinguished Alumnus during TU’s Homecoming weekend, October 18-20. A native of Monett, Missouri, Jarvis dreamed of a career in marine biology but was heavily recruited by TU’s petroleum engineering department. He received a Kermit Brown Engineering Scholarship and the opportunity to explore the oil industry as a student. “Tulsa really kind of found me and then supplied all those things I was short of — direction, motivation and a view of what my future might be,” Jarvis said.

After graduation, Jarvis accepted a position at Amoco but soon followed his entrepreneurial ambitions with the launch of his own engineering and geological consulting business. The first of at least five companies he would establish, build up and sell, Jarvis found his niche in the oil and gas industry.

One company sale in particular created the opportunity for Jarvis to branch out into other areas. Jarvis founded Barrick Exploration Company in 1981 and eventually sold it to cattle and horse ranching giant King Ranch in 1985. Following the sale, he was asked to manage the ranch’s oil and gas subsidiary.

“We turned King Ranch Oil and Gas around pretty successfully; and two years later, I was offered the top job running the parent company,” Jarvis said. “One thing led to another, and I ended up running this fairly big, diversified agribusiness with at least five companies he would establish, build up and sell, Jarvis found his niche in the oil and gas industry.

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One company sale in particular created the opportunity for Jarvis to branch out into other areas. Jarvis founded Barrick Exploration Company in 1981 and eventually sold it to cattle and horse ranching giant King Ranch in 1985. Following the sale, he was asked to manage the ranch’s oil and gas subsidiary.

“We turned King Ranch Oil and Gas around pretty successfully; and two years later, I was offered the top job running the parent company,” Jarvis said. “One thing led to another, and I ended up running this fairly big, diversified agribusiness with five,000 employees and 22 million acres around the world. It was fascinating and taught me a lot.”

Seven years later, Jarvis returned to his original career path in the oil industry and created a grassroots start-up company, which would eventually sell for $2.7 billion. His reputation as a savvy business entrepreneur grew. In recognition of his many accomplishments, Jarvis was named to TU’s Engineering Hall of Fame in 2010. His 2012 Distinguished Alumnus Award places him among an elite group of TU graduates who have advanced not only their personal careers, but also their overall industries.
**Alumni Profiles**

**David Wavrek**

TU alumnus David Wavrek (Ph.D. ’92) utilizes his degree on a daily basis as president of Petroleum Systems International, Inc. (PSI), a Salt Lake City-based oil field services and technology company.

Prior to working at PSI, Wavrek served as a research associate professor of civil and environmental engineering at the University of Utah and research assistant professor of geosciences at the University of South Carolina. His other work experience includes vice president of Humble Geochemical Services in Humble, Texas (1998-99) and manager of Geochemistry & Petroleum Systems Group, ESRI/EGI at the University of Utah (1992-98). Wavrek’s entire career has revolved around geosciences, working as a geologist, geochemist and engineer at Amoco Research in Tulsa, Robertson Research in Houston and as a field engineer at NL Baroid Logging Systems in Louisiana in the mid-1980s.

“I’ve had a fascination with geology since I was a little kid,” Wavrek said. “Once I got to college, I learned more about its connections to the petroleum industry, and I decided to make it my lifelong career.”

Wavrek is a certified petroleum geologist who has served as the senior author on more than 700 proprietary reports and presented more than 100 papers at research conferences. Throughout his work, he has received advanced technologies program funding from the U.S. Department of Energy, Shell’s “Game Changer” program, and the National Research Council Training Program Fellowship (Kazakhstan). He was awarded “Scientist of the Year” 2010 by AAPG-RMAG.

Wavrek worked as a research associate at TU and has served as chairman of TU’s Geosciences Advisory Board. In 2004, he and his classmate, Clive Ferree (MS ’91, president of Favel Group, C.A.), established the Dr. Colin Barker Geosciences Barker Student Endowment Fund to honor their former professor, an esteemed TU faculty member for 35 years, served as chair of the Department of Geosciences from 1987 to 2002. The endowment provides research assistance to outstanding geosciences graduate students for travel, tuition assistance and lab expenses.

Prior to studying at Tulsa, Wavrek earned a bachelor’s in chemistry and geology from Mount Union College and a master’s in geology from the University of Toledo. He said his TU education gave him a competitive edge in the geosciences industry.

“I really enjoyed TU’s campus environment and the interdisciplinary work I did through various projects,” Wavrek recalled. “The faculty and support staff encouraged me to strive for an ambitious career.”

Wavrek currently resides in Salt Lake City with his wife, Beth, where they enjoy skiing, automobile racing, and other outdoor activities.

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**Mark Marra**

TU alumnus Mark Marra (MS ’84) never intended to pursue a career in geology. As a student at Catawba College in Salisbury, North Carolina, his life revolved around playing football, but when the time came to make some serious life decisions, an encouraging professor provided direction.

“I was fortunate to have had a professor who convinced me that I had an aptitude for geosciences,” Marra said. “It turned out to be a good call.”

The Syracusen, New York native who was raised in Daytona Beach, Florida, received his bachelor’s degree in geology from Catawba College in 1981. Shortly after graduation, Marra hit the road for Tulsa to pursue a master’s in the same field.

“The reason I chose to attend TU’s graduate school was that a requirement for my undergraduate degree was to attend an eight-week summer field camp co-hosted by Phillips University and TU in the Colorado Mountains,” he said.

While at camp, Marra was introduced to several TU professors and became lifelong friends with the late Steven Bellovich, then dean of the College of Engineering and Natural Sciences. Bellovich convinced Marra to apply to TU’s grad school, and Tulsa has been Marra’s home ever since.

“I wouldn’t trade my time there for anything in the world,” he said. “My favorite memories were when Dr. Bellovich would find me in the lab on Fridays and say, ‘Come on, Marra, I need a beer, and you’re going to be my drinking partner.’”

As a graduate student, Marra worked as a teaching assistant and was hired by the small, independent oil firm Indian Wells Oil Company. His objective was to identify characteristics of the reservoir Indian Wells was drilling and increase efficiency for producers. The project quickly became his master’s thesis entitled “Depositional Environment of the Canyon Group Sandstones (Pennsylvania System) Irion County, Texas.”

“Working as a teaching assistant gave me the best opportunity to learn, and there’s no question those years prepared me for the rest of my career in geosciences,” Marra said.

After graduating from TU in 1984 and working at Indian Wells, he used his thesis research to build a successful career in the Canyon Group Sandstones reservoir, going independent in 1987. Teaming up with a few colleagues for a joint venture, Marra and his partners continue to drill in this same reservoir today.

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**PE alumnus appointed to new position at Caesar Systems**

TU alumnus Jean-Claude Goyon (MSPE ’85) was appointed to the newly-created position of regional director at Houston-based Caesar Systems, a consulting firm for energy exploration and production companies.

As region director of Europe, the Middle East and Africa, or EMEA, Goyon will work to improve the decision-making process of exploration and production company operators through adoption of PetroVR decision assurance software.

From Caesar Systems’ United Kingdom location, he will work directly with a team of client coaches in the region and assist them in adopting best practices accumulated over 15 years of PetroVR development and implementation.

Goyon’s previous work experience includes serving as senior business opportunity manager for new exploration and production business at Shell. He is a 1982 graduate of the French engineering school ENSEEIHT where he studied engineering, hydraulics and fluid mechanics. He earned dual masters degrees in petroleum engineering from the Ecole du Pétrole et des Moteurs in 1983 and TU in 1985.
TU research published in Biology Letters

Biological Science. Assistant Professor Warren Booth was featured in a study published in the September 2012 issue of Biology Letters journal. Booth led a team of biologists who studied the “virgin birth,” or parthenogenesis, of copperhead and cottonmouth snakes.

Booth and his collaborators, Charles Smith and Pam Eskridge (Wofford College and The Copperhead Institute), graduate student Shannon Hoss (San Diego State University), Gordon Schuett (Georgia State University), and Joe Mendelson (Zoo Atlanta, Ga.) recorded the physical and genetic characteristics of 22 field collected copperhead mothers and 37 field collected cottonmouth females after giving birth in a lab environment. Results showed one copperhead and one cottonmouth gave birth parthenogenetically; a finding Booth said is unusual in such a small test group.

“Parthenogenesis has only been documented in less than 0.1 percent of vertebrates studied,” he said. “On discovering the offspring had only half of the mother’s genetic makeup and lacked a paternal contribution, we realized we had found the proverbial needle in the haystack that many researchers in the past have considered an impossible task.”

Booth said the published research to date is “just the tip of the iceberg” when it comes to parthenogenesis. With test groups in South Carolina, Georgia and his own lab in Tulsa, Booth hopes to learn the secrets of parthenogenesis in reptilian species.

“By determining whether or not they are reproductively viable will help us explore whether or not this is a mechanism that may promote population establishment in the absence of males,” he said.

Booth’s research also was reproduced in National Geographic, Science, The Scientific American and The Huffington Post and was broadcast on the BBC, Discovery, LiveScience, MSNBC, Nature and New Scientist.

ENS welcomes new faculty

Warren Booth
Assistant Professor of Biological Science

Research Focus: “I am interested in a variety of questions, such as how populations are structured both spatially and temporally; and how they are related to one another. My lab research involves insects, amphibians, reptiles, mammals and birds; and I’m particularly interested in the interactions between disease vectoring and their disease reservoir hosts within fragmented and urbanized landscapes. I’m also interested in the evolution and distribution of alternate reproductive strategies within reptiles including parthenogenesis.”

TU Goals: “My goal is to develop a world-recognized lab in the field of molecular ecology. Obtaining grant funding will allow me to competitively attract high-achieving students. I work within a fantastic department and have developed a number of collaborative projects already, and I look forward to seeing that work come to fruition. Being able to develop new and deliver existing courses in an enthusiastic and effective manner allows me to pass on my knowledge to the next generation of researchers, educators and practitioners.”

Justin Chalker
Assistant Professor of Chemistry and Biochemistry

Research Focus: “I am generally interested in organic chemistry and chemical biology. My research centers on developing novel reactions and catalysts that streamline the synthesis and supply of valuable materials in a sustainable fashion. On another front, the research involves the development of reactions that allow selective manipulation and analysis of biomolecules, especially peptides and proteins.”

TU Goals: “My goal is to share my passion for organic chemistry with students at all levels. I truly believe that organic chemistry will be central in addressing the most pressing challenges in medicine, biology and sustainability. I want to bring energy to the classroom and the lab that will inspire undergraduates and graduates alike.”

Randy Hazlett
Associate Professor of Petroleum Engineering

Research Focus: “My research interests lie in reservoir engineering. Currently, I am modeling production from complex fracture systems produced in hydraulic fracturing of shale, unlocking the vast natural gas resource that will put our nation on the road to energy independence. At the same time, I am modeling multiphase flow on the microscopic level where the physics is well understood to forecast macroscopic properties. I maintain a continued interest in all aspects of enhanced oil recovery, such as surfactant flooding, that focus on recovering more oil from existing fields.”

Todd Otanicar
Assistant Professor of Mechanical Engineering

Research Focus: “My research focuses on fundamental understanding of thermal transport and how novel devices can be created to dynamically control heat transfer. This dynamic type of heat transfer control is leveraged in systems ranging from building energy efficiency to marine biology to the development of novel methods for energy conversion.”

TU Goals: “I want to develop a leading edge research program in controlled thermal transport. I hope to prepare, mentor and enlighten students for careers in the energy/heat transfer industry and provide excellent research opportunities for both undergraduate and graduate students.”

Rami Younis
Assistant Professor of Petroleum Engineering

Research Focus: “I hope to advance computer simulation software and numerical solver technologies towards a future where we routinely use full-resolution full-physics simulations to successfully operate emerging unconventional subsurface resource and environmental applications.”

TU Goals: “We are working on building the Future Simulation Systems industrial affiliates group. The group is prototyping the first-ever Automated Simulator Generator that will enable a future where simulators write themselves. We are also pioneering the development of numerical algorithms that never fail to solve any simulation problem.”
Faculty Briefs

Henshaw selected as ME chair

John Henshaw, who holds the Harry H. Rogers Chair of Mechanical Engineering, began his duties as chair of the Department of Mechanical Engineering in spring 2012. Henshaw, a materials engineering and mathematics graduate of Vanderbilt University (1979), also received a doctorate in materials science from the University of Delaware in 1990.

A 22-year veteran of the College of Engineering and Natural Sciences, his areas of research include composite materials, engineering design, sustainable energy and alternate fuel transportation.

As chair, Henshaw is responsible for the program’s curriculum and leading the Industrial Advisory Board. Other responsibilities include budget and the department’s ABET accreditation.

“I am honored to serve as the ME department chair at TU,” Henshaw said. “We have a truly distinguished faculty and a large, outstanding student body. They all make my job easier and more fun.”

Coberly named Math Department chair

Associate Professor of Mathematics William Coberly began his second stint as chair of the Department of Mathematics on July 1. His TU career began in 1974, and he was appointed chair of the Department of Mathematical and Computer Sciences in 1977, serving until 2005. In 2011-2012 with the completion of Rayzor Hall, the Tandy School of Computer Science was formed and mathematics and computer science became separate departments.

Coberly will help manage the operational aspects of the department and lead the implementation of the new doctoral program in mathematics.

He received his bachelor’s, master’s and doctoral degrees from Texas Tech University. His research areas include statistical methods in bioinformatics and neuroinformatics, and computational probability and statistics.

PE professor awarded SPE Distinguished Membership

The Society of Petroleum Engineers has awarded TU Professor of Petroleum Engineering Cem Sarica with SPE Distinguished Membership. Limited to 1 percent of SPE professionals, the Distinguished Member award recognizes members who have achieved eminence in the petroleum industry and the academic community, or who have made unusually significant contributions to SPE.

Sarica serves as the director of Fluid Flow Projects, Paraffin Deposition Projects and Horizontal Well Artificial Lift Projects in the McDougall School of Petroleum Engineering. The author of 117 technical papers in SPE and other industry literature, Sarica was recognized for his expertise in the areas of multiphase flow in pipes and flow assurance. He is active in several SPE committees and is the recipient of multiple awards.

“For me, it is an honor to serve such an organization that significantly contributes to the dissemination of knowledge and education in petroleum and natural gas engineering,” Sarica said.

Sarica is the fourth current faculty member in the McDougall School of Petroleum Engineering to receive the award.

SPE is a nonprofit professional association whose membership consists of more than 104,000 worldwide leaders in the energy industry.

Chemistry professor inducted into Higher Ed Hall of Fame

University of Tulsa Chemistry Professor Robert Howard was inducted into the Oklahoma Higher Education Hall of Fame during a special ceremony October 9, in Oklahoma City’s Jim Thorpe Museum and Oklahoma Sports Hall of Fame. Howard, former chairman of TU’s chemistry department, focuses on chemical education for elementary and middle school students along with theoretical chemical physics. In 2011, Creativity Oklahoma recognized him with an Oklahoma State of Creativity Great Inspirations Award. He was named Oklahoma Chemist of the Year in 2000.

Howard’s interests in theoretical chemical physics have resulted in publications in the Journal of Chemical Physics along with service on several national boards. His publications to K-12 chemistry education have been published in Gifted Child Today supported by the National Science Foundation. He has directed several statewide projects including the Oklahoma Teacher Education Collaborative and the Oklahoma Professional Development Institute in Science.

Before beginning his TU career in 1982, Howard taught as an assistant professor of chemistry at the University of Texas-Permian Basin in Odessa, Texas. Howard said he is honored to join legendary TU faculty members such as James Bell in the Oklahoma Higher Education Hall of Fame.

“A lot of the credit goes to my colleagues in the Department of Chemistry and the College of Engineering and Natural Sciences,” Howard said. “It’s amazing to see how much the sciences have changed and just how far we have come.”

Howard’s professional affiliations include the American Chemical Society, the American Association for the Advancement of Science and Sigma Xi. He has served as an editorial board member for several publications including The Journal of Mathematics and Science and The Journal of Physical and Chemical Reference Data.

Howard joins more than 150 education leaders who have been inducted into the Oklahoma Higher Education Hall of Fame since 1994.
Tandy School of Computer Science conducts cyber trust study

The University of Tulsa’s Tandy School of Computer Science was awarded a $2.2 million grant from the U.S. Air Force to explore the neurobiological basis of cyber trust.

Using cutting-edge research from the cyber security and neuroscience fields, students will use functional Resonance Magnetic Imaging scanners to monitor subjects while they play a cyber trust game online. The subjects will be asked to make decisions on whether or not they trust e-mails, websites and other online resources.

“This fMRI scanner will help us identify what parts of the brain are activated when participants make those decisions,” said John Hale Tandy Professor of Bioinformatics and Computational Biology, principal investigator and Tandy Chair in Bioinformatic and Computational Biology. “We’ll know not only what decisions they are making, but also why they are making them.”

Additional partners on the project include the Institute for Information Security, the TU Department of Psychology and the Laureate Institute for Brain Research. The study will begin spring 2013 and conclude in 2015.

EE and CS students launch mobile app study

In partnership with a cognitive neuroscience research team at Oxford University, TU electrical engineering and computer science students Eric Kuxhausen and Kunwoo Dodd have created a mobile phone application to support a novel risk/reward study. A project of the Institute of Bioinformatics and Computational Biology, the app consists of a dice gambling game subjects play, followed by a survey. Data is then collected from the app and uploaded to a server for further study. Tandy Professor of Bioinformatics and Computational Biology John Hale said the study’s results provide an inside look into the cognitive foundations of how humans evaluate risk and reward online.

The study is expected to begin in 2013.

In Memoriam

Richard Tomasi

The College of Engineering and Natural Sciences remembers retired Organic Chemistry Professor Richard Tomasi who passed away October 4, 2012. He was 78.

A native of Denver, Tomasi earned his undergraduate degree at Colorado State College. He received his master's and doctorate from Iowa State University.

Tomasi began his career at The University of Tulsa in 1962 and over the next 30 years, earned the respect and admiration of his students. He was known as a gifted teacher who enjoyed sharing his love for chemistry.

“Dr. Tomasi was a superb organic chemist, but his great gift was his ability to work with people,” said TU Chemistry Professor Bob Howard. “He was a great friend, a wonderful colleague, and one of those people who epitomized the spirit of TU.”

Tomasi is survived by three sons and five daughters.

Lola Kathryn (Katie) Whisenhunt

Katie Whisenhunt, former department assistant in the Department of Chemical Engineering, passed away on October 12, 2012. She was 83. Whisenhunt worked in the department for 16 years, retiring in 1988. She enjoyed traveling and spending time with family and friends. Services were held on October 17 in Tulsa.

Hale

Mohan

TU professor receives American Society of Mechanical Engineers award

Mechanical Engineering Professor Ram Mohan was elected to receive the ASME Fellow Award by the American Society of Mechanical Engineers. Fellow recognition is the highest elected grade of membership within ASME, honoring exceptional engineering achievements and contributions to engineering.

Among his many research interests, Mohan’s work focuses on the areas of control systems, manufacturing processes and multiphase flow separation.

He currently serves as a codirector of the Tulsa University Separation Technology Projects and is the site director of the NSF Industry/University Cooperative Research Center on Multiphase Transport Phenomena at TU. He has published more than 150 conference and journal publications.

“Dr. Mohan’s research resulted in the development of compact separators used in on-shore, off-shore and subsea oil and gas wells to separate liquids from gases,” said TU Professor Emeritus and ASME Fellow Edmund Rybicki. “His work and publications are recognized worldwide, and he is truly deserving of this prestigious award.”

Mohan earned his bachelor’s degree in mechanical engineering at the University of Kerala. He received his master’s and doctoral degrees in mechanical engineering from the University of Kentucky.

Mohan is a member of the ASME, the Society of Manufacturing Engineers and the American Society for Engineering Education.
Hawrylak leads research in RFID technology

A group of ENS students are hard at work on a couple of projects that could improve the efficiency of America’s healthcare industry and protect a person’s identity.

Under the advisement of Electrical Engineering and Computer Science Assistant Professor Peter Hawrylak, electrical engineering master’s student Chris Hart is developing a Radio Frequency Identification (RFID) card that stores an individual’s basic health information. Shaped like a credit card, the card carries vaccination records, medical history and other details that are presented to healthcare providers during medical appointments. Hawrylak said the technology could help address healthcare issues in some of Oklahoma’s most rural and poverty-stricken areas.

“There are a lot of children falling through the cracks in Oklahoma,” he said. “Children are often taken to a health clinic by different family members each time to receive treatment. As providers rotate through a series of clinics or perform their volunteer service, children are likely to be seen by different doctors, and their records may not be properly transferred.”

With Hart’s new ID card, children and other patients would have the ability to carry their vaccination history with them. During medical visits, a patient simply presents the card and healthcare providers can retrieve and update a child’s vaccination records. The card would eliminate any language barriers along with the need to transfer information from one health system to another.

“There’s nothing on the market like this right now,” Hart said. “Other Internet medical databases cost $10,000 and only advise how to handle a patient. They’re so expensive that only about seven percent of hospitals have them.” In comparison, Hart’s thesis project is much more economical at only around $3 per medical card. The scanners or readers used in medical offices by physicians would cost roughly $125. Some smartphones have built-in readers that can read the medical card.

“We’re hoping to provide a cheap and effective medical record storage method as opposed to online medical data storage,” he said.

Hawrylak said Hart’s ID card research project also includes case options for EMTs and paramedics. With the use of a scanner, emergency medical personnel could access a patient’s medical history, allergies, blood type and other information even if the patient could not communicate with first responders.

Hart’s research supports the mission of the Institute of Bioinformatics and Computational Biology, and he plans to present the project in his master’s thesis spring 2013. A paper on the EMT scenario has been accepted by the International Journal on Computational Methods and Algorithms in Medicine.

Today’s technology uses RFID for several other functions including access control in buildings and instant payment or contactless payments. Inexpensive RFID readers are readily available and now integrated into cell phones, allowing easy access for malicious parties to clone or use (via a man-in-the-middle attack) the RFID tag and gain access to sensitive information. This man-in-the-middle attack is difficult to resolve, and the only options are to allow unrestricted use or restrict complete access.

“Restricting all access can be problematic for legitimate users,” Hawrylak said. “What is needed is a gradual or graceful reduction in access or privilege.”

In response to the need for a gradual reduction in access, doctoral computer science student Matthew Butler developed a system (as part of his master’s thesis) to slowly take away user rights. Known as Dynamic Risk Assessment and Access Control, or DRAAC, its initial function focused on workstation PCs.

“It’s an access control system that can dynamically adjust to changes in the system,” Butler said. “Just one suspicious behavior isn’t going to shut you out of the system.”

Taking Butler’s original concept, computer science senior Steven Reed recently converted DRAAC to support RFID capabilities.

“RFID DRAAC provides a solution to the binary go/no-go security mentality and will help address the problems of cloned RFID tags and man-in-the-middle attacks,”

Hawrylak said. The research supports the mission of iSec — TU’s Institute for Information Security — and will help secure both access control and contactless payment systems.”

Reed and Butler will present a paper about the RFID DRAAC technology at the Cyber Security and Information Intelligence Research Workshop at Tennessee’s Oak Ridge National Laboratory in January 2013.
PDPU students visit Tulsa

In June 2012, TU’s Division of Continuing Engineering and Science Education, along with the McDougall School of Petroleum Engineering, welcomed a group of 16 third-year students and one professor from Pandit Deendayal Petroleum University (PDPU) in Gujarat, India, for a three-week educational program designed specifically for PDPU students. The Tulsa Undergraduate Petroleum Engineering Program is part of PDPU’s ongoing International Exposure Program and is the second event of its kind to be held at TU. PDPU said it plans to continue the partnership well into the future.

The primary purpose of the program is to expose students from PDPU to some of the practical aspects of petroleum engineering. In addition to classroom education, the program incorporates field trips and self-study lessons. Field trips to a variety of Oklahoma businesses that support the petroleum industry expose students to opportunities they would not have at home in India. Students also visited manufacturing operations, drilling rig operators, research facilities, production operations for both oil and gas fields, geological outcrop study, and an actual drilling operation.

TU faculty members lead instruction in the classroom. Following coverage of a particular topic, students engage in open-ended projects and problem solving. The instructor then discusses those problems with the students, and they are introduced to TU’s petroleum engineering course work.

The students are given informal feedback through quizzes and class discussion, creating a positive experience that will help them better understand America’s education system.

Students from the Pandit Deendayal Petroleum University in India tour TU’s petroleum and mechanical engineering facilities at North Campus.

CESE organizers present IPEC in Denver

Representatives from TU’s Division of Continuing Engineering and Science Education attended two key conferences this fall—the Society for Professional Engineers Annual Conference in San Antonio, (October 8-10) and the 19th annual International Petroleum Environmental Conference in Denver, October 30-November 1.

Each year, the TU-CESE sponsored IPEC attracts engineers, scientists and environmental professionals interested in developing and implementing new technology to resolve environmental problems in exploration, production and refining. More than 5,000 members from around the world have attended the conference since 1994.

This year's event was chaired by TU professor Kerry Sublette and John Veil of Veil Environmental LLC. Plenary speakers were Stan Belieu, deputy director of the Nebraska Oil and Gas Conservation Commission; John Boyson, operating manager of BC Technologies, Ltd., in Wyoming; Rebecca Thingelstand, environmental and health safety analyst of Anadarko Petroleum Corporation; John Veil of Veil Environmental LLC. Plenary speakers were Stan Belieu, deputy director of the Nebraska Oil and Gas Conservation Commission; John Boyson, operating manager of BC Technologies, Ltd., in Wyoming; Rebecca Thingelstand, environmental and health safety analyst of Anadarko Petroleum Corporation in Denver; and Dag Nummedal, director of the Colorado Energy Research Institute at the Colorado School of Mines in Golden.

The three-day conference included 20 corporate sponsors, 30 exhibitors and a poster session. The Denver stop marked the first time the IPEC was held in the Rocky Mountain region.
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