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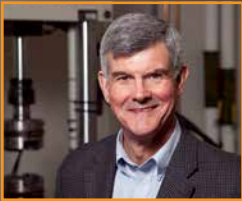
ENGINEER

THE UNIVERSITY OF TENNESSEE, KNOXVILLE • COLLEGE OF ENGINEERING

New National Academy of Engineering Member George M. Pharr and the Future of Materials Engineering at UT



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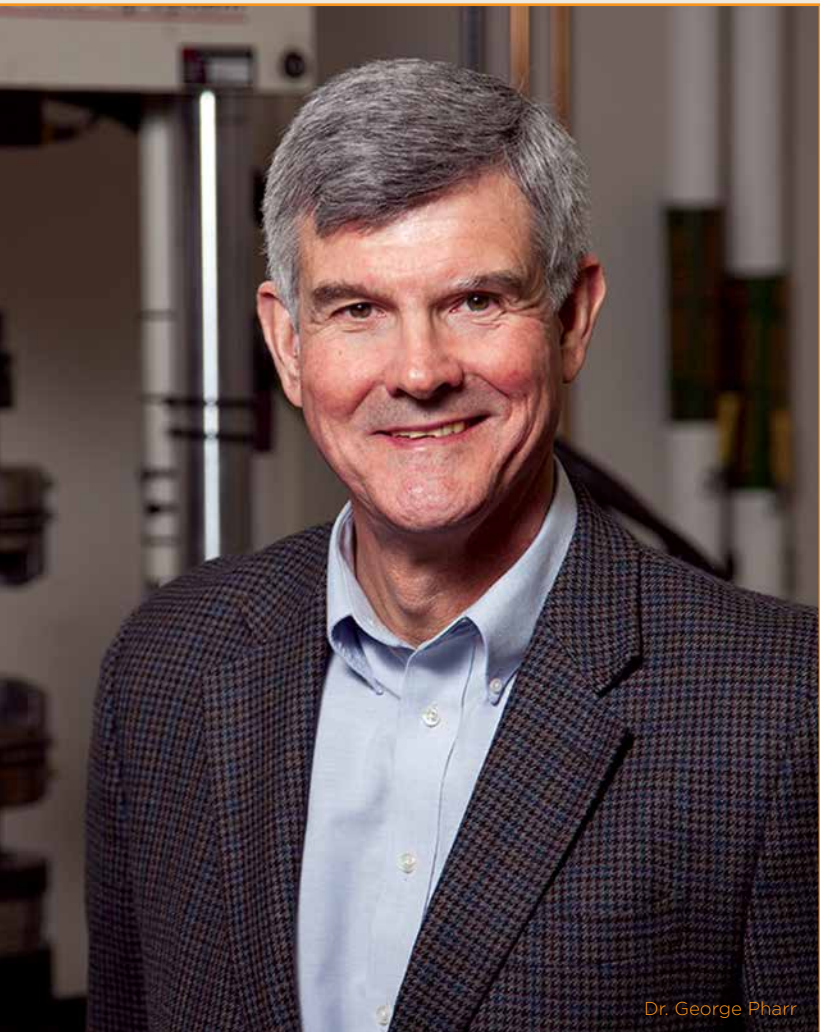
Dean's Message

Our governor recently introduced a bold plan, the TN Promise, as a part of the state's effort to increase the science, technology, engineering, and math (STEM) workforce in the state. It is a plan that will provide increased opportunity and motivation for high school students to attend the first two years free at the community and technical colleges within the state with the intent to increase the technologically trained workforce in Tennessee. It is also intended to encourage select students who choose that route to then consider transferring to four-year colleges within the state to further their education. While we believe that entering our college as a freshman is the preferred approach for the majority of our engineering students, we look forward to seeing an increase in interest from the students that may enter as transfer students. This trained workforce will be invaluable in helping our state compete for and increase manufacturing capabilities in our area.

In response to our unprecedented increase in undergraduate student enrollment and PhD enrollment over the last five years (34% and 65%, respectively), and in anticipation of increased emphasis on manufacturing in the US and our state, our college is also adding additional faculty in advanced manufacturing, composites, energy, power electronics, and many other areas. These additional faculty members and their staff support were made possible by increased resources that have been provided by the state, university, alumni, and friends of the college, and in collaboration with ORNL, other federally funded agencies/facilities, and our corporate partners. I encourage you to read about several of our newest faculty and the national and regional awards being received by our faculty and students in this edition of *Tennessee Engineer* as we continue to support the university and college's vision of becoming a Top 25 public university.

Wayne T. Davis

JIAM Director and Chancellor's Professor Pharr Named Member of the National Academy of Engineering



Dr. George Pharr

George Pharr, Chancellor's Professor in the Department of Materials Science and Engineering at the University of Tennessee, Joint Faculty Scientist in the Materials Science and Technology Division at the Oak Ridge National Laboratory (ORNL), and director of the Joint Institute for Advanced Materials (JIAM) at UT, has been named a member of the National Academy of Engineering (NAE). He becomes the fifth NAE member in the College of Engineering.

Election to the NAE is among the highest professional distinctions accorded to an engineer. Academy membership honors those who have made outstanding contributions to engineering research, practice, or education and to the pioneering of new and developing fields of technology, making major advancements in traditional fields of engineering, or developing and implementing innovative approaches to engineering education. The NAE elected sixty-seven US members and eleven foreign associates this year. This brings the total US NAE membership to two thousand two hundred fifty and the number of foreign associates to two hundred and fourteen.

"I was absolutely thrilled. There were some rumors floating around a few weeks before the official announcement, but prior to that I had no idea I had been nominated or was being considered," Pharr said. "So when the formal announcement came to me on February 5, it was truly a thrilling moment."

Pharr was elected to the academy for his "development of methods for determining mechanical properties of materials by nanoindentation."

"George is most deserving of this membership," said UT Chancellor Jimmy G. Cheek. "He has made great contributions to his field, the classroom, and to UT and ORNL as director of JIAM. This honor is a reflection of the world-class scientist that he is."

Pharr's research deals with understanding the mechanical behavior and strength of very small objects. These can be thin films, like those used in making semiconductor electronics

or in magnetic hard drives, or small particles or devices used in nanotechnology. Many of these have dimensions as small as fifty nanometers, which is about a thousandth the size a human hair. In many cases, the technological performance of these small objects depends on knowing exactly how strong they are. His research efforts for the last thirty years have been directed at ways to measure their strength and understand the basic physical mechanisms that determine their strength. One of the "mantras" in this field of research is that "smaller is stronger," and Pharr and his research team have been striving to understand why.

"When I started this line of research, the materials we intended to focus on were engineering materials, e.g., metals, alloys, ceramics, polymers, and semiconductors," Pharr said. "What we did not envision is there would be a wide range of applications for our testing methods in a large number of other scientific disciplines including geology, biology, medicine, and even anthropology."

Pharr is also a fellow of the Materials Research Society and the American Society of Materials International. He has served as editor of numerous academic journals and is the recipient of several awards, including the 2010 Materials Research Society Innovation in Materials Characterization Award, the 2007 Humboldt Research Award for Senior US Scientists, and the 1995 Amoco Teaching Award at Rice University.

Pharr received his bachelor's degree in mechanical engineering at Rice University and his doctorate in materials science and engineering from Stanford University.

"George is a leader in the materials science field nationally and internationally," said Wayne Davis, dean of the College of Engineering. "His research and ideas have served to inspire other faculty and his students."

The NAE recognition comes at an important time as the completion of the new JIAM building—the first structure on the university's new Cherokee Farm Campus—comes closer.

"Construction of the JIAM building is proceeding on schedule with phase I completion anticipated in late summer or early fall of this year," Pharr said. "Phase I will build out the entire external structure and finish half of the internal lab and office space along with an auditorium and several conference rooms. We are currently finalizing design plans for phase II, which will finish out the rest of the internal space. We hope that phase II construction will begin

immediately at the completion of phase I, and if that happens, the JIAM scientists should be moving into the building in the summer or fall of 2015. The building is now complete enough that you can get a good sense of what it will be like by walking through it. It is really going to be first class."

JIAM was established in 2005 and is comprised of a multidisciplinary team of scientists from UT and ORNL, operating at the forefront of modern materials science.

Through a partnership that spans more than sixty years, UT and ORNL researchers have maintained international prominence in the field of advanced materials synthesis and characterization. This broad research realm directly engages physicists, chemists, microscopists, computer scientists, and engineers, while involving myriad other areas of scientific investigation. Many of JIAM's scientists hold joint appointments at UT and ORNL. The UT-ORNL joint institutes were created to spur collaboration and capitalize on mutual strengths. JIAM is one of five UT-ORNL joint institutes.

"We hope that once all the JIAM scientists are under one roof and sharing the same coffee pot and lunch spaces, new multidisciplinary research collaborations will develop that will push materials research activities at UT and ORNL to new levels," Pharr added. "Given the strength and importance of advanced materials research here in East Tennessee, which stems from ORNL being the lead DOE laboratory for advanced materials development, there is no reason that JIAM shouldn't become a world class materials research institute."

As a NAE honoree, Pharr is in good company with other engineering members including Mark Dean, John Fisher Distinguished Professor in the Department of Electrical Engineering and Computer Science; Jack Dongarra, Distinguished Professor in the Department of Electrical Engineering and Computer Science; Ramamoorthy Ramesh, UT-ORNL Governor's Chair for Nanomaterials Engineering; and Steve Zinkle, UT-ORNL Governor's Chair for Nuclear Materials.

"It is certainly an honor to be included in such an august group," Pharr said. "I have worked with several of these folks over the years and have great respect for their abilities and accomplishments."

For more information on NAE, visit www.nae.edu. For more information on JIAM, visit jiam.utk.edu/about.php.



The Joint Institute for Advanced Materials is under construction on the UT Cherokee Farm Campus



Dean of Engineering
Wayne T. Davis

Donors Establish Wayne T. Davis Dean’s Chair in Engineering

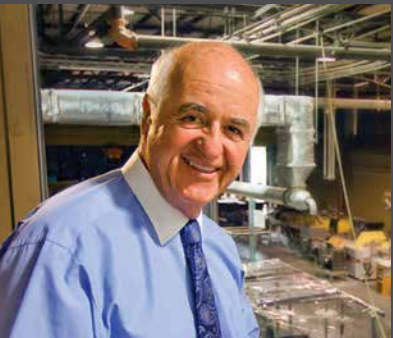
A \$3 million gift was announced on October 4, 2013, by John D. Tickle, who established this major endowment with his wife Ann, along with Chad and Ann Holliday, Joe and Judy Cook, and Eric and Elaine Zeanah. This endowed chair will enable UT’s current dean of engineering, Wayne T. Davis, for whom it is named, to drive the College of Engineering forward in exciting new directions. The Wayne T. Davis Endowed Chair in Engineering was named in recognition of Davis’ extraordinary service and leadership.

Since taking on the leadership of the college in March, 2009, Davis has led the college in remarkable achievements. Notably, the COE has grown by 34% at the undergraduate and 65% at the PhD levels; and the college has hired eleven out of fifteen UT-ORNL Governor’s Chairs in engineering, enhancing the strong collaborations between UT and Oak Ridge National Laboratory (ORNL). Additionally, he and Chancellor Jimmy G. Cheek presented a successful proposal to Governor Bill Haslam in 2013 that resulted in an additional \$3 million annually from the state of Tennessee to the College of Engineering to promote growth and enhance engineering initiatives.

Davis has served UT and the college with distinction and integrity since 1974. In fact, integrity is a word used by each of the donors to describe him. His energy was evidenced when, as a faculty member, Davis was principal investigator or co-principal investigator on eighty-five research grants. His expertise in air quality has earned him accolades including the Lifetime Achievement Award in 2007 from the Institute of Professional Environmental Practice. He was named a UT Macebearer in 2002—the top honor accorded faculty at the university—given to one who has exhibited longstanding exemplary service to the university, its students, and society.

“This endowment provides unique funds to support priorities of the college—staff awards, assistance to special student projects, or critical laboratory renovations and equipment, for example,” Davis said. “The beauty is that it is an endowment and will be ‘forever’ generating funds on an annual basis that can be used by me and future deans to further the mission of the college and its programs. I am also deeply appreciative and humbled that the dean’s chair was named in my honor and that I will be the first dean to hold the chair.”

Accolades from the Donors



John Tickle

“During the years that Wayne Davis has served as dean of the College of Engineering, he has shown tremendous leadership. Not only is he a leader in the engineering college, he is also one of the driving forces in the race to make the University of Tennessee a Top 25 public university.”

John D. Tickle (BS/IE ’65)
Chairman, Strongwell Corporation



Chad Holliday

“Dean Davis has spent his professional career serving the University of Tennessee, and he has been an outstanding dean of engineering. My wife, Ann, and I are proud to honor Dr. Davis by joining with the Ticksles, the Cooks, and the Zeanahs to establish the Wayne T. Davis Endowed Dean’s Chair in Engineering. As a UT industrial engineering alumnus, I have great faith in his leadership, integrity, and dedication to the College of Engineering and his vision for the future of engineering at UT.”

Chad Holliday (BS/IE ’70)
Chairman of the Board, Bank of America



Joseph Cook

“We are pleased to support honoring Wayne Davis with an endowed chair in engineering. Dean Davis epitomizes the highest quality of leaders with his focus on serving others and being accountable for outcomes. This award recognizes the outstanding progress the College of Engineering has experienced under Dean Davis’ guidance and sets a high mark for those who follow.”

Joseph C. Cook, Jr. (BS/IE ’65)
Principal and Co-founder, Mountain Group Capital



Eric Zeanah

“Wayne’s dedication to our College of Engineering and the University of Tennessee has been seen in so many ways over his tenure. Supporting him with this honor was an easy decision as it is rare to have an opportunity to work with someone who has both the vision and ability to move things forward.”

Eric Zeanah (BS/IE ’84)
President and Owner, American Accessories International
Chair-elect, College of Engineering Board of Advisors

Bioenergy Expert is Fifteenth Governor’s Chair



Dr. Art Ragauskas

Biomolecular Engineering with a complementary appointment in the UT Institute of Agriculture’s Department of Forestry, Wildlife, and Fisheries. He will serve in the Energy and Environmental Sciences Directorate and the Biosciences Division at ORNL.

Ragauskas will join the College of Engineering faculty effective June 1, 2014.

Ragauskas comes to UT from Georgia Tech, where he is a professor in the Department of Chemistry and Biochemistry and researcher within the Institute of Paper Science and Technology. This year, he was honored with the American Chemical Society’s Award for Affordable Free Chemistry and the Gunnar Nicholson Gold Medal Award from TAPPI, an arm of the American Paper and Pulp Association.

Dr. Arthur Ragauskas, an authority in bioenergy, has been named the fifteenth University of Tennessee-Oak Ridge National Laboratory Governor’s Chair.

He will serve as Governor’s Chair for Biorefining, based in the Department of Chemical and

In 2013, Ragauskas was elected as an American Association for the Advancement of Science Fellow and served as the Fulbright Distinguished Chair in Alternative Energy from 2008 to 2009. He was also a visiting fellow at ORNL in 2013, working in the US Department of Energy’s Bioenergy Science Center.

Ragauskas’s research is important to uncovering ways to convert biomass to biofuels, biopower, and biomaterials. Specifically, his work focuses on converting plant matter such as lingocellulose found in the cell walls of energy crops into biofuels. He also works to uncover applications of bio-based chemicals and materials for use in areas ranging from health care to packing material.

Ragauskas plans to collaborate with UT students and faculty and ORNL research scientists to develop biorefining research programs. He also looks forward to utilizing resources at UT such as the polymer characterization laboratory and biomass processing facilities, as well as ORNL resources like the Spallation Neutron Source and the Titan supercomputer.

Ragauskas has served as a program leader for Georgia Tech’s focused research program in biofuels, biopower, and biomaterials; a research theme leader at Georgia Tech, Imperial College London, and ORNL; and team leader for the industrial consortium program, Fiber Modification/Fiber Fiber Bonding. In 2008, he was nominated to the National Commission of Energy Policy and received the William H. Aiken Research Prize, among other honors for his research and teaching.

Ragauskas received his bachelor’s and doctoral degrees in chemistry from the University of Western Ontario.



Dr. Ramamoorthy Ramesh

Governor’s Chair Ramesh Receives TMS Award

Dr. Ramamoorthy (Ramki) Ramesh, UT-ORNL Governor’s Chair Professor and Deputy Director for Science and Technology at Oak Ridge National Laboratory, has been chosen as the recipient of the 2014 EMPMD John Bardeen Award given by The Minerals, Metals & Materials Society (TMS), a professional organization that encompasses the entire range of materials and engineering, from minerals processing and primary metals production to basic

research and the advanced applications of materials. The TMS Electronic, Magnetic, and Photonic Materials Division Award Committee approved the nomination of Ramesh for the honor. The award is presented to an individual who has made outstanding contributions and is a leader in the field of electronic materials. For more information, visit www.tms.org/TMSHome.aspx.

EECS Professor is ACM-IEEE Kennedy Award Honoree

Dr. Jack Dongarra of the University of Tennessee received the Association for Computing Machinery (ACM)-Institute of Electrical and Electronics Engineers (IEEE) Computer Society Ken Kennedy Award on November 19, 2013, in Denver at SC13, the International Conference on High Performance Computing. The honor was presented to Dongarra for his leadership in designing and promoting standards for mathematical software used to solve numerical problems common to high performance computing (HPC).

The Kennedy Award cited Dongarra for “influential contributions to mathematical software, performance measurement, and parallel programming, and significant leadership and service within the HPC community.”

Dongarra, a University Distinguished Professor in the Department of Electrical

Engineering and Computer Science, is the founder and director of the Innovative Computing Laboratory (ICL) and holds positions at Oak Ridge National Laboratory and the University of Manchester. He is a leader in research on implementing linear algebra algorithms for high performance computing architecture that has defined the mathematical software field. A Fellow of ACM, IEEE, AAAS, and SIAM, Dongarra is the recipient of the first IEEE Medal of Excellence in Scalable Computing, and the first recipient of the SIAM Special Interest Group on Supercomputing’s award for Career Achievement. He is a member of the National Academy of Engineering.

ACM and the Computer Society co-sponsor the Kennedy Award, which was established in 2009, to recognize substantial contributions to programmability and productivity in computing and significant community service or mentoring contributions. It was named for the late Ken Kennedy, founder of Rice University’s computer science program and a world expert on high-performance computing. Kennedy was one of Dongarra’s



Dr. Jack Dongarra

mentors and the two collaborated for many years. The Kennedy Award carries a US \$5,000 honorarium endowed by the ACM Special Interest Group on Computer Architecture (SIGARCH) and the Computer Society.

For more information, visit www.acm.org/press-room/news-releases/2013/ken-kennedy-2013/view.

Two COE Governor’s Chairs Named AAAS Fellows

Two College of Engineering UT-Oak Ridge National Laboratory Governor’s Chairs, are being recognized for their teaching and research by the American Association for the Advancement of Science (AAAS) by being named to the organization’s 2013 class of fellows.

In 2013, three hundred and eighty-eight members were awarded this honor by AAAS because of their scientifically or socially distinguished efforts to advance science or its applications. The new fellows were presented with an official certificate February 15, 2014, at the AAAS annual meeting in Chicago.

Dr. Sudarsanam Suresh Babu, UT-ORNL Governor’s Chair for Advanced Manufacturing in the Department of Mechanical, Aerospace, and Biomedical Engineering, was honored with an AAAS Fellowship for his distinguished contributions to computational materials sciences, nonequilibrium phase transformations, and application of in situ neutron and synchrotron diffraction tools, as well as other advanced characterization methods.

Dr. Terry Hazen, UT-ORNL Governor’s Chair for Environmental Biotechnology in the Department of Civil and Environmental Engineering and the College of Arts and Sciences, was honored with an AAAS Fellowship for his distinguished contributions in the field of microbial ecology and bioremediation, particularly for the systems biology approach to the Deepwater Horizon oil spill disaster.

AAAS is one of the largest scientific organizations in the world, serving more than two hundred and sixty-one individual science



Dr. Terry Hazen



Dr. Suresh Babu

societies with more than a million members. Fellows must be nominated to membership either by three current fellows, the CEO of AAAS, or AAAS steering groups. Nominations are subject to approval by the AAAS Council. The first class of fellows was named in 1874.

For more information on the nomination process and to search a database of current AAAS fellows, visit www.aaas.org/page/aaas-fellows.

CEE Researchers Awarded ORNL’s 2013 Significant Event Award

Dr. Joshua Fu, an associate professor in the Department of Civil and Environmental Engineering, and Dr. Kan Huang, a research associate, have been awarded the Significant Event Award from ORNL for their contributions to the project “Arctic Black Carbon Initiative,” funded by the Department of Energy. Black carbon (BC) is formed from incomplete combustion of fossil fuels, biofuels, and biomass. It has significant warming effects and human health impacts. In the Arctic region, this warming effect is especially essential due to the deposition of BC on snow that could significantly reduce the surface albedo and promote snowmelt. The UT team in this awarded project contributes significantly to the sources and amounts of BC emissions in Russia, where little information is available. A most recent BC emission inventory for Russia was established, including identifying missing sources and updating various emission sectors. Preliminary modeling results using the new Russian emission inventory evidently reduced gaps between observations and model simulation, partly accounting for the strongly underestimated BC concentrations over the Arctic from previous modeling effects. The contributions from the UT team will have



Dr. Joshua Fu



Dr. Kan Huang

profound implications on demonstrating BC emissions reduction opportunities in domestic Russia and also alleviating climate change over the Arctic region.

Zinkle Named American Physical Society Fellow



Dr. Steven Zinkle

Dr. Steven Zinkle, the UT-ORNL Governor’s Chair for Nuclear Materials, has been elected a Fellow of the American Physical Society (APS). Zinkle was recognized for his significant contributions to the fundamental understanding of radiation effects in metallic and ceramic materials.

An authority on the effect of radiation on materials in fission and fusion nuclear reactors, Zinkle came to UT from ORNL in 2013. At ORNL since 1985, he has also received the US Department of Energy’s E.O. Lawrence Award among numerous awards and is a fellow of five other professional societies and a member of the National Academy of Engineering.

Almost 250 new fellows were elected in 2013 for exceptional contributions to the physics enterprise. Fellowship is a distinct honor signifying

recognition by one’s professional peers. Each nomination is evaluated by the fellowship committee of the appropriate APS division, topical group, or forum, or by the APS General Fellowship committee. After review by the full APS Fellowship Committee, the successful candidates are elected by APS Council.

The American Physical Society is a non-profit membership organization working to advance and diffuse the knowledge of physics through its outstanding research journals, scientific meetings, and education, outreach, advocacy, and international activities. APS represents over fifty thousand members, including physicists in academia, national laboratories, and industry in the United States and throughout the world. For more information, visit www.aps.org.

Faculty Focus: Dr. Eric Boder

Department of Chemical & Biomolecular Engineering



Dr. Eric Boder (left) conducts a research project with student Maryam Raeeshzadeh-Sarmazdeh (right).

Dr. Eric Boder was on the University of Pennsylvania faculty in 2006 when he first visited UT to give a guest seminar for the Department of Chemical and Biomolecular Engineering (CBE). A look at the department's activities and a convincing sales pitch inspired him make the move to UT just a year later.

"I was impressed with the department and the vision for what the programs, especially the graduate education and research programs, could become," said Boder. "Our department head, Dr. Bamin Khomami, is a very enthusiastic and persuasive individual—not to mention a respected former teacher and advisor from my undergraduate days at Washington University. So when he brought up the possibility of moving to UT, I couldn't say no."

Boder is now CBE's career development associate professor, teaching biotechnology and bioprocess engineering courses, and conducting research in protein engineering. He is also the academic director for UT's new Institute of Biomedical Engineering (iBME).

Boder takes a traditional approach in the classroom, favoring a chalkboard or whiteboard over PowerPoint presentations in order to promote a better pace. He also stays mindful of student needs.

"I focus on being very prepared before going into the classroom, which really means trying to anticipate where students are going to have the most difficulty understanding the material," said Boder. "When developing content, I prefer to truncate the list of topics to avoid having to move too quickly and sacrifice details, depth, and rigor."

Boder sees success in teaching through the achievements of his students.

"I recently graduated my first PhD student from UT, and that is certainly the most measurable and rewarding example," he said. "I'm also very proud of the impact I've had on the many undergraduates that we have graduated since I arrived, and of the role I played in recruiting several outstanding new faculty to our department."

In research endeavors, Boder is enthusiastic about the formation of the iBME.

"I think that the establishment of the iBME has the potential to make a very large impact on research and education at UT," said Boder. "I'm excited about working with new groups of colleagues

to tackle some significant problems in imaging and therapy of, for example, amyloid-based diseases."

Boder hopes to play a role in developing novel peptide and protein-based tools for these biomedical applications.

"We are currently developing approaches to tailor the properties of proteins that undergo allosteric conformational switching," he said. "We hope to eventually develop systems that will be useful in biosensing or drug and gene delivery."

Looking ahead, Boder believes that this line of research will yield important solutions and better medicines.

"We are going to keep pushing our molecular switch research to see what kind of problems we might be able to solve with these," he said.

Outside of academia, Boder spends time with his wife Marti—who also has a PhD in chemical engineering—daughter Josie, 14; son Ethan, 11; and daughter Rose, 8. He helps out with Josie's dance company performances and travels to gymnastics competitions with Ethan and Rose.

Boder keeps up with graduate school friends via an annual fantasy football league, but doesn't have much time these days for previous hobbies such as home brewing and aviation.

"I used to tell my students that if you are going to be a PhD scientist or engineer, you have to give up fifty percent of your hobbies because your research must become your number-one hobby," said Boder. "I now tell people that once your kids get past about age ten, you have to give up the rest of them."

The research hobby is rewarding for Boder, though, especially within the CBE community.

"I have the pleasure of being part of an amazing group of passionate colleagues applying their expertise to topics ranging from fundamental understanding of the behavior of cells and nanoscale materials to developing new materials and processes for sustainable energy and drug delivery, among other things," he said. "That puts our program right in the middle of some of the most exciting research and education areas currently active in the college, and these are areas that are poised for dramatic growth in industry, with real potential to improve our lives. It's an exciting time to be part of CBE at UT."



The Heath Endowed Faculty Fellowship in business and engineering provides me with a unique opportunity to identify and encourage interaction and collaboration between the College of Business Administration (CBA) and the College of Engineering (COE) by working with my business counterpart, Dr. Chanaka Edirisinghe. The support from this award allows me not only to integrate my work in systems productivity and reliability with others in the CBA, but also to identify opportunities for other faculty and students in both colleges. The endowment has already generated educational and research collaborations.

Dr. Rupy Sawhney
Heath Faculty Fellow
Department of Industrial and Systems Engineering

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Thanos Papanicolaou Joins CEE as Goodrich Chair of Excellence



Dr. Thanos Papanicolaou

Dr. Thanos Papanicolaou has joined the Department of Civil and Environmental Engineering (CEE) as the Goodrich Chair of Excellence and a tenured full professor. Prior to joining the department, Papanicolaou was a Donald E. Bently Faculty Fellow of Engineering and professor of civil and environmental engineering at the University of Iowa, and was affiliated with IIHR Hydrosience & Engineering, and researcher for the Center for Global and Regional Environmental Research & Policy Center. Prior to his tenure at the University of Iowa, Papanicolaou was an assistant professor and associate professor of civil and environmental engineering at Washington State University. Papanicolaou is a member of numerous professional and scientific societies, serves on several editorial boards, is a technical advisor of several federal agencies, and was a 2008 National Civil Engineering Prize Award recipient.

He is a distinguished member of the Iowa Academy and has co-authored more than eighty refereed papers, numerous reports, and almost three hundred conference proceedings. According to Google Scholar, the number of citations of his papers reaches an impressive total of one thousand and twenty four. Since 2008 alone, his papers have been cited six hundred and seventeen times.

Papanicolaou is the new chief editor of the *Journal of Hydraulic Engineering* (American Society of Civil Engineers) and associate editor for the *Water Resources Research* (American Geophysical Union) and the *International Journal of Sediment Research*.

Papanicolaou earned a BS degree with honors in civil engineering from Aristotle University of Thessaloniki, Greece, and a MS degree in 1993 and a doctorate degree in civil and environmental engineering from Virginia Polytechnic Institute and State University. He also received fellowships from the Onassis Foundation and NATO.

Papanicolaou's research focuses on sediments and soil, and how they interact with flow and precipitation. He and his research team develop methods to predict the rate of transport and deposition of soil/sediment and also trace the sediment source.

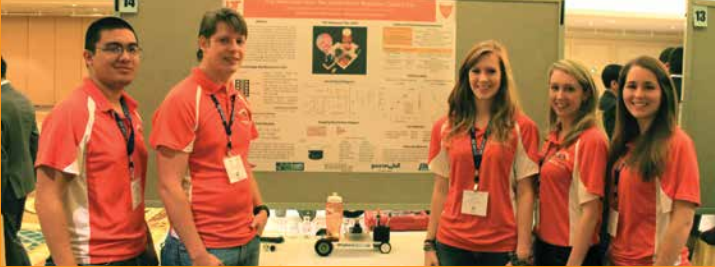
SMRC Director Elected IEEE Fellow

Dr. Chuck Melcher, the director of The Scintillation Materials Research Center (SMRC) and a research professor in the Department of Materials Science and Engineering, has been elected as a Fellow of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). This is the engineering organization's highest award, and serves as recognition of Melcher's outstanding research and professional accomplishments. For more information, visit www.ieee.org/membership_services/membership/fellows/index.html.



Dr. Chuck Melcher

UT College of Engineering AIChE Student Chapter Returned from the 2013 AIChE National Conference in San Francisco with a List of Awards



Members of UT's 2013 Chem-E-Car Team show off their competition entry, the Tennessee Titan. From left are Dennis Edralin, Aston Thompson, Amanda Jones, Kelli Byrne, and Alex David.



UT AIChE members present their award from the 2013 AIChE National Conference. From left are Christian Wilson, Alex David, faculty advisor Dr. Gabriel Goenaga, Amanda Jones, Kelli Byrne, Aston Thompson, and Dennis Edralin.

A team of students from the UT College of Engineering AIChE Student Chapter returned from the 2013 AIChE National Conference in San Francisco with a list of awards to show for their attendance. The team was also featured in a set of YouTube videos related to the conference's Chem-E-Car competition.

Kelli Byrne won the Praxair's ScaleUp Award for her essay submission. Her paper compared the emissions of greenhouse gases from hydrogen production through reforming of natural gas and electrolysis of water.

Amanda Jones won first place in the Undergraduate Student Poster Session on Fuels, Petrochemicals, and Energy for her poster "Comparison of Membrane Performance for Vanadium Redox Flow Batteries."

The Chem-E-Car Team competed with their car, the Tennessee Titan, in the 2013 National Chem-E-Car Competition and brought home the National SACH Award: Inherent Safety in Design for the best application of the principles of chemical process safety to the Chem-E-Car competition.

The Chem-E-Car Team Members were captains Byrne and Jones, Adithi Amarnath, Kristen Barnes, Alex David, Dennis Edralin, Megan Farell, Sam Kingkeo, Jordan Parkhurst, Kyle Saylor, Aston Thompson, and Christian Wilson.

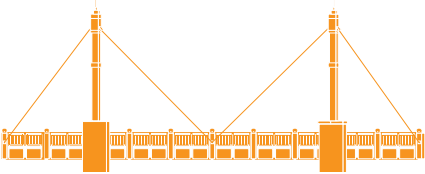
The chapter's faculty advisor is Dr. Gabriel Goenaga and the safety advisor is Dr. Douglas Aaron.

Portions of the competition are viewable on YouTube.com:

- The team's introduction video (tiny.utk.edu/9PESV) was shown before each of the Tennessee Titan's runs during the competition.
- AIChE officials interviewed team co-captain Amanda Jones about the UT entry. View the interview video at tiny.utk.edu/PcEn7.

Some of the UT team members, and one of the Tennessee Titan's competition runs, are shown in the official AIChE Chem-E-Car Competition video: tiny.utk.edu/8OukR

Engineering Students Explore Strongwell Corporation and Products



John D. Tickle discusses the Strongwell Corporation and the company's pultrusion techniques with College of Engineering Ambassadors during a December 2013 visit.

The company is an avid supporter of science, technology, engineering, and mathematics (STEM) development at the college level. COE students viewed all areas of the production process during the visit, including the daily operations, research and development, marketing, and sales functions that Strongwell engages in within the composites and manufacturing industry. The visit showcased the company's facilities and pultrusion techniques.



A composite beam from the Strongwell Corporation is put under pressure in a beam-bending test in the Department of Civil and Environmental Engineering lab.



Dr. Stephanie TerMaath, pointing at the computer screen, and students test a composite beam from the Strongwell Corporation in the Department of Civil and Environmental Engineering lab.

College of Engineering (COE) Ambassadors and several scholarship recipients used their study day on December 4, 2013, to visit a major industry leader—owned by a COE alumnus—and investigate engineering outside of their traditional classwork.

The students, accompanied by Dean Wayne T. Davis, traveled to Bristol, Virginia, to visit the Strongwell Corporation and have lunch with board of directors members John Tickle, chairman; his wife, Ann Tickle; and board member and COE Board of Advisors member Spike Tickle, and other company executives.

The visit showcased the company's facilities and pultrusion techniques.

"The Tickle family was so hospitable," said John Scobey, a former COE Ambassador who earned his BS degree in civil engineering from UT in December, 2013, and is now pursuing his MS degree at Georgia Tech. "The tour included an introduction to fiber reinforced plastic (FRP) and a tour of the pultrusion process from start to finish. Not only did the ambassadors learn about the material that was used to build the John D. Tickle Engineering Building

bridge, but we learned about the emerging market of composite materials."

Tours of different plant areas were led by key Strongwell staff members: David Ring, manager of government affairs; Meghan Carty, pricing manager; Melissa Harrison, fabrication estimator; Jeff Roberts, custom products manager at Bristol; and Te-kai Shu, print and social media specialist.

Discussion during the visit covered topics such as thermoset versus thermoplastic composites, market and job growth, the potential role of 3D printing, raw materials, how closely concrete resembles FRP, and the high tensile strength of composites.

After the tour, the group enjoyed a lunch and presentation by Spike Tickle on Strongwell's history and its trajectory for the future. John Tickle also shared insights from his years building the company.

COE students enjoyed the opportunity to interact with both the Ticks and Strongwell executives, asking questions about the future of the industry and possibilities it presents.

On the ride home to Knoxville, students also had the chance to talk with Dean Davis about the future of the College of Engineering, the Journey to the Top 25, challenges facing engineering students, and upcoming plans for new COE buildings.

Earlier in 2013, Dr. Stephanie TerMaath, an assistant professor in the Department of Civil and Environmental Engineering, and four of her students visited Strongwell specifically to learn about the advancement of composite materials versus traditional ones. Glenn Barefoot, Strongwell's vice president of marketing and business development, and David Ring led the tour.

Students Jonathan Weigand, Helene Rynczak, Geoff Goodmiller, and Shane Morrison received an overview briefing on composite manufacturing and applications for the materials. They also got to see the manufacturing process and product samples.

The visit provided the students with the opportunity to discuss the advantages of Strongwell's composite materials, and later in the year TerMaath's students had the chance to test those materials. In early December of 2013, her class gathered in a testing lab in the John D. Tickle Engineering Building to see how the products compare to more traditional materials.

The beam-bending test included two types of composite beams—square-tube and wide-flanged beams—and some steel and aluminum beams. Students were able to observe the localized damage in the composite beams versus the more global, plastic deformation of the metallic beams.

"We greatly appreciate the support from Strongwell that provided our students with invaluable hands on experience with composites," said TerMaath. "This interactive learning in the lab exemplified the distinctive behavior of composites, and the manufacturing tour enabled our students to witness composite production."



COE students and staff listen during a visit to the Strongwell Corporation. From left in front are John Scobey, Tyler Rowe, and Cole Stonebrook. Behind them are, from left, COE Executive Development Director Dorothy Bryson and student Ambassador Greg Tate.

College of Engineering Research Center Spotlight:

The Center for Transportation Research



The Center for Transportation Research faculty and staff: (bottom row, left to right): Lissa Gay, Melany Noltenius, Diana Webb, Becky Sherrod, Mollie Mitchell, Janice Osborne, Connie Brock, and Jenny Jones; (back row, left to right): Spence Meyers, Jerry Everett, Linda Capps, Airtion Kohls, Frank Brewer, Mareike Ortmann, Ted Newsom, Mark Burton, Matt Cate, Larry Bray, Dave Clarke, Steve Richards, Janet Lindsey, Danielle Meyers, Tammy Enix, Carol Hatmaker, Laura Liu, and DeAnna Flinchum.

For over forty years, the Center for Transportation Research (CTR) has been a nationally and internationally recognized research entity at the University of Tennessee (UT). The group continues to be an outstanding research venue for innovative faculty, researchers and graduate students who are finding new ways to deal with the nation’s transportation issues.

CTR currently has over \$10 million in research contracts. Transportation research, education, and technology transfer activities are vital to help rebuild the nation’s aging transportation infrastructure and to encourage solutions to tomorrow’s transportation problems.

CTR was created in 1970 to promote and facilitate interdisciplinary research, public service, and outreach in the field of transportation. The center began full-time operations in 1972. As a research center under the auspices of the College of Engineering (COE), CTR oversees various programs associated with the education, research, training, and workforce aspects of the transportation field.

“CTR’s slogan is ‘Transportation Solutions to Move Your World,’” said CTR Director David B. Clark. “To live up to everything that implies, the center strives to realize three goals. The first is to conduct a program of research in transportation that is recognized for its excellence, comprehensiveness, innovation, productivity, and national leadership. The second is to develop and sustain the technical expertise for high quality transportation research by the faculty and students within the departments and colleges of UT. CTR’s third goal is to serve the transportation research, service, and training needs of state and local government, business, and industry in Tennessee, the Southeast region, and the nation.”

CTR benefits the region, state, and nation through its programs of research, education, technology transfer, workforce development, training, and community outreach. The center’s work touches the lives of many by improving safety on the nation’s highways; making it easier for citizens to engage in bicycle and pedestrian activities; influencing and informing transportation policy; understanding the attitudes citizens have toward transportation issues; educating drivers on safe practices; advising on regional economic impacts; bringing transportation choices to underserved populations; engaging in human mobility design; promoting environmentally sound and sustainable alternatives to move freight; improving personnel safety in roadway work zones; maintaining and improving transportation infrastructure; and assisting public and private transportation agencies to keep their staffs up-to-date in industry methods, practices, and regulations. CTR accomplishes this ambitious agenda using its research faculty and staff, the resources of UT and the COE, and partnering with local, state, and federal agencies as well as other research institutions in the Southeast and the nation.

“CTR is involved in several transportation research consortia, most notably the Southeastern Transportation Center, which we lead, and the NURail Center at the University of Illinois,” Clark added. “This support from the US Department of Transportation (US DOT) for the University Transportation Centers program is critical for CTR’s funding of faculty research and financial support of graduate students. It helps us maintain our national recognition for UT’s transportation programs, especially in the area of comprehensive transportation safety. The Traffic Signal Academy is also gaining momentum and reaching a national audience. We justifiably have high hopes for its future because it fills a gap in continuing education and workforce development by training better traffic engineers, and improving traffic flows. And I am particularly pleased by a donation that was given to the UT Railway Association. This will help support students pursuing railroad careers by funding their travel to meetings and conferences where they can interact with industry leaders. We expect to build on our recent successes as we win more research contracts in our program areas. CTR researchers currently have several proposals under review.”

CTR recently won a \$5.5 million federal award that renews the center’s lead in the research consortium for the US DOT Federal Transit Administration Region 4, the Southeastern Transportation Center (STC). The two-year award from US DOT’s Research and Innovative Technology Administration is one of ten granted to regional university transportation centers. The money will advance US technology and expertise in the many modes and disciplines that comprise transportation through research, education, and technology transfer.

STC members include UT as the lead institution along with the University of Kentucky, the University of South Florida, the University of Central Florida, the University of Alabama, the University of Alabama Birmingham, the University of North Carolina Chapel Hill, North Carolina A&T State University, and Clemson University.

The consortium’s research focuses on the Secretary of Transportation’s strategic goal of improving public health and safety by reducing transportation-related fatalities and injuries.

“The consortium’s theme is comprehensive transportation safety,” said Steve Richards, consortium director. “This grant allows us to improve the safety of all transportation modes in the Southeast through a program of research, education, and technology transfer.”

Research findings will be communicated to officials and policymakers for consideration through research symposia, workshops, and publications. The funding also will support

graduate students at all participating universities to develop the next generation of safety leaders as well as address critical issues related to the shrinking transportation workforce.

“As a member of the Transportation and Infrastructure Committee for twenty-six years in the House of Representatives, I know the importance of this research,” said US Rep. John Duncan, Jr. “It will affect every American in the years to come as we take on the huge challenge of strengthening and modernizing our nation’s transportation infrastructure.”

“In the forty years of CTR’s existence, many achievements in safety have been realized with far-reaching effects,” Clarke said. “Among them are the child passenger restraint laws that CTR researched and promoted, which Tennessee adopted first in the nation. This work led to many Tennessee Department of Highway Safety proposals that gave rise to subsequent traffic safety laws including the Adult Occupant Protection law. These achievements came about through collaborations between the center and the State of Tennessee.”

CTR is actively engaged in outreach with local and statewide communities through its work helping transportation disadvantaged groups, collaborating with public schools, and connecting local law enforcement officers to the communities they serve.

Tennessee Vans is a social business enterprise whose mission is to meet the mobility needs of the transportation disadvantaged in a financially sustainable manner, working with community agencies to purchase vehicles to transport their clients to community events, jobs and training, and other community outreach services and activities that meet diverse client travel needs.

CTR has joined with the Tennessee Safe Routes to Schools program to develop an afterschool curriculum to teach children in grades K-8 about safety aspects of walking and biking to school. They will implement the Safe Routes program in conjunction with after school organizations such as YMCA and Boys and Girls clubs.

CTR is also the administrative home for the Law Enforcement Liaisons (LEL). As part of the Governor’s Highway Safety Office,



CTR Director David Clarke teaches the Railroad Track Inspection and Safety Standards workshop at the Tennessee Valley Railroad Museum in Chattanooga, November 2013. Dr. Clarke is demonstrating the use of a combination track gauge and level to the students.

LEL personnel plan, develop, and implement statewide initiatives to promote highway safety education and enforcement. LELs promote partnerships with law enforcement, prosecutors, the judicial system, and community partners to reduce crashes, injuries, and fatalities on our roadways.

“Today, CTR looks ahead to its next forty years of research and innovation by making its expertise and resources available to communities, researchers, educators, and transportation agencies throughout our region,” Clarke said. “CTR offers expert capability in transportation planning, intermodal transportation and freight research, personnel training, continuing education, technical conferences, and community mobility outreach.”

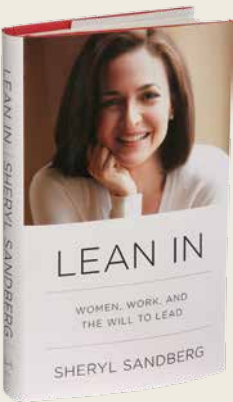
To learn more, visit ctr.utk.edu.

To learn more about the Southeastern Transportation Center, visit stc.utk.edu.



Aiton Kohls, director of CTR’s Traffic Signal Academy; Matt Cate, coordinator of the TN Transportation Assistant Program (TTAP); former CTR employee Jonathan Watson; and CTR Director Dave Clarke focus on a transportation project in downtown Knoxville.

Women in EECS Form Lean In Circle



Enterprising students in the Department of Electrical Engineering and Computer Science (EECS) found themselves on the forefront of the national Lean In movement not too long after forming their own UT student group, Women in EECS.

LeanIn.Org, named after the New York Times best seller *Lean In* by Facebook chief operating officer Sheryl Sandberg, is a private foundation focused on encouraging women to pursue their ambitions. Lean In partnered with the Anita Borg Institute (ABI), a nonprofit organization dedicated to the advancement of women in computing, and sought out Women in EECS to create the first Lean In Circles sub-community.

Circles are small peer groups that meet regularly—in person or online—to learn and share information. For this first Circle, they specifically wanted to focus on women in technology. ABI contacted Denise Koessler, a doctoral candidate in the Department of Electrical Engineering and Computer Science. A manager at the institute knew about Koessler's involvement in the recently formed UT group, and thought Women in EECS would be a good fit for their idea of Lean In Circles.

"I first heard of Lean In Circles in September 2013 when ABI called and asked me to lead their first circle," said Koessler. "I have received an annual scholarship from them and have been a very active member of their Grace Hopper Conference series."

The students formed Women in EECS in April of 2013 to recruit, mentor, and retain women in electrical engineering and computer science at UT. Their Lean In Circle was launched at ABI's Grace Hopper Conference in Minneapolis on October 3, 2013. Koessler helped present the launch at the conference and is designated as a

"Lean In Leader," an official brand ambassador for Lean In.

Women in EECS members have remained busy since their group's formation.

"We have a mentorship program underway; we are holding a course this semester which addresses the discussion points brought up in Lean In; and we are officially a part of Sheryl Sandberg's next Lean In book," said Koessler.

Sandberg's *Lean In for Graduates* is scheduled for release in April 2014. Koessler was quoted in a January 2014 *USA Today* article about involvement in the book and Lean In Circles.

The group's past activities have included the "Bazinga!" building party in August, 2013, in the Min Kao Electrical Engineering and Computer Science Building; a game night; attendance at the Grace Hopper, Southeastern Women in Computing, and Alliance of Women Philanthropists Annual Giving Circle conferences; the mentorship program kickoff; study breaks during final exams; and an interview workshop.

Future plans include a Hack-a-thon Workshop, a partnership to provide the "Hour of Code" program to Vine Middle School in Knoxville, and more mentorship programs. The group holds meetings every two weeks to discuss professional development, networking, and communication practices within each member's respective field.

Dr. Lynne Parker is the group's faculty advisor. Koessler is the president and chairperson. Other founding members are Katie Schuman, Nicole Pennington, Meg Drouhard, Casey Miller, Sadika Amreen, and Zahra Mahoor.

College of Engineering alumnus Dr. H.M. "Hash" Hashemian donated the seed funding to kick off Women in EECS through a \$10,000 contribution from his company AMS, the leading supplier of equipment, training, and services for in-situation response time testing and online calibration of temperature and pressure instrumentation in nuclear plants.

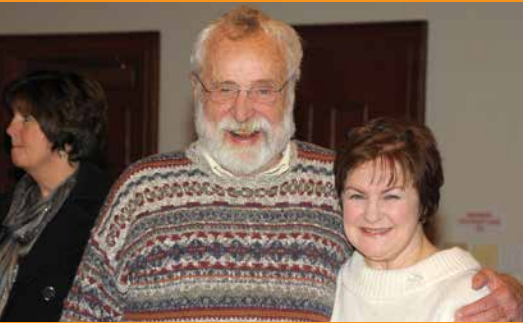


Women in Electrical Engineering and Computer Science (EECS) formed in 2013. Picture from left are faculty advisor Dr. Lynne Parker, Katie Schuman, Casey Miller, Meg Drouhard, Nicole Pennington, Denise Koessler, Sadika Amreen, and Zahra Mahoor.



Women in Electrical Engineering and Computer Science (EECS) launched the first Lean In Circle at the Grace Hopper Conference in 2013. Picture from left are Sadika Amreen, Katie Schuman, Casey Miller, Denise Koessler, Nicole Pennington, Meg Drouhard, and Zahra Mahoor.

COE Finance Director Judy Moore Retires in December 2013



Chancellor Emeritus Bill Snyder (left) dropped by the reception to give Judy Moore a hug.

Judy A. Moore, the college's longtime director of finance and administrative affairs, officially retired on December 31, 2013. The college held a reception on Friday, December 13, from 4:00 to 6:00 p.m. at the UT Welcome Center to honor Moore's thirty years of service to engineering and the university. Moore's daughter, Amy DuPree, and her husband, Hugh, and their two children made a special surprise appearance at the event, which was coordinated by staff members from the Finance and Administrative Affairs Office including Audrey Williams, Linda Watson, Jennell Klussman, and Mary Vineyard.

A total of over one hundred guests enjoyed a delicious appetizer buffet and a heart-warming PowerPoint slide show of the highlights from Moore's life and career at UT. Attendees included co-workers, former graduate assistants from the finance office, and numerous COE faculty and staff. COE Dean Wayne T. Davis spoke in tribute of Moore's dedication to the college and expressed appreciation for her long years of service.

Moore and her husband, Dr. Buddy Moore, have relocated to Murfreesboro, Tennessee. He is the executive director of the UT Space Institute.



Judy Moore (second from left) and her family at the retirement reception: (left to right) husband Buddy Moore; grandson Harrison DuPree; grandson Hubie DuPree; daughter Amy DuPree; and Amy's husband Hugh DuPree, Jr.



COE Dean Wayne Davis presents a painting by Ron Williams to Judy Moore at her retirement event.



Associate Dean for Academic and Student Affairs Masood Parang emceed the luncheon event.



Industrial engineering alumnus and donor Dwight Kessel (far right) and wife Gloria (right) talk with students and faculty at the college's Faculty and Staff Awards Dinner.



Student speaker Dave Seeman, a National Academy of Engineering Grand Scholar.



Scholarship donors Cindy and Mike Corn (center) enjoy the scholarship luncheon with (left to right) Department of Electrical Engineering and Computer Science Professor and Head Leon Tolbert; student Alex Roschli; development staff member Whitney Lee; and student Grace Biggs.

Engineering College hosts Student and Donor Appreciation Luncheon in October

The University of Tennessee College of Engineering hosted the Student and Donor Appreciation Luncheon at the Foundry on Thursday, October 31, 2013.

The annual event provides an opportunity to recognize outstanding students and to thank the donors who have generously provided support for scholarships. This year, for the first time, both department and college level scholarship recipients and donors were invited to the luncheon.

Dr. Masood Parang welcomed one hundred and forty guests, including donors, students, and university and college administrators, and noted that the college was celebrating 175

years of engineering at the University of Tennessee in 2013. He then introduced a special video presentation that outlined the history of engineering at UT.

The student speaker for the event was Dave Seeman, a senior in the Department of Mechanical, Aerospace, and Biomedical Engineering. Seeman is a COE Ambassador and will graduate in May of 2014 as a National Academy of Engineering Grand Scholar with a focus in entrepreneurship.

Parang concluded the luncheon by thanking the attending donors and extending congratulations to the outstanding students at the event.



As a student with an interest in computer science, I understand a great deal about problem solving. One of the greatest problems I have to face, as a student, is the issue of financial debt. The Anthony L. Vest Engineering Scholarship has been one of the most critical support beams that keep my tower of finances stable. Thanks to this scholarship, I have been able to not only maintain an acceptable GPA and complete the majority of my general classes, but I was also able to perform these tasks without having to take out any loans. I came to UT with the simple goal of learning more information and skills that will be useful for me throughout my life, and I can assuredly state that I am already accomplishing that goal. The Vest scholarship is proof that educational financial aid is important. I hope to continue to put this scholarship to good use and pursue my desire to learn even more here at UT.

Patrick Davis '14
Anthony L. Vest Scholarship Recipient

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EDP Students Participate in High-Profile Undergraduate Research Projects



Dr. Stephanie TerMaath (left) is working with Melanie Smith (right) on a project studying the effectiveness of Fiber Reinforced Polymer composite patches.

For over forty years, the Engineering Diversity Programs Office (EDP) in the College of Engineering has provided mentoring, support, and academic resources to underrepresented students during their engineering studies at UT. One of the most important components of the undergraduate experience is research. Currently, three Tennessee Louis Stokes Alliance for Minority Participation (TLSAMP) students are participating in important projects with COE faculty: Melanie Smith, Michael Massey, and Cristian Orozco. The TLSAMP program is a National Science Foundation funded grant geared towards increasing the pool of underrepresented students majoring in science, technology, engineering, and mathematics (STEM).

Smith is collaborating with Dr. Stephanie TerMaath, an assistant professor in the Department of Civil and Environmental Engineering, on a project studying the effectiveness of Fiber Reinforced Polymer (FRP) composite patches as a repair and reinforcement technique to improve the structural performance of metallic structure. FRP composite patches are adhesively bonded to damaged or undamaged metallic parts to increase load-carrying capacity and to improve damage tolerance of the part. This method has been successfully applied to aircrafts as well as naval vessels. In civil engineering, composites are now being integrated into the nation’s infrastructure, including bridges.

“Composite patches are ideal because they are easy to install, they resist corrosion, and they are easily formed into any desired shape,” Smith said. “Though composites are becoming increasingly popular in structural engineering applications, the uncertainty in the composite lamina properties can lead to unknown reliability of patch behavior resulting in prohibitive safety factors in the design of patches.”

A composite lamina is composed of fibers supported by a matrix. The variability in the fiber and matrix properties occurs as a result of many complex variables. This project presents a probabilistic analysis of the lamina properties resulting from the uncertainty in the input parameters.

“Working on this project has really broadened my horizon. I joined the research team after the diversity office encouraged me to look into research, and now my goal is to go to graduate

school,” Smith commented. “It has shown me how to apply civil engineering to real world situations. Working as a research assistant with Dr. TerMaath has given me the chance to learn about something I am interested in at my own speed. This opportunity has given me an introduction into graduate level material. Also, working with Dr. Jenny Retherford on distribution curves of the lamina properties has increased my coding skills. Through research I feel that I have a better understanding of the concentration that I want to pursue and the variety of options I have as a civil engineer.”

“I first met Melanie over the summer when we were both working with the HITES program to encourage under-represented high school students to pursue STEM degrees,” TerMaath said. “Melanie was one of the counselors, and I was immediately impressed with her maturity and enthusiasm for learning. Melanie has rapidly learned very advanced engineering methods and is writing a sophisticated set of programs to perform complex probabilistic evaluation of material behavior. I am grateful for the efforts of the EDP Office to facilitate research collaboration between faculty and exceptional students such as Melanie.”

Smith hopes to gain an in-depth understanding of structures and composite materials and added that the research that has gone into this project should increase efficiency with testing and analyzing the variability in the lamina properties and provide a better knowledge of the behavior of the composites. She hopes to continue this project through graduate school.

Massey’s research project is being supervised by Governor’s Chair in Advanced Manufacturing Dr. Suresh Babu. Babu is part of a research team that is working to increase the reliability, efficiency, and productivity of advanced additive manufacturing techniques. This initiative is divided into several areas, including large-scale productions, plastics, metals, compounds, and even electronics. Massey’s role is to work with Dr. Ryan Dehoff of ORNL on analyzing the effects of orientation and size in 3-D printed metals on the electron laser melting platform at the Manufacturing Demonstration Facility.

The overall goal of the project is to create a revolution in manufacturing by making various additive manufacturing techniques the main player. This includes making large-scale high quality products without limits to size, design, or geometry. Massey’s research is focused on properly cataloging and minimizing the effects of orientation in this process, especially for metals. His personal goal is to use this research and knowledge as a launching platform for his own graduate and professional research.

“On one level, this project helps relate a lot of the theoretical knowledge learned in the classroom to real world lab situations,” Massey said. “In addition, as this is a relatively unexplored area of engineering techniques, when things happen unexpectedly and to lesser degree even when they go perfectly, there are crucial critical thinking skills to explain why. This is different from a classroom setting, where we are told why and then we do the work. In the lab, we use the scientific method and form a hypothesis, test, and compare our hypothesis to our results. This gives me a distinct advantage in that I have accredited experience in a research setting, proven my ability to apply my skills to various aspects of a professional engineer, and have a particular knowledge in a specialized field.”

“The ability to work in an interdisciplinary team really challenges students, as well as faculty like me,” Babu said. “These challenges

lead to discoveries in making additive manufacturing real for aerospace and energy applications.”

Massey also works with two mentors at Oak Ridge National Laboratory (ORNL), Chad Duty and Ryan Dehoff.

“In some ways, the mentors are like tutors, in that they go over concepts needed for the paper work side of the research,” Massey commented. “But more importantly, they make sure you understand the physical theory of what’s going on and do their best to make sure you have all the training you need. They also recommend extra readings and trainings that would help in this experience, making sure I get the most out of this experience.”

In addition to their research projects, Smith and Massey both recently won honors at the TLSAMP undergraduate research conference, held February 27-28, 2014, at Vanderbilt University. Smith won second place in the engineering category of the poster competition for her entry titled “Probabilistic Analysis of Composite Lamina Properties.” Smith’s performance in the competition was evaluated based on scientific merit, originality, and her ability to explain her research and respond to questions from conference participants and poster session judges. Massey won third place in the Oral Presentation Competition in the engineering category at the event. His research project was the Center for Ultra-wide-area Resilient Electric Energy Transmission Networks (CURENT), and he was mentored by the professor and head of the Department of Electrical Engineering and Computer Science Leon Tolbert.

Orozco is working with CEE assistant professor Angelica Palomino in a NSF sponsored project titled “Engineering a Modifiable Clay: ‘Tunable’ Polymer-Clay Composites.” The purpose of this research is to investigate the modifiable properties of “tunable” clay-polymer composites composed with pH- and ionic concentration-responsive polymers. The results of this research will provide a greater understanding of responsive polymer-clay composite systems, which ultimately lead to the improvement of barrier systems, clay liners, and contaminant removal systems by using tunable engineered soil materials.

Orozco has personally been working on determining the plastic behavior of these materials by measuring the Atterberg limits; as well as investigating composite response under different pH and ionic concentrations by measuring its swelling/shrinkage.

“I believe this research opportunity is highly beneficial for me as it allows to more deeply comprehend the behavior of clay soils,” Orozco said. “Understanding how a particular soil will behave gives civil engineers more freedom to design and maintain heavy steel and concrete structures on a given soil.”

“Cristian’s participation has been invaluable to the progression of this project,” Palomino said. “The work that he is performing will lead to a greater insight into the behavior of ‘tunable’ clay-polymer composites. I am very appreciative of the opportunity to include Cristian as a member of my research team.”

Orozoco hopes this undergraduate research opportunity will prepare him for the challenges and environment that he will encounter in graduate school.

All three students agree that the EDP program and staff have been instrumental to their success as engineering students.

“The EDP staff has been helping me since day one, starting with tutoring sessions for my introductory engineering courses to all the way to GRE prep classes,” Orozco said. “I can always count on them when I need a little help on anything, whether this might be finding an undergraduate research position or helping me create a resume.”

Smith said the EDP has been a huge influence on her college career.

“EDP has provided me with amazing opportunities, and it is the reason I became interested in graduate school and involved in



Michael Massey (center) in the Manufacturing Demonstration Facility with Dr. Ryan Dehoff (left) and UT-ORNL Governor’s Chair in Advanced Manufacturing Dr. Suresh Babu.



Dr. Angelica Palomino (right) and EDP student Cristian Orozco are collaborating on a research project funded by the National Science Foundation.

research. The support from EDP has encouraged me to push myself further and excel within engineering,” Smith added. “They offer a multitude of resources including seminars, conferences, and a welcoming environment for students. I always feel that I can come to the office for advice about my academic goals or my future career plans. I feel proud to be an underrepresented student within my field and am grateful for the support that the EDP office has given to me.”

“The EDP was crucial in my initial recruitment of this project,” Massey said. “However, they have been supporting me the whole time in my academic career, everything from tutoring to counseling on future plans. I’ve met other students with similar goals and backgrounds, been exposed to various programs and organizations, and have the opportunity to help influence others thru mentoring and per-collegiate development programs. I think it is the staff of the EDP office that makes it such a welcoming place to get the support I need.”

“The EDP and the TLSAMP programs both encourage students to not only take advantage of internships and co-ops, but to explore other experiences, most importantly research,” said Erica Echols, a program coordinator in the EDP office. “Undergraduate research offers a perspective of the student’s academic discipline that normally is not gained while taking their semester courses. We applaud our student researchers on the great work they are doing and the faculty mentors that continue to invest time and knowledge into our students.”

Alumni Profile

University of Tennessee College of Engineering alums Mark Cox (BS/ChE '89) and Steve Crawford (BS/ChE '87) have a lot in common. The two men were both born in Kingsport, Tennessee, grew up in that city, and even went to the same high school. Cox and Crawford have been employed long-term with Eastman Chemical Company, which is located in Kingsport, and both currently hold professional positions with the company—Cox as Senior Vice President, Chief Manufacturing and Engineering Officer and Crawford as Senior Vice President and Chief Technology Officer. So it is no surprise that they share similar goals and visions for Eastman and for their careers.

Cox became interested in engineering as a youngster, assembling models of planes, trains, boats, and automobiles. In high school, he realized that he enjoyed chemistry and seeing how the earth's elements come together to create new and useful things. After graduation, he decided to major in engineering at the University of Tennessee.

"I knew I was interested in engineering and although I finally decided to major in chemical engineering, I found the breadth of engineering disciplines offered at UT very attractive," Cox said. "Also, the university was close to home, and offered an attractive scholarship. I was confident I would receive a quality education that would, if I applied myself, provide the opportunity to pursue a meaningful career."

Cox started his engineering career as a co-op (cooperative education) student at Eastman Chemical Company and was very pleased with the company culture and opportunities provided. After graduation, he began working at Eastman on a full-time basis and had multiple assignments within manufacturing, research & development, and commercial business management arenas. He eventually decided to further his education by studying for a Master of Business Administration (MBA) degree.

"During the early part of my career at Eastman, I had the opportunity to interface with several business organizations within the company and learned that I enjoyed working to create value at the intersection of science and commerce," Cox commented. "As my commercial interest grew, the company and I realized that some business education would allow me to contribute more meaningfully to the company's success. Northwestern's MBA program offered strong general business management preparation and was structured such that I could commute to Chicago on weekends to engage in the program."

Cox believes that his background in both business and engineering have allowed him to make unique contributions to Eastman, which is a technology-driven company that interfaces with global markets.

In his current position, Cox oversees Eastman's worldwide design and construction efforts along with Eastman's global manufacturing operations. This includes responsibility for the safety of employees and the communities in which Eastman operates.

"We spend a lot of time ensuring that we design, build, and operate safely," Cox said. "We also work hard to produce the highest, quality products in the most efficient manner possible."

Crawford was initially interested in medicine, but he eventually chose chemical engineering for his undergraduate degree because it provided the chemistry curriculum as well as the engineering and math influences to provide a diverse set of choices going forward. He decided to attend UT after a campus visit.



Mark Cox (left) and Steve Crawford (right) are both executives with Eastman Chemical.

"The culture and the size of the university aligned well with my preferences," Crawford said. "UT's chemical engineering program also had a very challenging curriculum, which was important to me."

Crawford also started with Eastman as a co-op student and enjoyed the practical application of his studies. He went to work for the company full-time after graduating, initially hired into the technology division, but he quickly moved into manufacturing. He held several management positions in the Acetyl and Cellulose Esters Division before returning to technology in 2000. During his twenty-seven years at Eastman, Crawford was a part of several initiatives, including the Tritan™ launch, the emergence of the company's Displays product line, and the expansion of the Asia Pacific Technology organization.

Crawford's division is responsible for providing global technical support to Eastman's manufacturing assets, focused on operational excellence, safety, reliability, and improved productivity. The group also has responsibility for new process and product development and for providing technical support to customers. The continued growth of the company is a primary focus.

"We employ fourteen thousand people around the world and serve customers in one hundred countries, so Eastman is a global company," Crawford said, "Our impact in East Tennessee and the state as a whole is particularly substantial. Our international headquarters are in Kingsport, and we have six thousand five hundred permanent employees plus another three thousand five hundred contract employees here. That makes our Tennessee Operations Eastman's largest site—and makes us the biggest manufacturer in the state. In terms of sheer economic impact, Eastman's Kingsport site has an estimated impact of \$4.8-\$5.6 billion in Tennessee."

Both Cox and Crawford plan to continue their careers at Eastman for years to come.

"When I think of my future, I think of the future goals of the Eastman team," Cox said. "My desire is to serve all Eastman stakeholders—employees, our communities, shareholders, suppliers, customers—with integrity and intensity such that when I leave my current role, we can collectively say that we improved in the areas of safety, productivity, and innovation while never compromising on our core beliefs. It is Eastman men and women who have and will make our company a great one."

"At Eastman, we want to be world class innovators," Crawford commented. "We want to create value for our customers by delivering practical solutions for their needs both today and in the future. We aim to combine our unique insights and proprietary technologies to deliver new offerings that our customers value. Process and application innovation has always been at the core of our strength and culture."

Cox and his wife, Karen, met at UT, where she received her bachelor's degree in education in 1991. The couple has a son and daughter, and enjoys outdoor activities and exploring the national parks (including the Great Smokeys).

Crawford and his wife, Shawna, met while both were working at Eastman, and they have two sons. They both play golf and enjoy exercising together.

Development Update



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TO Big IDEAS



Executive Director of Engineering Development
Dorothy Bryson

Dorothy Barkley Bryson
Executive Director of Development
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Web site: www.engr.utk.edu/give

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Department of Nuclear Engineering Wins First UT-COE Halloween Spirit Challenge

Faculty and staff from the Department of Nuclear Engineering (NE) won the inaugural UT COE Halloween Spirit Challenge on October 31, 2013. The challenge, also called the "Battle on the Bridge," took place between NE and the occupants of the new John D. Tickle Building: the Department of Industrial Systems Engineering (ISE) and the Department of Civil and Environmental Engineering (CEE).

The NE team's theme was "Pirates," as they were attempting to "take over" the walkway bridge to the Tickle building. They were successful and were crowned "winners" by a team of COE staff judges, who presented them with a now-coveted Halloween trophy.

CEE's costume theme featured characters from the animated film *Despicable Me*. ISE's costume theme was "Industrial and Systems Engineering taming the evil forces that affect process efficiency."

Nuclear engineering faculty and staff thanked their able competitors and plan on defending their title in 2014.



The three departmental winners of the costume contest were, from left, Dr. James Ostrowski from Department of Industrial and Systems Engineering as "The Man in the Yellow Hat," along with his Curious George; Dr. Ondrej Chvala from the Department of Nuclear Engineering as a pirate; and Dr. Chris Cox from the Department of Civil and Environmental Engineering as a "minion" from the film *Despicable Me*.



Ahoy, mates! The Department of Nuclear Engineering Pirate Team took first place at the UT-COE Halloween Spirit Challenge.



Dr. Lee Han, Dr. Jenny Retherford, and Dr. Chris Cox from the Department of Civil and Environmental Engineering dressed as characters from the animated film *Despicable Me* for the Halloween Spirit Challenge.



Faculty and staff from the Department of Industrial and Systems Engineering pose in costume during the Halloween Spirit Challenge.

College of Engineering Names New Coordinator of Media Relations

David Goddard, formerly of the *Knoxville News Sentinel*, has joined the College of Engineering as coordinator of media relations, where he will focus on media placement for engineering research, faculty, students, and outreach.

Goddard reports to Dean Wayne Davis and serves on the dean's leadership team. He is also a member of the Office of Media and Internal Relations team, which is part of the UT Office of Communications and Marketing.

An East Tennessee native, Goddard was most recently an online producer for the *News Sentinel*, where he spent seven years compiling, editing, designing, or working with the publication of articles for both print and online distribution. Prior to the *News Sentinel*, he worked as assistant news editor for the *Daily Times* in Maryville and as a reporter for the *Cleveland Banner* and the *Morristown Citizen-Tribune*.

Goddard graduated from UT in 1998 with a bachelor's degree in geography. He is a three-time winner of the Society of Professional Journalists Award of Excellence as well as the 2012, 2011, and 2008 winner of the Tennessee Sports Writers Association's statewide award for design.

"David will help advance our strategic goals for growing the college and enhancing Tennessee's workforce," Davis said. "His background as a reporter and producer will help us share the many ways our college has an impact across the state, nation, and world."

Goddard will work closely with the Engineering Communications Office and Engineering Development Office on advancing public relations goals with the college's broad constituencies.



David Goddard

Events & Awards

UT Engineering Team Wins Awards at First Knoxville Holiday Canstruction



The UT CEE team works on the Canstruction project: (left to right) Trey Pippin, Sarah Howell, Steve Harvey, CEE professor Dr. Jenny Retherford, Emily Dahlstrom, Jonathan Skinner, Javan Reynolds, Marvin Martinez, Aaron McClellan (student team leader), and Kyle Scobie (Messer representative, team corporate sponsor).



Finishing out the Canstruction project at the Knoxville Convention Center.

A team from the University of Tennessee College of Engineering led by Department of Civil and Environmental Engineering professor Dr. Jennifer Retherford was awarded for its unique sculpture at the first Knoxville Holiday Canstruction that took place at the Knoxville Convention Center November 23-December 3, 2013.

Five location teams of architects, engineers, and construction companies competed in the Knoxville Canstruction, a massive can sculpture art competition presented by Messer Construction Co. that benefited Second Harvest Food Bank of East Tennessee. Nationally, Canstruction events take place in one hundred and seventy cities and are one of the largest national contributors of food to local food banks. Qualifying structures from the Knoxville Canstruction event will be entered into the national Canstruction competition. Each Canstruction structure typically includes between nine hundred and three thousand five hundred cans, with only one-quarter inch plywood or Plexiglas between the rows of cans and one-quarter inch cardboard tubing for support.

Nine judges representing media, arts organizations, nutritionists, tourism organizations, and local food production companies convened to select the winners of competition and scored each structure in four categories. A “People’s Choice Award” was decided through a public vote on the Knoxville Canstruction Facebook page.

The College of Engineering team won “Best Meal” and “Honorable Mention” for its sculpture “CANcracker.” The sculpture included two large nutcrackers with a moving mouth and motion-censored sound effect built with cans to prepare a balanced meal of chili with peanuts and fruit dessert. The team was selected for creating the most nutritious meal to help fight hunger in East Tennessee and for earning the second-most points among the jurors. The team was also awarded the coveted “People’s Choice Award” for receiving the most votes in an online poll.

The Knoxville Holiday Canstruction donated more than ten thousand cans of food to help Second Harvest Food Bank of East Tennessee. Second Harvest targets the working poor—those who are employed but might not receive benefits or earn sufficient wages. According to Second Harvest, one in six East Tennesseans lives in poverty and has difficulty meeting basic needs. The charity serves one hundred and fifty-eight thousand people each month. It secures and distributes more than 16 million pounds of food and grocery products annually and is a partner with Feeding America, a national network of food banks.

COE Welcomes High School Students to Engineers Day 2013



Cavanaugh Mims (BS/NE '86), COE alumnus and president of the UT Alumni Board of Directors, was the keynote speaker for the 2013 College of Engineering Engineers Day.

Engineers Day has been a UT College of Engineering tradition since 1912, when engineering students were enlisted to help construct a road to Estabrook Hall. Now, each October, undergraduate engineering classes are dismissed for one day to allow university students and faculty to spend time interacting with hundreds of potential engineering students from high schools across the region.

On October 24, 2013, almost one thousand students from forty-two different high schools (and some home-schooled students)

traveled to UT’s Knoxville campus to explore and learn about engineering through discussions, project demonstrations, and exhibits prepared by UT engineering student clubs and societies. Participants experienced an overview of the different engineering disciplines and saw examples of how an engineer’s work impacts daily life.

The keynote speaker for the day was COE alumnus Cavanaugh Mims (BS/NE '86). Mims enjoyed a long career with the Department of Energy and the Tennessee Valley Authority before founding his own company, Visionary Solutions, LLC. He is also the current president of the UT Alumni Board of Directors.

Engineers Day features six competitions for visiting students.

The Quiz Bowl, presented by Tau Beta Pi (the National Engineering Honor Society), pits teams of four against each other in three rounds of multiple-choice questions. A team from Farragut High School in Knox County won the 2013 Quiz Bowl.

The Egg-Drop Competition is sponsored by the Department of Materials Science and Engineering (MSE), the Materials Advantage student chapter, and student chapter of the Society of Plastic Engineers. This contest challenges students to design a device that will protect an egg from breaking when dropped. The winning team for 2013 was from East High School in Memphis.

The UT Student Chapter of the American Society of Civil Engineers (ASCE) sponsors the High School Balsa Wood Bridge Competition, which tests the structural efficiency of miniature bridges constructed by participants. Students from Hampton High School, in Carter County, won this time around.

The Food Battery Competition, sponsored by the UT Materials Research Society (MRS), provides a lesson in emissions-free transportation by challenging students to design a battery from edible or drinkable materials. First place went to a student at Pigeon Forge High School.

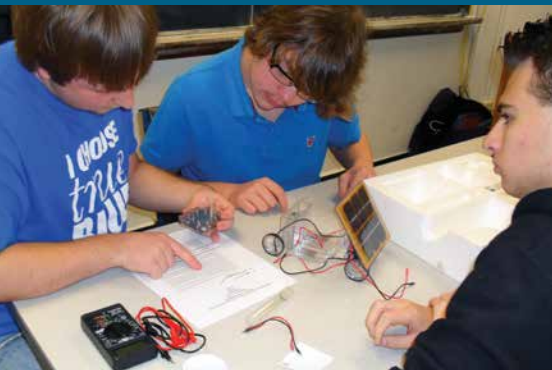
The Radiation Shielding Competition, sponsored by the American Nuclear Society (ANS), challenges students to construct a shield that blocks radiation from an intended target. This year’s winners attend the L&N STEM Academy in Knoxville.

The Society of Hispanic Professional Engineers (SHPE) at UT coordinated the very first Solar/Fuel Cell Car Race for the 2013 Engineers Day. Teams assembled small cars, energized solar fuel cells, and competed in a twenty-two foot race in Ferris Hall. Students from Pigeon Forge High School, in Sevier County, won with their entry.

More information on the competitions and Engineers Day can be found at www.engr.utk.edu/ed or by calling the Engineering Academic and Student Affairs office at 865-974-2454.

The next Engineers Day will be held in October 23, 2014.

High-school students work to build their entry in the very first Solar/Fuel Cell Car Race, coordinated by the Society of Hispanic Professional Engineers (SHPE) at UT for the 2013 Engineers Day.



Students compete to design and build an effective battery in the Food Battery Competition during the 2013 Engineers Day.



Students attempt to build the strongest structure in the Balsa Wood Bridge Competition during the 2013 Engineers Day.



High-school students test their engineering skills in the Egg Drop Competition during the 2013 Engineers Day.



Enjoying the College of Engineering Homecoming 2013 event are (left to right): Linda Davidson; Dean Wayne Davis; Linda Whaley; Lee Dodds; John Hanula; and Kevin Colvett.



Greeting guests at the Homecoming 2013 event are (left to right) Juliette McClure from the Engineering Development Office and Engineering Ambassadors Emily Leturno and Tyler Rowe.

COE Hosts Successful

The University of Tennessee College of Engineering hosted its annual Alumni BBQ on the Hill on Saturday, November 9, 2013. The event, held three hours prior to kickoff of the UT-Auburn game and catered by Dead End BBQ, included two hundred and thirty-nine faculty, staff, students, alumni, and special guests.

The Homecoming celebration featured exhibits and demonstrations, reunions with former classmates and faculty, and games for both adults and children.

Student exhibitors included the American Society for Civil Engineers, who showed off steel bridge and concrete canoe projects; the American Society of Chemical Engineers, who demonstrated the chem-e-car; the Society of Women Engineers; the Engineering Professional Practice Office; the Department Nuclear Engineering; the Engineering Ambassadors; and the Engineering Fundamentals Program.



CBE professor Pete Counce (far right) talks with students at the COE 2013 Alumni BBQ event.



Brady Dove (left) and Adele Poole (right) play a game of cornhole.

Guests also enjoyed tours of the new Min H. Kao Electrical Engineering and Computer Science Building and the John D. Tickle Engineering Building.

Special guests included COE Dean Wayne Davis and wife Sylvia; Associate Dean for Research and Technology Bill Dunne; and ISE department head John Kobza, as well as many other engineering faculty, both current and retired.

Although the Tennessee Volunteers were defeated by the Auburn Tigers at the game following the event (Auburn went on to play against Florida State in the national BCS championship) spirits remained high and everyone enjoyed the beautiful fall weather and the opportunity to demonstrate the Vol spirit.

Alumni News

COE Alum Receives Fung Young Investigator Award



Dr. David W. Merryman

Dr. W. David Merryman II (BS/ES '01, MS/ES '02), an assistant professor in the Biomedical Engineering, Pharmacology, Medicine, and Pediatrics Department at Vanderbilt University, has been selected by the American Society of Mechanical Engineers (ASME) to receive the Y.C. Fung Young Investigator Award at the 2014 seventh World Congress of Biomechanics Conference in Boston, Massachusetts, in July.

Merryman received a BS degree in 2001 and a MS degree in 2002 from the University of Tennessee, both in engineering science.

The Young award is presented for singular achievements in the study of heart valve mechanobiology in the teaching of biomechanics, and in recognition of outstanding services to the engineering profession, including the ASME Bioengineering Division. For more information, visit www.asme.org/about-asme/get-involved/honors-awards/achievement-awards/y-c-fung-young-investigator-award.

COE Alumnus is Selected for Two Prestigious Recognitions



Dr. Dewey Hodges

Dr. Dewey Hodges (BS/AE '69), a professor at the Guggenheim School of Aerospace Engineering at Georgia Institute of Technology, recently received one national engineering organization award and is nominated for a second.

Hodges received the American Institute of Aeronautics and Astronautics (AIAA) Award for Aeroelasticity in 2013. The Ashley Award for Aeroelasticity recognizes outstanding contributions to the understanding and application of aeroelastic phenomena. It commemorates

the accomplishments of Professor Holt Ashley, who dedicated his professional life to the advancement of aerospace sciences and engineering and had a profound impact on the fields of aeroelasticity, unsteady aerodynamics, aeroservoelasticity, and multidisciplinary optimization. Hodges was recognized for lasting contributions to analysis methodology for aeroelasticity of rotorcraft and high-aspect-ratio wings, and development of educational materials for undergraduate study of aeroelasticity. The award consisted of an engraved medal, a certificate of citation, a rosette pin, and an honorarium.

Hodges will also be recognized by AHS International at the 2014 Alexander A. Nikolsky Honorary Lectureship. The lecture will be delivered at the 70th AHS Annual Forum and Technology Display in Montréal, Québec on Tuesday, May 20, 2014. The Nikolsky Lectureship is awarded to "an individual who has a highly distinguished career in vertical flight aircraft research and development and is skilled at communicating technical knowledge and experience." Hodges was cited for his seminal contributions to analysis methodology of aeroelasticity and structural dynamics of rotors, and his development of textbooks and courses in these areas."

Hodges has been an international leader in the development of the analytical and computational methods for analysis of structural mechanics, structural dynamics, and aeroelasticity. His research contributions are continuously cited and applied by his peers in the field. Hodges' work is known for its strong foundation in mathematical rigor and first principles.

For more information, visit:

www.coe.gatech.edu/content/ae-professor-dewey-hodges-awarded-aiaa-holt-ashley-award-aeroelasticity

www.vtol.org/publications/ahs-press-releases/2014-nikolsky-award

UT College of Engineering Alumnus Selected for New Cast of NBC's "American Dream Builders."



Tarrick Love

Tarrick Love (BS/ME '97), the co-owner of Hart-Love Enterprises, LLC, has been selected as part of an elite group of only twelve accomplished designers and homebuilders from around the country to join the cast of the new NBC show, Nate Berkus' *American Dream Builders*. Hosted by the famed interior designer and producer, this reality competition series will premiere on the NBC network on March 23, 2014. Each week, the contestants will be pitted against each other in two massive, transformative home-renovation projects, ultimately competing for a cash prize of \$250,000.

Love, who owns the company Hart-Love Enterprises, LLC, with his wife, Tanisha Hart-Love, also a University of Tennessee graduate from the College of Arts and Sciences in 1999 and the College of Law in 2002, has won two awards for historic preservation in the state of Tennessee. The Hart-Love Enterprises, LLC, and Love's other firm, Dream Build Nashville, are based in Nashville.

Love began his career as a mechanical engineer and after eleven years in the field found his passion in home building. Since forming his own companies in 2006, Love has served as a licensed general contractor and developer for more than one hundred new builds, renovations, and additions. He is a certified Leadership in Energy and Environmental Design (LEED) builder.

Berkus will be one of the judges for the competition, and will be joined by Heisman Trophy winner, former NFL running back, and landscape architect Eddie George and design expert Monica Pederson. George also has Tennessee connections as he spent the majority of his career with the Tennessee Titans football team based in Nashville.

Pederson is a nationally famed designer and host of *Designed to Sell* whose work has been featured on HGTV as well as other network and cable television shows.

Four College of Engineering Alumni Named in the Top 40 under 40.



Jason Brooks



Bill Peter



Tony Spezia III



Anne Weaver

The UT College of Engineering is proud to acknowledge four outstanding alumni who were recently named to the *Business Journal's* Forty under 40. The awards, now in their seventh year, honor individuals younger than 40 who are making great achievements and contributing to philanthropic efforts in the East Tennessee region. The program is sponsored by Lincoln Memorial University.

The engineering alums making the list include: **Jason Brooks** (BS/CEE '08, MS/CEE '10), president and CEO, Lamar Dunn and Associates Inc.; **Bill Peter** (MS/MSE '02, PhD/MSE '05), associate division director, Materials Science and Technology Division, Oak Ridge National Laboratory; **Tony Spezia III** (BS/ME '01, MS/ME '03, MBA '03), senior manager, mechanical engineering, Siemens Medical Solutions USA; and **Anne Weaver** (BS/IE '03, MS/EM '07), director of the Facilities Management Division, Oak Ridge National Laboratory.

Photos shot for the *News-Sentinel* by J. Miles Carey.

Alumni News

1980s



John Hanula (*BS/Architecture '83, BS/CE '84*), senior vice president and business development director with CH2M Hill, US client sector, was named to the Board of Directors of the WaterReuse Research Foundation. As a board member, Hanula will represent the water industry and work to advance the science of water reuse, recycling, reclamation, and desalination. He was also appointed in November to the Sonny Astani Department of Civil and Environmental Engineering Advisory Board at the University of Southern California (USC) Viterbi School of Engineering. Hanula is based in CH2M Hill's Los Angeles, California, office.

1990s



Dr. Don Malloy (*PhD/ME '99*) was named in the February 2014 edition of *PE*, the National Society of Professional Engineers (NSPE) magazine, as a contender for the Federal Engineer of the Year Award for 2014. He also received the 2013 Air Force Materiel Command Senior Civilian Engineer Award, cited for demonstrating "innovation, initiative, and unrivaled technical expertise, creating and executing a risk reduction plan to support a low-cost, accelerated aerial target development effort." Malloy is the flight systems analysis lead with the Arnold Engineering Development Complex (AEDC) Analysis and Evaluation Branch at Arnold Air Force Base.

Memorials

Staff



Angela Miller

Angela Miller, of the College of Engineering Advising Services staff, passed away suddenly on Monday, December 30, 2013. She was a graduate of Powell High School in Knoxville, and also a 2009 graduate of the University of Tennessee. Miller joined the advising office in 2011 and was a recipient of the Outstanding Staff Award in 2013.

Faculty



Milton Bailey

Dr. John Milton Bailey Jr., of Knoxville, passed away October 12, 2013, at his home in the Shannondale Retirement Community. Bailey was a professor emeritus in the Department of Electrical Engineering and Computer Science (EECS) and an adjunct participant at the Oak Ridge National Laboratory (ORNL). In 1994, he received the Nathan W. Dougherty Award for Distinguished Service in the Engineering Profession, the most prestigious award given by the College of Engineering at the University of Tennessee. Bailey held five patents in the field of electric motor design and control.



Dr. Joseph Perona

Dr. Joseph James Perona, former head of the Department of Chemical and Biomolecular Engineering (CBE), died on December 5, 2013, at his home in Brevard, North Carolina. Born May 28, 1930, Perona was a professor of chemical engineering at UT from 1963 until his retirement in 1996, and served as the head of CBE from 1984 until 1990. While in Knoxville, Perona was a member of the Smoky Mountain Hiking Club, after retiring to Cashiers, the Nantahala Hiking Club, and after moving to College Walk Retirement Community in Brevard, the Pisgah Hikers. For six summers while in his 70s he made hiking trips in the French and Italian Alps, the last when he was 79. He was a member of the Sierra Club and the Nature Conservancy.



Andrew Spickard

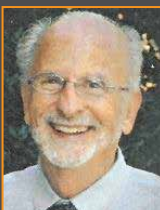
Dr. Andrew Spickard, former associate dean of the College of Engineering, died Saturday, December 2013, at Blount Memorial Hospital in Maryville. Born July 22, 1921, he was a graduate of Tennessee Military Institute and the University of Washington in Seattle, where he studied engineering and business administration. He served in the Pacific Theatre as a captain during World War II. Spickard retired from Alcoa in 1978 following a thirty-five-year career in management positions in sales, real estate, and subsidiary companies. At the time of his retirement he was president of Alcoa Construction Systems, Inc. Following his Alcoa service, he

joined the staff of the UT College of Engineering, where he held the position of associate dean until he retired in 1988.



Dr. Joseph Spruiell

Dr. Joseph Spruiell, former head of the Department of Materials Science and Engineering (MSE), passed away peacefully at his home in Knoxville on February 17, 2014, after a brief illness. Born on October 13, 1935, Spruiell graduated with his BS, MS, and PhD in engineering from the University of Tennessee. He taught at UT for fifty years, and served as department head in MSE for fifteen years.



Clement Wilson

Dr. Clement "Clem" Wilson (*BS/ME '56, MS/MechE '59*) died on January 25, 2014. He was a UT professor emeritus in the Department of Mechanical and Aerospace Engineering. Wilson received his BS and MS from UT and his PhD in Engineering from Purdue University. He worked for IBM in engineering management for twenty-six years. While with IBM in Boulder, Colorado, he was a member of the College of Engineering Board of Advisors. After retiring from IBM, Wilson returned to UT to teach engineering. He was a member of Tau Beta Pi and Pi Tau Sigma Engineering fraternities and Phi Sigma Kappa social fraternity. He was the author of numerous technical papers. Wilson was presented an Outstanding Engineering Alumnus Award by UT.

Student

US Air Force Captain **Christopher Stover** died on January 7, 2014, in a helicopter accident while serving his country off the coast of England. He was a Master's Degree candidate in the Department of Nuclear Engineering from the fall of 2012 through the fall of 2013. Stover was a native of Vancouver, Washington.

Alumni

Dr. James W. Blackburn (*PhD/ChemE '88*) died on February 21, 2013. He was a resident of Carbondale, Illinois.

Robin Hinton Hines, (*MS/ME '63*) died on November, 15, 2013. He was a resident of Tullahoma, Tennessee.

John Mauk Kennerly (*BS/ChE '65*) died on October 14, 2013. He was a resident of Knoxville.

Herbert L. Parr (*BS/ME '57*) died on May 29, 2013. He was a resident of Nashville, Tennessee.

John Goode Pettyjohn (*BS/EE '56*) died on January 26, 2013. He was a resident of Seymour, Tennessee.

John William Taylor (*BS/CE '58*) died on January 16, 2013. He was a resident of Adamsville, Tennessee.



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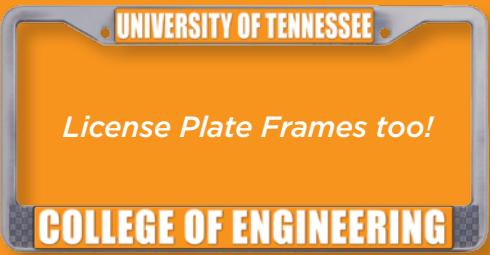
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Calendar

Spring 2014

Classes Begin	Jan 8
2nd Session Begins	Feb 27
Spring Break	Mar 17-21
Classes End	Apr 25
Study Day	Apr 28
Exams	Apr 29-30, May 1-2, 5-6
Graduate Hooding	May 8
Commencement	May 7-10
Official Graduation Date	May 10

Fall 2014

Classes Begin	Aug 20
Labor day	Sept 1
Fall Break	Oct 16-17
Classes End	Dec 2
Study Day	Dec 3
Exams	Dec 4-5, 8-11
Graduate Hooding	Dec 12
Commencement	Dec 13
Official Graduation Date	Dec 13

Contact Information

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Dr. Wayne Davis, <i>Dean of Engineering</i>		Dean's Office	974-5321
		Development	974-2779
Dr. Bill Dunne, <i>Associate Dean for Research & Technology</i>		Engineering Advising Services	974-4008
		Engineering Diversity Programs	974-1931
Dr. Veerle Keppens, <i>Associate Dean for Faculty Affairs</i>		Engineering Fundamentals	974-9810
		Engineering Professional Practice	974-5323
Dr. Masood Parang, <i>Associate Dean for Academic & Student Affairs</i>		Engineering Research	974-8360
		Engineering Student Affairs	974-2454
Departments		Finance & Admin. Affairs	974-5279
Chemical & Biomolecular	974-2421	Research Centers	
Civil & Environmental	974-2503	Materials Processing	974-0816
Electrical & Computer Science	974-3461	Maintenance & Reliability	974-9625
Industrial & Information	974-3333	Scintillation Materials	974-0267
Materials Science	974-5336	Transportation Research	974-5255
Mechanical, Aerospace &		Intelligent Systems and	
Biomedical	974-2093	Machine Learning	974-5803
Nuclear	974-2525	CURRENT	974-9720
Administration & Programs		Innovative Computing Laboratory	974-8295

Big Orange Friday

Show us your orange!

Do you want to show your love for the University of Tennessee? Participate in Big Orange Friday! Every Friday, UT alums are encouraged to wear orange. The color unites alumni and fans alike, and provides an opportunity to connect with one another and tell our Volunteer stories to the world.

Wear your colors. Tell your story.

#BigOrangeFriday

Future Vols

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Refer a Vol at futurevols.utk.edu