The University of Tennessee to Lead $259 Million National Composites Manufacturing Institute

UT Vice Chancellor for Research Taylor Eighmy (right) and COE Governor’s Chair in Advanced Manufacturing Suresh Babu (left) were the principal investigators for the proposal that led to UT’s leadership of the Institute for Advanced Composites Manufacturing Innovation (IACMI).

President Barack Obama (right) and Vice President Joe Biden (left) announce UT’s leadership of IACMI at the Techmer PM plastics fabrication company in Clinton, Tennessee, in January 2015.
I am as excited as I ever have been upon reviewing the topics being covered in this latest edition of Tennessee Engineer. More than ever, our students, faculty, and staff are engaged in providing the best education to an increasingly larger number of undergraduate and graduate students. Our freshman class this year is the largest ever and all indications are that the Fall 2015 class will be one of the largest increases that we have seen in the last ten years—thanks to the recently added Volunteer Scholarships for both in-state and out-of-state students. The great news is that those entering students are highly engaged in their education, participating at increasing numbers in our world class cooperative engineering program, in undergraduate research experiences led by our faculty, and in international exchange programs. Many of these experiences are being augmented by the very strong support of our donors and friends of the college as well as from corporations.

I have said over the last couple of months that the next several years will see a substantial increase in our college’s development of partnerships with companies across the US. In this edition, we feature UT’s recent success, as announced by President Obama in January in Clinton, Tennessee, of being awarded the fifth of the nation’s new manufacturing institutes. The institute, IACMI, will be operated as a 501(c)3 under the University of Tennessee Research Foundation. IACMI focuses on reducing technical risk and develops a robust supply chain for advanced composite materials in automotive applications and others such as wind turbines and compressed gas storage.

It will provide an opportunity for our faculty and students to engage with the one hundred and twenty-two partner members, including numerous industries, non-profit organizations, universities, and state and federal agencies. We already have partnerships and relationships with many of the partners, but IACMI will enhance those and provide opportunity for us to create even stronger relationships with all participants. In the end, our faculty and students will have an opportunity to engage in research and training and to become better positioned to make an impact on the future manufacturing and innovation that are needed for our state and nation to be competitive world-wide. It is exciting to be at the center of this national initiative.

IACMI is one of many of our initiatives in which the college is engaged and comes in a line of other notable successes, such as the college’s recent inclusion as a research partner in the National Network for Manufacturing Innovation Institute and the American Light Metals Manufacturing Innovation Institute – Light-Weight-innovation for Tomorrow (ALMMI-LIFT). These all enhance our existing programs such as the NSF-DOE Engineering Research Center—CURRENT; our Reliability and Maintainability Center (RMC); profiled on page 22), and our Engineering Professional Practice co-op programs. Couple these with the activities that our alumni are involved in worldwide and our college and its graduates are making a huge impact worldwide—and even in outside of the world, as we have a UT engineering graduates manning the International Space Station. It is a great time to be a Vol!

Wayne T. Davis
Wayne T. Davis Endowed Chair in Engineering
University of Tennessee to Lead $259 Million Public-Private Partnership

On Friday, January 9, 2015, President Barack Obama and Vice President Joe Biden visited the Knoxville area to announce that the University of Tennessee will lead the Institute for Advanced Composites Manufacturing Innovation (IACMI), a $259 million public-private partnership. The Institute reflects a $70 million commitment from the U.S. Department of Energy and $189 million in commitments from (IACMI’s) partners.

Supported by the Advanced Manufacturing Office in the DOE’s Office of Energy Efficiency and Renewable Energy, IACMI joins four other institutes backed by the Obama administration in a recent push to accelerate advanced manufacturing.

IACMI will be both a magnet and a catalyst for rapid innovation and the process itself.

One of the stated goals of Obama’s Clean Energy Manufacturing Initiative by recipient for his role in advancing manufacturing and the process itself.

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President Obama (center) and Vice President Joe Biden (far right) take a look at the 3-D printed carbon fiber replica of a Shelby Cobra at Techmer PM, a plastics fabrication company based in Clinton Tennessee. The car was printed by a team including UT engineering students Andrew Messing and Alex Roschli.

President Obama discusses the IACMI initiative with Martin Keller, associate laboratory director at Oak Ridge National Laboratory, at the announcement event.

The Cobra was 3D-printed with advanced composites that cut its weight in half while improving performance and safety, with a motor powered by wide-bandgap power electronics that are more efficient and less expensive than traditional silicon technologies and can be charged wirelessly. Amazingly, the car was developed and produced by six people in just six weeks. Officials at ORNL were also pleased with what the project achieved. “They really helped out with the printing and assembly of the car,” said ORNL group leader Lonnie Love. “They, and a number of other UT students, are critical members of our team.”

For more information, visit tntoday.utk.edu/2015/01/09/white-house-picks-ut-lead-national-composites-manufacturing-institute/.

Related video: www.youtube.com/watch?v=VobUkNKpCGE

“The UT Nonwovens Research Laboratory (UTNRL) has a long history of working with industry on product development in the areas of specialty fibers, nonwovens and composites. Because of my experience in processing of fibers/fabrics and carbon fibers, I was actively involved in the commissioning of Carbon Fiber Technology Facility (CFTF) at ORNL and hope to continue to collaborate with ORNL and industrial partners in providing solutions to problems in composite manufacturing as a part of IACMI. This project will open additional opportunities for our students to gain hands-on experience with our pilot line facilities. Our industrial partners are also excited about this opportunity to share their expertise with other consortium members in IACMI.”

“The university was involved in this project since inception, and as the car was assembled to go after this award, our involvement was driven, in part, by our shared focus with ORNL in the advanced manufacturing space–metallic, carbon fiber, and composites.”

“This has brought together unprecedented commitment from state governments, industry, and research institutions to develop the workforce, create jobs, and increase global manufacturing competitiveness in advanced polymer composites. Our state partners include the top five states for automotive employment and companies representing seventy percent of US automotive manufacturing.”

“I was involved with the IACMI core team since its formation, representing the University of Tennessee, Knoxville, and integrating our technical capabilities and unique university resources in the area of the carbon fibers and polymer composites. Working closely with the faculty, IACMI board members, and Vice-Chancellor Eighmy, and Dean Davis, I look forward to the opportunities with IACMI as it evolves.”

“Being the lead institution on this project is a testament to the ideas, research, and faculty that we bring to the table. From our expertise in developing the materials of the future to our work in advanced manufacturing techniques and 3D printing, our college has a wealth of expertise that we can share with the institute, and that really shows in our selection to lead that enterprise.”
Zawodzinski, Paddison Selected For Royal Academy of Engineering Fellowships

The United Kingdom’s Royal Academy of Engineering awarded Thomas Zawodzinski, the Governor’s Chair Professor in Electrical Engineering (EECS) and its students. Burdette has a strong personal commitment to UT, in particular the Department of Civil and Environmental Engineering (CEE) and its students. Burdette has established the endowment in honor of Burdette’s service and commitment to UT, in particular the Department of Civil and Environmental Engineering (CEE) and its students. Burdette has been an educator at UT for over forty-five years. Burdette, who is the Fred N. Peckbloom Professor in the CEE department, has also been named the P. G. Hoadley Award for 2014. The award, given to the outstanding engineering educator by the Tennessee Section of the American Society of Civil Engineers, is one of the highest honors attainable in her field.

Burdette is a fellow of both the American Society of Civil Engineers and the American Concrete Institute.

MSE Faculty Member Receives Funding for International Research Project

The award, given to the outstanding engineering educator by the Tennessee Section of the American Society of Civil Engineers, is one of the highest honors attainable in her field.

Both professors serve in the Department of Chemical and Biomedical Engineering.

The program was established to develop capacity and facilitate collaborations by distinguished international experts with UK universities. With only three total professors from the United States being selected the previous year, having two from the same college, let alone the same department, is an amazing accomplishment.

Paddison, who is a member of the Royal Society of Chemistry among other notable organizations, will spend a month in the Department of Materials Science and Metallurgy at the University of Cambridge.

“As I have spent significant time in the past at Cambridge University as a Visiting Fellow and Scholar, this is nevertheless a real privilege and honor that promises to be another intellectual and fruitful experience,” said Paddison.

Paddison will spend the month of June in the UK and will present lectures and seminars on the multiscale modeling of materials for batteries and fuel cells.

Zawodzinski will spend part of the upcoming summer visiting the laboratory of Professor Nigel Brandon, Department of Earth and Environmental Sciences at Imperial College in London to continue collaborative work.

Research proposals will be formulated to forge connections and collaborations between UT and the various UK institutions.

For more on the Royal Academy of Engineering, visit raeng.org.uk.

COE Faculty Members Receive $1.2 Traffic Safety Project Grant

Two faculty members associated with the College of Engineering’s Center for Transportation Research (CTR), Professor Shashi Nambisan from the Department of Civil and Environmental Engineering (CEE) and CTR Transportation Research Director Jerry Everett and their research team have won a $1.2 million grant from the US Center for Disease Control and Prevention (CDC) that will greatly improve the safety of drivers and passengers on Tennessee’s highways. The grant from the CDC will offer support for the project for three years.

The high number of injuries and deaths from traffic incidents prompted agencies such as the World Health Organization and the United Nations to recognize the epidemic proportion of these problems. In response, the CDC created a competition to select a team that would lead efforts to improve nighttime seat belt usage and Nambisan and Everett’s team were the winners.

“This project brings together researchers, practitioners and the public in a collaborative fashion to address a real-world transportation issue,” said David Clarke, CTR director.

Highway traffic safety is a key aspect of our center’s mission, and we can achieve that better by getting everyone on the same page,” Nambisan pointed out that, on average, the number of people killed in traffic incidents each day in the United States is roughly the same as if an airline crash every day. Statistics have shown a much higher number of injuries and fatalities among unbelted motorists with high blood alcohol content in post-dusk incidents compared to daytime crashes.

“Most of the studies done so far and the efforts to enforce have focused only on daytime hours,” said Nambisan. “The focus of this initiative is to improve the enforcement rate by night through coordinated enforcement and outreach efforts." The study will be conducted in Knox, Roane, Loudon, Sevier, and Rutherford counties, with data from Rutherford County—where no out-of-county traffic enforcement is provided—used to support the project.

Observations will be made about driver behavior at a variety of locations such as sporting events or highway checkpoints.

“The strength of our partnership with the Governor’s Highway Safety Office is critical to this study,” said Everett. “Additionally, with this award we are hopeful that this project wouldn’t be possible.”

Paddison, a period of outreach and advertising, more observations will take place to see what impact the message has had.

ECCS Fisher Professor Named National Academy of Inventors Fellow

Dr. Claudia Rawn, an associate professor in the Department of Materials Science and Engineering (MSE), has been named a National Academy of Inventors (NAI) Fellow, earning one of the highest honors attainable in her field. Rawn is the third member of the department to be honored in the last seven years.

Rawn is the director of the Center for Materials Processing and a faculty member of both the Institute for Biomedical Engineering (IBME) and the Joint Institute for Advanced Materials (JAM). She has helped organize the MSE department’s Materials Camp since 2004. ASM started its fellows program in 1989 to help recognize significant achievements or contributions the field of materials science.

Rawn’s contributions from her work in situ X-ray and neutron diffraction to study a prominent class of novel energy materials from superconductors to gas or control devices. Rawn and the other members of the 2014 class were formally inducted at an October 1st, 2014, meeting in Pittsburgh.
Frontiers in Research and Innovation’s recently announced initiative practically no energy to operate.

Intrinsic magnetism, or spin, of electrons to create new possibilities three UT College of Engineering professors recently named to the Nature scientific journal position he held until his death in 2012.

Mills scholarship fund upon Mills’ death in 1996. The Harlan D. and Kay Henry Endowed Professor Faculty Member Named First Jerry Ericsson/Harlan Mills Chair.

Dr. David Mandrus, a professor in UT’s Department of Electrical Engineering and Computer Science, has been selected as the first Jerry and Kay Henry Endowed Professor.

Mandrus, of the Department of Materials Science and Engineering, was selected in large part because of his research, teaching, and publications.

A fellow of the American Physical Society, Mandrus’ research has covered everything from LED research to researching materials for the electronics of the future.

The endorsement, which comes with a monthly stipend and is designed to be renewed every five years, highlights a string of recent national recognitions for Mandrus, who serves in a joint faculty position with Oak Ridge National Laboratory.

Since February, Mandrus has been honored in the noted scientific journal Nature twice, he has been chosen as a Gordon and Betty Moore Foundation Synthesis Investigator, and he was one of three UT College of Engineering faculty named to the “World’s Most Influential Minds” list by Thomson Reuters.

Mandrus is currently a project involving the use of the intrinsic magnetism, or spin, of electrons to create new possibilities for future electronic devices, including sensors and new types of computer memory. These advances and require practically no energy to operate.

He is also a member of the University of Washington-led team taking part in the National Science Foundation Office of Emerging Frontiers in Research and Innovation recently announced initiative to develop 2-D technology advancements.

Dr. David Mandrus

Eastman Chemical Funds Two COE New Professors of Practice

Eastman Chemical has continued its strong partnership with the Department of Chemical Engineering by naming two new professors of practice.

Dr. Yan Xu, of the Department of Electrical Engineering and Computer Science (ECE), and Dr. Matthew Young, of the Department of Mechanical, Aerospace, and Biomedical Engineering (MABE), received the designation as part of a $2 million-plus commitment to the college.

“Eastman’s collaboration with the College of Engineering is an excellent example of a successful partnership between business and education,” said Etta Clark, Eastman’s vice president of global public relations and policy. “By developing a strong foundation, we are enabling students to be successful in the workforce.”

Professor practice positions are set up so that faculty can provide detailed hands-on education in specific areas.

Young’s research is paving the way for advancements in manufacturing that encourage innovative and productive critical thinking and problem-solving skills in students.

Young has been able to give students practical instruction from his own experiences, train them in the latest tools of the trade, and offer advice when asked about course work or career options.

Xu, whose expertise lies in the realm of power systems, will have the opportunity for hands-on industry research and help educate students about the most up-to-date ways of ensuring companies have their energy and electricity needs met.

“Eastman’s partnership with our college continues to be valuable to students and faculty alike,” said Leon Tolbert, head of the ECE Department.

Dr. Matthew Young

Hines Receives SEC Award

Dr. Wesley Hines, professor and head of the Department of Nuclear Engineering, is the recipient of the 2014 Industrial & Engineering Conference (SEC) Faculty Achievement Award for the University of Tennessee.

The awards honor those with outstanding records in both teaching and scholarship who serve as role models for both junior faculty and students, and have been recognized by colleagues nationally or internationally. This puts Hines in company with five others for the past 10 years of the Year Award.

For more information on the SEC awards, visit www.theseccu.com/sec-faculty-achievement-awards.php.

Dr. Wes Hines

Sawhney Honored By IEMO Society

Dr. Rupy Sawhney was honored with the Outstanding Educator Award in 2015 by the Industrial & Engineering Operations (IEOM) Society.

The society recognized Sawhney for his exceptional contributions to the field of industrial engineering and operations management.

Sawhney is a professor in the Department of Industrial and Systems Engineering and a Health Fellow in Business and Engineering.

For more information about IEOM, visit iemo.org.

Dr. Rupy Sawhney

UTSI Professor Receives 2014 Outstanding Aerospace Engineers Award

University of Tennessee Space Institute H.H. Arnold Chair John Schmisseur was recently honored by Purdue University as one of that school’s Outstanding Aerospace Engineering alumni for 2014. UTSI is located in Tracy City, Tennessee, and is a part of the College of Engineering.

Schmisseur is the director in the Department of Mechanical, Aerospace, and Biomedical Engineering at UT, got his PhD from Purdue in 1997. Prior to coming to UT, he was the Chief of the Energy Division and Program Manager for Aerothermodynamics within the Air Force Office of Scientific Research.

He received the award for his “distinguished contributions to education, academia, governmental service, or other endeavors that reflect the value of an aerospace engineering degree.”


Dr. John Schmisseur

NE Faculty Members Receive Three Grants Totaling $2.6 Million

Professors in the College of Engineering’s Department of Nuclear Engineering are part of three separate nuclear safety and security grants that collectively have been awarded $2.6 million.

The US Department of Energy’s Nuclear Energy University Programs has made a $1 million grant to a team led by Associate Professor Ivan Maldonado and including Governor’s Chair Brian Wirth that is looking at nuclear reactor related issues.

$1 million to a team including Assistant Professor Jason Hayward that is developing a new imaging system capable of monitoring dry storage casks. Maldonado’s team will try to analyze and evaluate fuels that are more tolerable to accidents, helping with nuclear safety, and calling into question the public has about nuclear facilities.

Additionally, the team—including Oak Ridge National Laboratory researchers Jeff and Andy Worrall—will study how those fuel ideas pave the way to increase efficiency.

The project Cable is working on is associated with the Northwest National Laboratory (NNL) but is funded by the National Nuclear Security Administration’s Office of Defense Nuclear Nonproliferation Research and Development.

The project involves setting up a computer program that can estimate the potential for nuclear fuel to make the US more secure.

The team hopes to use cosmic ray muons, noting that the particles are effectively and inexpensively monitored.

The project is among those that have a massive impact on nuclear energy and safety.

For more information, visit www.utki.edu/news/News_2014/ release/14-3schmisseurreceivesoutstandingaerospaceengineeraward.htm.
Dr. Butch Irick, who serves as faculty advisor for the team, said, “It is certainly no understatement to say that a grant of this nature is a big deal.” Said Wayne Davis, dean of the College of Engineering, “This will certainly make a difference to the efforts of Butch Irick and his students working on EcoCAR3.”

The software—specifically NX™ software for computer-aided design and high-tech electronics companies—took the extra step of having to use traditional monetary grants for purchasing.

“The software—specifically NX™ software for computer-aided design and high-tech electronics companies—will be used by the EcoCAR3 program led by the College of Engineering, Aeronautical, and Biomedical Engineering Research Associate Professor David “Butch” Irick, who serves as faculty advisor for the team,” said Bill Boswell, the company’s senior director of partner strategy. “Our academic partnership with UT encourages students to pursue careers that will revitalize manufacturing in the U.S. and around the world.”

The EcoCAR3 competition is focused on the ability of university teams to take a Chevrolet Camaro and convert it into a hybrid vehicle without sacrificing any of the “muscle car” persona that the vehicle is known for.

UT is one of sixteen schools in the competition, which pairs engineering students with business students to pursue the project as a team of the overall team goal of designing, marketing, and advertising the vehicle.

McLellan is one of the many students who has worked with Irick and his students on EcoCAR3. “Siemens PLM Software is dedicated to helping develop the next generation of highly trained and highly qualified engineers and technologists,” said Bill Boswell, the company’s senior director of partner strategy. “Our academic partnership with UT encourages students to pursue careers that will revitalize manufacturing in the U.S. and around the world.”

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Siemens PLM Software has donated an in-kind software license valued at $37 million to the College of Engineering. The grant gives students access to the same technology used by automotive manufacturers, aerospace developers, and high-tech electronics companies. The software will be used by the EcoCAR3 program led by Department of Mechanical, Aerospace, and Biomedical Engineering Research Associate Professor David “Butch” Irick, who serves as faculty advisor for the team.

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Dr. Gong Gu, at left, works in the lab with graduate students, from left, Wan Deng (left) and Ali Mohsin (right).

Dr. Gong Gu—Department of Electrical Engineering and Computer Science

Dr. Gong Gu followed his fascination with the material graphene from industry research and development into the academic world of the College of Engineering (COE). He has found success in the move, with major breakthroughs that made the pages of the journal Science in 2014.

“Graphene is a two-dimensional material with many wonderful properties,” said Gu, an associate professor in the Department of Electrical Engineering and Computer Science (EECS). “I became interested in it, and later got a small grant from DARPA (Defense Advanced Research Projects Agency) to work on it. That project got me started.”

Gu’s previous position, at the Sarnoff Corporation, gave him some room for investigation. His initial project inspired him to expand his exploration, though, and he knew he needed a university setting for that. He found a warm welcome at UT. “I liked the people who interviewed me. That’s very important,” said Gu. He did wonder, momentarily, how his particular interests would fit in to the EECS. He noticed very few colleagues working in electronic materials and devices—areas relevant to his research on graphene—and wondered if that could make for slim collaboration opportunities.

“I then noticed faculty members in other departments—such as the Department of Materials Science and Engineering—doing related work, as well as user facilities and collaboration opportunities at Oak Ridge National Laboratory,” said Gu. He realized that he would have more opportunities at UT than elsewhere.

“I ended up also working with colleagues in very different fields in EECS,” he said. “A diverse department is actually an advantage.”

Gu has collaborated on a project with Dr. Itamar Arel and Dr. Jeremy Holleman, both faculty in EECS, and looks forward to more interaction. He thanks a long list of colleagues for welcoming him to the UT engineering community. “There is still a long way to go to directly verify the predicted spin polarization,” said Gu. “That’s something my group really hopes to achieve. Besides the material properties of 2-D materials, there are myriad new physical phenomena to explore. We will continue to synthesize new materials, examine their properties, and eventually build new devices. New physics will lead to new device concepts.”

Gu seeks motivation and curiosity, along with a solid knowledge in basic science and engineering, in students that join his research group. These traits are valuable when working with the exciting potential that graphene offers. The group gained notice in 2014 when they synthesized a one-dimensional boundary between crystals of graphene and hexagonal boron nitride, a boundary that is predicted to have an exotic property called spin polarization. If proven, this property could lead to electronic—or “spintronic”— devices that can do ultra-low power computing. “The landscape is very interesting to me,” said Gu.

Many EECS faculty members helped Gu get started here with lab space and equipment. He is grateful for the support shown by former EECS department head Dr. Kevin Tomsovic and current head Dr. Leon Tolbert, as well as joint advanced Materials (JAM) director Dr. George Pharr and deputy director Dr. Hanno Weitering. In addition, Associate Dean for Research and Technology Bill Dunne and research director Jada Huskey helped with lab space and proposal assistance, and the EECS office staff helped him navigate administrative processes.

“I had heard of southern hospitality before, but that really impressed me after I moved here,” he said. “People in Knoxville and at UT are very nice. I often got lost in my early days living in Knoxville, but people didn’t honk no matter how long I stopped at intersections.”

Gu and family—wife Jane Xu and their daughter Ruhan, age twelve—enjoy life in Knoxville, and traveling the world as well. He took an immediate liking to UT’s Big Orange color, and even to the way COE buildings are situated on The Hill. The landscape is very interesting to me, said Gu. “You can enter a building at any level!”

Gu tries to pass along the hospitality he experienced by bringing enthusiasm and fun into the classroom, often relating technical aspects of engineering to common experiences. “High-frequency signals propagate along co-axial cables as waves, and the wave could be reflected back if care is not taken,” he said. “That care could be the use of an extra piece of cable with the right specs. When I teach electromagnetic fields, I show the students that this extra piece of cable actually does the same thing as the anti-reflection coating on our eyeglasses, something closer to our everyday life.”

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Dr. Gong Gu (far right) outlines research goals with members of his research team (left to right): Vineet Khullar, Wan Deng, and Ali Mohsin.

I am honored to be the recipient of the Gonzalez Family Endowed Professorship. This award is particularly significant to me since it is supported by Dr. Ralph Gonzalez, the former head of the Department of Electrical Engineering and Computer Science. This association sets a high bar and encourages and stimulates me to live up to his legacy. The resources provided by this professorship will allow us to build a world-class image processing program that will add to Dr. Gonzalez’s legacy and will benefit our faculty and students for many years to come.

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Faculty Focus: Dr. Gong Gu

Dr. Gong Gu—Department of Electrical Engineering and Computer Science

Hanno Weitering. In addition, Associate Dean for Research and Technology Bill Dunne and research director Jada Huskey helped with lab space and proposal assistance, and the EECS office staff helped him navigate administrative processes.

“I had heard of southern hospitality before, but that really impressed me after I moved here,” he said. “People in Knoxville and at UT are very nice. I often got lost in my early days living in Knoxville, but people didn’t honk no matter how long I stopped at intersections.”

Gu and family—wife Jane Xu and their daughter Ruhan, age twelve—enjoy life in Knoxville, and traveling the world as well. He took an immediate liking to UT’s Big Orange color, and even to the way COE buildings are situated on The Hill. The landscape is very interesting to me,” said Gu. “You can enter a building at any level!”

Gu tries to pass along the hospitality he experienced by bringing enthusiasm and fun into the classroom, often relating technical aspects of engineering to common experiences. “High-frequency signals propagate along co-axial cables as waves, and the wave could be reflected back if care is not taken,” he said. “That care could be the use of an extra piece of cable with the right specs. When I teach electromagnetic fields, I show the students that this extra piece of cable actually does the same thing as the anti-reflection coating on our eyeglasses, something closer to our everyday life.”

Gu seeks motivation and curiosity, along with a solid knowledge in basic science and engineering, in students that join his research group. These traits are valuable when working with the exciting potential that graphene offers. The group gained notice in 2014 when they synthesized a one-dimensional boundary between crystals of graphene and hexagonal boron nitride, a boundary that is predicted to have an exotic property called spin polarization. If proven, this property could lead to electronic—or “spintronic”— devices that can do ultra-low power computing. “There is still a long way to go to directly verify the predicted spin polarization,” said Gu. “That’s something my group really hopes to achieve. Besides the material properties of 2-D materials, there are myriad new physical phenomena to explore. We will continue to synthesize new materials, examine their properties, and eventually build new devices. New physics will lead to new device concepts.”

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Student News

WomEngineers Day to Bring Advice, Resources to Knoxville

The College of Engineering has launched its Leadership Program, which promotes leadership development and provides resources for students who are interested in engineering, business, or entrepreneurship.

COE Students Win by Boyd Venture Challenge

The College of Engineering has announced that four student startup companies—two from UT—are the winners of the Venture Challenge, a competition for student entrepreneurs. The companies are Make Me Modern Inc, a company that offers website design; Microwaves in Motion, a startup that develops microwave-powered devices; and Daniel Lawhon, a junior in computer engineering.

College of Engineering Researchers Discover Key Finding in Cerebral Palsy Research

The new finding, published in the journal *Pediatric Research*, shows that children who have cerebral palsy have a higher risk of falling during balance tasks. The researchers, including Dr. Jeffrey Reinbolt, have discovered that the growth of muscle fibers in the brain is not occurring as it should, which could be indicative of a hereditary disorder.

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The lessons I learned at UT, both in the classroom and in on-campus work assignments, have been extremely successful and are still with me today," said Stone. "The College of Engineering has always given students a good foundation, but being able to take that next step and introduce them to the real world is even better." The program is run through the Office of Engineering Professional Practice, which provides students with the opportunity to gain real-world experience.

"We recognize that learning leadership skills is a major component for their future success," said Dr. Wayne Davis, dean of the college. "By providing them with these experiences starting their freshman year and expanding it when opportunities and interest arise, we believe that we can help them be prepared professionally as well as programmatically." The program isn't the first that Stone has helped his alma mater create. In 2014, he and a group of colleagues established the Prados Scholarship in honor of Professor Emeritus John W. Prados of the Department of Aerospace and Biomedical Engineering. It awards $12,500 annually to two students who are chemical engineering, mechanical, and business minors who have participated in the co-op program.

Stone's latest way of giving back was announced at the college's student and donor appreciation luncheon, where Davis presented him with an award to honor his commitment.

Leadership in the workplace, financial management techniques and finding a work-life balance are a few of the topics on the docket for WomEngineers Day, scheduled to be held at the Knoxville Convention Center on April 11, 2015. The conference aims to bring together people interested or involved in engineering and other STEM—science, technology, engineering and math—fields of study. While most attendees will be from the University of Tennessee, Knoxville, College of Engineering, the invitation extends to students at all local high schools and other universities. Organizers also feel that one of the keys to a more well-rounded, inclusive environment is bringing men and women together, thus the conference is open to all.

"Everyone can benefit from the topics that will be covered," said Jessica Boles, the event's lead coordinator and a senior in the Department of Electrical Engineering and Computer Science at UT. "The goal is to educate students in both professional and personal topics not found in the engineering classroom.

The keynote speaker for the conference, will be the opening keynote speaker for the inaugural WomEngineers Day Conference.

College of Engineering Launches Leadership Program

The College of Engineering created the J. Michael Stone Engineering Professional Practice Leadership Program in October 2014. Named for Stone, a 1963 alumnus of the college, the program will be set up to facilitate growth in leadership skills for students pursuing a bachelor of civil engineering cooperative education program.

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DENSO Boosts UT Engineering’s Hybrid Vehicle Research

The lab is designed so that students can test their ideas in a simulated vehicle environment, a technique known as in-the-loop testing, rather than having to install them in “real” automobiles. Avoiding the need to constantly change tools every time they test something with UT made DENSO’s support natural.

“Our longstanding partnership with UT’s engineering program is important to the quality of products we produce around the world,” said DENSO Manufacturing Tennessee Senior Vice President Mike Brackett.

The added bonus of the support is that it will allow UT students to focus more on hybrid vehicles and other emerging technologies. DTI is helping them prepare for the rapidly changing automotive world. For its part, DENSO views the grant not just as an opportunity for advancements in technology but as an investment in what it feels is UT’s greatest resource: students.

According to the company, that has a benefit to everyone involved.

“Supporting these high-caliber educational programs provides us with local student co-ops, senior design collaboration and full-time engineers,” said Brackett, who is also a board member of the North America DENSO. “This alliance has ongoing value to us and the entire automotive industry.”

The foundation offered the same support to the students, who started work in 2011 with the goal of helping support the ideas of students in the fields of engineering and technology. In addition to the current grant, they have also sponsored the EcoCar program as well as emissions research and control programs at UT.

UT Engineering Students Help ORNL, Local Motors Print Drivable 3D Car

“Of course, we have a very close relationship,” said UT’s Kyle Goodrick, who worked on the software that allows engineers to see exactly how the printed layers are interacting when they print. “They were essential to the car being built in Chicago, and the overall project accelerated the adoption of innovative 3D printing.”

James Earle, a UT graduate, spearheaded the Local Motors efforts at the MDF, while a handful of UT students played key roles.

“Being able to help improve their visualization efforts was something that is reminiscent of the experience I learned in class while working on the project,” said Goodrick. “One of the biggest tasks involved improving the performance of software that allows engineers to see exactly how the printed layers will look before committing to printing them.”

“We had an initial goal of coming up with software that could generate tool paths faster than existing programs but still allow us to have complete control over the print,” said Young. “As we worked on the overall project with fellow student Andrew Mearing, Aaron Young and Alex Roschil, Goodrick and Roschil were essential to the process, while Mearing and Young are majoring in computer science.

Much in the same way that a printer prints one line after the next, a 3D printer prints layers of the final object one after the next. Mearing worked on the framework to plan the printing paths, while Goodrick and Young worked on ways to improve their visualization and facilitate easier repair. Once at the show, Roschill and Mearing operated the printer.

“The car is done, but our work on this project is just beginning,” said Roschill.

Young added that he was able to directly use some of the things he learned in class while working on the project, again showing the connection between the work and research at UT. ORNL group director Lonnie Love said that UT’s students played a critical role on the project, adding, “From our perspective, to say that this project would have been a failure without the students is not an overstatement.”

Nuclear Engineering Students Receive NNSA Fellowships

Two graduate students from the Department of Nuclear Engineering received fellowships from the National Nuclear Security Administration (NNSA) Graduate Fellowship Program (NGFP). The NGFP prepares and builds the next generation of leaders in nuclear security, working directly in NNSA program and site offices across the country.

Tracey Washington accepted a fellowship position in the National Defense Nuclear Nonproliferation and Arms Control, Nuclear Controls (NA-242) in Washington, DC. Her fellowship is for June 2015 through June 2016. She is currently working on her PhD in energy science and engineering through the Bredesen Center.

Paredes Yasni accepted a fellowship position at the NNSA site office at the Pantex Plant near Amarillo, Texas. A 2014 graduate of the nuclear engineering program, he is working on his MS degree. His fellowship will also run from June 2015 through June 2016.

For more information about the program, visit nngf.gov.

Telesis Academy of Science and Math

A fourth-grade class from the Telesis Academy of Science and Math in West Covina, California, “adopted” the University of Tennessee for the school year in a program aimed at ensuring college preparation and interest for the students of the school. The College of Engineering sent the class UT and College-related items to help them celebrate the UT spirit. To read more about the school, visit www.telesisacademy.net.

In addition to the lunch, the college’s presence included an address by Associate Dean Douglas Parang. Also, Dr. Bill Hamel of the Department of Mechanical, Aerospace, and Biomaterials Engineering hosted a prebuild workshop.

“Our relationship with FIRST Robotics and with those budding engineers is one that is very serious,” said Parang. “Being able to help nurture those young minds is frankly the very definition of creative technical and engineering workforce of the future.”

The team had six weeks to work on their robots, which were then bagged and held securely until the start of the regional competition on April 2, 2015, in Knoxville.
Dr. Gerd Duscher

Zhuravleva’s research—described as a “model project” by DHS—would not only make much less per unit volume but also suffer from a reduced energy of nuclear radiation detection—cost and efficiency. This discovery also opens up its possible use for invisibility and cloaking.

Dr. Mariya Zhuravleva

Divining nuclear materials—found that the reaction between silver and cobalt serves to unexpected result.

Dr. Ramki Kalyanaraman, a professor in both the Department of Materials Science and Engineering (MSE) and the Department of Chemical and Biomedical Engineering (CBE), Dr. Gerd Duscher, also a professor in MSE, recently made a breakthrough in research that could lead to a better coupling of light and magnetism, which in turn could yield improvements in data storage, sensing, imaging, and optical communication.

Using silver and a cobalt-iron compound, they focused on exploring the unique interactions of those materials—specifically, their magnetic and visibility properties. The concept is that by finding the right mix of materials with these properties you can make data archiving faster, cheaper, and with a higher density of storage.

In finding the right mix of materials, their team happened upon an entirely unexpected result.

Dr. Chuck Melcher

The DOE of Homeland Security (DHS) is recognizing the UT College of Engineering’s (COE) leading role in research into advancements in safety and detection surrounding nuclear-related issues since the beginning of the atomic age through its Academic Research Initiative. By the time this latest project wraps up the university and the DHS will have spent thirteen years at the forefront of Homeland Security’s efforts towards nuclear nonproliferation.

Dr. Dr. Mariya Zhuravleva

COE Professors Make Invisibility Research Breakthrough

Dr. Gerd Duscher

The Department of Homeland Security (DHS) is recognizing the UT College of Engineering’s (COE) leading role in research into advancements in safety and detection surrounding nuclear-related issues since the beginning of the atomic age through its Academic Research Initiative.

Dr. Chuck Melcher, the director of the Scintillation Materials Research Center (SMRC) and a research professor in the Department of Materials Science and Engineering (MSE), and Dr. Eric Lukosi, assistant professor in the Department of Nuclear Engineering (NE), have been awarded a $1.75 million five-year grant to investigate novel low-cost scintillators for radiation detection.

Dr. Ramki Kalyanaraman

The competition for 2017 was selected for its importance to a broad range of applications, from improving the way the system will operate will be much like an organic shopping cart, with the technology being compatible with smartphone applications. Tracking will begin at the point of shipment with a bar code or QR code being scanned on a smartphone and thus entered into the virtual manifest.

Dr. Mariya Zhuravleva

The information will then be linked to the relevant emergency response guides and safety data sheets, and be made available to emergency personnel in real time, allowing them to arrive at their destination.

Dr. Ramki Kalyanaraman

This is a big step forward in terms of being able to track these materials,” said Stephen Richards, director of the STC. “At the same time, giving authorities the information they need in a far speedier manner is a vital part of this as well.”

Dr. Mariya Zhuravleva

Under the current paper manifest system used by most logistics companies, accidents have made it impossible to access cargo descriptions. That can leave fire and police officials aware only that a hazmat placard on it but not what the material is or who owns it. Even require paper manifests to be updated as products are offloaded.

Dr. Mariya Zhuravleva

The e-HM system—being devised by a UT-based...and government agencies such as the FBI. “This is a big step forward in terms of being able to track these materials,” said Stephen Richards, director of the STC. “At the same time, giving authorities the information they need in a far speedier manner is a vital part of this as well.”

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College of Engineering Programs Receive Prestigious Carnegie Community Engagement Classification Designation

The University of Tennessee, Knoxville, received several well-deserved good news in January when the Carnegie Foundation named UT for its prestigious Carnegie Community Engagement Classification Designation for 2015.

The recognition comes for institutions that Carnegie feels do the best job of teaming up with communities to address the needs of the citizens in the areas they serve.

For the College of Engineering, the award held special meaning as several college-led initiatives were singled out as exemplars—groups that stood above and beyond the norm and are said to be examples to others.

All told, a dozen groups, institutes and initiatives with varying involvement and support from the College of Engineering were chosen:
- The Appalachian Community Health and Disaster Readiness Project, designed to help with Red Bird Mission, Manchester Memorial Hospital and Emergency Management Services of Clay County.
- The Center for Transportation Research, which serves a variety of transportation, safety and economic needs throughout the country.
- Current’s Adventures in STEM girls camp, which introduces advanced engineering, mathematics and biology to middle school girls.
- Fall Service Community Schools, which helps meets the basic needs for Knoxville-area schools in an attempt to improve graduation rates and livelihoods.
- Great Smoky Mountains National Park and UT, for the education opportunities and research that UT provides.
- The Institute for a Secure and Sustainable Environment (ISSE), which seeks to improve water quality and study the watershed of the surrounding area.
- The Institute for Smart Structures, which aims to improve the agriculture industry.
- Volt Teach, which targets students in STEM fields with an interest in teaching in the hopes of strengthening those courses for UT students.
- With fifty groups being selected in total at UT, having a dozen ties to the College of Engineering serves to highlight the strength of the program at UT.
- “Certainly, seeing the involvement we have is a good reflection on the college, our students, our faculty and what we can provide,” said Dr. Wayne Davis, dean of the college. “Not just what can do for UT, but to our community and even the greater good.”

The College of Engineering Distinguished Lecture Series will feature a variety of programs and projects related to the college’s journey to being celebrated.

Dean Wayne T. Davis is pleased to announce that Dr. Araceli A. Espinoza will direct the development of the college’s upcoming Distinguished Lecture Series and will also provide coordination with a variety of programs and projects related to the college’s journey to the Top 25 public colleges of engineering. She will also assist with the college’s efforts to provide a more diverse faculty and student body.

Espinoza will direct the development of the college’s upcoming Distinguished Lecture Series and will also provide coordination with a variety of programs and projects related to the college’s journey to the Top 25 public colleges of engineering. She will also assist with the college’s efforts to provide a more diverse faculty and student body.

The College of Engineering Distinguished Lecture Series will officially launch in the fall of 2015. The plan is to showcase speakers who are internationally and nationally renowned in their field. The college hopes to present at least five lectures per semester.

“UT faculty and students, as well as those from other institutions, will be able to enjoy the lectures in person, via live webcast or through an archive of the presentations,” Espinoza said.

Espinoza earned her BA in American Studies from U.C. Berkeley, and completed a ME in Postsecondary Administration and Student Affairs from the University of Southern California, where she also earned a PhD in Urban Education Policy.

Espinoza’s research focuses on the postsecondary experiences and outcomes of racial and ethnic minority (REM) students, first-generation college students and REM students in the STEM fields. She has given multiple presentations at national conferences and has published her research in peer-reviewed journals including the Journal of College Student Development. Her work can also be found in the books The Education of the Hispanic Population: Selected Essays and Fostering Success: Essays on Ethnic and Racial Minorities in STEM: The Role of Minority Serving Institutions.

Dr. Araceli Espinoza Joins the College of Engineering as Special Projects Coordinator

Dean Wayne T. Davis is pleased to announce that Dr. Araceli A. Espinoza joined the College of Engineering as the Special Projects Coordinator in September 2014.

Espinoza will direct the development of the college’s upcoming Distinguished Lecture Series and will also provide coordination with a variety of programs and projects related to the college’s journey to the Top 25 public colleges of engineering. She will also assist with the college’s efforts to provide a more diverse faculty and student body.

Dr. Araceli Espinoza
The Reliability and Maintainability Center (RMC) seeks to lead in the advancement of reliability and maintainability education and practices within both the academic and industrial communities. Students gain valuable experience to work on research projects and the center’s internship program. Companies benefit from access to fresh ideas and approaches that save on cost by sharing non-proprietary information, learning what had worked and not worked in the past, was very valuable, helping to guide our strategy long term.

In other corporate interactions, the RMC partnered with Emerson Process Management to name the 2014 Reliability Program of the Year, a distinction that went to LyondellBasell’s Channelview, Texas, plant. The award-winning reliability manager provided on-going training and support during the 2015 Maintenance and Reliability Conference (MARCON). The RMC holds regular meetings for members to share practices and information, and sponsors MARCON for discussing new methods, applications, and techniques. The 2015 conference was held February 23-26 in Knoxville. It featured ten workshops and more than thirty papers, which included four keynote presentations. It was held at the Knoxville Convention Center to accommodate growth since the previous year.

“Year we boasted about eighty percent practitioner papers,” said Blache. “Also, keynotes from Koch Industries, Novellus, Siemens,

Dr. Klaus Blache, director of the Reliability and Maintainability Center, points out equipment that the center uses in its instruction.

The Reliability and Maintainability Center (RMC) seeks to lead in the advancement of reliability and maintainability education and practices within both the academic and industrial communities. Students gain valuable experience to work on research projects and the center’s internship program. Companies benefit from access to fresh ideas and approaches that save on cost by increasing throughput and improving safety and quality for their industries.

“We deliver programs and processes that lead to better results in the member companies,” said Dr. Klaus Blache, RMC director and research professor in the Department of Industrial and Systems Engineering.

The RMC launched in 1996 with twelve participating companies and now has more than fifty member companies, including Alpha Natural Resources, Amazon, Bayar, Cargill, Dow Chemical, Eneregi, DuPont, Eastman Chemical, General Motors, Gooddyer, Kuehig Green Mountain, Koch, Nissan, Oak Ridge National Laboratories, Owens Corning, Schlumberger, and the Redstone Arsenal/US Army.

Blache contributes the growth to maintaining an active profile for the center, including targeted meetings with potential member companies and coverage in national publications such as Uptime and Maintenance Technology. A growing professional development program has also brought many groups to the center. RMC also attends several conferences each year, offering keynote and technical presentations on reliability/maintainability and presenting membership opportunities in both the center and the College of Engineering’s Reliability and Maintainability Engineering (RMIE) minor and graduate program.

Two members of the RMC Board of Advisors (member company representatives voted by all member companies for three-year terms) are replaced each year. As evidence of the RMC interest by companies, thirteen individuals ran for the open positions decided on in February 2015.

“The RMC is recognized as the premier program for RME students and reliability and maintainability professionals development,” said Blache. “We’re business-focused, so if they use our processes and programs, the end result is that they are going to improve their operations and they’re going to save money.”

That recognition is reinforced by the positive experience of member companies, as evidence in testimonials from industry representatives like Barry Cross, global operations support manager for Schlumberger’s Drilling & Measurements Business Unit. “Schlumberger joined the RMC with the intent of stepping out of our comfort zone (oilfield service industry) to see what other industries and individual companies were doing with respect to reliability and maintainability of their equipment,” said Cross. “The ability to connect with reliability and maintainability practitioners, sharing non-proprietary information, learning what had worked and not worked in the past, was very helpful, helping to guide our strategy long-term.”

The RMC continues to add new programs to its roster. Blache led a 2014 faculty-led study-abroad course, “Global Perspectives on Lean, Reliability, and Maintainability,” in Munich, Germany. In a 2014 faculty-led study-abroad course, “Global Perspectives on Lean, Reliability, and Maintainability,” in Munich, Germany. In January 2015, RMC presented a boot camp class at the Nissan Training Center in Smyrna, Tennessee, and other offsite locations are in discussion. Other new offerings from RMC include in-house training on maintainability concepts with companies like Georgia Pacific. The center is also putting together the RMC Data Mining and Benchmarking Lab, funded by Grainger, for undergraduates doing internships to learn applied skills.

Also, more than one hundred and sixty College of Engineering students were invited to MARCON, as a maintainability class assignment, to listen to the professional presentations and investigate technologies with exhibitors. The RMC works in conjunction with the Reliability and Maintainability Engineering (RMIE) academic program, directed by Dr. Mingzhou Jin. Undergraduate students can minor in reliability and maintainability, while graduate students can earn master’s degrees or graduate certificates through either on-campus or distance-learning courses.

“The RMC helps to advance reliability and maintainability education and practices,” said Jin. “The center helps to connect students and faculty in the RME program with industry to achieve exceptional value by arranging internship and providing real-world projects. MARCON provides students an opportunity to hear industrial practices directly from reliability practitioners. The conference also provides the RME program a recruiting and job placement opportunity.”

“The RMC teaching labs will move this summer from Estabrook Hall to offices on floor B-1 of Perkins Hall. The Factory Teaching Lab will go to B-67; the Spare Parts Best Practice and Technologies Lab will go to B-67; the RMC Teaching Classroom to B-60. Room 501 of East Stadium Hall is being converted into the Data Mining and Benchmarking Lab. The move, part of the relocation of several engineering programs into Perkins, should be complete by the beginning of August 2015.

“The center’s reliability & maintainability (R&M) services and company memberships are based on growth, but at a controlled pace to maintain a high quality program,” said Blache. “It’s important to offer the right balance of relevant training, networking and share best practices, having a sufficient number of student interns, and provide overall member-company support on their R&M journey.”
I don’t usually focus on us in this newsletter because philanthropy is truly all about you. However, I want to be sure you all know the Engineering Development and Alumni Team because we are out on the road around the country visiting our graduates and corporate partners. Our office is located in Perkins Hall, right in the heart of “Engineering Country” and just down the hall from Dean Davis. This central position gives the college’s leaders access to us and puts us in the middle of the action where we can know students and faculty.

In-state, we organize around the departments so that we have liaison relationships while out-of-state we cluster geographically to maximize travel dollars. We also work with centrally-based corporate & foundation relations officers and regional development officers, expanding our team with other great colleagues.

Dorothy Bryson, Executive Director
Overall vision and direction, campaign planning, board of advisors, events, donors around the country. Twenty-five years fundraising experience. In Engineering Development since 2008.

Brian Shupe, Director
Department of Mechanical, Aerospace, and Biomedical Engineering & Department of Chemical Engineering. Out-of-state: North Western, Western, and Central United States, plus Alabama. In Engineering Development since 2009.

Adlai Hurt, Director

Amy Johnston, Director

Whitney Lee, Leadership Annual Giving Coordinator
Leadership level donors including coordinating the Dean’s Circle. In charge of Senior Impact, our senior gift challenge. In Engineering Development since 2012.

Amy Johnston, Director

Christina Parsons, Development Assistant
Office coordination and support. In Engineering Development since 2008.

Kathleen Kim-Baker, Development Assistant
Office coordination and support. In Engineering Development since 2009.

One of our strengths is our longevity. This gives us the opportunity to develop relationships with our alumni and other friends of the college. We welcome the opportunity to get to know you and help you with ways your financial support and involvement can move the College of Engineering forward. Every gift – every size – has tremendous impact.

Contact us at:
University of Tennessee
College of Engineering
Office of Development
118 Perkins Hall
Knoxville, TN 37996
865-974-2779
engrdev@utk.edu
Or contact me personally
Dorothy Barkley Bryson
dbryson@utk.edu

Spring into Warm Weather
With new COE logo apparel
www.shgstores.com/utkce/
College of Engineering Executive Development of Director Dorothy Bryson (third from right) with special guests at the fundraising breakfast (left to right): Mea Reeves (BS/ChE '85), Bryan McBride (friend of a guest); Ted Dunnaville (BS/EE '92), Alvis Williams (BS/EE '79); Sotiria Basakchieva (BS/S'89), Travis Griffin (Director of Engineering Diversity Programs); Rodney Brooks (BS/ME '85); Deborah Brown (BS/EE '82), Mark Drues (BS/EE '82); Cavanaugh Mims (BS/ChE '86), Dwight Hutchins (BS/ChE '85); Lou Elia Burton (BS/ChE '88, MBA '92); and Dr. Mark Dean (BS/EE '79).

On Friday, October 10, 2014, engineering alumni gathered to celebrate the legacy of the founder of the College’s Engineering Diversity Programs (EDP) during a luncheon at the University Center ballroom and the dedication of UT’s first new residence in nearly forty years, the Fred D. Brown Jr. Residence Hall. The facility is named after the first director of the college’s diversity programs, established in 1973.

The day started with breakfast for a small group of volunteers in the Executive Dining Room of the University Center. Engineering alumni Dwight Hutchins (BS/ChE '86), Rodney Brooks (BS/ME '85) and Cavanaugh Mims (BS/ChE '86) chaired the meeting, which focused on efforts to raise $1 million for three specific EDP funds—the Fred D. Brown Jr. Pre-College Program Endowment (named for James Pippin, who succeeded Brown as director of diversity programs until 2006)—the Engineering Diversity Excellence Endowment, and the Fred D. Brown Jr. Minority Academic Endowment, and the James Pippin Pre-College Program Endowment (named for James Pippin, who succeeded Brown as director of diversity programs until 2006)—in celebration of Brown’s life and legacy in a dedication ceremony that included live music, food, and tours of the residence hall.

Brown’s son, Douglas Brown, delivered one of the most poignant of the day’s speeches. As he recalled memories of his father—some of which sparked laughter and some of which highlighted his impact on the hundreds of former students who were mentored in their lives and the importance of alumni and friends joining them in investing in the UT funds that support today’s diversity efforts to continue Brown’s legacy of providing access, opportunity, and student support in pursuit of a UT engineering education. Approximately sixty alumni were in attendance, including around sixty of Fred Brown’s family members, some from as far away as Massachusetts and California.

In the afternoon, UT President Joe DiPietro, Chancellor Cheek, Dean Davis, and Brown’s family, friends, and former students, joined in celebrating Brown’s life and legacy in a dedication ceremony that included live music, food, and tours of the residence hall.

Brown was the first African American teacher at Oak Ridge High School after it was integrated and became the first African American member of the Alcoa Board of Education, and he is credited with laying the foundation for the UT College of Engineering’s diversity recruitment programs for pre-college students, provides support and mentoring for underrepresented students during their time on campus, and encourages and facilitates enrollment of its participants in graduate school.

Brown was an extremely important person in the lives of his students,” said Dean Davis, who was a professor at UT when Brown arrived. “He was instrumental in making sure that students didn’t just come to UT, but that they graduated.”

Many former students who participated in the engineering diversity programs described how Brown took a “hands-on” approach to their education. “He would come to dorms and check to make sure you were studying and he would make a point of walking with you to class to make sure you went,” said Robert McKinley (BS/ME ’86). “He made it clear that you were here to learn.

Hispanic, Native American, Pacific Islander, Alaskan Native, and female students. The EDP now offers successful summer recruitment and education programs for pre-college students, provides support and mentoring for underrepresented students during their time on campus, and encourages and facilitates enrollment of its participants in graduate school.

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Mims said Brown came to his house in Georgia to convince him to come to UT, something a number of his former students echoed. Mims said that at the time he didn’t even know where UT’s campus was located, but something about Brown’s pitch convinced him to come.

Several students echoed the sentiment that Brown’s guidance was key to them not only getting through college, but thriving. “He would come to our dorm and see if we were playing cards or studying,” said Spruell Driver Jr. (BS/CE ‘87, BS/IE ‘87), who emceed the EDP luncheon and is now on UT’s Board of Trustees. “He did everything he could to make sure we were prepared for success.”

The two hundred and fifty thousand square-foot residence hall houses about seven hundred undergraduates.

The building includes an art gallery, two restaurants, recreation and workout facilities, Internet and conference lounges on every floor—even its own post office.

The Fred D. Brown Jr. Residence Hall is the first building at the university named for an African American individual.

For more information and a look at the facility, visit: www.engr.utk.edu/students/halls/suite/#fred-d-brown-jr

For more information on the fundraising campaign for Engineering Diversity Programs, visit www.engr.utk.edu/give/diversity.

Diversity Program Graduates Join Together to Celebrate as the University Dedicates Fred D. Brown Jr. Residence Hall

UT Board of Trustees member and luncheon emcee Spruell Driver (BS/CE ‘87) (left) greets Dwight Hutchins (BS/CH’86, right) at the College of Engineering Diversity Programs Luncheon.
As a student entering the University of Tennessee, one of my main goals was to avoid financial debt. The Alcoa Outreach and Bennett Croswell scholarships have played important roles in helping me accomplish this goal and avoid taking out student loans. Due to the generosity of these benefactors, I had the opportunity to study abroad and spend five weeks in London where I took two engineering classes while exploring the city and United Kingdom. Furthermore, as a student on campus I have not had to worry about finding a part-time job to pay for school or pay off student loans. This has allowed me to focus on my academic studies and getting involved on campus. My experience as an undergraduate student at UT would have been much harder financially if I had not received these two scholarships. I cannot express enough how grateful I am for this educational merit aid and how much of a positive impact it has had on my life.

William Fredebeil
Alcoa Outreach Scholarship
Bennett Croswell Scholarship
Dr. Donald B. Bivens, (BS/ChE ’52) had been appointed Chair of the Research Board of Directors for the Institute of Industrial Engineers (IIE) as its new vice president and business-unit manager for engineering projects. In this role, he is responsible for the growth and development of IIE’s consulting and engineering business.

During Inklebarger’s graduate work at UT, he led the hardened concrete research laboratory as a graduate research assistant for Dr. Edwin Bundtke. He is a licensed Professional Engineer in Tennessee and a member of the American Society of Civil Engineers (ASCE).

Sheryl Ellison Ponds (BS/ME ’87), was named the recipient of the 2014 CREW DC Annual Achievement Award. The award recognizes CREW DC members who have accomplished success with a significant achievement/challenge in their individual career goals over the course of the past year. CREW (Commercial Real Estate Women) is the only organization in the Unfied States that is dedicated to supporting the advancement of women in the commercial real estate industry. The Washington, DC, chapter of CREW is a founding member of CREW Network and is the largest chapter in the country with approximately 400 members.

Dr. Harry Lee Johnson (BS/ME ’62, MS/CE ’68, PhD/CE ’71) died on October 12, 2014. A resident of Birmingham, Alabama. He was appointed Chair of the Research Board of Directors for the Institute of Industrial Engineers (IIE) as its new vice president and business-unit manager for engineering projects. In this role, he is responsible for the growth and development of IIE’s consulting and engineering business.

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The University of Tennessee Space Institute (UTSI) marked its fiftieth anniversary with a two-day celebration September 11-12, 2014. Almost three hundred people gathered to celebrate this milestone of the institute.

The celebration events included a picnic, games, concerts, comedy show with well-known comedian Henry Cho, fireworks, a historical and technical session, student poster presentations, and a banquet.

Several UTSI alumni and professors participated in the historical and technical session. Notable guest speakers included: David Haibert, retired Arnold Engineering Development Center (AEDC) historian; Wesley Harris, first UT/UTSI Vice President; Dr. James Wu, UTSI Professor Emeritus; Dr. Roger Crawford, UTSI alum and Professor Emeritus, John Rampy, UTSI alum and retired AEDC Exec Director; Pete Hoffman, UTSI alum and Boxing Vice President; and Winfried (Wimp) Goethert, son of UTSI founder.

UTSI, located on Woods Reservoir in rural Tullahoma, was founded in 1964 to support AEDC at Arnold Air Force Base as an education and research facility. The campus is adjacent to AEDC and the air force base on 565 acres made available by the US Air Force and granted to UTSI by the Department of Health, Education, and Welfare.

Discussions about opening space technology institute began as early as 1949. In 1956, the Air Force made contractual arrangements with the University of Tennessee to establish an AEDC graduate study program for center employees, using off-campus custom space provided by the Air Force. Joel Bailey was the first director of the UT initiative, followed by Robert Young.

In 1983, Douglass and several other colleagues formed Computer Restoration, which provided computer repair services. Douglass later transformed the company into ProNova, a firm that focuses on proton therapy for cancer patients. He has received numerous awards for his contributions to the field, including the Distinguished Achievement Award from the American Society for Therapeutic Radiology and Oncology (ASTRO) in 2010.

Terry Douglass

The Distinguished Alumnus Award: Terry Douglass

Terry Douglass has shaped an industry, transformed medical practice, and enhanced the quality of life for millions of people around the world. He is an internationally recognized leader in proton therapy, and has made significant contributions to the field of radiation oncology.

Douglass earned a bachelor’s degree in physics from the University of Alabama in 1982, and a master’s degree in electrical engineering from the University of Alabama in 1983. He then went on to complete his PhD in physics at the University of Alabama at Birmingham in 1987.

Douglass joined ProNova, a company he founded in 2000, in 1989. The company was later acquired by Elekta, a Swedish company that specializes in proton therapy systems.

In 2011, Douglass was named a fellow of the American Physical Society, and he was elected to the National Academy of Engineering in 2012. He also received the Distinguished Achievement Award from the American Society for Therapeutic Radiology and Oncology (ASTRO) in 2010.

Douglass is currently developing Provision Health Alliance at Knoxville, a world-class comprehensive clinical outpatient center for cancer care with a wellness focus. The core is the Proton Therapy Center, using an innovative form of radiation therapy that focuses beams on tumors and results in less damage to adjacent tissue. Along with this effort, Douglass’ firm, ProNova, could make proton therapy more accessible worldwide.

Distinguished Alumnus Award: Kimberly Scheibe Greene

Kimberly Scheibe Greene is responsible for overseeing all of Southern Company’s system operations throughout the company’s multi-state region. She is also responsible for strategic planning, research and environmental affairs, and power supply under Greene’s direction, along with Southern Power and Southern Wholesales Electric Cooperatives.

A Knoxville native, Greene earned her BS in engineering science and mechanics from UT in 1988 and her BS in biomedical engineering from the University of Alabama at Birmingham in 1990. She began her career at Southern Company Services in 1991 as a mechanical engineer and progressed through various areas of engineering, operations, and finance.

She spent eight years at a Southern Company subsidiary, Southern Energy Inc., now NGR, and worked in the areas of finance, strategic planning, business and asset management, and environmental affairs. In 2005, she completed the Advanced Management Program at Harvard Business School.

Greene returned to Tennessee in 2006 to join the University of Tennessee as assistant vice president for development and alumni affairs. In 2007, Greene joined TVA as the organization’s chief financial officer, and then served as TVA’s group president of strategy and external relations; later, she was the chief generation officer, responsible for more than 30,000 megawatts of coal, natural gas, hydro, and renewable power generation. In 2010, she returned to Tennessee to assume her current role as president and group executive of Southern Energy Inc., now NGR, and worked in the areas of finance, strategic planning, business and asset management, and environmental affairs. In 2011, she completed the Advanced Management Program at Harvard Business School.

Greene is on the board of the Electric Power Research Institute (EPRI) and recently served as the EPRI Board Chair; she also serves on the advisory boards for the UT College of Engineering and the University of Alabama at Birmingham Master of Safety Engineering Program. She is also a member of the board of the Alliance to Save Energy and the Georgia Aquarium.

Greene is a member of the UT Alliance of Women Philanthropists, the Georgia Chapter of the International Women’s Forum, and the Executive Women in Energy organization. She was inducted into the University of Alabama at Birmingham’s College of Engineering’s College of Leaders, and served on the advisory board for the “Women in Engineering” program.

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**Office of Engineering Professional Practice Hosts Record Number of Businesses at Expo**

One of the key experiences for students in the College of Engineering is the opportunity to take part in a paid co-op or internship education experience. The college’s Office of Engineering Professional Practice (EPP) helps match students with potential companies, making sure the pairing is educationally relevant to the students’ future goals and current academic interests.

Each year, the EPP office hosts a pair of expos during the year, giving companies and students a chance to interact and see if they are a good fit for working together. This fall, the number of companies that came to UT was large, with seventy-seven businesses setting up booths in the concourse of Thompson-Boling Arena, interviewing more than six hundred thousand four hundred interviews took place between students and corporate representatives.

An engineering co-op student discusses employment possibilities with a representative from Kimberly-Clark at the Engineering Professional Practice Expo.

The companies ranged from East Tennessee giants such as DENSO Manufacturing, and Eastman Chemical to international conglomerates like BMW, ExxonMobil, DuPont, and Nissan.

“This year was not only our largest expo in program history, but the number and variety of companies in attendance gave our young students unprecedented exposure,” said EPP Director Todd Reeves. “The possible co-op or internship assignments that come out of this give them the experiences they need to better prepare for their future.”

Over five hundred businesses have relationships with the EPP and the university. Founded in 1926, the EPP office is one of the oldest of its kind in the south. EPP-sponsored expos of this type that showcase engineering students early in their academic career continue prove that UT is a significant resource for the business and technology community.

ExxonMobil was one of the international corporations represented at the EPP Expo.

The Expo facilitated more than 1400 interviews between students and corporate representatives.

**COE 2014 Engineers Day Features Keynote Address from International Space Station**

As part of the event, attendees will received a keynote address from UT alumnus and current NASA astronaut Barry Wilmore speaking from the International Space Station.

Barry Wilmore graduated from UT Knoxville College of Engineering.

UT alumnus Barry Wilmore (left) and fellow Astronaut Reid Wiseman (right) set up their space suits and tools in the equipment lock of the Quest Airlock aboard the International Space Station on October 1. Wilmore received his master’s in aviation systems from UT and was the keynote speaker for the 2014 Engineers Day.

Engineers Day attendees listen to keynote speaker Barry Wilmore speaking from the International Space Station.

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Office of Engineering Professional Practice Hosts Record Number of Businesses at Expo

For more information and competition results for Engineers Day, visit [engr.utk.edu/ed/](http://engr.utk.edu/ed/).
COE Hosts Student and Donor Appreciation Luncheon in October

On Thursday, October 2, 2014, College of Engineering students, faculty, staff, and alumni, donors, and special friends of the college gathered at The Foundry for the Student and Donor Appreciation Luncheon.

This annual event provides an opportunity to recognize outstanding students and to thank the donors who have generously provided support for scholarships. Both department and college level scholarship donors and recipients are included in the event.

Associate Dean for Academic and Student Affairs Massoud Parang welcomed one hundred and eighty-one guests and then introduced COE Dean Wayne Davis. After his remarks, Davis then presented an award to donor J. Michael Stone, who recently created the J. Michael Stone Engineering Professional Practice Leadership Program. Named for Stone, a 1963 alumnus of the college, the program is set up to facilitate growth in leadership skills for students participating in the engineering cooperative education program.

The program is run through the Office of Engineering Professional Practice, which helps students find paid co-op and internship positions. The funding will provide tools and resources for students to use while they are out on co-op assignments in addition to leadership development activities that will be available once they return to campus.

Davis then introduced the keynote speaker, COE alumnus Bennett Crosswell, President, Military Engines for Pratt & Whitney and a COE board member, who provided interesting commentary on his student years at UT and his professional experience as a leader in the organization responsible for providing and sustaining propulsion power for the US services and the country’s foreign allies—approximately six thousand engines operated by more than thirty nations. After his remarks, Crosswell showed off his “Go Vols Beat Florida” tee shirt and was presented with a special gift in recognition of his role as speaker at the event.

Parang concluded the luncheon by thanking the attending donors and congratulating the outstanding students at the event.

The College of Engineering 2014 Halloween Spirit Challenge

Departments Compete in Second Annual Engineering Halloween Spirit Challenge Competition

The UT College of Engineering held its Annual Alumni Barbeque on the Hill on Saturday, October 4, 2014, with two hundred and thirty-two guests attending. The event included a barbeque lunch, catered by Daad End BBQ, and featured student and faculty exhibits and demonstrations, reunions with former classmates and faculty, and games for both adult and children.

The UT Volunteers football team capped off the day with a resounding 45-10 victory over UT Chattanooga.

The Department of Chemical and Biomedical Engineering selected The Wizard of Oz as their Halloween costume theme.

The characters in the dressable TV movies were the Halloween theme for the Department of Mechanical, Aerospace and Biomedical Engineering, including MADB department head Matthew Munch (far left, with big nose) and former department head Bill Hemli (next to Munch with safety glasses).

The “Zombies,” of the Department of Civil and Environmental Engineering were led in a dance across the bridge to Michael Jackson’s Thriller by Interim Department Head Greg Reed (center).

The characters of the dressable TV movies were the Halloween theme for the Department of Mechanical, Aerospace and Biomedical Engineering, including MADB department head Matthew Munch (far left, with big nose) and former department head Bill Hemli (next to Munch with safety glasses).

The UT Engineering Alumni Enjoy the College of Engineering 2014 Alumni Barbeque on The Hill

COE Dean Wayne Davis (second from right) talks with engineering alumni at the 2014 Homecoming Alumni Barbeque.

The EcoCAR 5 drew a lot of interest from attendees at the 2014 Homecoming Alumni Barbeque.

Representatives of the student chapter of the Institute of Industrial Engineers greet guests at the 2014 Homecoming Alumni Barbeque.

The “pro-nuclear protesters” from the Department of Nuclear Engineering at the COE Halloween Spirit Competition.
The University of Tennessee, Knoxville
College of Engineering
114 Perkins Hall
Knoxville, TN 37996-2012

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Contact Information

Senior Administration
Dr. Wayne Davis,
Dean of Engineering
Dr. Bill Dunne,
Associate Dean for Research & Technology
Dr. Veerle Keppens,
Associate Dean for Faculty Affairs
Dr. Masood Parang,
Associate Dean for Academic & Student Affairs

Departments
Chemical & Biomolecular 974-2421
Civil & Environmental 974-2503
Electrical & Computer Science 974-3461
Industrial & Information 974-3333
Materials Science 974-5336
Mechanical, Aerospace & Biomedical 974-2093
Nuclear 974-2525
Administration & Programs

Communications 974-0533
Dean’s Office 974-5321
Development 974-2779
Engineering Advising Services 974-4008
Engineering Diversity Programs 974-1931
Engineering Fundamentals 974-9810
Engineering Professional Practice 974-5323
Engineering Research 974-8360
Engineering Student Affairs 974-2454
Finance & Admin. Affairs 974-5279
Research Centers
Materials Processing 974-0816
Maintenance & Reliability 974-9625
Scintillation Materials 974-0267
Transportation Research 974-5255
Intelligent Systems and Machine Learning 974-5803
CURENT 974-9720
Innovative Computing Laboratory 974-8295

Calendar

Spring 2015
Classes Begin Jan 7
2nd Session Begins Feb 26
Spring Break Mar 16-20
Classes End Apr 24
Study Day Apr 27
Exams Apr 28-30, May 1, 4-5
Graduate Hooding May 7
Commencement May 6-9
Official Graduation Date May 9

Fall 2015
Classes Begin Aug 19
Labor day Sept 7
Fall Break Oct 15-16
Classes End Dec 1
Study Day Dec 2
Exams Dec 3-4, 7-10
Graduate Hooding Dec 10
Commencement Dec 11
Official Graduation Date Dec 11

Reception Honors NAE Member
George Pharr

An invitation-only reception was held on October 6 in the West Club of the Neyland Stadium Skybox to honor Dr. George Pharr, director of the Joint Institute for Advanced Materials (JIAM) for his election to the prestigious National Academy of Engineering. He is the fifth National Academy member in the College of Engineering. Pharr is also a Chancellor’s Professor in the Department of Materials Science and Engineering and joint faculty scientist in the Materials Science and Technology Division at Oak Ridge National Laboratory.

The McKamey Professor of Engineering, Pharr directs the UT-ORNL Joint Institute for Advanced Materials (JIAM). The JIAM building is now under construction on the Cherokee Farms Innovation Campus, a joint project of UT and ORNL, along Alcoa Highway.

Election to the NAE is among the highest professional distinctions an engineer can receive. Academy membership honors those who are pioneering new and developing fields of technology, making major advancements in traditional fields of engineering, or developing and implementing innovative approaches to engineering education.

Pharr is among sixty-seven engineers nationwide elected in the 2014 NAE class and one of two thousand two hundred and fifty who belong to the academy. Attendees at the event included UT Chancellor Jimmy G. Cheek, COE Dean Wayne Davis, COE Associate Deans Masood Parang, Bill Dunne, and Veerle Keppens, and Pharr’s wife, Marilyn, and other family members.

Dr. George Pharr