

TENNESSEE

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ENGINEER

THE UNIVERSITY OF TENNESSEE, KNOXVILLE • COLLEGE OF ENGINEERING

An Exciting New Era in Materials Science Research Begins with the Opening of the Joint Institute for Advanced Materials!

The Joint Institute for Advanced Materials (JIAM) on UT's Cherokee Farm Innovation Campus



ENGINEERING

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Dean's Message

The Power of E—Engagement

In engineering and mathematics, we often talk about e raised to the power of x. In the growth of a college and the increase in the quality of a college or university's programs, we often talk about the power of e—that is, the power of engagement. I don't have to look very far to see engagement in our college. As I glance out of my office windows, I see the Min H. Kao Electrical Engineering and Computer Science building and the John D. Tickle Engineering Building (housing the Department of Civil and Environmental Engineering and the Department of Industrial Engineering) and the recently renovated courtyard that now lies between Perkins, Ferris, and Dougherty. The design of the next new engineering complex that will replace Pasqua and Estabrook is being initiated this fall. All of these are a result of past and on-going engagement between our students, staff, faculty, and alumni and friends of the college as well as engagement between the college and the UT administration, Facilities Services, and the State of Tennessee. Our cover photo on this issue is about engagement as the funds for the new Joint Institute for Advanced Materials (JIAM) came from a combination of university, state, and federal sources. More importantly, all of these buildings provide opportunity for faculty and students (both pre-college, undergraduate, and graduate) to participate in collaborative education and research. Our freshman programs (the Honors Engineering Program and the Engineering Fundamentals Program—the Jerry E. Stoneking engage™ program) are all about faculty/student interaction and engagement as students learn to work in teams.

The majority of the articles found in the following pages are about engagement: the named professorships and scholarships, the interaction of faculty and students with federal and state agencies, student society activities, as well as the alternative spring break and study abroad activities where our students are interacting with and learning about the culture of other countries. Even our COE Distinguished Lecture Series is about engaging our students, faculty, and alumni, as well as faculty and students from other universities, as it is delivered live (and archived) via the web. We invite everyone to become more engaged with our college and its programs as engagement is a powerful activity that will help us to become an even more outstanding college!

Wayne T. Davis
Wayne T. Davis Endowed Chair in Engineering



Dr. Veerle Keppens, the new director of JIAM, in her first floor office.



Dr. Philip Rack in his lab in the JIAM building.



The main lobby of the new JIAM building.



The first floor common area in JIAM.



The JIAM third floor study area.



Cliff Hawks

JIAM Building Opening Begins Exciting New Era in Materials Science Research

An exciting new era in materials science research has started at the University of Tennessee with the opening of the Joint Institute for Advanced Materials (JIAM) Building on the Cherokee Farm Innovation Campus.

The state-of-the-art contemporary building is mostly completed, with laboratories on the second floor still under construction due to specially-coated fume hoods that are yet to be installed, but offices on the first and third floor are open, along with laboratories on the first floor and a food area. The building also features a common area with an extensive view of the Tennessee River, designed to encourage interaction among faculty, staff, and students. Bus service is available from the main UT campus to JIAM, and the facility is anticipated to be fully completed by October of 2016.

Established in 2005, JIAM comprises a multidisciplinary team of scientists from UT and Oak Ridge National Laboratory (ORNL).

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 JIAM building was initially funded with \$20 million from the federal government. The university and the State of Tennessee provided additional support for the building's completion.

Dr. Veerle Keppens, the college's associate dean for faculty affairs and the current head of the Department of Materials Science and Engineering (MSE), is the new director of JIAM.

"JIAM was established to encourage multi-disciplinary materials research projects with faculty members from different

departments and colleges," Keppens said. "In addition to encouraging research initiatives, we plan to have seminars and lectures from faculty outside JIAM to generate discussion and ideas. I also hope we can have casual get-togethers so people can meet and get to know one another and be aware of what is going on outside of their own areas."

Several of the MSE faculty have already moved into the facility, including the Leonard G. Penland Chair, Associate Department Head, and Professor Philip Rack.

"The best feature of the new building is the view," Rack said. "Who cannot help but be inspired by the scenic overlook of the Tennessee River! Beyond that, the building and facilities are great and the JIAM staff is top notch. My office is on the third floor with a great view and my labs are on the ground floor conveniently close to the microscopy facility."

Rack's research focuses on nanomaterials synthesis and device integration. The new microfabrication cleanroom facility that Dr. Eric Lukosi from the Department of Nuclear Engineering manages and the microscopy facility that Dr. Gerd Duscher from the MSE department directs will be great complements to what Rack's research group is working on.

Located only five minutes from campus, the Cherokee Farm Innovation Campus' overall mission is to enhance the university's ability to promote economic development, maximize unique resources and partnerships, and take a national leadership position in innovation research. The campus is supervised by the UT System administration and Cliff Hawks is its president and CEO.

"JIAM is the fifth joint institute between UT and ORNL and obviously the first to be located on UT's Cherokee Farm Campus," Hawks said. "I believe locating JIAM at Cherokee Farm gives the research and development park a tremendous advantage as we work to recruit materials science businesses. Companies locating at Cherokee Farm will have the ability to access all of the tools and talent at the facility. Students focusing on materials science research will also have convenient access to a truly state-of-the-art materials science research facility. Having JIAM located in this area also gives students the opportunity to work directly with technology companies that are partnering with the university."

A second building is now being constructed on the Cherokee Farm Campus. The first facility to be privately developed on the location will be home to Civil and Environmental Consultants Incorporated (CEC). CEC, Inc. has several locations across the

The team at the groundbreaking for the Civil and Environmental Consultants Incorporated Building included (from left) Cliff Hawks, president and CEO of Cherokee Farm Innovation Campus; Dean of Engineering Wayne T. Davis; Vice Chancellor for Research and Engagement Taylor Eighmy; UT Vice President David Milhorn; Tennessee Governor Bill Haslam; UT System President Joe DiPietro; Vice President of CEC James Tomiczek; President and CEO, Partners Development Russ Watkins; Executive Vice President/COO, Cherokee Farm Development Corporation Barry Davis; and Vice President UT Research Foundation Stacey Patterson.



A rendering of the new Civil and Environmental Consultants Incorporated (CEC) Building on the Cherokee Farm Campus.

US and has added East Tennessee to that list as they partner with the UT College of Engineering. The new building, now under construction, will also provide additional space that can accommodate more private sector companies who are partnering with the university and ORNL.

"We are in the early development stages of the campus and we are working aggressively now to move forward with a third building," Hawks added. "We expect Cherokee Farm to be a great tool as the university continues to build relationships with private

sector companies who are focused on long-term research and development relationships. Over the next five years I would like to see Cherokee Farm and the university breaking ground on more buildings that are home to those companies that see real value in partnering with UT and ORNL and living in our community."

For more information on JIAM, visit <http://jiam.utk.edu/index.php>

For more information on the Cherokee Farm Innovation Campus, visit <http://www.cherokeefarm.org/welcome/>

COE Dean Davis Named ASEE Fellow



Dr. Wayne T. Davis

COE Dean Wayne Davis has been awarded one of the highest honors an engineering educator can receive: election as a Fellow of the American Society for Engineering Education (ASEE) in recognition of his contributions as a researcher, teacher, and leader.

Davis and ten other new inductees were formally introduced at the annual ASEE conference in New Orleans on June 27th, 2016.

While the college has been a part of the organization since 1921, Davis joins John Prados, professor emeritus of chemical engineering, as the only two faculty members to be elected ASEE fellows.

Davis earned his master's degree in environmental engineering in 1973 and his doctorate in civil engineering in 1975, both from UT.

He quickly became a leading expert on air quality and pollution control methods and helped write several textbooks on the topics that are still in use today.

The U.S. Environmental Protection Agency, Department of Energy, and Department of Transportation, along with the National Science Foundation and Oak Ridge National Laboratory, among other organizations, have all turned to him for expertise and involvement in air quality studies.

As recently as 2014 the People's Republic of China invited him to speak in the face of the ongoing air quality crises there.

In addition to his research and teaching activities, Davis has played an integral role within the college, serving as associate dean for research and technology from 2003 to 2008 and as interim dean in 2008 before being appointed dean in 2009. He received the Chancellor's Award for Research and Creative Achievement in 1994. In 2003, he served as Macebearer, the university's highest faculty honor.

The ASEE acknowledged his continued impact when informing Davis of his selection, saying the nominating committee and voters applauded his research engineering education efforts.

Davis is a recipient of the Lyman Ripperton Outstanding Professor Award from the International Air and Waste Management Association and the Lifetime Achievement Award from the Institute of Professional and Environmental Practice. He has been secretary and treasurer of the Global Engineering Deans Council and was elected in 2014 as a board-certified environmental engineering member of the American Academy of Environmental Engineering and Science. He currently serves as a member of the editorial review board of *Engineering*, a journal recently established by the Chinese Academy of Engineering.

NE Assistant Professor Receives Powe Junior Faculty Award

Dr. David Donovan, an assistant professor in the Department of Nuclear Engineering, was selected to receive a Ralph E. Powe Junior Faculty Enhancement Award in May. Donovan's selection was particularly significant since only thirty-five awards were given out of 132 applicants. The award, given by Oak Ridge Associated University (ORAU), provides seed money for research by junior faculty at ORAU member institutions. The awards are intended to enrich the research and professional growth of young faculty and result in new funding opportunities.

As a consortium of major PhD granting academic institutions, ORAU cultivates collaborative partnerships that enhance the scientific research and education enterprise of the nation.



Dr. David Donovan

COE Faculty Receive NSF CAREER Awards



In addition to three faculty members who have already received the National Science Foundation's prestigious CAREER Award in 2016, two additional engineering professors are also now recipients.

T CIVIL & ENVIRONMENTAL ENGINEERING

Dr. Jon Hathaway, an assistant professor of civil and environmental engineering, recently earned a CAREER Award from NSF for his work in sustainable urban water management.

Hathaway's project aims to develop strategies for more effective modeling and strategic placement of green infrastructure in urban watersheds over a five-year period.

The educational component of the project includes outreach to K-12 students through the Knox County Adopt-a-Watershed program, introduction of green infrastructure concepts to freshmen, and a new graduate-level course on watershed-scale hydrologic modeling.

The project could lead to more effective urban watershed restoration, where stakeholders can more confidently test proposed strategies prior to installation.

These improvements will also allow maximized public and ecological benefit with available resources.



Dr. Jon Hathaway

T ELECTRICAL ENGINEERING & COMPUTER SCIENCE

Dr. Wei Gao, an assistant professor in the Department of Electrical Engineering and Computer Science, has also received an NSF CAREER Award.

Wei's field, mobile computing, has been an indispensable part of modern life. However, diverse manufacturing limits make current mobile devices far from ideal for being used anytime, anywhere. Traditional solutions design individual mobile devices for different application scenarios by exploring tradeoffs among the various design perspectives, but cannot scale to the increasing complexity and performance requirements of future mobile applications.

Gao's research is on interconnected mobile computing (IMC), which fully interconnects multiple mobile devices owned by the same user via wireless networks and allows these devices to complement each other via cooperative resource sharing. IMC aims to fundamentally remove the physical boundary between mobile devices and hence augment the mobile computing capability provided to the user. The success of this research could fully unleash the potential of heterogeneous mobile devices and allow insertion of highly pervasive and cognitive mobile applications into every aspect of human life.

The NSF CAREER Award helps to support the career development of young faculty members and enhances their research efforts



Dr. Wei Gao

Dongarra Honored with Two Prestigious Supercomputing Awards



Dr. Jack Dongarra

Dr. Jack Dongarra is an icon of the supercomputing world, from his work compiling an annual list of the world's fastest computers to his research expanding the boundaries of supercomputing.

Recently, Dongarra—the director of the Innovative Computing Laboratory (ICL)—has been recognized with a pair of impressive awards.

The Association for Computer Machinery (ACM) recently honored Dongarra with the High Performance Parallel and Distributed Computing Achievement Award at the annual High Performance and Distributed Computing Conference in Kyoto,

Japan, while the Institute of Electrical and Electronics Engineers (IEEE) will bestow him with the Super Computing (SC) 2016 Test of Time Award at its conference in November.

Dongarra's expertise in computing dates back decades and includes his work as editor of the groundbreaking *Sourcebook of Parallel Computing* in 2003.

The award also serves to recognize his contributions to concepts dealing with the development, innovation, design, and testing of new devices.

As the name implies, the SC award goes to innovation that has stood the test of time—in this case, a paper Dongarra authored in 2000 with Clint Whaley titled "Automatically Tuned Linear Algebra Software (ATLAS)."

ATLAS is a particular form of technology known as autotuning, a program that can optimize itself to the highest levels of performance for different computer hardware.

A major step up from preceding programs because of the way it self-optimizes, ATLAS continues to be cited and relied upon as a baseline measurement in the scientific community almost two decades after its release—an eternity in the world of computing.

Dr. Julie Carrier Named BESS Department Head



Dr. Julie Carrier

The College of Agricultural Sciences and Natural Resources welcomed Dr. Julie Carrier as the new head of the Department of Biosystems Engineering and Soil Science (BESS) on April 1. Carrier was formerly with the University of Arkansas, where she served as a professor in the College of Engineering Department of Biological and Agricultural Engineering. Her research interests include promoting the use of renewable energy production, specifically biofuels and biochemical production from cellulosic biomass, and she has twice won recognition as an outstanding researcher. She is

also known for her ability to provide outstanding service to students. Carrier has won four student service and teaching awards since 2003.

Dr. Larry Arrington, UT Institute of Agriculture Chancellor, expressed his appreciation to Dr. Eric Drumm, a former professor in the Department of Civil and Environmental Engineering and the former head of BESS, for his outstanding leadership during his tenure as head. Drumm is returning to his teaching and research interests. He plans to work with BESS construction science program and to support the senior design sequence as well as to pursue research projects related to soil science and hydrology.

The BESS department is affiliated with the College of Engineering via several of its academic programs.



Dr. Mark Whorton Named UT Space Institute Executive Director



Dr. Mark Whorton has been named the new executive director of the UT Space Institute in Tullahoma.

Whorton was previously the chief technologist of Teledyne Brown Engineering in Huntsville, Alabama, and president of Teledyne Optech Inc. in Kiln, Mississippi. His expertise is in modeling, designing, and analyzing control systems for aerospace vehicles.

Whorton also was an adjunct professor at Tennessee State University's Center of Excellence in Information Systems, where he worked on next-generation large-scale ground-based telescopes. He served as a manager at NASA's Marshall Space Flight Center, where he led teams designing navigation, guidance, and control systems for manned and unmanned space vehicles.

"UTSI has a proud legacy of significant contributions to our state and our nation, and it is an honor to have the opportunity to join the UTSI team," Whorton said. "We have great people and world-class facilities and I am excited about the opportunities ahead of us to build on that foundation with excellence in research and graduate education."

Whorton has a doctorate in aerospace engineering from the Georgia Institute of Technology and master's and bachelor's degrees in aerospace engineering from the University of Alabama.

The UT Space Institute is a graduate education and research institution adjacent to the US Air Force Arnold Engineering Development Center. UTSI was established in 1964 and is internationally recognized for graduate study and research in engineering, physics, mathematics, and aviation systems. The institute is affiliated with the College of Engineering and both share academic programs and initiatives and joint faculty.



Dr. Mark Whorton

COE Faculty Recognized at the 2016 Chancellor's Honors Banquet

The 2016 Chancellor's Honors Banquet was held on Monday, April 20, 2016, and several College of Engineering faculty and students were recognized at the event.

Dr. Lee Han, a Department of Civil and Environmental Engineering (CEE) professor and a collaborating scientist at UT and Oak Ridge National Laboratory, received the prestigious L.R. Hesler Award. Students, colleagues, and friends of the longtime head of the botany department—and former dean of the College of Arts and Sciences—established this award to reward exceptional teaching and service.

In the past decade alone, Han's research has accounted for more than \$10 million in funding. His particular expertise is in traffic safety, infrastructure, and laws, with a key area related to the use of red-light cameras. His studies have investigated whether they improve safety and how municipalities can misuse them to generate revenue. Media outlets from National Public Radio to the *Oregonian* newspaper have cited his work nationally.

Han, who almost always sports a bow tie in class, has a reputation among his students for being funny and upbeat, as well as for being able to inspire them. He is also a valued mentor to undergraduates and graduate students.

Dr. Stephanie TerMaath, an assistant professor in the Department of Mechanical, Aerospace, and Biomedical Engineering, received the Angie Warren Perkins Award. TerMaath has worked in all three areas of the department. She excels in curriculum development, and colleagues say she has fundamentally improved the entire aerospace program.

As a teacher, TerMaath has enriched students' experiences by arranging field trips for her Introduction to Aerospace Engineering class to visit the Boeing 777 assembly plant while leveraging her connections at Lockheed Martin to bring in top speakers in the industry.

Outside the classroom, TerMaath serves as faculty advisor to the Society of Women Engineers. She is active with the Commission for Women and works with high school students who are interested in engineering.

TerMaath's research focuses on how and why thin structures fracture. She has been prolific in sharing her findings in journal articles and through presentations, and her work holds promise for improving many materials, from aerospace components to brain implants.

Named for the first dean of women at UT, the Angie Warren Perkins Award honors outstanding leadership in campus governance or administration at the level of department head, director, or below.

Dr. Rupy Sawhney, a Heath Fellow in Business and Engineering and a professor of industrial and systems engineering, received the Excellence in Academic Outreach Award. This recognition honors those who exemplify UT's land-grant mission by using intellectual capital to benefit the citizens of Tennessee.

Sawhney has developed outreach initiatives that model effective collaboration between universities and local communities. They include the popular Kids U summer program "Do You Want to Be an Engineer?" for middle and high school students and the Lean Enterprise Systems Summer Program, which hosts international students in Knoxville for five weeks to strengthen participants' multicultural awareness.

Sawhney also works to make life better for Knoxville residents with disabilities. Project Eric, named for his late student Eric Arendt, resulted in an app that gives disabled citizens the ability to connect with drivers through a preloaded text format that is fully integrated into the public transportation system. He also helped an alumnus with cerebral palsy become more independent by conducting a time-and-motion study that led to the design of a mechanical assistance system. The research from this project has helped in the analysis of other disabilities that affect movement. In 2015, Sawhney was appointed to the Mayor's Council on Disability Initiatives.

Dr. Leon Tolbert, Min H. Kao Professor and Head of the Department of Electrical Engineering and Computer Science, received the Research and Creative Achievement Award. Over the past decade, Tolbert has been a productive researcher, authoring or co-authoring sixty-six journal articles. He won four prize papers from the Institute of Electrical and Electronics Engineers (IEEE). In 2013, he was named an IEEE fellow in recognition of his research and leadership within the organization over the past decade. He is a founding member and co-principal investigator of the Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks, or CURENT, a National Science Foundation Engineering Research Center that is jointly supported by the US Department of Energy and annually funded at \$4 million. He is also the principal investigator on a \$2.65 million DOE grant to develop a traineeship in wide bandgap power electronics for graduate students. He continues his outstanding work of advising and mentoring a new generation of graduate students in his department.

Dr. Gong Gu, an associate professor in the Department of Electrical Engineering and Computer Science, received the Research and Creative Achievement-Professional Promise Award. Gu is a prodigious researcher whose h-index—twenty-seven for the Web of Science—already exceeds the average in his field. His primary interest lies in the heterostructures of two-dimensional materials. Published in the journal *Science* in 2014 and cited sixty-eight times, his landmark study in this area examines how the concept of heteroepitaxy in 3-D semiconductors can be extended to two dimensions, resulting in a one-dimensional interface. Gu's other research interests include photovoltaics and organic electronics. For this work, Gu and his student, S. Das, were featured on the cover page of the journal *Nanoscale*. He is known for his open-mindedness, perseverance, and leadership in the discipline.



Dr. Lee Han (left) receives the L.R. Hesler Award from UT Chancellor Jimmy G. Cheek (right) at the 2016 Chancellor's Honors Banquet.



Dr. Stephanie TerMaath (left) receives the Angie Warren Perkins Award from Dr. Jimmy G. Cheek (right).



Heath Fellow Rupy Sawhney (left) is presented with the Excellence in Academic Outreach Award by Dr. Jimmy G. Cheek.



Dr. Jimmy G. Cheek (right) presents the Research and Creative Achievement Award to Dr. Leon Tolbert (left).



Dr. Jimmy G. Cheek (right) presents the Research and Creative Achievement-Professional Promise Award to Dr. Gong Gu (left).



Dr. Emmanouil Doxastakis, associate professor, Department of Chemical and Biomolecular Engineering



Dr. Maxfield Schuchard, assistant professor, Department of Electrical Engineering and Computer Science



Dr. Zhimin Xi, assistant professor, Department of Industrial and Systems Engineering



Dr. Gila Stein, associate professor, Department of Chemical and Biomolecular Engineering



Dr. Mark Denavit, assistant professor, Department of Civil and Environmental Engineering

COE Welcomes New Faculty with Orientation Event

The College of Engineering welcomed seven new faculty members at the New Faculty Orientation event on Monday, August 15, in Room 435 in the Min H. Kao Electrical Engineering and Computer Science Building.

The group heard informative presentations from COE deans, directors, and department heads and also enjoyed a luncheon in the Min Kao Building and a welcome dinner in the Toyota Auditorium of the Howard Baker Center on the UT campus.

The Department of Chemical and Biomolecular Engineering has two new faculty members: Dr. Emmanouil Doxastakis and Dr. Gila Stein, both of whom are associate professors.

Doxastakis received his PhD from the University of Patras and is a member of the Biophysical Society, the American Institute of Chemical Engineers, the American Physical Society, and the Technical Chamber of Greece.

Stein received her PhD from the University of California, Santa Barbara, and received a National Science Foundation CAREER Award in 2012; was a NRC Postdoctoral Fellow in 2008-2009; and is a member of the American Institute of Chemical Engineers, the American Physical Society, the American Chemical Society, the Adhesion Society, and the Society of Professional Engineers.

Dr. Mark Denavit is a new assistant professor in the Department of Civil and Environmental Engineering. He received his PhD from the University of Illinois at Urbana-Champaign, and was the Winner, OpenSees Challenge for best new OpenSees powered tool on NEESHUB (portalframe2d) in 2013 as well as receiving the Sandra M. and Raju A. Vinnakota Award from the Structural and Stability Research Council in 2012. He is a member of the American Institute of Steel Construction and the American Society of Civil Engineers.

Dr. Maxfield Schuchard is a new assistant professor in the Department of Electrical Engineering and Computer Science. Schuchard recently received his PhD from the University of Minnesota and has been a featured speaker at several engineering conferences.

The Department of Industrial and Systems Engineering welcomed Dr. Zhimin Xi as a new assistant professor. Xi received his PhD from the University of Maryland, College Park. He received the Best Paper Award at the International Conference on QR2MSE this year, and also the Top 10 Best Paper Award at the ASME Design Automation Conference in both 2015 and 2011.

Dr. James G. Coder has joined the Department of Mechanical, Aerospace, and Biomedical Engineering as an assistant professor. He is a member of the American Institute of Aeronautics and Astronautics (AIAA) and serves on the Applied Aerodynamics Technical Committee. He also is involved with AIAA CFD Drag Prediction and High-lift Prediction Workshops.

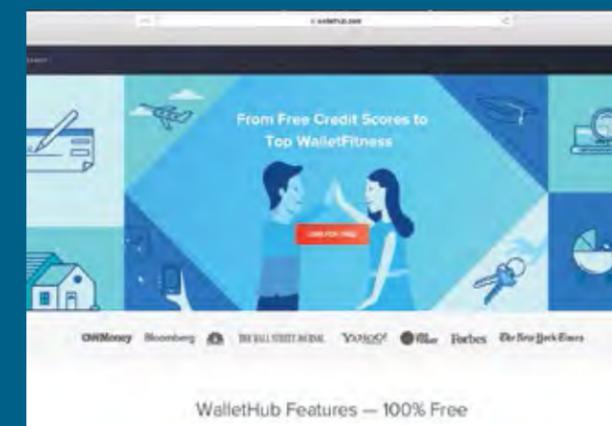
The Department of Nuclear Engineering welcomed Dr. Richard Wood as a new full professor. Wood received his PhD from the University of Tennessee and was the US Chief Delegate at the International Electrotechnical Commission, SC45A. He is a member of the American Nuclear Society and the Institute of Electrical and Electronics Engineers. He is also on the Executive Committee of the American Nuclear Society's Human Factors and Instrumentation and Control Division (HFICD).



Dr. Richard Wood, professor, Department of Nuclear Engineering.



Dr. James G. Coder, assistant professor, Department of Mechanical, Aerospace, and Biomedical Engineering



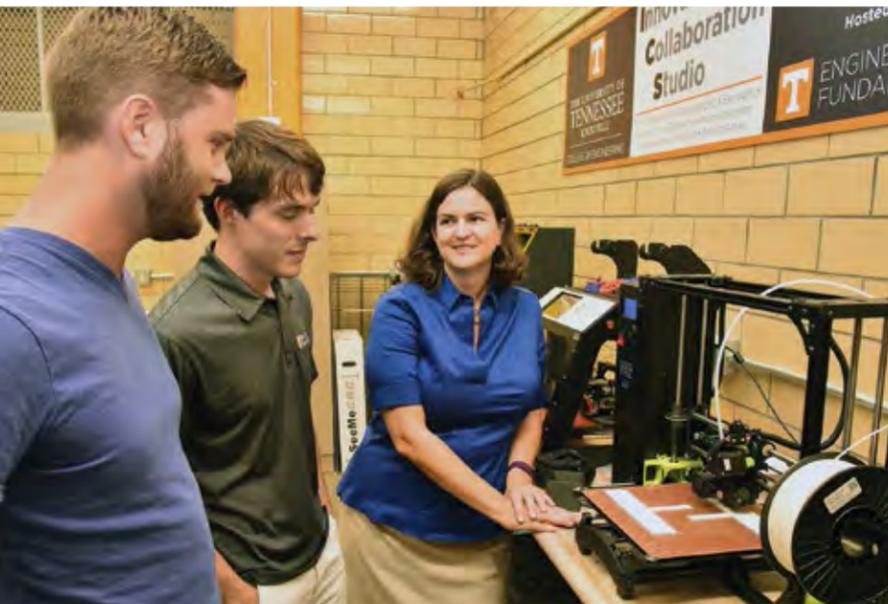
CTR Director Featured in WalletHub Article

Dr. David Clarke, a research associate professor in the Department of Civil and Environmental Engineering the director of the Center for Transportation Research was recently interviewed by the WalletHub web site about more economic ways to drive automobiles, traffic safety and about changes in automotive technology. The interview can be found at <https://wallethub.com/edu/best-worst-cities-to-drive-in/13964/#david-b-clarke>



Dr. David Clarke

Faculty Focus: Dr. Stephanie TerMaath



PhD students Nathan Phelps (left), and Michael Holloway (center) work with Dr. Stephanie TerMaath (right) in the Innovation and Collaboration Studio.

Dr. Stephanie TerMaath joined the College of Engineering in 2012 as an assistant professor after spending more than ten years in the industry sector. Her time in the field included positions at Lockheed Martin Aeronautics Company, Exponent Failure Analysis Associates, Applied Research Associates, and Boeing Phantom Works. While she enjoyed and gained valuable experience at each company, her dream job is mentoring students and young engineers.

"I think that one of the most important and rewarding contributions to society is to educate our next generation of engineers," TerMaath said. "Spending time with the students energizes me and I find that their enthusiasm is contagious."

TerMaath came back to academia as teaching has always been a passion. She takes great pride in mentoring young engineers as they enter the workforce.

"Having a trusted mentor for honest discussion and support is invaluable, and I aim to provide that type of reinforcement and guidance to my students," she said. "It is an incredible experience for me to interact with our amazing students, to learn about each of their unique stories, and to follow their careers."

Her ten years of experience in the field has helped shape the way she structures her curriculum. TerMaath teaches with a multidisciplinary approach in mind.

"From my industry experience, I witnessed firsthand the complex problems that can be solved by teams comprising expertise from many disciplines," she said. "As a result, I believe our academic institutions must educate a capable workforce that is experienced in innovative thinking and multi-disciplinary collaboration."

In order to facilitate this multidisciplinary approach, TerMaath likes to take her students on field trips to facilities like Boeing, the Naval Surface Warfare Center, Strongwell, or NASA. She also uses campus facilities like Neyland Stadium to showcase the importance of structures in all sorts of engineering projects.

"Talking with engineers in the workforce is an outstanding opportunity for the students to learn more about their field and explore career options," TerMaath said.

TerMaath's interdisciplinary approach goes beyond the classroom into her research as well.

"Much of the methodology and computational tools developed in my group are applicable to a wide range of problems," TerMaath said. "For example, my current research spans brain shunts, additive manufacturing, fracture mechanics, and bonding of dissimilar materials, and all of these projects are based on a computational multi-scale structural mechanics approach coupled with sensitivity analysis."

In her time since joining the faculty, TerMaath has won a variety of awards, but she is especially proud of her awards for mentoring. In 2015, she was named the TN Louis Stokes Alliance for Minority Participation (TLSAMP) Research Advisor of the Year and in 2014, received the Penn State Schreyer Honors College Outstanding Scholar Alumni Mentor Award.

TerMaath also recently received the Angie Warren Perkins Award. Named for the first dean of women at UT, this award honors outstanding leadership in campus governance or administration at the level of department head, director, or below. TerMaath was recognized for the award as she is an advocate for women in STEM. She is a Faculty Advisor for the Society of Women Engineers, a member of the Commission for Women, and helped launch WiSTAR3.

"The objective of WiSTAR3 is to provide networking and educational opportunities for women graduate students in STEM," TerMaath said. "The program is off to a great start, and past events include a lunch with Dr. Veerle Keppens, Associate Dean of Engineering and Material Science Department Head, discussions on effective communication and FMLA, and an afternoon tea social."

Her work mentoring young engineers did not begin at the university. At Applied Research Associates, TerMaath set up a mentoring program for interns and young professionals.

"I developed and led a training program to prepare our young employees with skills needed for success at the company, such as marketing, proposal writing, and communicating with program managers," TerMaath said.

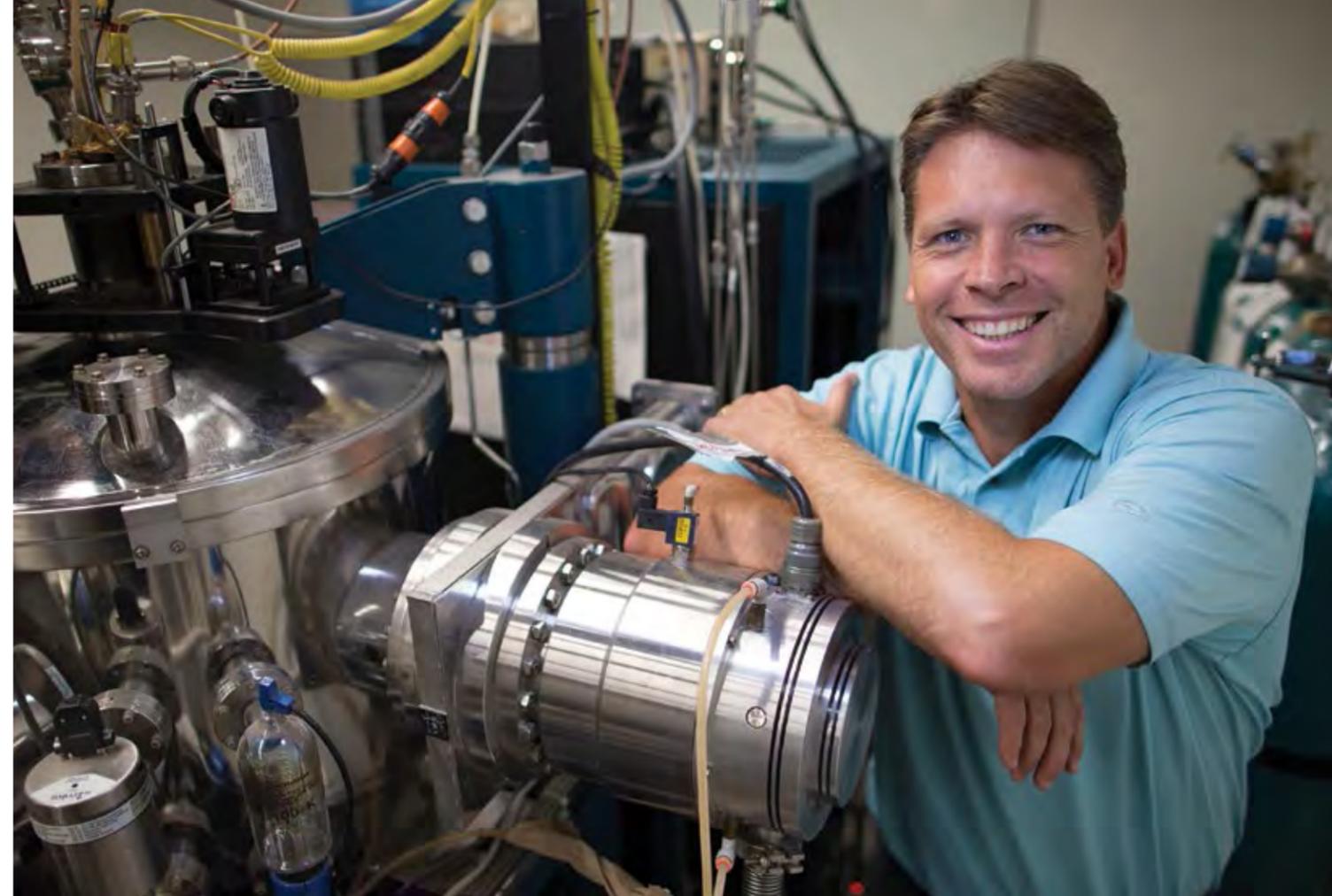
TerMaath has degrees from Penn State University (BS), Purdue University (MS), and Cornell University (PhD) focusing on structural engineering. One of her reasons for choosing UT is its close proximity to Oak Ridge National Laboratory (ORNL).

"My primary objective when searching for an academic position was to identify a university that performed cutting-edge research in a multi-disciplinary environment," she said. "The Joint Institute of Computational Sciences (JICS) is a collaborative effort between UT and ORNL to advance computational modeling and simulation. My research is primarily computational, and the opportunity to work in the multi-disciplinary environment of JICS on the nation's top supercomputers was very appealing."

In addition to its proximity to ORNL, TerMaath considers herself a southerner and she liked UT's southern location. Plus, she enjoys hiking and biking in her spare time and the Great Smoky Mountains provide many new trails for TerMaath to blaze. TerMaath has also won a Best in Show ribbon in the needlework competition at the Tennessee Valley Fair the last three years.



Dr. Stephanie TerMaath (left) and Emily Hutchins (right), a sophomore in nuclear engineering, work with the 3D printers in the Innovation and Collaboration Studio.



The generous support of the Leonard G. Penland Chair enhances my group's ability to study nanoscale material properties that we can exploit and integrate into transformative new technologies. I am honored and motivated to represent both UT and Mr. Penland's memory by mentoring and inspiring undergraduate and graduate students.

Dr. Philip D. Rack
Professor and Leonard G. Penland Chair
Associate Department Head
Department of Materials Science and Engineering

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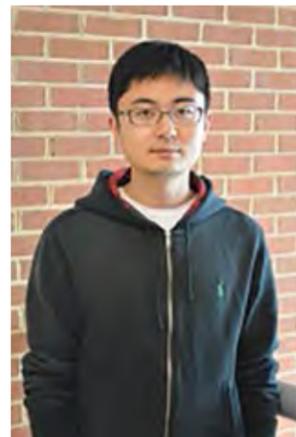
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Environmental Engineering Student Wins Prestigious Award

Hannah Woo, a doctoral student in Civil and Environmental Engineering, was honored as one of ninety students to receive a \$15,000 Scholar Award from the Philanthropic Educational Organization Sisterhood. The award is presented to women in the United States and Canada pursuing a doctoral-level degree with a high level of academic achievement and their potential to have a positive impact on society. Woo's research uses the latest DNA sequencing technology to identify and investigate microbes with plant-degrading enzymes in the deep ocean that help break down lignin, a waste product of biofuels manufacturing.

Hannah Woo



Can Huang Receives Chinese Government Award

Can Huang

Can Huang, a doctoral candidate in the Department of Electrical Engineering and Computer Science, was recently honored with the Chinese Government Award for Outstanding Self-Financed Students Abroad. The award is presented to only 500 of their more than 500,000 students studying abroad. Recipients are chosen based on an evaluation of their academic and research work and the awards includes a \$6,000 scholarship and a certificate. Huang is a member of the Power Systems Research Group in the Center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks (CURENT).

SYSTERS Recognized at Chancellor's Honor's Banquet

SYSTERS: Women in EECS received the Charles R. Burchett Extraordinary Contributions to Campus Life award at this year's Chancellor's Honors Banquet. The award was created to honor students and student organizations for extraordinary contributions to campus life. SYSTERS mission is to recruit, mentor, and retain women in the Electrical Engineering and Computer Science (EECS) department. Since the group was founded, the percentage of women in EECS has increased from 6.1 to 9.6.



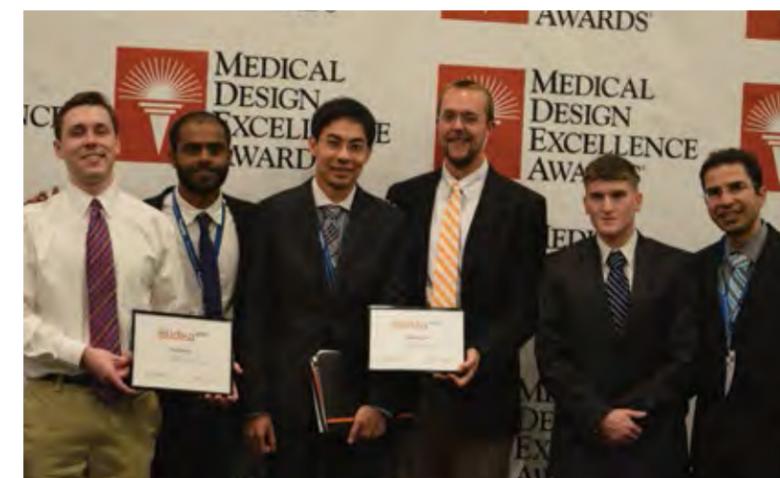
The SYSTERS group includes (standing left to right): Maeve Lawniczak, Divyani Rao, Jessica Boles, Aysha Shanta, Peixing Liu, Morgan Dyar; (sitting left to right): Sophie Wardick, Gangotree Chakma, Mwamba Bowa, Diane Garcia

College of Engineering Students Receive Tennessee Engineering Foundation Scholarships

Two members of the College of Engineering received Tennessee Engineering Foundation Scholarships. Rebecca Kimberlin, a junior in the Department of Mechanical, Aerospace, and Biomedical Engineering, won the Dorothy and Arthur Crouch Memorial Scholarship and Kelli Grissom, a junior in the Department of Civil and Environmental Engineering, was awarded a Tennessee Engineering Foundation Scholarship. The Tennessee Engineering Foundation raises funds for scholarships and other K-12 STEM education support activities.



Kelli Grissom, left, and Rebecca Kimberlin, right, with Dr. Masood Parang, Associate Dean for Academic & Student Affairs.



John Till, Guru Venkatesan, Tony Nguyen, Graham Taylor, Richard Steiner, and Reza Abiri (from left to right) were recognized at the MD&M Medical Device Trade Show & Competition in New York.

MABE Graduate Students Win VentureWell BMEidea Competition

A team of graduate students and faculty from the Department of Mechanical, Aerospace, and Biomedical Engineering recently won the VentureWell BMEidea Competition. The team included graduate students Reza Abiri, Caroline Bryson Black, Tony Nguyen, Richard Steiner, Graham Taylor, John Till, and Guru Venkatesan as well as faculty members Matthew Mench and Xiaopeng Zhao. The team was awarded a \$10,000 prize for their project FastCast, a cast set by pressure in less than two minutes for immediate stabilization of the bone. The BMEidea award is the nation's leading competition where biomedical and bioengineering students are tasked with pioneering a health-related technology for a real clinical need.



Students who were recognized for extraordinary scholarship at the Chancellor's Honors Banquet included (from left to right): Maeve Elise Lawniczak, Brandy Nicole Manka, Benjamin Cole Pollack, and Kristen Nicole Miranda.

Ten College of Engineering Students Receive Academic Achievement Award

Ten students in the College of Engineering were recognized for exhibiting extraordinary scholarship at the Chancellor's Honors Banquet. William Alexander Hawks, Maeve Elise Lawniczak, Brandy Nicole Manka, Kristen Nicole Miranda, Andrew Leonidovich Orekhov, Megan Anne Peck, Benjamin Cole Pollack, David Priddy, Ryan Wagner, and Liam Weaver all received the 2016 Extraordinary Academic Achievement Award at the Chancellor's Honors Banquet on April 19.



American Indian Science and Engineering Society Hold Inaugural Conference at UT

The American Indian Science and Engineering Society (AISES) held their inaugural regional conference at UT hosted by the Native American Student Association. The theme of the conference was "Building a Bridge Between the Past and the Future—through Education" and highlighted the struggles Native Americans face to maintain their cultural identity as they attempt to find success in academic and professional capacities. Improving education, tribal health care, laws, sustainability, and information technology were among the topics discussed at the conference this past April.



Research Update

CEE Professor Helping NASA Understand Changes in Arctic Ice

NASA first began using satellites to monitor Arctic sea ice in 1979, putting attention on a key player in the planet's health.

Since that time, the agency has tracked the decline of the ice pack as it has continued to shrink. As of March, the ice pack was 620,000 square miles smaller than it was in 1979.

While the cause of global climate change continues to be a hot-button political topic in the United States, a researcher in the College of Engineering may have pinpointed the reason for the retreat of sea ice.

Dr. Joshua Fu, a professor in the Department of Civil and Environmental Engineering (CEE), has been instrumental in the study of black carbon.

"There's been a tremendous amount of Arctic ice melt, whereas the melting in Antarctica hasn't been as severe," said Fu. "We set out to look at the reasons why that might be, and black carbon emerged early on as a key substance."

Black carbon is a result of the incomplete burning of fossil fuels, which results in a concentration of particulate matter that's higher than what is typically found in other forms of air pollution. Because of that extra matter, black carbon has the tendency to settle back to the ground.

As anyone who has owned a dark car can attest, the outside air temperature doesn't have to be all that warm to make the inside of the vehicle uncomfortably toasty.

In much the same way, when black carbon follows the global air patterns north and settles on the ice, it greatly increases its temperature compared to the outside air. This warming, in turn, melts the ice at a quicker rate.

"The black carbon melts the ice faster, which decreases the amount of ice in the Arctic, which means there's less ice to reflect the sun's rays, which warms the region and melts the ice even more rapidly," said Fu. "It's a double hit on the Arctic."

Fu was able to build models that track black carbon pollution back to its source by monitoring nitrogen oxides, whose rates are closely tied to black carbon. That breakthrough was so astounding that NASA even reached out to him for feedback and input.

What he found was that most of the black carbon came from just three regions: Siberia, the Niger Delta, and the Middle East, with 26 percent of the substance coming from Russia alone.

The thing all three regions have in common? They are all major petroleum producing regions where, incredibly, mass quantities of natural gas are burned off as a waste product.

The impact from the United States was much smaller, though the rapid growth of fracking sites, which often burn gas, has seen the country climb from thirteenth to fifth in the overall rankings of black carbon producers.

The next step for Fu is to expand research efforts and improve black carbon tracking methodology, something made easier by the burgeoning cooperation between NASA, the U.S. Department of Energy, Russia, and researchers.

"If we can come up with a better way to track black carbon itself independent of nitrogen oxides, we can make a more pinpointed effort to controlling them and finding ways of reducing them," said Fu.

He added that he's begun working with the first doctoral student he had, Louis Diaz, who is now a professor in Chile. Together, they are studying ways of monitoring glacial decline in the Andes Mountains as well as Antarctica.



A student wearing the Guide Glass prototype device.



The Guide Glass prototype device.

EECS Professor Develops New Technology in Guide Glass

If you are standing at an intersection in the heart of a major US city, and hear a "chirp, chirp, chirp" sound, it's most likely an accessible pedestrian signal—a device that provides visually impaired people with audible cues about the status of a walk signal.

Obviously the repetitive sounds are better than nothing, but they can't actually tell someone whether it's safe to cross the street or not. Reckless drivers, objects in the crosswalk, and potholes can present dangerous obstacles.

But what if there were a way to alert blind pedestrians to these potential pitfalls?

Jindong Tan, a professor in the UT Department of Mechanical, Aerospace, and Biomedical Engineering, is working on a unique device that could improve mobility without being overly cumbersome. It's called Guide Glass.

The wearable tech resembles a pair of sunglasses, with the addition of a small GoPro camera on one side. The camera and a variety of sensors are connected to an onboard microprocessing unit that converts the visual information into data.

Proprietary software analyzes the data to evaluate the surroundings in real time. The results are translated into words and transmitted to the wearer through an earpiece.

Guide Glass might look a bit like the ill-fated Google Glass product.

"We actually filed paperwork on ours before Google came out with theirs," Tan said. "It just happened to work out that the designs are similar."

Tan's team began by studying how the eye transmits signals to the brain—where the decisions about movement are made.

For example, a person standing on the curb unconsciously calculates whether or not they have time to cross the street based on what they see.

"If a person's brain could make such a calculation, so could a computer," Tan commented.

The team placed a premium on creating a practical compact design using small but powerful components.

"Mobility is about three things: direction, range, and access," Tan explained. "Being able to address all of those things at once is the key to truly opening up the world for the visually impaired."

Unfortunately, the most common methods available to help visually impaired people navigate can't address all three at the same time. Guide dogs can help with direction and range but can't warn of access restrictions like low-hanging branches. Walking sticks help users detect obstructions and distance but fall short of providing direction.

Finding a way to deliver all three elements concurrently with a gadget the size of a cracker is the challenge Tan and his team are facing.

"The current version of Guide Glass is able to convey angle, depth, distance traveled, whether a door is open, things like that," he said. "It tells the person the info they need, when they need it."

Tan hopes improvements in GPS technology will eventually allow further refinements, leading to even more precise calculations and directions.

While the promise of Guide Glass represents a tremendous boon for those with permanent visual impairments, there may also be applications for those in situations where vision is temporarily obscured.

Firefighters in a smoky building, rescue personnel in a blackout, or police entering a darkened crime scene could benefit from the device since it doesn't rely on light to make measurements.

"The possibilities for making a big impact on society are exciting," Tan said. "We just need to secure enough funding to bring it to market."

With appropriate funding, he believes Guide Glass could begin public trials as soon as 2018.

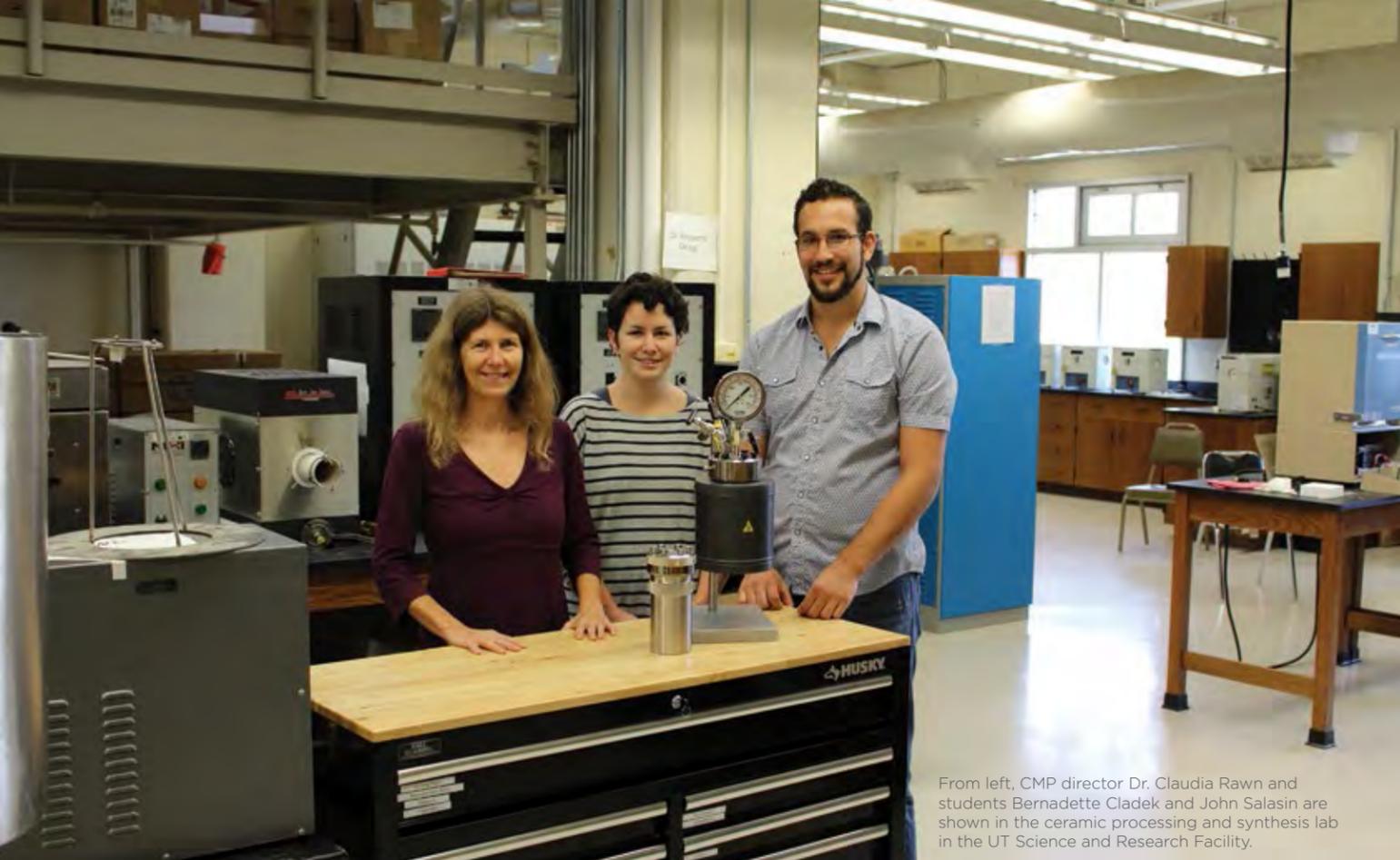
Even with the obvious positive implications for society, Tan explained, money has been hard to come by because investors are looking for big profit margins. He noted that they are constantly on the lookout for federal dollars, and the Smith-Kettlewell Eye Research Institute has recently expressed interest.

Until the right partner is found, the team will remain focused on improving Guide Glass to ultimately achieve their vision of helping those unable to see on their own.

Guide Glass article originally published in *Quest* magazine, written by David Goddard. Photography by Brian Notess.



Jindong Tan



From left, CMP director Dr. Claudia Rawn and students Bernadette Cladek and John Salasin are shown in the ceramic processing and synthesis lab in the UT Science and Research Facility.



Maneel Bharadwaj, a PhD student in the Department of Materials Science and Engineering and a graduate research assistant/teaching assistant in the Materials Joining Group, works on research projects funded by CMP industrial memberships.



Jingxuan Ge, a PhD student in the Department of Materials Science and Engineering and partially funded by the CMP, is part of the Plasmonic Nanomaterials research group.



John Salasin, a graduate student supported partially by the CMP, consolidates samples using UT's new hot uniaxial press.

College of Engineering Research Center Spotlight: The Center for Materials Processing

The University of Tennessee and the Tennessee Higher Education Commission (THEC) established the Center for Materials Processing (CMP) in 1985 with the mission to foster and promote research on materials. The CMP provides support for teaching and for conducting basic and applied research, with emphasis on relationships between processing, structure on various scales, and properties of all classes of materials. This support improves existing processing and synthesis techniques, develops new materials and technologies, transfers improvements to the applied sector, and equips students to thrive in the broad field of materials science and engineering.

"CMP-supported students conduct a wide variety of research. Current topics being studied include metals joining, high entropy alloys, scintillator materials, biomaterials, additive manufacturing (3-D printing), structural marine aluminum alloys, and transparent conductive oxides," said Dr. Claudia Rawn, director of the CMP since 2012. "A big part of materials processing is understanding the resulting structure and physical properties of the materials. So, in addition to processing of materials, characterization of materials is also an important aspect of the students' research."

Faculty and students associated with CMP conduct studies in multiple departments of the College of Engineering, and across a broad spectrum of investigation.

"In addition to the materials science and engineering department, there is a lot of materials research going on in departments such as chemical and biomolecular engineering, civil and environmental engineering, and mechanical, aerospace, and biomedical engineering," said Rawn.

In recent years, CMP has helped purchase equipment to outfit the recently renovated undergraduate MSE laboratories on the sixth floor of the Dougherty Engineering Building.

"In 2015 the CMP helped to fund the purchase of a thermal gravimetric analyzer (TGA), matching a differential scanning

calorimeter (DSC) that was purchased using MSE department differential tuition," said Rawn. In 2016, the CMP helped to fund the purchase of a dilatometer for measuring bulk thermal expansion.

"The newly acquired equipment from the CMP greatly enhances the MSE undergraduate laboratories, and the curriculum we can offer," said Chris Wetteland, director of the MSE Undergraduate Laboratories. "Experiments conducted using the dilatometer will offer students direct understanding on how processing conditions ultimately determine some materials properties."

"The bulk of the CMP funds go to supporting students," said Rawn. "The CMP has a long history of supporting graduate students, and over the last few years we have really worked on supporting undergraduate research in the area of materials processing. "At the end of the summer, we host an undergraduate summer research poster session and the winners get travel award. In April 2016, we sent four students to present their research at the National Conference on Undergraduate Research (NCUR) in Asheville, North Carolina."

This has been very important for the undergraduates that have received support. This year, the CMP also received an alumni donation in appreciation for the support and in honor of its importance in the alumni career.

Will Hoskins is one notable undergraduate who receives CMP support. He is a senior from New Tazewell, Tennessee, pursuing an honors degree in MSE and is also in the Chancellor's Honors Program. From June 2014 until June 2016, he worked as an undergraduate research assistant in the Materials Joining Group (MJG) under the guidance of Dr. Carl D. Lundin. His research experience has been jointly funded by CMP and the CMP membership participation of the Materials Properties Council and the Welding Research Council.

Hoskins has earned several awards and received the Materials Technology Institute (MTI) Bert Krisher Memorial Scholarship

during his relationship with CMP. He plans on graduating with his bachelor's degree in May of 2017 and is enrolled in the five-year BS/MS program in MSE, which will be completed under Lundin's guidance.

The CMP state-appropriated funds from THEC are matched by support from industry and governmental agencies. Industrial support is provided through CMP memberships, research contracts, and gifts. An important feature of funds derived from center memberships is the cost sharing of facilities and administrative costs (indirect costs) by the university.

Since its beginning, CMP has maintained a close relationship with the research staff of Oak Ridge National Laboratory (ORNL). The original proposal for the center was a combined effort by the late Dr. J. E. Spruiell, then head of MSE; J.O. Stiegler, director of metals and ceramics at ORNL; and Dr. Carl McHargue, then a joint ORNL/UT faculty member.

They sought to provide "real world" research projects for graduate students using the resources of both UT and ORNL. Several UT faculty members have joint appointments as ORNL research staff, and over the years contracts from ORNL provide support for research faculty, who conduct research as guest scientist and engineers at the facility.

"The initial proposal for CMP envisioned offering memberships to companies that would: A) support graduate research assistants to conduct precompetitive research of interest to the company; and B) allow company scientists and engineers access to UT laboratories and equipment," said McHargue, who became the CMP director in 1990—following Spruiell and Dr. Joseph Danko—and remains active as a consultant.

While the center's mission has evolved to focus more on educational benefits for students, the ability of the technical staff of a company to access and use unique equipment located in UT laboratories remains an important aspect of the CMP for companies located in Tennessee. There are multiple membership options to suit different needs, such as concerns over the intellectual property that might be produced by research.



In the foreground, civil engineering PhD student Stephen Pupilampu, partially funded by the CMP, studies mechanical properties of structural marine aluminum alloys and the effects of thermal stresses on these alloys.



COE Dean Wayne Davis (left) presents a plaque to Dr. Nancy Love (right) in recognition of presentation as a speaker in the Distinguished Lecture Series on March 9, 2016.

Special Feature: The College of Engineering Distinguished Lecture Series

The Spring 2016 Distinguished Lecture Series

The College of Engineering (COE) Distinguished Lecture and Webinar Series continued in spring 2016, featuring five guest speakers. Lecturers presented their topics in person in Room 622 of the Min H. Kao Electrical Engineering and Computer Science Building and via an Internet simulcast.

The series was established to have top academic and professional experts from around the world speak about key topics and research of the day in a forum that all interested individuals could access without having to be directly located in Knoxville.

The webcast is live and questions can be submitted to the lecturers via e-mail. Archived videos of each presentation is made available online for later viewing.

The spring 2016 Distinguished Lecture Series included University of Southern California Professor Francisco Valero-Cuevas, Missouri University of Science and Technology Professor Mariesa Crow, University of Michigan Professor Nancy G. Love, North Carolina State University Professor Viney Aneja, and NASA Advanced Concepts Deputy Manager Les Johnson.

The spring series of speakers began on January 27, 2016, with Dr. Francisco Valero-Cuevas, a professor of biomedical engineering and biokinesiology and physical therapy, computer science and aerospace and mechanical engineering in the Viterbi School of Engineering at the University of Southern California. His talk was "An Integrative Engineering Approach to Neuromuscular Control," addressing two examples of how this approach can reconcile divergent views on the biomedical-field topic.

Dr. Mariesa Crow, PE, gave the lecture "VRB Energy Storage Performance Characterization for Microgrid Applications" on Monday, February 29. She is the Fred Finley Distinguished Professor of Electrical Engineering, Department of Electrical

and Computer Engineering, Missouri University of Science and Technology; a Fellow of the Institute of Electrical and Electronics Engineers; and vice president for publications, IEEE Power & Energy Society. Her talk addressed recent efforts to characterize the Vanadium Redox Battery (VRB) for microgrid applications.

Dr. Nancy Love, a professor in the Department of Civil and Environmental Engineering at the University of Michigan, visited UT on March 9, 2016, to give her talk, "At the Confluence: Nutrients, Trace Chemicals, and Sustainability in the Urban Water Sector," a discussion of water usage, treatment, and recovery. Her lecture addressed innovative and energy-efficient nitrogen and phosphorus management approaches to improving the infrastructure in place today for dealing with urban wastewater. Love is the 2015-2016 Association of Environmental Engineering & Science Professors Foundation (AEESP) distinguished lecturer.

Dr. Viney P. Aneja, professor of air quality at North Carolina State University, was the fourth speaker of the spring lectures on March 23, 2016, with a talk on air quality and atmospheric studies titled "The Impact of Agriculture on Air Quality and Climate: Is Nitrogen the Next Carbon?" His talk addressed a need for an integrated nitrogen management strategy and new policies that cover these concerns, plus challenges to the scientific community to continue quantifying the benefits of nitrogen mitigation.

The spring slate concluded April 4, 2016, with Les Johnson, NASA deputy manager for the Advanced Concepts Office at NASA's Marshall Space Flight Center and an acclaimed author. His talk, titled "Solar Sails for Spacecraft Propulsion," addressed advanced topics related to space flight, travel, and eventual colonization. A solar-sail propulsion system would allow spacecraft to travel without the need for storing fuel.



Dr. Viney Aneja during his presentation as part of the College of Engineering 2016 Spring Lecture Series on March 23, 2016.



Mr. Les Johnson demonstrates an action involving solar sails during his COE Distinguished Lecture Series presentation on April 4, 2016.

For more information on the lecture series and the speakers, visit www.engr.utk.edu/distinguished_lecture/index.html

The Fall 2016 Distinguished Lecture Series

The Fall 2016 Distinguished Lecture Series features five leading experts in their respective fields:

Monday, September 12, 2016

Dr. Joan Brennecke
Keating-Crawford Professor
Department of Chemical and
Biomolecular Engineering
University of Notre Dame



Dr. Joan Brennecke

Monday, September 19, 2016

Dr. Robert J. Davis
Earnest Jackson Oglesby
Professor, Department of
Chemical Engineering
University of Virginia



Dr. Robert J. Davis

Monday, September 26, 2016

Dr. Vigor Yang
William R.T. Oakes Professor
and Chair, School of Aerospace
Engineering
Georgia Institute of Technology



Dr. Vigor Yang

Monday, October 3, 2016

Dr. John D. Boice, Jr., Sc.D.
Professor of Medicine,
Cancer Epidemiologist
Vanderbilt-Ingram Cancer Center



Dr. John D. Boice

Monday, October 31, 2016

Dr. David L. Sedlak
Plato Malozernoff Professor,
Co-director of Berkeley Water
Center, and Director of the Institute
for Environmental Science and
Engineering
Department of Civil and
Environmental Engineering,
University of California, Berkeley



Dr. David L. Sedlak

Special Feature: COE Global Initiatives Office Sponsors Student Trip to Cuba



Brian Grim and Reed Schneider, from left in front, use a homemade level while building a bench in Cuba.

The College of Engineering (COE) office of Global Initiatives organized a service and cultural experience trip for students to Cuba in May of 2016. This was the college's first outreach project to the island since the recent lifting of long-standing travel restrictions.

COE International Coordinator Judith Mallory led the trip, the thirteenth for Global Initiatives. Participating students were Evalynn Borrego, freshman, and Reed Schneider, sophomore, both biomedical engineering majors; Brian Grim, freshman, and Aubrey Casey, junior, both mechanical engineering majors; Abigail Cooper, freshman chemical engineering major; and Meghan Treece, a senior in political science.

Dr. Ralph Gonzalez, former head of the Department of Electrical Engineering and Computer Science, was born in Cuba. He spoke with the group of students before the trip to help them plan and prepare for their visit. Students for this trip also benefitted with scholarships from the Gonzalez Family Endowment, established a few years ago by Gonzalez and his wife, Connie.

Mallory arranged the trip with Globe Aware, a company that had previously arranged a successful COE trip to Costa Rica.

"I heard over a year ago that they were going to be having trips to Cuba, so I kept in touch with them about it," said Mallory. "When it was announced that they were good to go, I started planning the trip in earnest."

The company has past experience with travel to Cuba, and facilitated a smooth trip for the UT group. Since no US-owned carriers were yet flying into Cuba, the group flew into Cancun, Mexico, to transfer to Cubana Airways for the remainder of the outbound trip.

Andres Gonzalez, in-country coordinator, met them at the Jose Marti airport in Havana and took them to a casa particular, or private home, located in historic Habana Vieja ("Old Havana") where they stayed for the week. The Cuban government recently

approved the use of private homes for tourist rental. The casa particular used by the group was an entire floor of an apartment building that was more than 100 years old.

"The workdays were spent in the district of Casa Blanca, accessible by an old, rusty ferry in excellent operating condition," said Mallory. "The quieter side of Havana, Casa Blanca has some residents working on the promotion of economic development. One attraction they hope to soon complete is a therapeutic center that will offer services to the community as well as tourists."

For its service project, the UT group helped build a kiosk in Casa Blanca to be used as a venue for selling coconuts, along with benches for both customers and the community in general to use. One of the local workers on the project opened a coconut with a machete so that students could sample coconut water straight from the shell.

All materials used for the construction were recycled, and nails were pulled from the lumber and straightened for re-use. Students brought tools for the project, as they are expensive and difficult to obtain in Cuba. The tools were then donated for future building projects.

"We started off with an overview of the project and what it hoped to accomplish, and was then followed by a lovely walk around the site and surrounding area," explained Treece.

While touring the site, the group saw the sculpture El Cristo de la Habana, "The Christ of Havana," a colossal sculpture by Cuban artist Jilma Wood. The marble statue is about twenty meters high and weighs around 320 tons, resting on a base of three meters in which Wood buried diverse objects of the era.

Before and after the construction project, UT students toured Havana, the capitol city, and other regions.

"An emphasis on this particular trip was cultural exchange," said Mallory. "Of course, we stress that on all of our trips, but this one was structured in such a way as to show that we are



The view from the Mirador, or overlook, shows the unique appearance of the Viñales Valley in the western part of Cuba.



This view of the Havana Harbor is from the rooftop of the city's Camera Obscura.



Meghan Treece prepares recycled materials for use in the building project in Cuba.



UT students who traveled to Cuba in the spring were, from left, Brian Grim, Meghan Treece, Abigail Cooper, Evalynn Borrego, Aubrey Casey, and Reed Schneider.

glad to be there to help. But we are just as glad to get to know them, experience the culture, see the place, learn about what is happening there, and so forth."

A state-licensed tour guide led students on a five-mile walk around Havana that ended in a ride in bici-taxis back to the apartment. These are bicycle-style vehicles with semi-covered double seats on the back for passengers. Some of the bici-taxis had music, bumper stickers, air horns, and hood ornaments from classic cars.

Along the walking route, the group saw various plazas, parks, green spaces, sculpture, museums, fruit stands, Santeria shops, and homes. They visited an old pharmacy museum complete with antique medicine jars, microscopes, and mortar and pestle sets. The museum still functions as a drugstore.

Two other sites of interest included the Floridita Restaurant—which claims to be the cuna de daiquiri ("cradle of the daiquiri"), where the frozen drink was supposedly invented—and the Hotel Ambos Mundos. Both are purported to be places frequented by Ernest Hemingway, a favorite of Cubans, on his numerous trips to the country.

"Interestingly, the slogan at one of the newer restaurants was, 'Hemingway was never here,'" said Mallory.

Part of the walking tour took place along the Paseo del Prado, a wide terrazzo walkway, which was recently used as the runway for a fashion show by the House of Chanel. The walkway leads through town to the Bay of Havana and the famous Malecon, the road running alongside the sea.

"The Malecon is to Havana what the Champs Elysees is to Paris," said Mallory.

The COE group saw many styles of architecture in the city, and many of the vintage 1950s US-made cars that are still in use throughout Cuba. An evening was spent at the Castillo de San Carlos de la Cabana, the largest fortress in Latin America, dating

from the 18th century. Here, the group observed the nightly canon ceremony, the Cañonazo, which is re-enacted by actual military personnel in period costume. A canon is fired in this elaborate ceremony, symbolic of a historic time when the city gates were closed at 9:00 p.m. each night.

Another activity involved a road trip to the west side of the island to the Viñales Valley. On the way there, the guide explained that hitchhiking is a popular form of transportation in Cuba, even encouraged by the government. People along the roadside waved Cuban pesos to entice drivers to stop. Tobacco and other crops are cultivated in the valley, mostly by traditional agricultural techniques.

"The architecture and nature were stunning, especially the mountains," said Borrego. "The mountains in Viñales are not your typical mountains. They have round and flat tops that remind me of gumdrops."

The trip was particularly meaningful for Borrego, who has Cuban ancestry.

"I couldn't give up the chance to visit Cuba, to learn about its culture, to become closer to the part of me that was a mystery," she said. "It was a dream come true. The architecture was stunning and the people were lively."

Back in Havana, the group viewed Cuba's Camera Obscura, an early form of camera first detailed by Leonardo da Vinci, at the Plaza Vieja. This room-sized camera offers a unique 360-degree view of the city. Other visited sites included the Rio Almendares Tunnel, the Fortress of San Carlos, and Cuba's Chinatown.

"After seven days in Cuba, the group came away with an appreciation for the gastronomy, culture, people, history, politics, and economy of this country only recently opened to visits by United States citizens," said Mallory.



Incoming freshman students experienced college classroom settings during the 2016 Intercollegiate Summer Bridge Program.

The 2016 Intercollegiate Summer Bridge (ISB) Program took place June 10–July 1, 2016, for its third year. This residential summer program seeks to increase retention for underrepresented student populations studying in areas of science, technology, engineering, and mathematics (STEM). Twenty-eight students attended the program to prepare for the college environment through academic classes, college life workshops, and STEM-related field trips.

Attending students felt the program gave them important insight and connections for their upcoming college experience.

“I gained more knowledge there about the subjects we were learning than anywhere else,” said Adiany Cartagena, an incoming freshman biomedical engineering major with a pre-med concentration. “It also gave me a good idea on how much work I would have to do in order to succeed in college.”

“My favorite part of the ISB program was interacting with all the great people I met there,” said Frenando Blevins, who plans to pursue an industrial engineering major, with a potential double minor in entrepreneurship and Spanish. “The professors were fantastic and I learned a lot from them, but even more so I learned a lot from my peers.”

“When someone needed help and asked, if one person didn’t know then they would move on until someone knew,” added Jaron Burns, who plans to major in chemical engineering.

ISB is a collaboration with the College of Engineering, the College of Agriculture and Natural Resources, and the College of Arts & Sciences. The program uses a model established by the Tennessee Luis Stokes Alliance for Minority Participation (TLSAMP) to provide an overview of fundamental academic subjects for STEM majors, particularly in math and chemistry. These subjects have been the main academic focus for the past several years. This year a chemistry lab was added to compliment the lecture portion and expose students to college-level laboratory settings and instruction methods.

“The new experience that stood out to me in this program were the classes and the coursework,” said Blevins. “Had it not been for the ISB, I definitely would not have been prepared to take on all this work.”

College life workshops were also part of the ISB, focusing on various campus departments. Presenters came from offices such as the Center for Career Development, Office of Greek Life, Student Leadership, and various others. The emphasis was to provide students a glimpse of the many resources at UT, and the benefits of developing experiences outside the classroom room to compliment what they study inside the classroom.

“I have always known that being an engineering major was going to be hard,” said Cartagena. “But now I know that I have resources at my disposal that will help me succeed. The College of Engineering does not play around when it comes to helping students, and I couldn’t be more grateful.”

Several STEM site visits are incorporated into the program, including the Oak Ridge National Laboratory (ORNL) and DENSO Manufacturing. Also, leadership development opportunities with New Horizons Experiential Learning Center focused on team-building and communication skills.

At ORNL, students were able to view the Additive Manufacturing Integrated Energy (AMIE) Demonstration Project with Dr. Roderick Jackson, which focused on rethinking ways that electrical power is generated, stored, and used. The AMIE project utilizes an integrated energy system between a building and a vehicle.

“I learned how important their research is, not only to the US, but the entire world,” said Blevins. “It was a fantastic experience overall.”

Students were given a tour of the Oak Ridge Leadership Computer Facility, which provided an opportunity to see several super computers on site and a tour of the Aquatic Ecology facility.

DENSO Manufacturing partnered with ISB for another year to allow students to tour their facility, meet staff, and provide students insight into how various disciplines of engineering play roles for the auto-parts industry. Students were able to meet current co-op interns from UT and Tennessee Tech University. The co-op students provided their personal perspectives on how to find co-op programs, navigate the interview process, and how involvement in student organizations helped build the pre-professional skills.

ISB participants visited Eastern Tennessee State University’s College of Medicine to learn about continuing their education in the medical field. They had the opportunity to meet with admissions staff, talk with current medical students, and participate in hands-on activities.

At the culmination of the program, an awards luncheon was provided for participants, family, friends, and various university faculty and staff. Gifts were presented to the deans of each sponsoring college (engineering; arts & sciences; and agriculture and natural resources), instructors, ISB student counselors, and staff members. Several students were honored for top performance and being most improved for the math and chemistry courses.



Counselors, in foreground, and students from the 2016 Intercollegiate Summer Bridge Program



Students in the 2016 Intercollegiate Summer Bridge Program experienced interactive engineering activities.



Students in the 2016 Intercollegiate Summer Bridge Program visited the Lost Sea, underground caverns in Madisonville, Tennessee.



The Bodenheimer Fellows (left to right): Aaron Young, Kyle Harris, Jessica Boles, John Duggan, and Adam Disney. Not pictured: Spencer Cochran and Patricia Eckhart.

Aaron Young

"In the exciting new area of neuromorphic computing, I am researching how to implement the FPGA realization of the Dynamic Adaptive Neural Network Arrays (DANNA) neuromorphic model. The Robert E. Bodenheimer Fellowship is letting me focus on this exciting, cutting edge research while pursuing my master's degree, without being financially dependent on my parents or having to seek additional employment."

Kyle Harris

"I chose the University of Tennessee because I am interested in space flight electronics and Dr. Blalock does this kind of research. My research is on space flights research for NASA. The Bodenheimer Fellowship has allowed me the opportunity to pursue a PhD in cutting edge integrated circuit design processes."

Jessica Boles

"The University of Tennessee is the perfect mix of being an engineering school and home sweet home for me. The Bodenheimer Fellowship gave me the opportunity to keep studying what I love for the university I love. I study power electronics which is anything that converts from one form of power to another form and because of that it extends all the way from small electronics to power grids."

John Duggan

"In my research, I take species observations and environmental information from the Great Smoky Mountains National Park and combine them to produce habitat models, which my team then uses to communicate the area's biodiversity. It's something I have fallen in love with, and I'm extremely appreciative that the Bodenheimer Fellowship has helped to put me in the position to continue this work."

Adam Disney

"I grew up here in Knoxville. When I was planning to go to graduate school, people said that choosing my advisor was very important. I had already worked with Dr. James Plank, and we worked well together. So I chose to continue at UT to work with him. I doubt that I would be going to graduate school without the Bodenheimer Fellowship—financially, I don't think it would have been possible. I'm doing neuromorphic computing. Current computer hardware architecture improvements are not moving forward as rapidly as they did once. One of the areas of research to move it forward is neuromorphic—taking inspiration from the human brain."

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Facilities Update

New construction, renovations, and landscaping projects have continued over the summer on the UT campus. The College of Engineering's Associate Dean for Research and Technology Bill Dunne has provided an update on specific projects related to the engineering campus.

The Estabrook Road project along the Second Creek, along the eastern boundary of campus behind Ferris Hall and the Dougherty Engineering Building will be substantially completed by the end of August. This capital landscape project involves Barge Waggoner Sumner & Cannon Inc. (BWSC), Facilities Planning and Facilities Services. The old chain link fence was torn down and the road support improved. The rebuilt road with sidewalks and railings consistent with the campus standards will be installed. When finished, this project will upgrade the "look and feel" of the engineering campus along the road between the John D. Tickle Engineering Building and Cumberland Avenue, improving the streetscape with trees, lighting, seating and new paving to enhance appearance and accessibility for this part of campus. For example, a new terrace will be built across from the new steps that go down the hill between Dougherty and Ferris, and it will have seating overlooking Second Creek as well as wireless access.

"The retaining wall beneath the sidewalk in this area was a particularly challenging job," Dunne said. "The team had to use man-made block to emulate limestone and other natural stone that is in the area to support the sidewalk. These cast pieces of concrete weigh 6,000 pounds and add a lot of stability to the steep slope beneath the sidewalk and road."

A less dramatic but very important project will also take place when the windows and roofs are repaired for both Perkins and Ferris Hall.

"The university received maintenance funds to replace the roofs and windows of these two buildings, improvements which were very much needed," Dunne said. "This is a very serious and important commitment from the university to the engineering campus and this will help greatly with the weather-proofing and energy efficiency of these two older buildings."

Dunne added that renovation work finishing this summer will make Dougherty Hall primarily the home of the Departments of Chemical and Biomolecular Engineering and Mechanical, Aerospace, and Biomedical Engineering. With the completion of this work and the opening of the Joint Institute for Advanced Materials (JIAM) building, the Department of Materials Science and Engineering will still have its new instructional laboratories in the building, but its faculty will be mostly based in Ferris Hall with SERF and the JIAM building. The opening of the JIAM building on the Cherokee Farm Campus is also discussed in the cover story in this issue.

As for new construction, the College of Engineering and the Department of Nuclear Engineering (NE) continue to work with UT administrators and the officials with the State of Tennessee to finalize financing and plans for a new engineering complex. Programming has been completed.

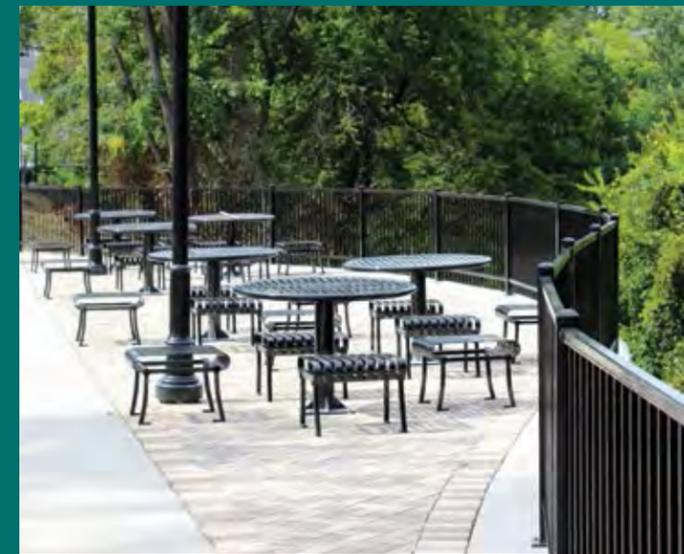
"A Request for Proposals (RFP) was sent out in August of this year," Dunne said. "The design team for the building should be confirmed by early fall, and we should be well into the design process for the new building by January, 2017."

Dunne anticipates that if state funding is approved, construction of the building would begin in the fall of 2017.

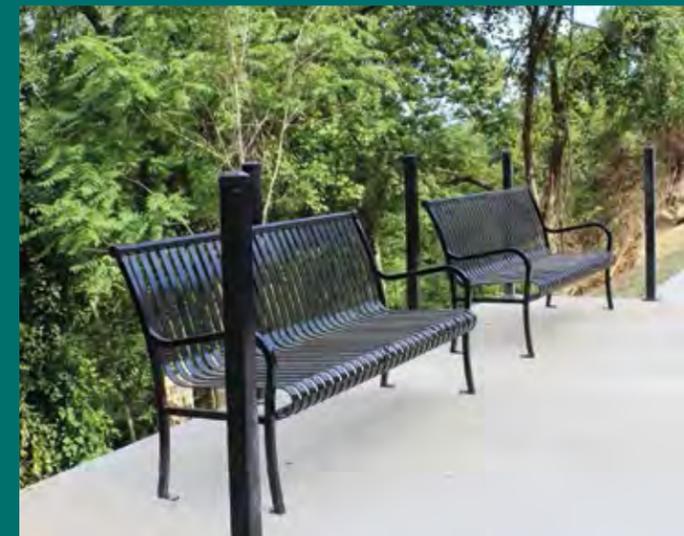
Current plans are for the building to house the freshman engineering programs, the NE department, undergraduate design and project space, and flexible research laboratories. The building will be sited in the area where Pasqua, Berry, and Estabrook Halls are located, but the exact configuration has yet to be determined.

"We're also finalizing our plans for moving the NE labs and administrative and faculty offices," said Dunne. "It looks as though we will be able to move their laboratories into SERF until the new building is completed, and we are reviewing options for office space that will hopefully keep the NE department close to the other engineering buildings. Several new facilities are being completed on campus right now and subsequent moves should open up some space on The Hill."

The engineering occupants of Estabrook were previously relocated, with the Jerry E. Stoneking *engage*TM Program administrators, faculty, and teaching spaces now in Perkins Hall. The Engineering Diversity Programs Office and the Engineering Advising Office also relocated to Perkins. In its new home, the *engage*TM program is collaborating with several departments to establish the Innovation & Collaboration studio to support student design projects with a maker space. The studio is located in the newly remodeled basement of Perkins Hall.



The project includes new seating areas as part of the landscaping project on the eastern end of campus.



Benches next to the new railing being installed along the repaved sidewalks on Estabrook Road.



A view of the new overlook on Second Creek that offers benches and new lighting.

Leaders in Philanthropy: Jim Gibson

Social responsibility, love of environment drive Gibson to give back



Jim Gibson

In a house in Berkeley Heights, New Jersey, a small town an hour west of New York City, the basement was hot, alive with the whirr and crackle of machines roll forming stainless steel strip and welding it into tubing. As a young man, Jim Gibson (BS/IE '71) would help with his father's new business making stainless steel tubing. A little embarrassed, Gibson would paint equipment in the front driveway. However, this did not deter his high school sweetheart, Jill Ramsey, who grew up in Chicago. "I cherish the memories now," Gibson reminisced.

He went on to attend a two-year college in New Jersey and then the University of Tennessee, Knoxville. Coming to Knoxville in the late 60's was a culture shock, "You turned on the TV and you saw Cas Walker. He had his card table set with his canned goods, he was telling what a good price he had this week on peas or something like that," Gibson remembers the variety show that was launching Dolly Parton's career. After two quarters at UT, Gibson dropped out to marry Jill, who by then was going to the University of Colorado. It took some convincing for Jill to join him in Knoxville, but he came back, graduating from UT in 1971.

Gibson returned to work for his father's business, Gibson Tube, in a 12,000 square foot facility. He built it up, becoming the president and owner. By the time he wound up selling it in 1999, it was a quarter of a million square feet of manufacturing in a different location, employing one hundred and fifty people.

"It doesn't happen very often anymore where somebody starts a business in their basement and it gets pretty big, but it happened to my father and me," Gibson said.

He then established Pressure Tube Manufacturing, LLC, a new tubing products company. After many years in the industry, Gibson decided to retire, selling Pressure Tube Manufacturing. He and Jill now live in Basking Ridge, New Jersey, spending more time with family including their two daughters and four grandchildren.

Gibson also enjoys managing their family farm which he started after reading the book *The Omnivore's Dilemma: A Natural History of Four Meals* by Michael Pollan. "I've always been kind-of an earthy guy," Gibson commented. He has goats, chickens, pigs, and a beautiful stand of native, warm season grasses.

Gibson said he is now focused on "whatever I can do to enrich my life, but also try to make the world a better place with my philanthropy."

As a trained industrial engineer, Gibson recognizes challenges and takes action to be a part of the solution. He generously supports the causes he cares about, including with his philanthropy. At UT alone, he has made gifts supporting the Center for Sustainable Energy and Educational Research, the Jerry E. Stoneking *engage*™ Program, the John D. Tickle Engineering Building (new home of two departments, including Industrial and Systems Engineering), and establishing the Gibson Endowed Chair in Engineering.

Musing over the complicated, expensive problems society is facing now, especially in the realm of sustainable energy, Gibson has hope.

"Back one hundred years ago, the Carnegies and the Vanderbilts and the Rockefellers would put a lot of their fortune into libraries, museums, and research," Gibson said. "But they did that when they were in the latter part of their life. The one bright spot that I see is the young multi-billionaires who are concerned about the future, spending a lot of money on research that government and the typical industries are not. Hopefully they will come up with a great source of non-polluting energy. They are doing a lot of work where government, with politics and everything, is not."

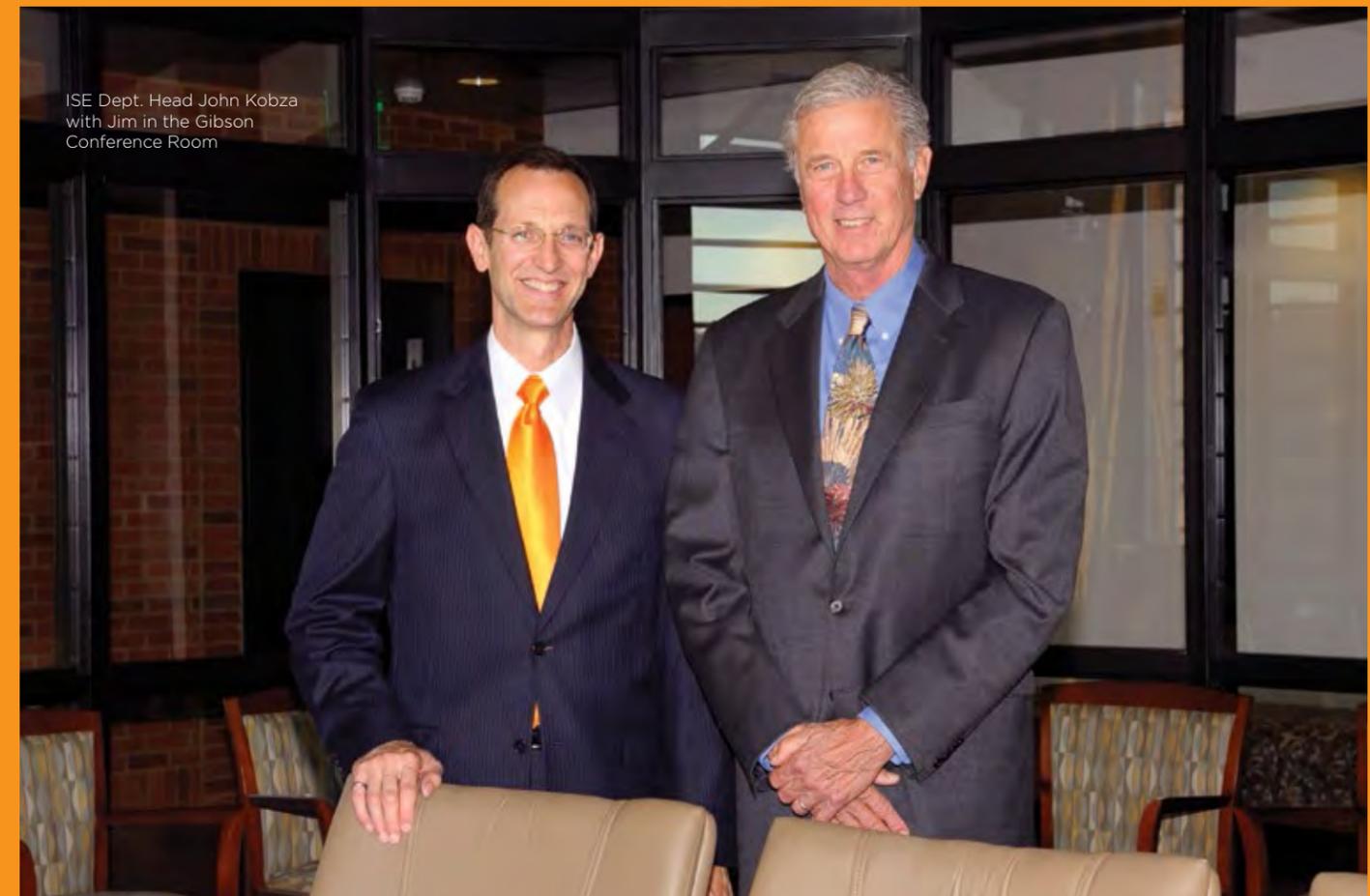
Surrounded by big bluestem, little bluestem, and switchgrass, Gibson stands in his field of untapped biomass energy, goats bleating in the background. "I think I'm an atypical graduate that is giving back, which I'm very happy to do," Gibson added.



Article written by Kathleen Kim-Baker, College of Engineering Development Office



Touring the UT Institute of Agriculture, Gibson finds a machine invented by his father



ISE Dept. Head John Kobza with Jim in the Gibson Conference Room

Development Update

We are pleased to institute a new feature in this publication: **Leaders in Philanthropy**. Long before I became the chief development officer for engineering, this college had a strong tradition of generosity among its donors and friends. It is my great privilege to work with many of you (or see the work you do with our excellent development staff). This new feature will tell the stories of individuals whose impact is both immediate and long lasting. We began in the spring 2016 Tennessee Engineer with **Ralph** and **Janet Heath** and continue in this issue with **Jim Gibson**. And thank you to each and every one of you who give to the College of Engineering. **You make a difference!** For more information on how you can support the college with your giving please contact me at:



Dorothy Barkley Bryson

Executive Director of Development
118 Perkins Hall • Knoxville, TN 37996
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Hall of Fame Recognizes Outstanding Engineers



John Prados, right, stands with College of Engineering Dean Wayne Davis after his induction into the Department of Chemical and Biomolecular Engineering Hall of Fame.

In order to recognize and celebrate the achievements of outstanding former faculty and alumni, several of the College of Engineering departments have established Halls of Fame.

Dr. John Prados, a UT vice president and a University Professor Emeritus in the Department of Chemical and Biomolecular Engineering (CBE), was named the inaugural member of the CBE Hall of Fame in honor of his sixty years of service to the department as a teacher, administrator, and university icon.

Prados joined the department as a graduate assistant in 1953. He quickly climbed the ranks in both the department and the college, serving as a full-time faculty member from 1956 to 1968 before spending the next two decades in stints as associate dean of engineering, dean of admissions and records, acting chancellor of the Knoxville and Martin campuses, acting director of energy conversion programs at the UT Space Institute, and, from 1973 through 1988, vice president for academic affairs of the statewide UT System.

“The faculty in the department wanted him to be the first and only person elected to our hall of fame in its inaugural year,” said department head Dr. Bamin Khomami. “It’s an acknowledgement of his standing in the field as well as his outstanding contributions to our program over many decades.”

Prados is a fellow of the American Institute of Chemical Engineers (AIChE), the Accreditation Board for Engineering and Technology (ABET), and the American Society for Engineering Education. He has received the L.E. Grinter Distinguished Service Award, UT’s Macebearer Award, and the James T. Rogers Award from the Commission on Colleges. He has also served as secretary and president of ABET.



ISE professor Dan Doulet, the first inductee into the department’s Hall of Fame.

He built a successful consulting practice and later a good-sized importing company while teaching courses geared toward students working in international fields and manufacturing. His Engineering Economy course was one of the most popular electives across the college because of the real-world experiences he brought to the classroom. He was the third head of the Department of Industrial Engineering from 1970-76.

Doulet was also instrumental, working with a grant from the Tennessee Valley Authority, in revitalizing industry in the town of Dunlap. Doulet incorporated industrial engineering graduate students to help create Dunlap Industries, Inc., a zipper manufacturing company which celebrated its fiftieth anniversary on June 7, 2016.

Doulet retired from UT in 1992. He served as an inspiration and a mentor to a generation of industrial engineering alumni who became successful entrepreneurs, business owners, and captains of industry, including John D. Tickle and Eric Zeanah, who took over Doulet’s import company and is president/owner of what is now American Accessories International.

“It is not unusual to meet with alumni who talk about the passion for change and improvement they have because of the influence of Professor Doulet,” said ISE Professor and Head John Kobza. “What is more surprising are the non-alumni who learn I am affiliated with the ISE Department, then start talking about Dan Doulet and how he helped them or their company. As both an alumnus and a faculty member, he represents the best of the department and the University of Tennessee.”



MSE Professor and Department Head and JIAM Director Veerle Keppens (left) presents the MSE Hall of Fame recognition to Dr. Warren Oliver.

an eye on developing better, faster, and cheaper ways to test materials at the nano- and micro-levels. Oliver holds fourteen patents and has published more than two hundred and fifty papers in peer reviewed international journals.

Oliver served as a research scientist at the Oak Ridge National Laboratory (ORNL), where he was responsible for the development of alloys for high-temperature structural applications, as well as the mechanical properties microprobe. As president and co-founder of Nano Instruments, Inc., he oversaw all research and development. When MTS Corporation acquired Nano Instruments, he became the vice president, where he managed the Nano Instruments Innovation Center; he also acted as Senior Scientist and General Manager. Since 2009 he has been the President of Nanomechanics, Inc., where his vision guides the research and development of the company’s innovative nanomechanical testing technology. Oliver also currently serves an adjunct professor at UT.

In 2010, Oliver and his research partner Dr. George Pharr, a professor in the MSE department, won the Innovation in Materials Characterization Award (IMCA) from the Materials Research Society, for seminal contributions to the development of the instrumentation and analysis methods of nanoindentation for characterizing the mechanical properties of materials at the micrometer- and nanometer-length scales.

“The Oliver family counts three generations of materials scientists, with strong ties to our department,” said MSE Department Head and Joint Institute for Advanced Materials (JIAM) Director Veerle Keppens. “Warren’s accomplishments in small-scale mechanics have been nationally and internationally recognized, and the accolades he has received recently culminated in his election to the National Academy of Engineering. He’s putting the bar very high for our future inductees.”

The Department of Materials Science and Engineering (MSE) selected **Dr. Warren Oliver**, a newly inducted member of the National Academy of Engineering (NAE) and president of Nanomechanics, Inc. to be the first inductee to the MSE Hall of Fame.

Oliver’s research at Stanford University, the University of Tennessee, Knoxville, and in his role as President of Nanomechanics, focuses on small-scale mechanical testing, with



College of Engineering Dean Wayne Davis, left, and Department of Mechanical, Aerospace and Biomedical Engineering head Matthew Mench, right, stand with the family of Joel Bailey.

The Department of Mechanical, Aerospace, and Biomedical Engineering recently added three new members to its Hall of Fame, including a former department head, a former high-ranking official of the Boeing Company, and the current chief operating officer of the Southern Company.

Joel Bailey, Howard Chambers, and Kimberly Greene, respectively, joined last year’s inaugural class of four and were honored with a presentation at the department’s office in the Nathan W. Dougherty Engineering Building and a dinner at the Foundry.

“This new class of inductees again sets a perfect example for our current students to follow and to understand what kind of career and life are possible with a degree from our department,” said department head Matthew Mench. “Students walking by the wall with all of the class members will see the wide variety of paths available to them while at the same time learning some of the history of the department.”

The 2016 class includes:

Dr. Joel F. Bailey

Bailey received mechanical engineering degrees from Purdue University and Lehigh University before joining UT’s faculty in 1949. He served as head of the department from 1952 to 1973. In 1956, Bailey helped establish the graduate study program at the Arnold Engineering Development Center in Tullahoma, now known as the UT Space Institute, and served as its first director.

In 1967, Bailey was named an Alumni Distinguished Professor. He was also instrumental in the founding of the Pi Tau Sigma engineering honor society chapter at UT. The society’s award to the senior in mechanical engineering with the highest average is named in his honor. During his career, he also held academic positions at Lehigh University, Oregon State College, and Northwestern University.

Howard E. Chambers

Chambers graduated from UT with a bachelor’s in mechanical engineering in 1964.

He served with the Boeing Company for many decades and played critical roles on some of the company’s highest-profile projects before retiring in 2011. While at Boeing, he was vice president and deputy program manager of the 787 program, vice president and general manager of space and intelligence systems for Boeing’s Integrated Defense Systems, chairman of the board of Boeing Satellite Systems International Inc., and chairman of the board and CEO of Boeing Satellite Systems Inc.

He also served as chairman of the board of Spectrolab Inc. and has received the 2002 Amelia Earhart Award for mentoring, the 2009 Nathan Dougherty Award for the College of Engineering, and the 2015 UT Alumni Service Award. He also served on the College of Engineering Board of Advisors, where he is now an emeritus member.

Kimberly S. Greene

Kimberly Greene earned her bachelor’s degree in what was then known as engineering science and mechanics—now mechanical engineering—in 1988. She went to work at Southern Company in 1991 and has enjoyed a successful career with the energy giant, including serving as vice president of finance and treasurer.

From 2007 to 2013, Greene worked for TVA, serving as chief financial officer, executive vice president of financial services, and chief risk officer before returning to Southern Company as president and CEO of Southern Company Services.

Greene became chief operating officer and executive vice president of Southern Company in 2014. She was named to the list of “Top 25 Power Women to Watch” by *Atlanta Woman* magazine and named Power-Gen’s 2015 Woman of the Year.

She serves on the advisory board for both the UT College of Engineering and the University of Alabama at Birmingham School of Engineering. Greene is a member of the Alabama Engineering Hall of Fame and a recipient of the UT Distinguished Alumni Award.

These three individuals join the 2015 inductees—former Chancellor William Snyder, former astronaut Henry Hartsfield, former American Society of Mechanical Engineers president Richard Rosenberg, and longtime Chrysler Corporation fixture Rinehart Bright—in the MABE Hall of Fame.

The College of Engineering is proud to recognize these distinguished individuals whose achievements have contributed so much to engineering education, research, and outreach.



Department of Mechanical, Aerospace and Biomedical Engineering head Matthew Mench, left, and College of Engineering Dean Wayne Davis, right, stand with Howard Chambers and his wife Debra.



Department of Mechanical, Aerospace and Biomedical Engineering head Matthew Mench, left, and College of Engineering Dean Wayne Davis stand with Kimberly Greene.

Van Hooser Begins New Position at NASA



Katherine Van Hooser

Katherine Van Hooser (BS/AE '91), began working for NASA upon graduating from UT with her aerospace engineering degree. She was promoted in April 2016 to Chief Engineer of Marshall Space Flight Center in Huntsville, Alabama.

Van Hooser, originally from Madisonville, Kentucky, has a life-long interest in the space program, and began her career at NASA in 1991 as a turbomachinery engineer. She soon became team leader, and was responsible for many aspects of the design and implementation for turbine-driven pumps in liquid rocket engines. Her career awards at NASA include the 2001

Software of the Year Award, the 2008 Exceptional Engineering Achievement Medal, the 2010 Silver Snoopy Award, and the 2011 Distinguished Service Medal.

She was previously deputy director of Marshall's Materials and Processes Laboratory, beginning in early 2015. Today, she oversees around 150 NASA team members, assuring the technical excellence of all Marshall-assigned spacecraft, propulsion, science payload, life support, and mission systems.

Claxton Awarded "40 Under 40" Recognition



Samuel Allen Claxton

Samuel Allen Claxton (BS/ME '01) was chosen for the 2016 "40 Under 40" list by *Consulting-Specifying Engineer* magazine. Claxton is a dual-licensed mechanical and fire-protection PE and the principal, mechanical engineer, and partner for CMTA Inc. of Lexington, Kentucky. Candidates were nominated by a professional colleague or mentor and judged based on their commitment to excellence in their academic, professional, personal, and

community involvement. *Consulting-Specifying Engineer* seeks to encourage and recognize the most talented young individuals in the engineering community supporting the building industry. For information, visit www.csemag.com/events-and-awards/40-under-40.html.

Claxton worked for Smith Seckman Reid (SSR) for almost ten years in his hometown of Nashville after graduating from UT. There, he designed major sporting arenas, convention centers, laboratories, hospitals, and educational and institutional facilities. He moved to CMTA in 2010 to work on sustainable, high-performance projects. He designed Kentucky's largest heat-recovery central plant as part of a \$200 million renovation for Lexington's Baptist Hospital. Claxton takes an active role in mentoring young engineers, and stays active with charitable organizations in his community.



George W. Haun Jr.

Haun Named to Dow Fellowship

George W. Haun Jr. (BS/ChemE '87) was named Manufacturing and Engineering Technology Fellow at The Dow Chemical Company, where he has served in numerous technology development roles in his twenty-eight year career.



Randall Brown

COE Communications Specialist Inducted into Writers Hall of Fame

Communications Specialist III Randall Brown was inducted into the East Tennessee Writers Hall of Fame at a luncheon in Knoxville on August 18th. Brown has been with the COE Communications Office since March of 2012 and handles writing, editing, and design responsibilities. He was previously with the *Knoxville News Sentinel* for thirteen years as an entertainment writer.

Brown, a University of Tennessee, Knoxville, alumnus, also writes a freelance weekly column for the *Knoxville News Sentinel's* "Go!" entertainment section under the pseudonym of "Downtown Randall Brown."

"This is a very well-deserved honor for Randall," said COE Communications Director Kim Cowart. "He does a wonderful job writing articles for our engineering publications, and everyone enjoys his column in the local newspaper with his unique perspective on living in Knoxville."

Alumni

Al R. Batey (BS/CE '57) died on March 9, 2016. He was a resident of Brentwood, Tennessee.

Samuel Bettis (BS/ME '59) died on July 4, 2106. He was a resident of Cleveland, Tennessee.

Barbara Briggs (MS/IE '86) died on November 17, 2015. She was a resident of Morristown, Tennessee.

Edgemon Brown (BS/EE '57) died on July 4, 2016. He was a resident of North Palm Beach, Florida.

John Brown (BS/ME '50, MS/ME '55) died on June 17, 2016. He was a resident of Atlanta, Georgia.

Arthur Brun (BS/ChE '56) died on March 21, 2016. He was a resident of Beaumont, Texas.

Lawrence Gerow (BS/EE '78) died on July 6, 2016. He was a resident of Knoxville, Tennessee.

Wesley G. Grace (BS/CE '67) died on March 14, 2016. He was a resident of Memphis Tennessee.

Timothy Hargrave (BS/CE '84) died on April 6, 2016. He was a resident of Waynesboro, Virginia.

Isa Nicolas Jaber (BS/ChE '52) died on May 5, 2016. He was a resident of Natchez, Mississippi.

Glen Langston (BS/ME '054) died on July 26, 2016. He was a resident of Knoxville, Tennessee.

James Russell Long (BS/EE '68) died on July 19, 2016. He was a resident of Huntsville, Alabama.

Milton Howard Parnell (BS/EE '47) died on May 18, 2016. He was a resident of Collierville, Tennessee.

John J. Parran Jr. (BS/ChE '48, MS/ChE '49) died on March 10, 2012. He was a resident of Cincinnati, Ohio.

A. Thomas Pearce (BS/IS '51) died on May 8, 2016. He was a resident of Knoxville, Tennessee.

James Ray Phillips (BS/CE '49) died on June 12, 2016. He was a resident of Jacksonville, Florida.

Carl Schwerin (BS/ME '48) died on May 31, 2016. He was a resident of Memphis, Tennessee.

Charles Simmons (BS/IE '71) died on June 7, 2016. He was a resident of Fort Worth, Texas.

David Snodgrass (BS/IE '87) died on May 18, 2016. He was a resident of Kingsport, Tennessee.

Campbell Wallace (BS/CE '50) died on April 8, 2016. He was a resident of Knoxville, Tennessee.

Robert Warren (BS/ME '58) died on April 26, 2016. He was a resident of Huntsville, Alabama.

John E. Watson (MS/ChE '51) died on February 7, 2016. He was a resident of Middletown, Ohio.

Howard A. Whitsitt (BS/EE '49) died on March 5, 2016. He was a resident of Memphis Tennessee.

Faculty



Dr. Buddy Moore (right) and Judy Moore (left) at the UTSI fiftieth anniversary picnic.

Dr. Robert "Buddy" Moore, director of the University of Tennessee Space Institute in Tullahoma (UTSI), passed away on May 21, 2016.

"Our university, our state, and indeed our scientific community at large has lost a remarkable individual," said UT Chancellor Jimmy G. Cheek. "Buddy's contributions to a number of fields will leave a lasting impact matched only by his devotion to UT."

Moore became the UTSI director in 2010 and was in the process of retiring from the institute this year.

Established in 1964 to focus on research in engineering, physics, mathematics, and aviation systems, UTSI has now awarded more than 1,500 graduate degrees and almost 200 doctorates through its program, run in conjunction with UT's College of Engineering.

Under his leadership, the institute had several prominent successes, including eighteen consecutive months of having a graduate in space, the fiftieth anniversary celebration of its founding, and new undertakings in both materials and hypersonic flight.

"Our graduates stand as a testament to our contributions to both aerospace and the defense of the country," Moore said of the institute's impact during its fiftieth anniversary celebrations. "We're also focused on making scientific and technical advances, not only in issues surrounding flight but in the automotive industry as well."

Moore first came to UT in 1981 as an assistant professor of microbiology, eventually rising through the ranks to become head of that department.

In 2001, Moore became associate dean for research and graduate studies for the College of Veterinary Medicine. He additionally served as director of the Center of Excellence in Livestock Diseases and Human Health for the college as well as director of the Comparative and Experimental Medicine graduate program, a joint effort with the UT Health Science Center.

He also served as a staff fellow at the National Institutes of Health before coming to UT and was an associate editor of the *Journal of Immunology* and editor of *Infection and Immunity*.

Moore was married to Judy Smith Moore, the COE's former director of the Finance and Administrative Affairs Office, who retired in 2013 after having served the college for a number of years.



Dr. Belle Upadhyaya (center) with (from left) Department of Nuclear Engineering Professor and Head Wes Hines; Governor's Chair Stephen Zinkle; nuclear engineering alumnus Hash Hashemian; and Governor's Chair Brian Wirth at the retirement party for Upadhyaya in March.



CEE Professor and Department Head Chris Cox (right) presents a plaque designating emeritus status to retiring civil engineering professor Dr. Ed Burdette (left) at Burdette's retirement event in May.

COE Expresses Appreciation to Retiring Professors at Special Events

The College of Engineering bid farewell to two longtime professors this past spring. Dr. Belle Upadhyaya from the Department of Nuclear Engineering (NE) retired on December 30, 2015, and his retirement event took place on March 3, 2016. Dr. Ed Burdette retired from the Department of Civil and Environmental Engineering (CEE) on July 31, 2016 and his retirement event took place on May 20, 2016. Both were honored by family, friends, faculty, staff, and students who celebrated their achievements and recognized their importance to the College of Engineering.

Upadhyaya has been an internationally respected professor in the NE department for over forty years, and his lengthy list of honors and awards includes the university's Alexander Prize in 2015; COE Research Fellow Awards in 2004, 2007, and 2014; the college's Moses E. and Mayme Brooks Distinguished Professor Award; the American Society of Engineering Education's (ASEE) Glen Murphy Award in 2007; and the Chancellor's Award for Research and Creative Achievement.

Burdette is an iconic member of the CEE department, and he is retiring after an almost sixty-year run at UT. A dedicated educator and researcher, Burdette has received numerous honors during his career at the university, including the Peter G. Hoadley Award from the Tennessee Section of the American Society of Civil Engineers (ASCE) in 2014; CEE Outstanding Teaching Award in 1989, 1998, 2008, 2012, and 2014; The Alumni Outstanding Teaching Award in 2000 and 2007; the COE Teaching Fellow Award in 2006 and 2014; UT's Alexander Prize in 2001; and Burdette was the UT Macebearer, one of the university's most prestigious honors, in 1990.

Upadhyaya and his wife, Dr. Nirmla Upadhyaya, who is a physician at the University of Tennessee Medical Center, established the Upadhyaya Family Endowed Engineering Scholarship in 2015. The scholarship is available to juniors and seniors in the Department of Nuclear Engineering who have demonstrated successful academic performance.

Burdette has had several honorariums set up in his name, including the Edwin G. and Patsy H. Burdette Fellowship in Structural Engineering, which was established by UT alumni Ted and Linda Winstead in 1994. He was also honored with a professorship, established in 2015 by UT Alumni Charley and Lynn Hodges as the Dr. Edwin G. Burdette Endowed Professorship. Currently, Dr. Baoshan Huang holds this honorary title.

If you are interested in honoring either of these two distinguished professors with a gift to the College of Engineering, please contact the Engineering Development Office at (865) 974-2779 or e-mail the office at enrdev@utk.edu.



COE Dean Wayne Davis (right) presents the Nathan W. Dougherty Award to Dr. Hash Hashemian (left) at the college's Faculty and Staff Awards Dinner in April.

The College of Engineering honor nuclear engineering alumnus Dr. Hash Hashemian at the Faculty and Staff Awards Dinner

The College of Engineering honored nuclear engineering alumnus Dr. Hash Hashemian along with other faculty and staff members at the Faculty and Staff Awards Dinner on Thursday, April 21, 2016. The event took place at the Knoxville Museum of Art.

When Hash Hashemian, then a recent nuclear engineering graduate, and then-department head Tom Kerlin co-founded Analysis and Measurement Services (AMS) in 1977, their main goal was to provide the nuclear energy industry with a reliable source of testing and problem solving.

In the years since, AMS has become a globally recognized leader in nuclear energy and safety, establishing a connection in every nuclear plant in the United States as well as in several other countries.

Hashemian has garnered several awards for those efforts, and now his alma mater is recognizing him with the highest honor the College of Engineering (COE) can bestow, the Nathan W. Dougherty award.

The award has been given annually in honor of Dougherty, who served as dean of the college from 1940 to 1956 and was a captain of UT's football and basketball teams as a student athlete in the early 1900s. He was inducted into the College Football Hall of Fame in 1967.

Recognizing Dougherty's success in engineering and education, the award singles out those who have "brought honor and distinction to the college through their achievements or who have made significant contributions to the engineering profession in Tennessee through their professional activities."

For Hashemian, those activities include being named a fellow of the American Nuclear Society, winning the society's Robert L. Long Training Excellence Award, receiving a UT Alumni Professional Achievement Award, and providing financial support to help found the organization Systems: Women in Electrical Engineering and Computer Science, which serves to recruit, mentor, and retain women in those fields at UT.

"Hash Hashemian is one of those special individuals who has made a very significant contribution to the nuclear engineering field," said College of Engineering Dean Wayne Davis. "He has also been a great alumnus and friend to the college and to the departments in which he has been involved. He is very deserving of this award."



Nazy Hashemian (left), wife of Dougherty Award recipient Hash Hashemian, and her mother, Pari Aghazadeh (right) at the COE Faculty and Staff Awards Dinner.



Civil engineering alumni Kathy Williams (left) and Ron Cook (right) enjoy a conversation with COE Dean Wayne Davis (center).

College of Engineering Recognizes Outstanding Alumnus, Faculty and Staff at Awards Dinner



COE Dean Wayne Davis (right) presents the Dean's Faculty Research Excellence Award to Dr. Steven Skutnik (left).



Dean Wayne Davis (left) presents the second Outstanding Advisor Award to Dr. John Ma.



Dr. Jenny Retherford (left) is presented with the Charles Edward Ferris Award by Dean Wayne Davis (right).



Dr. Claudia Rawn (left) receives the Leon and Nancy Cole Teaching Award from Dean Davis (right).



Dr. Kevin Tomsovic (left) receives the Moses E. and Mayme Brooks Distinguished Professor Award from Dean Davis (right).



Dean Davis (left) presents the Outstanding Advisor Award to Industrial and Systems Engineering Professor John Kobza (right), who accepted the award for ISE professor Dr. Mingzhou Jin.



Dean Wayne Davis (left) presents the Translational Research Award to Dr. Matthew Mench (center) and Dr. Thomas Zawodzinski (right).



Dean Wayne Davis (left) presents the Outstanding Staff Award to William Frank Holliday (right).

Additional awards presented at the event:

Outstanding Staff Awards

Jada Huskey, director, College of Engineering Research Office
William Frank Holliday, accounting specialist III, Materials Science and Engineering
Jonathan Turnmire, IT specialist, Department of Civil and Environmental Engineering

College-wide Faculty Awards were presented in the following areas:

Outstanding Advisor

Mingzhou Jin, professor and associate head, Department of Industrial and Systems Engineering;
John Ma, professor, Department of Civil and Environmental Engineering

Leon and Nancy Cole Teaching Award:

Claudia Rawn, director, Center for Materials Processing and professor, Department of Materials Science and Engineering

Charles Edward Ferris Award:

Jenny Retherford, lecturer, Department of Civil and Environmental Engineering

Moses E. and Mayme Brooks Distinguished Professor Award:

Kevin Tomsovic, director, CURENT and professor, Department of Electrical Engineering and Computer Science

Dean's Faculty Research Excellence Award:

Steven Skutnik, assistant professor, Department of Nuclear Engineering

Teaching Fellows:

Daniel Costinett, assistant professor, Department of Electrical Engineering and Computer Science
Aly Fathy, James McConnell Professor, Department of Electrical Engineering and Computer Science
Paul Frymier, professor, Department of Chemical and Biomolecular Engineering
Xueping Li, associate professor, Department of Industrial and Systems Engineering

Professional Promise in Research Awards:

Wei Gao, assistant professor, Department of Electrical Engineering and Computer Science
Jason Hayward, UCOR Faculty Fellow in Nuclear Engineering, Department of Nuclear Engineering
Kai Sun, assistant professor, Department of Electrical Engineering and Computer Science
Cong Trinh, assistant professor, Department of Chemical and Biomolecular Engineering

Research Achievement Award:

Baoshan Huang, Edwin G. Burdette Professor, Department of Civil and Environmental Engineering
Joshua Fu, professor, Department of Civil and Environmental Engineering;
Hairong Qi, Gonzalez Family Professor, Department of Electrical Engineering and Computer Science
Philip Rack, Leonard G. Penland Chair, Department of Materials Science and Engineering
Fred Wang, R. M. Condra Chair of Excellence and professor, Department of Electrical Engineering and Computer Science

Translational Research Award:

Matthew Mench, R. M. Condra Chair of Excellence, professor and head, Department of Mechanical, Aerospace, and Biomedical Engineering
Thomas Zawodzinski, Governor's Chair for Electrical Energy Storage, Department of Chemical and Biomolecular Engineering



Dean Wayne Davis (far left) and Associate Dean Bill Dunne (far right) present the Research Achievement Award to (left to right) Dr. Fred Wang; Dr. Philip Rack; Dr. Hairong Qi; Dr. Joshua Fu; and Dr. Baoshan Huang.



COE Dean Wayne Davis (far left) and Associate Dean for Faculty Affairs Dr. Veerle Keppens (center) present the Teaching Fellow awards to (left to right) Dr. Daniel Costinett; Dr. Paul Frymier; Dr. Xueping Li; and Dr. Aly Fathy.



Associate Dean for Research and Technology Bill Dunne (far right) and Dean Wayne Davis (far left) present the Professional Promise in Research Awards to (left to right) Dr. Jason Hayward; Dr. Cong Trinh; Dr. Kai Sun; and Dr. Wei Gao.



Jada Huskey (left) receives the Outstanding Staff Award from COE Dean Wayne Davis (right).



Jonathan Turnmire (left) receives the Outstanding Staff Award from COE Dean Wayne Davis (right).

Ribbon-cutting Ceremony Takes Place at New Fibers and Composites Manufacturing Facility



Governor's Chair in Advanced Composites Manufacturing Uday Vaidya, who will direct the new center, speaks at the ribbon-cutting event on August 22.



COE Dean Wayne Davis addresses the guests at the opening of the Fibers and Composites Manufacturing Facility and Engineering Annex.



The ribbon cutting team at the Fibers and Composites Manufacturing Facility and Engineering Annex.



A demonstration of the facility's capabilities at the opening event on August 22.

UT's Advanced Manufacturing Center and Engineering Annex Holds Grand Opening

More than one hundred people were on hand recently for the opening of a new center at the University of Tennessee, Knoxville.

The Fibers and Composites Manufacturing Facility and Engineering Annex, located on White Avenue, features several laboratories with cutting-edge machines devoted to advanced manufacturing of composites typically containing carbon fiber and plastic resins.

The center's opening is the latest success for UT's College of Engineering, Oak Ridge National Laboratory, and IACMI-the Composites Institute, which are pushing the frontier of manufacturing capabilities, said Wayne Davis, dean of the College of Engineering.

"About eight-and-a-half years ago I met with ORNL's Craig Blue, who said that advanced manufacturing would be the next big thing," said Davis. "We've been able to add faculty in that area, particularly with our Governor's Chair program with ORNL, which has allowed us to be real leaders in this area and an economic strength for the region."

Officials at the ceremony repeatedly cited the positive effect that UT, ORNL, and IACMI have had on Tennessee's economy. IACMI alone represents a \$259 million investment in the local economy. Also, the alliance of UT, ORNL, and IACMI has attracted partnerships with a variety of industries, ranging from aerospace and automotive to energy and power, over the past few years.

"The composites manufacturing industry is changing rapidly, and we're at the epicenter of that change," said UT Vice Chancellor for Research and Engagement Taylor Eighmy. "That's the truly important thing about having facilities like this one, and the impact it has on East Tennessee. The advanced manufacturing ecosystem is growing here, and we look forward to it."

Governor's Chair in Advanced Composites Manufacturing Uday Vaidya will oversee most of the research in the newly renovated space, which previously served as a center for nonwoven fibers. He said the center's state-of-the-art facilities will bring a bonus to students: more hands-on experience with the wave of changes coming to manufacturing.

"Students will be able to get their hands dirty-work their way through the system from concept to manufacturing a final product," said Vaidya. "We have the chance to be the best place for experiential learning." While the bulk of the building will be what Blue, now IACMI CEO, called the "cornerstone of composite manufacturing in the South," it retains some of its engineering heritage thanks to the EcoCAR team.

UT's team, which has participated in all but one of the EcoCAR competitions held in the past three decades, has space in the building. The facilities will give the EcoCAR team more open area to run its tests.

College of Engineering Celebrates at 2016 Commencement

The College of Engineering held its spring commencement ceremony at Thompson-Boling Arena on Saturday, May 14, at 2 p.m.

Randy Boyd, Commissioner of the Tennessee Department of Economic and Community Development, was the keynote speaker for the event.

Boyd imparted some of the wisdom and advice he has gained over the years, with a key point being to view challenges as opportunities.

He told the graduating class stories of how he had turned opportunities into a successful business, Radio Systems Corporation. Headquartered in Knoxville, the company employs six hundred and thirty workers across seven countries and produces pet devices such as Invisible Fence and PetSafe.

With annual sales of more than \$350 million, the business has allowed Boyd to take part in several other ventures, such as controlling the organization that owns the Tennessee Smokies and serving on tAchieves, which allows first-generation college students access to education through donations.

In his current role, Boyd helped launch Governor Bill Haslam's Drive to 55 initiative and Tennessee Promise, both of which seek to improve the number of Tennesseans with a college education.

He told students of his successes outside the business world as well, such as mountain climbing and running in the Boston Marathon, relating each one back to the central point that everything starts by saying yes when the chance presents itself.

As part of the graduation ceremony, several students were singled out for additional acknowledgement.

Willie Kemp, a materials science major, was recognized for his selection as a Torchbearer. That award represents the top student honor awarded by the University of Tennessee, Knoxville, regardless of college.

Students earning recognition as top College of Engineering graduates included:

Matthew Buttrey, nuclear engineering | Liam Weaver, civil engineering
William Hawks, chemical engineering | Aaron Young, computer engineering

Graduating students who had taken part in the National Academy of Engineering's Grand Challenge Scholars program were also recognized:

Natalie Beitel, electrical engineering | Adam Hasse, nuclear engineering
Duncan Greeley, materials science | Katie Rogers, biomedical engineering

Greeley and Weaver were also part of the group of College of Engineering ambassadors who graduated Saturday, along with:

Steven Shuman, civil engineering | Haley Whitaker, electrical engineering
Greg Tate, chemical engineering

Six COE graduates become commissioned as the newest members of the armed forces.

Lieutenant Col. Brian Lancaster, US Air Force, administered the oath to five Air Force graduates and one Army graduate.

The Air Force inductees included:

Austin Love, industrial engineering | David Place, computer engineering
Austin Martin, civil engineering | Ryan Roper, computer science
Conor O'Dell, mechanical engineering

The Army inductee was:

Bradley Pershke, nuclear engineering

Lancaster spoke of the dedication the six have shown, particularly given the current state of affairs in the world.

"During uncertain times, with our nation's military engaged globally as well as defending our homeland, these young men have answered our nation's call to serve and to lead in our armed forces," said Lancaster. "They will now join a military force that not only provides our nation with an umbrella of security and freedom that we generally take for granted but also a military that routinely goes into harm's way to provide humanitarian aid to victims of natural disasters, oppressive regimes, and other hardships around the globe daily. And they do this willingly, as Volunteers."

The ceremony ended with the tradition of the students exuberantly tossing their mortarboards into the air.



UT Macebearer and materials science and engineering professor Dr. George Pharr leads in the faculty procession at the commencement event.



Students were in high spirits at the college's 2016 commencement ceremony.

College of Engineering Dean Wayne T. Davis (right) presents a plaque to Randy Boyd, Commissioner of the Tennessee Department of Economic and Community Development, in recognition of his serving as speaker for the COE 2016 Commencement Ceremony.



Associate Dean for Academic and Student Affairs Masood Parang (center) shakes hands with an engineering student at the commencement ceremony as Chancellor Jimmy G. Cheek (right) looks on.



Lieutenant Col. Brian Lancaster, US Air Force, administers the oath to five Air Force graduates and one Army graduate.



SMRC Director Charles Melcher welcomes guests to the ten year anniversary celebration of the research center.



UT Senior Director of Corporate Relations Marc Gibson (left) talks with Mark Andreaco, vice president of the Siemens detector center (second from left), Dr. Peter Cohen, a Siemens Research Scientist (center) and Dr. Jim Williams, CEO of Siemens Molecular Imaging (far left) at the 10th anniversary event.



Scintillation Materials Research Center director Chuck Melcher, left, talks with College of Engineering dean Wayne Davis at the center's tenth anniversary celebration.

SMRC Commemorates 10th Anniversary of Center



In the ten years since its founding, the Scintillation Materials Research Center in UT's College of Engineering has become one of the world's leading centers for the discovery, development, and application of scintillators—materials that emit light when in the presence of radiation, providing a valuable detection method.

Distinguished guests, alumni, and key partners were on hand to mark that anniversary recently at a celebration of the center and its various industrial and academic partners, particularly its founding partner, Siemens. The ten year anniversary event took place on April 7, 2016, at the SMRC offices and laboratories in the Science and Engineering Research Facility (SERF).

The center's research has been impactful in a number of ways, perhaps most importantly in cancer detection and homeland security.

While the two might seem extremely different, the center's basic work of detecting radiation helps tie them together.

"This center is an example of what we can do when we partner with industry," said Wayne Davis, dean of the college. "This celebration is a great showcase not only of what the SMRC has accomplished, but what is possible when we get together with leading businesses in the scientific field."

One such business, Siemens Medical Imaging, was responsible for the founding of the SMRC and continues to support much of the center's research.

Beginning as CTI Molecular Imaging Inc., a group of UT alumni engineers started out by specializing in PET and CT scanners for use in the medical community, work that led to Time magazine recognizing the group's scanner as the medical invention of the year in 2000.

Siemens later acquired CTI and conceived a partnership that became the SMRC.

Siemens executives were on hand Thursday to talk about that teamwork.

"When you work together with another entity on something that is truly groundbreaking, something that has the potential to change lives, it requires trust in your partner," said Jim Williams, CEO of Siemens Molecular Imaging. "Your relationship has to be strong and it has to be open. That's what we have with UT and that's what's helped resolve a lot of problems in the processes and developments we have."

Williams talked about the development of the PET scan in particular, and how the work being done by the center with Siemens is important to bringing that life-saving technology to a greater slice of the population.

He said cost limits the availability of PET scans to much of the world but the center's ongoing research could lead to more efficient materials with a reduced price tag.

Mark Andreaco, vice president of Siemens Detector Center, said technology development could be challenging if businesses are too focused on maintaining their bottom line rather than making improvements, but that Melcher was a visionary.

"He was interested in advancing the science, not just the product at hand," said Andreaco.

UT chemistry professor George Schweitzer played a key role, too, helping find a new way to process a key material manufacturers had to lower their costs.

Melcher noted that more than fifty undergraduate and graduate students have come through the center in the past decade, contributing work that has been cited throughout the scientific community.

For more information on SMRC, visit <http://www.engr.utk.edu/smr/>.



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Calendar

Fall 2016		Spring 2017	
Labor day	Sept 5	Classes Begin	Jan 11
Fall Break	Oct 6-7	MLK Holiday	Jan 16
First Study Day	Nov 30	Spring Break	Mar 13-17
Classes End	Dec 1	Spring Recess	Apr 14
Second Study Day	Dec 2	Classes End	Apr 28
Exams	Dec 3, 5-9	Study Day	May 1
		Exams	May 2-5, 8-9
Graduate Hooding	Dec 8	Graduate Hooding	May 11
Commencement	Dec 9	Commencement	May 10-12
Official Graduation Date	Dec 9	Official Graduation Date	May 13

Contact Information

Senior Administration		Dean's Office	974-5321
Dr. Wayne Davis, <i>Dean of Engineering</i>		Development	974-2779
Dr. Bill Dunne, <i>Associate Dean for Research & Technology</i>		Engineering Advising Services	974-4008
Dr. Veerle Keppens, <i>Associate Dean for Faculty Affairs</i>		Engineering Diversity Programs	974-1931
Dr. Masood Parang, <i>Associate Dean for Academic & Student Affairs</i>		Engineering Fundamentals	974-9810
Departments		Engineering Professional Practice	974-5323
Chemical & Biomolecular	974-2421	Engineering Research	974-8360
Civil & Environmental	974-2503	Engineering Student Affairs	974-2454
Electrical & Computer Science	974-3461	Finance & Admin. Affairs	974-5279
Industrial & Systems	974-3333	Research Centers	
Materials Science	974-5336	Materials Processing	974-0816
Mechanical, Aerospace &		Maintenance & Reliability	974-9625
Biomedical	974-2093	Scintillation Materials	974-0267
Nuclear	974-2525	Transportation Research	974-5255
Administration & Programs		Intelligent Systems and Machine Learning	974-5803
Communications	974-0533	CURRENT	974-9720
		Innovative Computing Laboratory	974-8295

Save the Date College of Engineering Homecoming 2016



University of Tennessee Homecoming 100th Anniversary!
 Saturday, November 5, 2016 • 3 hours prior to kickoff
 Engineering Courtyard (Between Ferris and Perkins Hall)
 Catered by Dead End BBQ

Register today at www.volsconnect.com
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For more information, contact Kathleen Kim-Baker at
 (865) 974-2779 or e-mail kbaker25@utk.edu.