mabe

Fall 2017 • Alumni Newsletter

A UT-led team is redesigning aviation as we know it.

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MECHANICAL, AEROSPACE & BIOMEDICAL ENGINEERING

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On the cover: A photo of the NASA-commissioned concept called the Subsonic Ultra Green Aircraft Research (SUGAR) Freeze aircraft. Created by Boeing, the aircraft runs on liquid natural gas and burns significantly less fuel than current planes.

From the Department Head

Thanks for taking a look at the fall 2017 issue of the Department of Mechanical, Aerospace, and Biomedical Engineering (MABE) alumni magazine. I hope you enjoy it!

Progress continues on Rocky Top toward our goal of a Top 25 public program in engineering. Over the past 5 years, PhD enrollment in the college increased from 468 to 667. The college is now the 19th largest public engineering PhD program in the United States, and the fastest growing PhD program among the Top 40 public programs.

As the largest overall department within the college, MABE has also experienced tremendous growth in both sheer numbers of students and faculty, but more importantly in the quality of our educational and research facilities, research productivity, and external recognition. In the past two years, research commitments to the department from external sources are now on par with our aspiring Top 25 peers. New undergraduate laboratories await students in the fall, and our design, prototype, and testing experiences are second to none.

There is always more work to do, of course, but visible progress is everywhere. A tremendous example is the recent $9.9 million dollar NASA University Leadership Initiative grant led by MABE faculty Jim Coder and Stephanie TerMaath.

Another example of positive change is in the expansion of industrial participation in senior design projects. The second annual Senior Design Showcase was held in the spring and had over 400 participants and some fantastic project outcomes, which you can read about in this issue.

Of course, everyone wants to wish our most famous recent alumni, Joshua Dobbs, the best in his new job with the Steelers. Joshua and his family have been tremendous representatives of the university and department, and we will miss him in the halls of Dougherty. As a native of Pennsylvania myself, I know the Steeler nation will embrace someone of his dedication and character.

Finally, please keep sending us your pictures and sharing stories of your days at UT in Knoxville or at UTSI. These stories often get the most response from alumni, so please send us some memories of your days at Big Orange!

Thanks again for taking the time to find out what's going on in MABE. I look forward to hearing from you and invite you to get in touch and stay connected.

Best regards,

Matthew Mench

@UTKMABE

With more than 3,100 students, about 700 faculty, staff, and retirees, about 400 alumni, and one bluetick coonhound, UT set the GUINNESS WORLD RECORD title for the largest human letter.

Vols Break World Record

Early in the morning on March 29, Volunteers stood together to create a Power T that spanned 190 feet by 190 feet, encompassing the majority of Shields-Watkins Field at Neyland Stadium. NBC's Today show viewers witnessed the feat, which was part of Rokerthon 3, weatherman Al Roker's week-long trek to five universities to break world records.

Engineering Vols were in attendance, including MABE's Eastman Assistant Professor of Practice Matthew Young, who was the letter's architect. Using CAD software, Young answered a critical question for event organizers—how do you design a Power T large enough to hold 4,000 people?

"The question is, when you actually get out there and you're standing there, where do you draw the lines and where do you stop and how many people should be in each row?"

Young spent time ensuring the T's two arcs would not only look perfect, but could also be formed and held in place by an early morning crowd of excited Vols without marching band experience.

"Part of the shape is very simple and straightforward. Making the elipse just right was more complicated. I spent time doing some geometry layouts for the T so they would look right," said Young.

Young's calculations were spot on. Shortly after 8 a.m. on March 29, Michael Empric, representing GUINNESS WORLD RECORDS, announced the official head count of 4,223 and verified that UT had broken the record previously held by Queen's University in Ontario, Canada. As confetti cannons blasted and the UT pep band launched into "Rocky Top," Chancellor Beverly Davenport accepted the Guinness award.

"This has been a wonderful opportunity for the nation to see our beautiful campus and share in our Volunteer spirit," said Davenport. "I am so proud of our students, faculty, staff, retirees, and alumni and extend a big thank you to every Vol who turned out and made this happen."

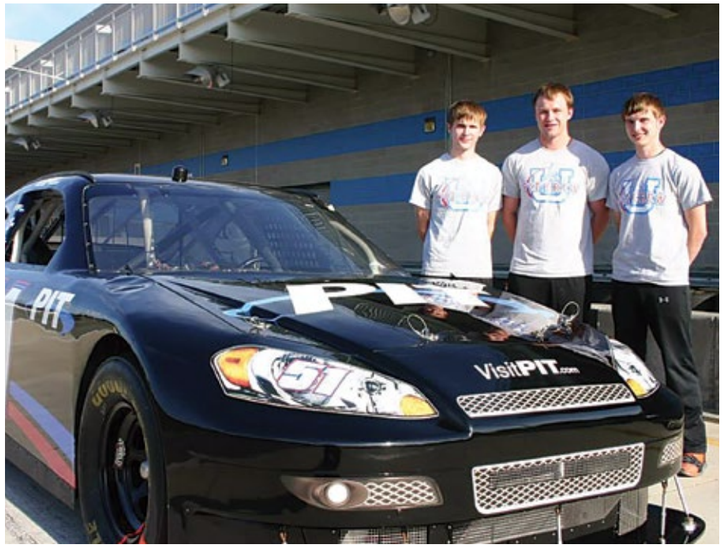
Engineering Twins Race to Internship

Twin siblings Taylor and Tyler Patterson, both mechanical engineering majors, recently finished a summer internship with BK Racing. This Monster Energy NASCAR Cup Series team fields the number 83 and number 23 Cup car. The internship kept the brothers on the go.

"We went to the race track every week," Taylor said. "This gave us the opportunity to see different parts of the country, and that was really exciting for us."

During practice and qualifying, the Pattersons took notes of changes made to the cars to see what did and did not help increase speed.

"We then used these notes to see what set up would be the best for the race," Taylor said. "During the race, we sat on top of the pit box with the crew chief and calculated fuel mileage. I did this for the 23 team, and Tyler did the same thing for the 83 team. It was a cool experience sitting on the pit box for a Cup race."



Tyler Paterson, far left, and Taylor Patterson, far right, are UT mechanical engineering majors who secured summer 2017 internships with BK Racing. They are shown here with their friend Reid Moldenhauer, center, a mechanical engineering major at the University of Nebraska, during a racing school they attended in Mooresville, North Carolina.

The brothers worked in teardown, stripping the cars down to a bare chassis as they came off the track. They measured components using a Romer arm to see if the parts could be reused. They also helped in the design department, using SolidWorks to model brake ducts, brake hoses, and more.

"The best and most important thing that we've learned is how to use the simulation software that most race teams use to set up their cars," Taylor said. "Running simulations allows engineers on race teams to make changes to the set-up and observe how they affect the car's performance. All of this is done on a laptop, and the results are extremely accurate to what the results would be if you made these changes in real life."

The accuracy surprised them. "We can make a set of changes in the sim software and make the same set of changes on the race car, and the results are nearly identical," said Taylor.

The Pattersons also play roles on the UT EcoCAR 3 team for their senior design project. They have picked up some insight they will be able apply to the project.

"Working this internship has allowed us to better our knowledge with vehicle dynamics, and we think we will be able to construct some ideas to improve some aspects of the car, such as ride quality and drivability, for the competition," Taylor said. "We have also improved our CAD work throughout the summer, and we utilize CAD for refinements on the EcoCAR 3 team."

The twins were originally offered internships by two different racing teams. They credit Travis Greenlee, engineering career consultant in UT's Center for Career Development, for helping to review their resumes before they applied for their summer positions.

"The guys in management at both race teams said our resumes and cover letters were impressive and well written," Taylor said. "I think it was a big help in landing us these opportunities."

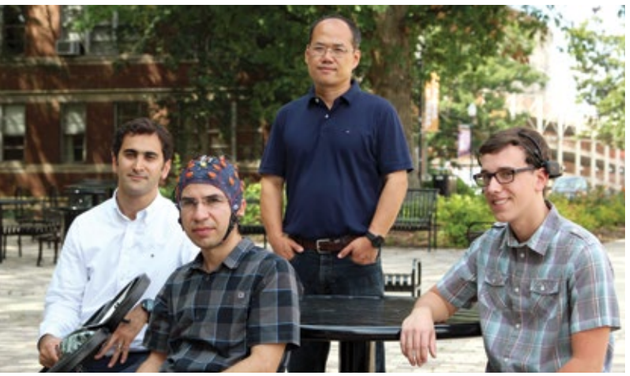
Doing by Thinking

It's a cold, frosty morning, and your thoughts turn to snuggling under the covers with a cup of coffee while the house warms up.

Suddenly, your coffee machine kicks into gear just as the heat begins to rise in your home. No, it's not your imagination. By merely thinking about it, your home is now cozier, your hot cup of java awaits in the kitchen, and you didn't have to lift a finger.

The reality of controlling electronic devices using only your brain is closer than you think, thanks to the research of Associate Professor Xiaopeng Zhao.

A drone is the first device Zhao, graduate students Reza Abiri and Soheil Borhani, and undergraduate Justin Kilmarx, have demonstrated the ability to pilot using brainwaves, and they are amazing spectators who have the opportunity to see them make the drone fly without a normal hand-held controller.



Zhao and his students (left to right) Soheil Borhani, Reza Abiri, Xiaopeng Zhao, and Justin Kilmarx.

According to Zhao, the mind-controlled drone is an example of the amplification of brain computer interface (BCI), or using the brain to control computers and machines.

"We can monitor the brainwaves of a human subject using electroencephalography (EEG) sensors," Zhao said. "We use the mind-controlled drone as a testbed to develop convenient, efficient, and accurate BCI paradigms. It is a great challenge to decode a human's thoughts from EEG since the signals are very complex and subject to a huge amount of noises and artifacts.

"We aim to develop new algorithms to improve the usability of BCI for a broader public audience."

To control a drone using the mind, an individual must first undergo a 10-minute training. While wearing an EEG headpiece, the individual imagines moving his or her hand to follow the trajectory of a cursor on a computer screen for a few minutes.

> "The young minds seem to work better than the older ones," said Zhao. "In my lab, the students control the drone much better than I do."

A machine learning model is developed using the training data which decodes the imagined body kinematics from the individual's EEG signals. After this, the subject is ready to control the drone.

When the individual imagines making the drone move forward or rotate, the brainwave signals are fed into the machine learning model. Once the individual's intentions are decoded, the signals are sent to the drone through Wi-Fi in real time, and the drone will start flying.

Controlling the drone is not an easy task and takes a lot of training and practice to master.

Originally, research involving mind-controlled devices focused on medical applications for patients with motor disabilities or neurological disorders, but has evolved beyond healthcare needs.

"The exact technique used for the mind-controlled drone can be used to operate any other machine or device," Zhao said. "Mind-controlled devices may change the way we live. For example, you might use your mind to adjust the temperature in a room or to make a cup of coffee."

The drone is just one device Zhao and his students can control. Robotic arms, cars, social robots, and computer games are all on the slate.

Zhao is teaming up with other researchers to find beneficial ways to use the mind-controlled devices, including working with Assistant Professor Subhadeep Chakraborty to develop and improve applications, partnering with Assistant Professor of Psychology Aaron Buss to improve performance through multimodal techniques, and researchers at the University of Kentucky to develop BCI tools for diagnosis of patients with cognition and attention deficits and train these patients for rehabilitation.

In the near future, as BCI research evolves and techniques improve, mind-controlled devices will be a normal part of life. Improvements in healthcare, education, entertainment, communication, and yes, even for making the early morning routine run a little smoother, are just a few of the things that could be impacted.

Awards Banquet Honors Outstanding Students, Faculty, and Alumni

Butch Wilmore speaks to guests about his time in space.

Nearly 200 people gathered at The Foundry in April for MABE's 10th Annual Honors Awards Banquet. The event is held each year to celebrate outstanding students, faculty, and alumni.

Guest speaker NASA astronaut Barry "Butch" Wilmore awed the guests with his photos and stories from his time spent aboard the International Space Station.

During the banquet, Department Head Matthew Mench officially inducted Wilmore and Michael Sawyers, who are both alumni, into the MABE Hall of Fame for their accomplishments and contributions to the engineering profession and society.

Other award recipients were:

Students

Guru Anand Venkatesan, *Student Leadership Award*
Emily Beckman, *Outstanding Senior in Aerospace Engineering Award*
Ryan Carter, *Outstanding Senior in Mechanical Engineering Award*
Philip Clarke, *Outstanding Graduate Student Award*
Joshua Dobbs, *Volunteer Spirit Award*
Justin Harmon, *Outstanding Junior in Mechanical Engineering Award*
David Marsh, *Outstanding Senior in Mechanical Engineering Award*
Landen McDonald, *Outstanding Junior in Mechanical Engineering Award*
Gillian McGlothin, *Outstanding Junior in Aerospace Engineering Award*
Katherine Stiles, *Outstanding Junior in Biomedical Engineering Award*
John Till, *Outstanding Graduate Student Award*
Hunter Woodall, *Outstanding Senior in Biomedical Engineering Award*

The photo booth was a big hit this year with students posing with their friends.

Faculty and Staff

James Coder and **Caleb Rucker**, *Louis and Ann Hoffman Endowed Excellence in Research Award-Tenure Track*
Hans DeSmidt, *B. Ray Thompson Endowed Excellence in Research Award-Tenure*
Danny Graham, *Department Heads Endowed Outstanding Staff Award*
Evans Lyne, *Pi Tau Sigma Excellence in Teaching Award*
Matthew Mench, Cyrus Daugherty, and Alan Pezeshki, *MABE Translational Research and Innovation Award*
Stephanie TerMaath, *MABE Outstanding Faculty Initiative and Leadership Award*
Eric Wade, *Thomas Stewart McCorkle Family Endowed Faculty Award*

Corporate Sponsor Spotlight

DENSO

DENSO North America Foundation (DNAF) gave a $50,000 grant to the MABE department to purchase equipment for their manufacturing laboratory in 2003.

Since that gift, DNAF has continued to support the department and is now one of its largest and most steadfast corporate sponsors—$430,000 of its $605,000 in backing to the university since then has come to MABE—helping secure modern equipment, fuel senior design projects, expand hybrid vehicle research, and propel UT's EcoCAR team.

From left, DENSO representatives Brian Crawford and Melissa Smith present department head Matthew Mench and Butch Irick with a donation for EcoCAR research.

"Innovation throughout the manufacturing industry will continue to produce more growth opportunities for students in skilled trades and technical fields," said Doug Patton, DNAF president and executive vice president of engineering at DENSO International America, Inc. "Companies will lean on this young workforce for years to come, and in order to succeed we need to empower students by giving a better sense for what they'll experience in the workplace."

Since 2016 alone, DNAF's support allowed the department to purchase a much-needed truck to transport the EcoCAR to competitions and funding to develop a virtual proving ground teaching and research laboratory.

"The strong and sustained commitment of our industrial partners at DENSO has enabled tremendous opportunities for our students and faculty," said Matthew Mench, MABE department head. "Without this support, the alternative vehicle programs would have difficulty even competing. The training the EcoCAR programs have given our students is tremendous and enables dozens of them to graduate into their dream jobs in the automotive industry."

DENSO is one of East Tennessee's largest employers, with more than 4,900 employees at its Maryville and Athens facilities.

"DENSO is proud to be a strategic partner with the University of Tennessee who has a great reputation for graduating highly talented individuals, and is a strong resource for DENSO," said Brian Crawford, DENSO's Staffing Advanced Specialist.

"Hiring our graduates shows their support to our students and their confidence in our engineering programs," Mench said.

DENSO's support and partnership with UT expands beyond the department. The company also sponsors a summer cookout and the biannual internship and co-op recruitment fairs for the college's Office of Engineering Professional Practice; a field trip for the college's E-VOL10 summer camp for underrepresented rising tenth-graders; and provides career development support for the university's campus-wide job fair.

"Over the past decade, we have watched the relationship between DENSO and the university evolve into a collaborative partnership that now supports multiple areas across our campus," said Rickey McCallum, associate director of corporate and foundation engagement at UT.

"The partnership between the EcoCAR3 program and DENSO's North America Foundation has become a huge attraction for MABE students. DENSO's continual support of these programs allows us to provide a platform that prepares students with hands-on learning for high-tech job opportunities in the automotive industry. I am truly grateful for DENSO's continued support of our automotive design activities, and look forward to watching how this partnership evolves in the years to come."

DNAF is the corporate foundation for DENSO in North America, a global supplier of automotive components and systems with more than 30 consolidated companies across North America.

Since 2001, DNAF has advanced the auto industry through grants to colleges and universities, providing students with the technology, tools, and experiences they need to prepare them for jobs after graduation.

Ready for Liftoff

Like millions of other people around the world, Katherine Van Hooser ('91) spent April 12, 1981, glued to coverage of the first space shuttle launch.

As the Space Shuttle *Columbia* cleared the tower that day, Van Hooser, then a sixth grader, hoped that one day she would work for NASA.

Barely ten years later, that dream became a reality.

"I was fortunate to know early in life what I wanted to do," said Van Hooser, who was recently named the chief engineer at NASA's Marshall Space Flight Center in Huntsville, Alabama.

"After learning about that first launch, I followed everything about the shuttle and NASA and worked toward becoming a part of it."

The first step was pursuing a degree in aerospace engineering at UT. It worked out well for Van Hooser, the daughter of two proud UT alumni.

"Before attending medical school, my dad was a Sigma Chi at UT with Johnny Majors, and my dad's best friend also played football for the Vols," said Van Hooser, whose mother graduated with a master's degree in medical social work. "I started attending football games as a small child, so I grew up as a UT fan."

Her decision to attend UT was further cemented by a tour of various engineering and science buildings, but she began to wonder if a field such as physics might be a better path to NASA.

That's when the late H. Joe Wilkerson ('70), a longtime professor of aerospace engineering at UT, offered some perspective.

If she started in engineering and switched to something else, he explained, many of her classes would still be relevant, but if she started in something else and came to engineering, she would still have four years of engineering classes in front of her.

"That made sense, so I stuck with my choice to go into aerospace engineering. I loved the challenge and subject matter and never changed," said Van Hooser.

Associate Professor J.A.M. Boulet also made a strong impression on her.

"We were required to take several classes in engineering science and mechanics," said Van Hooser. "These classes were tough, but Dr. Boulet made them interesting and fun."

Van Hooser interviewed with NASA, but in that pre–cell phone era had missed their calls offering her a position because she was in the lab working on her project. NASA was determined to track her down.

"I was delivering my presentation to faculty when the department secretary opened the door and asked 'Is Katherine Van Hooser here? NASA is trying to call her,'" Van Hooser said. "To be making an aerospace engineering presentation for a grade and have it interrupted because NASA wanted to talk to me could not have worked out any better!"

Since joining NASA in 1991, Van Hooser has worked on a number of projects including improving the main engines on the very shuttles she grew up watching. She was deputy chief engineer and then chief engineer for the space shuttle main engine for the last 21 launches of the shuttle program.

"That was the best job I could ever have imagined," said Van Hooser.

Later, she became the first chief engineer for the engines on the new exploration-class Space Launch System (SLS), the biggest rocket ever built.

Now, in her new role as the Marshall Center chief engineer, she is responsible for ensuring the technical success of all spacecraft, propulsion, science payload, life support, and mission systems, from the smallest instrument payloads to the giant pieces of the SLS rocket that will take astronauts to deep space destinations, including Mars.

Despite her work and busy schedule, Van Hooser still tries to attend at least one football game a year.

> "I love seeing how the UT campus has grown and improved, and I tell the Alabama grads that, win or lose, I'd rather spend a lifetime as a Vols fan than one day stuck as a Bama fan."

Asked what advice she would offer students who are interested in working for NASA, Van Hooser didn't hesitate: "Find something you can be passionate about and make it work for you."

"There's such a huge variety of jobs available at NASA; there are lots of opportunities," Van Hooser said. "We need engineers, but we also need nutritionists, botanists, technicians, programmers, crew, crew trainers, doctors, accountants, and people with all kinds of skills."

Up, Up, and Away

NASA Turns to MABE to Head Major Aviation Project

Humanity's fascination with flight dates back at least two millennia, with the Greek myth of Daedalus and Icarus serving as an early example of the dreams—and dangers—of human flight.

Now, the latest NASA project is looking to UT for guidance in that ever-present pursuit of flight, albeit with a much higher safety component than those early Hellenistic fliers.

A UT-led team, headed up by MABE Assistant Professors of aerospace engineering James Coder and Stephanie TerMaath, will focus on producing a more aerodynamically capable aircraft, with NASA providing $9.9 million for their efforts—believed to be the largest NASA award for a UT-led project.

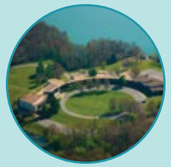
"To have our department chosen to lead such a prestigious endeavor and group of universities is a validation of the faculty, research, and students that we have," said Department Head Matthew Mench. "After all, this is something that won't just affect us at UT, but the very nature of flight itself."

Over the next five years, UT will lead a team composed of researchers from Penn State University, Texas A&M University, the University of Illinois Urbana-Champaign, Old Dominion University, the University of Wyoming, and two aviation companies—the Boeing Corporation and Airfoils Inc.

Through an overall investment of nearly $50 million, NASA's vision is to reshape aviation technology by improving flight dynamics, communications, speed, and propulsion.

Advancements are expected to alter the look, cost effectiveness, safety, and reliability of aviation.

While the recent $9.9 million project might be the largest NASA-backed flight project in UT's history, it is far from the first time the department has impacted NASA's mission.



1958—UT's (then) Department of Mechanical Engineering establishes a graduate program at Arnold Air Force Base. That program has since evolved into the UT Space Institute (UTSI).

1960—Students at UT first have the option to add an aerospace engineering concentration to their mechanical engineering degree.

1964—The department formally changes its name to the Department of Mechanical and Aerospace Engineering, with PhD programs in both disciplines first offered.

1968—UT graduates its first aerospace engineers.

1969—Henry "Hank" Hartsfield begins coursework at UTSI and is selected to the astronaut program, becoming the first UTSI student selected. Eight more will follow.

1982—Hartsfield becomes the first UT graduate in space when he pilots the Space Shuttle *Columbia* with former Apollo astronaut Ken Mattingly.

1991—UT aerospace engineering student Katherine Van Hooser accepts a job with NASA prior to graduating, having fallen in love with the space shuttle as a child.

1992—Chris Hadfield, a Canadian pilot and UTSI grad, is selected to the astronaut corps. He will take part in two shuttle missions, one Soyuz mission, and two space station missions.

1994—Three UTSI grads—Dominic Gorie, Jeffrey Ashby, and Joe Edwards Jr.—are selected as astronauts. Combined, the three complete a total of eight shuttle missions.

Building a Better Wing

The main focus of UT's efforts will be the development of a new type of wing, specifically in regard to flight systems and the way lift and drag are controlled through flaps.

Current flap systems extend and retract various amounts depending on whether the aircraft is ascending, descending, or flying level.

While the system works well enough as is, it requires added bulk—and therefore additional weight—due to the machinery and hydraulics involved.

"Creating a wing that is more efficient, one that also has less drag, is where our research can really make a difference," said Coder. "We have full confidence in the concept and just need to show how it can be integrated."

That concept revolves around what is known as laminar flow.

The design of most modern aircraft creates turbulence in the air as it passes over the surface, pockets of circulating air that can increase drag, reduce efficiency, and disturb people inside the aircraft.

With laminar flow, those pockets are lessened or eliminated entirely by using designs that reduce attributes that contribute to turbulence, including flaps and airfoils.

By replacing those movable components with ones that remain permanently in place—known as slotted natural laminar-flow airfoils—Coder's design reduces drag, weight, and the effect of shock waves at high speeds, while at the same time providing extra lift at slower speeds.

While it's only one design possibility, the fact remains that any leap forward is bound to change the look of aircraft.

Early NASA illustrations of Coder's concept look more like the Pan Am Clippers of yesteryear than modern aircraft, with wing placement returning to an over-fuselage placement rather than midbody.

"In a sense, we're not improving current aircraft as much as we are creating a new building block for aircraft," said Coder. "This is a game changer for aviation."

1996—Scott Kelly completes his degree from UTSI and is accepted into the astronaut corps. He is UT's most prolific astronaut to date, having spent more than 520 days in space across four missions.

1998— UTSI grad William Oefelein is selected as an astronaut. He will later pilot the Space Shuttle *Discovery* on a 13-day mission.

2000—UTSI grad Barry Wilmore is selected as a NASA astronaut.

2004—Randolph Bresnik becomes UTSI's ninth, and, to date, most recent astronaut.

2005—Van Hooser is named head of the program responsible for the main engines of the very space shuttle program she grew up watching.

2009— Bresnik and Wilmore fly together aboard the Space Shuttle *Atlantis*, spending 11 days aboard the International Space Station.

2010—Kelly takes his third spaceflight and is commander aboard Expedition 26. This is Kelly's first long-duration spaceflight.

2011—Van Hooser is named chief engineer of NASA's Space Launch System Liquid Engines Element.

2011—Wilmore serves as CAPCOM, the person at Mission Control who communicates with the astronauts, for STS-35, the final mission of the space shuttle program.

2013—Hadfield records a cover of David Bowie's "Space Oddity" aboard the International Space Station. It currently has 37 million views on YouTube. Sing along at *tiny.utk.edu/hadfield*.

Holding It Together

While Coder's part of the team focuses on the design, TerMaath will be focused on the feasibility and reliability of the materials and structure of the aircraft itself.

Using materials that are lightweight, durable, and strong without being bulky will be the key to the project.

TerMaath said that the team would be open to anything in its quest for the right final product, whether that means adapting existing materials or coming up with something new.

Students will get hands-on experience in testing flow dynamics, designs, and materials, further heightening the value of the project to UT.

It might seem daunting, but it's a process TerMaath is familiar with, having served on the airframe certification team for the military's F-35 fighter jet.

"There is a major testing component to doing the unknown," said TerMaath. "We get to be creative in what we come up with, to customize what we do and use, etcetera.

"You don't get an opportunity to start fresh on something every day."

TerMaath said she expects the team to go through a series of steps that involve trying out new designs, narrowing the best ones down through optimization, testing those options, and finally simply "getting creative" in their approach.

After all, when there's no blueprint to follow you can do what you want.

"It is gratifying to see the University of Tennessee in a leadership position for this important project. It is a great example of how a public-private partnership and inter-institutional cooperation can result in solutions that address important challenges facing our world."

—Chancellor Beverly Davenport

2014—Wilmore, who earlier piloted the Space Shuttle *Atlantis*, heads to the space station for a six-month mission, serving as commander for part of the mission. At his request, NASA installs the SEC Network on the station so he won't miss UT football.

2015—Three MABE students—Justine Barry, Carol Miselem, and Meghan Green—join NASA's Johnson Space Flight Center together upon graduation.

Barry

Miselem

Green

2015–2016—Kelly returns to the International Space Station for a study to compare his physiology after a year in space with that of his twin brother, who remained on Earth.

With Kelly's safe return to Earth, UT astronauts have now spent a collective 993 days in space.

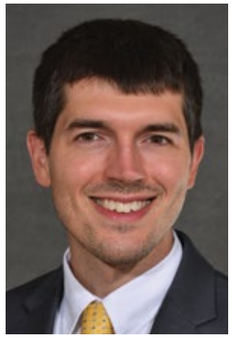
2016—Van Hooser is named manager of the Chief Engineers Office at NASA's Marshall Space Flight Center.

2017—A team of MABE undergraduate students competes in NASA's Mars Ice Challenge.

2017—NASA selects MABE Assistant Professor James Coder to lead a $9.9 million project, with fellow MABE Assistant Professor Stephanie TerMaath leading a key thrust of the project.

2017—Bresnik launches to the International Space Station in July, becoming the most recent UTSI graduate to do so.

Faculty Notes



Dustin Crouch Joins MABE

This fall, Dustin Crouch joined the MABE faculty as an assistant professor of biomedical engineering.

“This faculty position is a dream opportunity for which I am very grateful,” Crouch said. “I am ecstatic about joining MABE and its outstanding team of teachers and researchers. The University of Tennessee is the ideal place for me to start my lab and make a big impact in the areas of upper limb biomechanics and assistive devices.”

The goal of his research is to develop methods and technologies that will improve the function of people with upper limb movement disorders.

Crouch’s specific areas of interest include developing computer algorithms that will enable hand prostheses to move more naturally, reducing loads in intact muscles and joints for upper limb prosthesis users, and designing low-cost shoulder exoskeletons to aid movement for people with shoulder pain and weakness.

“I hope to bridge the expertise of many faculty in the department to create something truly innovative and effective,” Crouch said. “I will also work hard to help move what I learn or develop toward clinical application so that patients can benefit from the research.”

Some of Crouch’s notable accomplishments include publishing simulation and animal model work in well-regarded clinical journals such as the Journal of Hand Surgery and Journal of Bone and Joint Surgery; having his work on infant nerve injury featured in the October 2014 issue of the surgical society newsletter AAOS; and developing a new musculoskeletal-model-based controller for hand prosthesis that was awarded funding by NSF and DARPA.

Crouch holds a bachelor’s in aerospace engineering from North Carolina State University and a doctorate in biomedical engineering from Wake Forest University. Before joining MABE, he worked as a research scientist at NCSU’s Neuromuscular Rehabilitation Engineering Lab.

Hans DeSmidt was recently promoted to full professor. DeSmidt is the aerospace program coordinator for the department and has co-authored ten articles published in refereed journals and twenty-five conference papers. He has received more than $1 million in research support and has been described as a leader in his field.

Associate Professor and Graduate Program Director **Kivanc Ekici** was recently assigned to the editorial board of the Journal Aerospace Science and Technology, published by Elsevier. As an associate editor with experience in turbomachinery and engine modeling, Ekici was assigned fourteen submissions dealing mostly with the numerical modeling of aerospace systems. The journal has seen a recent surge in submissions. Its impact factor has risen to 2.07—one of the highest among aerospace journals.

Professor **Bill Hamel** received the Charles E. Ferris Faculty Award at the college’s awards dinner in April. The award is given to a faculty member who has a distinguished record of research and teaching in the area of technology advancement and is also involved in the community. The award was established by the Knoxville Technical Society to honor Charles Ferris, the college’s first dean, for his fifty years of service to UT.

Trevor M. Moeller, UT Space Institute associate professor and graduate program director, was selected as a faculty fellow by the NASA Marshall Space Flight Center Faculty Fellowship Program this past summer. Moeller spent ten weeks working on a research project involving a low-power electric propulsion thruster with his Marshall collaborator, Kurt Polzin. In April, Moeller received the Charles & Julie Wharton Teaching Fellowship Award for superior teaching at the college’s awards dinner.

Assistant Professor **Andy Sarles** recently received the 2017 Gary Anderson Early Achievement Award from the Adaptive Structures and Material Systems Branch of ASME. The award recognizes younger faculty whose work has already had an impact in their field.

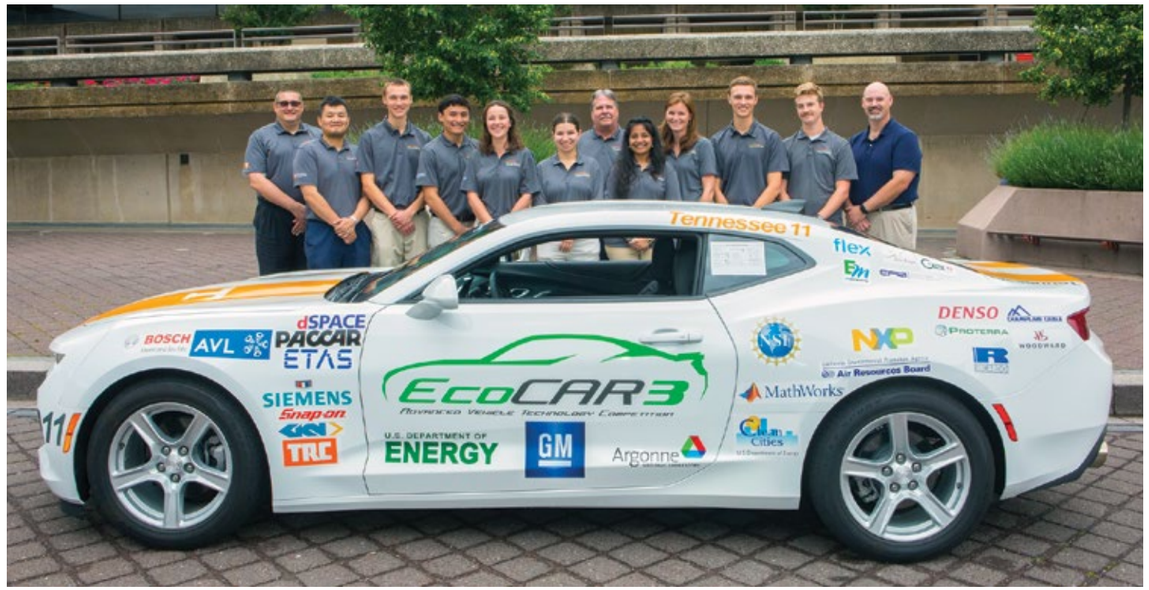
The American Institute of Aeronautics and Astronautics (AIAA) members elected UTSI’s Executive Director **Mark Whorton** as the new technical director of the space and missiles group. Whorton began his term in May and will hold the position for three years.

Whorton has been an active member of AIAA since 1987. He is an AIAA fellow, AIAA director for Region II, AIAA TAC Strategic Technologies Committee deputy chair and member, and member of the AIAA New Initiatives Subcommittee.

Whorton was recently named a University of Alabama 2017 Distinguished Engineering Fellow

Eastman Assistant Professor of Practice **Matthew Young** (L) joined Materials Science and Engineering Lecturer **Chris Wetteland** (R)at the last spring Mic/Nite hosted by the Office of the Provost. Young and Wetteland spoke about additive manufacturing and the college’s new Innovation and Collaboration Studio. Mic/Nite is held twice a year to enhance the intellectual, interdisciplinary, and cultural life of UT’s faculty and staff. View their presentation at tiny.utk.edu/ICS.

Student Notes



UT Team Finishes Big at EcoCAR 3 Competition

UT's EcoCAR team had their best performance in 20 years at the EcoCAR 3 Year Three competition held May 14–20 at General Motors Milford Proving Grounds in Milford, Michigan, and May 21–25 in Washington, DC.

This year's competition asked all 16 teams to integrate their hybrid-electric designs into a 2016 Chevrolet Camaro. The vehicle had to be more energy-efficient without losing high-performance or safety features.

Going into the competition, UT was in 6th place based on pre-competition reports and other deliverables.

At the Milford Proving Grounds the team underwent a series of 8 vehicle dynamic testing events, garnering 1st in 0–60 acceleration, 1st in 50–70 acceleration, 1st in ride quality, and 2nd in autocross.

After a week of technical, communications, and project management presentations in DC the team came in 5th place overall—a huge accomplishment after having placed 13th at last year's competition.

Emily King, communications manager for the UT team, received the Spirit of Communications Award, and Butch Irick, MABE research professor and the team's faculty advisor, received the Outstanding Faculty Advisor Award from the National Science Foundation.

"We worked with a large support team from the Tickle College of Engineering, our team sponsors, and professionals in East Tennessee who lent time and support to our team this year to help us do so well," King said.

"The team has seen improvement in all areas of the competition," said Irick. "The team has designed and built a car that is reliable and not unduly complicated, and that was evident at Milford Proving Grounds where the team completed all of the events with only two issues with loose hose clamps."

"There is further room for improvement, though. There were still four teams ahead of us."

The team wants to be prepared for the Year Four—and final—competition of the EcoCAR 3 project, which will be held next spring in Yuma, Arizona, and Los Angeles.

The team is already preparing to spend the next year refining the hybrid controls system and the powertrain integration in a few areas as well as additional general testing and evaluation.

UT's team is composed of 30 students, mostly mechanical engineering undergraduates, but undergraduate and graduate students in communications, business, and electrical engineering are also part of the team.

One major aspect of the team's Year Three performance is that their Camaro is now approved for on-road testing. So, if you're driving around the streets of Knoxville, keep your eyes peeled for an orange-striped white Camaro with a Power T on its hood. Chances are, it'll beat you off the line.

Design Team Wins Third Place in Student Competition

The UT American Society of Mechanical Engineers (ASME) Student Design Team won third place in ASME's Student Design Competition, held in April, at the North America East Engineering Festival (E-Fest) at Tennessee Tech.

Each of the 48 competing teams were required to design, construct, and operate a prototype that meets the requirements of the problem statement set forth by ASME.

This year's competition was a Robot Pentathlon, with each team's robot competing in a 10-meter sprint, a tennis ball throw, a golf ball hit, a stair climb, and a weight lift.

The UT team's robot did great in all of the events, winning third in the sprint, seventh in the lift, fifth in the throw, sixth in the climb, and seventh in the hit. Adding these positions together, they ended up with a total score of 28—only 8 points behind first-place.

The annual competition provides a platform for ASME student members to present their solutions to a range of design problems, from everyday household tasks to groundbreaking space exploration.

BME Design Team Wins EUReCA Awards

Ortho Design, a biomedical engineering senior capstone design team, received two awards for their project, Drill Guide Stabilization System for Acromioclavicular Reconstruction Surgery, at the Exhibition of Undergraduate Research and Creative Achievement (EUReCA) event.

The team received second place for design in the college of engineering category and received a silver Office of Research and Engagement Undergraduate Research Excellence award.

MABE Students Honored at Chancellor's Banquet

In April, several MABE students were honored at the yearly Chancellor's Honors Banquet, hosted for the first time by Chancellor Beverly Davenport.

The honors banquet is held each spring to recognize students, faculty, staff, and friends for their extraordinary achievements. Student awardees were:

2017 Extraordinary Academic Achievement

Kathryn H. Culhane
Joshua Dobbs

2017 Extraordinary Campus Leadership and Service

Guru Anand Venkatesan

2017 Extraordinary Professional Promise

Aaron L. Anderson-Walker
Seyedreza Djeddi
Yasser Ashraf Gandomi
Jingke Mo
Farshad Salimi Naneh Karan
Aravinda Ramakrishnan Srinivasan

2017 Scholar Athlete Awards

Kathryn Culhane
Joshua Dobbs

2017 Top Collegiate Scholar Awards

Gary Lynn Collins Jr.

2017 Jimmy and Ileen Cheek Graduate Student Medal of Excellence

Caroline Black

Ashraf Gandomi Receives Excellence in Graduate Research Award

PhD student Yasser Ashraf Gandomi received the Graduate Student Senate's (GSS) Excellence in Graduate Research award last spring.

GSS presents this award each year to a graduate student who has received national and/or international recognition in their field and shows professional promise in their area of research and creative achievement.

Gandomi works in the Electrochemical Energy Storage and Conversion Laboratory under the direction of his advisor, Matthew Mench.

Senior Design Showcase

April 27 was a big day for MABE seniors—they had the opportunity to show off the projects they had been working on all year at MABE's second annual Senior Design Showcase.

Over 400 project sponsors, faculty, staff, and students filled Thompson-Boling Arena to see the 39 team projects on display.

This year, the students not only worked on projects for industry, but also for local non-profit community organizations like Friends of the Smokies and Young-Williams Animal Center.

The teams were required to create a poster and have their finished project on display at the showcase. Awards were given to the best top three posters and presentations, as well as a People's Choice Award that everyone at the event could vote on.

Next year's showcase is scheduled for April 26, 2018 at Thompson-Boling Arena. The department hopes to increase the number of projects next year and have an even larger crowd attend the event.

Best Poster

1st Place
Young-Williams Team 1
Project: Pneumatic Head-to-Lab Guillotine
Purpose: To design and develop a device to effectively and efficiently perform the "Head to Lab" procedures on deceased rabies-infected animals.
Team members: Daniel Colburn, William Fredebeil, Alicia Holcomb, and Daniel Stone
Faculty advisor: Larry Sharpe

2nd Place
CALM Solutions Team
Project: Jackson-Pratt Bulb "Cap"
Purpose: To create an accessible closure mechanism for a silicone bulb evacuator that prevents accidental openings at the emptying port to reduce biohazard waste spillage..
Team members: Luke Calderon, Maggie Fraser, Courtney Getchell, and Allison Nelson
Faculty advisor: Jeff Reinbolt

3rd Place (Tied)
ORNL MDF Team
Project: Tungsten in Gas (TIG) Welding Torch Design for Robotic Welding in Big Area Additive Metals Manufacturing (BAAMM)
Purpose: To design a TIG torch that is customizable for integration as the robot welder end effector in BAAMM.
Team members: Jared Bell, Justin Killian, Christopher Masuo, and Chandler Oakley
Faculty advisor: Bill Hamel

Eastman Team 1
Project: Aeration Column for Eastman Chemical Company
Purpose: To design an aeration column to test the fluidization parameters of various powders Eastman Chemical Company purchases and manufactures.
Team members: Caroline Hill, Charles Irvine, Jinzhi Qiao, and Jonathan Trent
Faculty advisor: Matthew Young

Best Project

1st Place
Young-Williams Team 1
Project: Pneumatic Head-to-Lab Guillotine

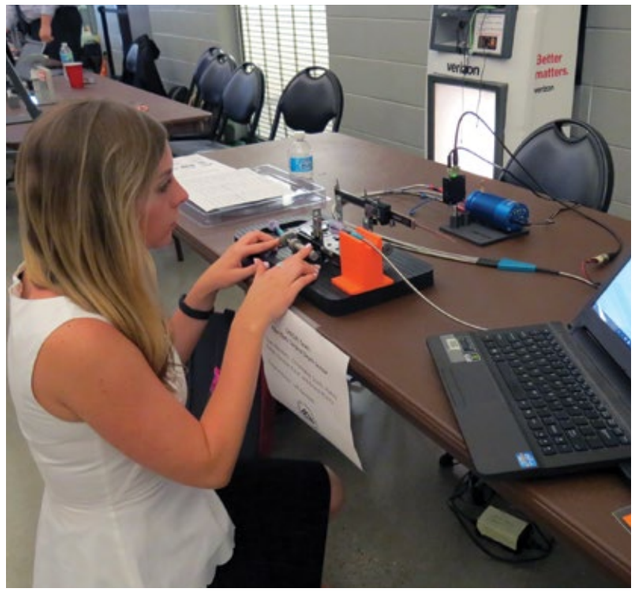
2nd Place
CHEC(K) Team
Project: Fiber Optic Surgical Depth Sensor
Purpose: To design a micro-surgical-depth sensor to assist surgeons during vitreoretinal surgery, specifically during the peeling of the epiretinal membrane, to decrease the risk of damage to the retina.
Team members: Ernest Rivera, Hailey Fisher, Christopher Davitt, and Christian Kacar
Faculty advisor: Jeff Reinbolt

3rd Place
Ortho Design Team
Project: AC Drill Guide
Purpose: To design a device that can make holding and controlling drill guides during acromioclavicular reconstruction surgery easier, lessen the radiation delivered to the patient, and help fatigued surgical staff.
Team members: Jake Childs, Jarrod Nachtrab, Austin Conley, and Jason Seinfield
Faculty advisor: Jeff Reinbolt

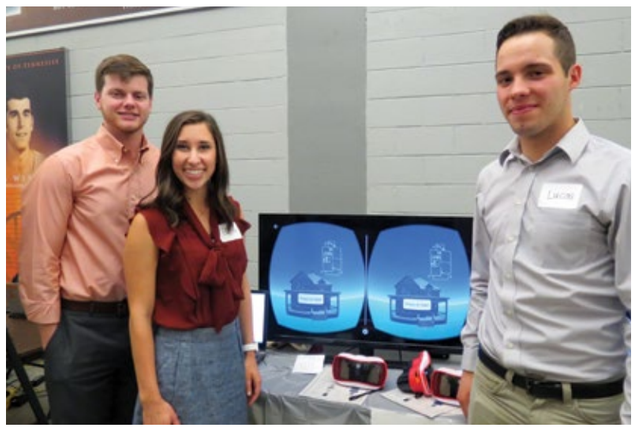
People's Choice

EcoCAR 3 Team
Project: 2016 Chevrolet Camaro Hybrid Vehicle Development
Purpose: To develop and integrate hybrid-electric designs that will make the vehicle even more energy-efficient without losing the high-performance and safety features Camaro buyers expect.
Team members: Jan Bruckbauer, Aubrey Casey, Cory Elliott, Lucas Lafond, Nicholas McCormick, Ronnie McKay, Nick Menning, Zachary Menning, Jonathan Moore, Patrick Rybak, Ryan Sayne, and Hastin Witt
Faculty advisor: Butch Irick

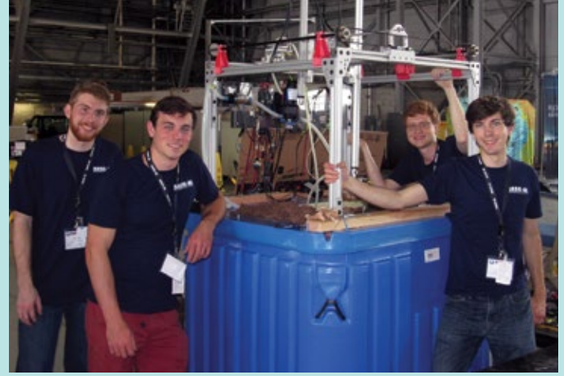
Students pose with their poster during the senior design showcase.



Hailey Fisher works on her project during the showcase.



Students show off their virtual reality project.



Mars Ice Challenge Update

In the previous edition of this magazine, readers were introduced to a team of undergraduate students who spent six months designing and building a robotic device to extract water from the large ice deposits believed to exist just below the surface of Mars. The project was for NASA's Revolutionary Aerospace Systems Concepts-Academic Linkage (RASC-AL) Mars Ice Challenge.

In June, four of the 21-member student team traveled with their faculty advisor, Assistant Professor Brett Compton, to NASA's Langley Research Center in Hampton, Virginia. There, they represented UT as one of only eight teams selected to compete.

"Our robot is designed to work similarly to a trencher or road ripper, cutting through overburden with chain-mounted teeth and then moving the extracted overburden away from the extraction site," explained Ethan Vogel, one of the team leaders.

After overcoming some unforeseen obstacles, the team's robot worked reasonably well and was able to extract water for the judges. Unfortunately, their digging unit didn't have the torque needed to effectively cut into the wet burden.

Although the team didn't win, it was a wonderful experience for the students and allowed them to show off the engineering and design skills they are learning.

"One of our goals was to demonstrate to NASA and the professional aerospace community that UT produces world-class engineering students, and hopefully help start building the reputation of the college as a top-tier program," said Vogel.

"It was a fantastic experience and everyone learned a lot, met a lot of interesting people—NASA folks and students on the other teams—and gave it their all," said Compton. "I am very proud of this team."

The students are evaluating their performance at the competition and are already preparing for next year's competition.

The team is looking for new members, so any engineering student, freshman to post-doc, interested in joining the team should email Ethan Vogel at ***evogel4@vols.utk.edu***.

Dean's List Spring 2017

Summa Cum Laude

Aerospace Engineering
Teague A. Aarant
Rekesh M. Ali
Benjamin C. Barnhill
Chad Batten
Emily A. Beckman
Camille E. Bergin
Braxton Brakefield
Jared A. Carnes
Zane Chapman
Gary L. Collins
Caroline H. Cotton
Zackery C. Crum
Adam C. Dalton
Daniel E. Epperson
Samantha N. Golter
Timothy L. Grizzel
Max E. Hackenbrack
Hannah M. Hajdik
Brenton W. Ho
William A. Huffman
Cole R. Keck
Ryan E. Kelly
Ethan Long
Jacob A. McCoy
Gillian S. McGlothin
Michelle E. McNamara
Matthew F. McVey
Daniel A. Perling
Chapel R. Rice
Travis S. Roock
Matthew J. Schwartz
Stewart R. Whaley
William D. Wisdom
Arianna Worthy
Joseph T. Wray
Jeffrey B. Zajkowski

Biomedical Engineering
Sara B. Aboeleneen
Ifedayo A. Akinduro
Olufunke T. Anjonrin-Ohu
Taylor A. Berger
Austin Conley
William P. Davis
Simran Dayal
Sarah Enani
Jordan A. Failla
Hailey M. Fisher
Margaret A. Fraser
Emily C. Gable
Lauren T. Jennings
Kaleb S. King
Lindsey M. Kirk
Alicia A. Matavosian
Mitul N. Mistry
Bradley S. Moore
Chloe P. O'Dell
Leslie H. Ottinger
Sara E. Parker
Herak Patel
Paige F. Paulus
Megan E. Pitz
Kimberly S. Presentation
Rachel L. Slappy
Elijah D. Smith
Katherine E. Stiles
Mitchell T. Stockinger
Joseph Tawfik
Andrew J. Tucker
Gavin L. Warrington
Hunter M. Woodall

Mechanical Engineering
Jessica K. Adams
Leyton A. Adams
Collins L. Alexander
Abdualrhman S. Almaflah
Alexander W. Arbogast
Keith S. Arnwine
Harrison C. Barrett
Andrew L. Bennett
Jacqueline O. Berger
Connor J. Bihlmeyer
Nathan T. Bingham
James D. Blanks
Bradley M. Bloedorn
Georgiana S. Blue
Nathaniel C. Brandt
Carter W. Breeding
Stephen E. Brennan
Erin Brown
Jan T. Bruckbauer
Michael J. Buckley
Laura M. Burke
Jesse Butler
Rory M. Butler
William C. Buttrey
Austin R. Cain
Joseph A. Camacho
Ryan M. Carter
Courtney T. Cartwright
Dakota Cauthen
Wilton M. Chapman
Kangmin Cheng
Jake A. Childs
Jia Rong Chong
Eric Clark
Daniel J. Colburn
Jared J. Colburn
Austin K. Cole
Nicholas R. Collins
Gregory M. Corson
Kathryn H. Culhane
Adam T. Daniel
Brooke S. Davidson
Austin M. Davis
Robert K. Davis
Edward Deiderich
Daniel R. Dirscherl
Andrew J. Duncan
Ryan J. Durkee
Adam M. Edwards
Mikayla M. Ehrsam
Andrew N. Elder
Richard S. Emeott
Bryan Z. Fitzsimmons
James F. Fitzsimmons
Christopher J. Fowler
William J. Fredebeil
Henry V. Gilbert
Brandon J. Glover
Joseph C. Goble
Conner W. Godbold
Grayson D. Gregory
Jacob N. Groothuis
Clark A. Hall
Justin H. Harmon
Elissa L. Heckman
Rebekah F. Henderson
Sarah R. Higginbotham
Caroline M. Hill
William M. Holmes
Jacob M. Hromi
Brandon J. Hunt
Victoria E. Idem
Henry I. Iduoze
Benjamin D. Jacob
Nabeel I. Jaser
Treavor C. Johnson
Bethany D. Jones
Taylor W. Jordan
Michael B. Keesee
Christopher R. Kelly
Justin T. Killian
Rebecca H. Kimberlin
Benjamin R. Kinga
Hunter D. Kissner
Kelsey N. Klett
Kurtis A. Kuipers
Lucas A. Lafond
Mariah R. Lafond
Stephen C. Lagutchik
Brooks M. Leftwich
Kenneth G. Ligon
Katelyn J. Luthi
David M. Marsh
Tyler J. Mccubbins
Landen G. Mcdonald
Zachary J. Menning
Matthew J. Montgomery
William J. Morrell
Adam W. Neal
Daniel A. Newman
Zachary B. Nolan
Grayson T. Northern
John M. Painter
Donald J. Partin
James M. Pearce
Abigail C. Pennington
Connor L. Roberts
Sawyer A. Schultz
Jared S. Shaffer
Dustin V. Shults
Logan T. Sissom
Rebecca C. Sphar
John P. Spires
Thao N. Strong
Samuel C. Swayne
William R. Thompson
John F. Thress
Zachary K. Timm
Dylan C. Townson
Parker E. Trulove
Caleb D. Walker
James Walsh
Nathan S. Ware
Matthew R. Weathers
Ethan T. Weaver
Jesse M. Wilson
Trenton B. Yount

Magna Cum Laude

Aerospace Engineering
Daniel S. Allen
Will T. Baskette
Alexander J. Brown
Trenton J. Bullman
Derek A. Cox
Coleman R. Davis
Gabriel C. Hatcher
Seth R. Holladay
Shelby W. Honaker
David M. Kight
Joshua P. Kincaid
Willie N. Parker
Steven D. Patrick
Caleb H. Peck
Jared E. Pyron
Angus Shaw
Nathan G. Stover
Ethan A. Vogel

Biomedical Engineering
Evalynn C. Borrego
William Z. Clayton
Lauren A. Crothers
Cameron A. Goodman
Trenton J. Hinson
Justin R. Kilmarx
Lakin B. Light
Brittani A. Lopez
Andrew Miller
Julia M. Morss
Jarrod K. Nachtrab
Allison J. Nelson
Amanda N. Randolph
Curtis T. Schunk
Lauren A. Smith
Dan D. Stedham
Carli M. Stewart

Mechanical Engineering
Gabriel S. Abbu
Jacob B. Aljundi
Ahmed Alyousef
Alix J. Ambrose
Shafer L. Beary
Benjamin A. Brannum
William T. Bright
Steven B. Campbell
Timothy A. Campbell
Amy L. Carpenetti
Joseph B. Chong
Mcgavock L. Crawford
Zackery R. Crystal
Lucas R. Despins
Richard H. Estey
Nicholas M. Foster
Robert S. Garibay
Mac R. Gasque
Andrew J. Homan
Dylan O. Hoskins
Dalton I. Houser
Charles J. Irvine
Fernando Karg
Charles E. Key
Benjamin R. Luffman
Jacob T. Maine
Christopher J. Masuo
James A. McBroom
Robert D. McClendon
Kelsey A. McConachie
Thomas B. McDavid
Nicholas R. Menning
Erin M. Miller
Connor A. Morton
Jacob N. Nagy
Tyler J. Newsom
Joseph Nixon
Chandler M. Oakley
Jenny P. Patel
Nisarg B. Patel
Tyler N. Patterson
Landon J. Pauls
Celeste A. Pelletier
John A. Perryman
Daniel B. Ramsey
Matthew G. Rumbolt
Vincent K. Runyan
Kiel T. Russell
Patrick T. Rybak
Joshua Smith
Yuvraj M. Sriram
Neal A. Stehling
Joseph M. Stockli
William C. Tourville
Jonathan T. Trent
Steven C. Trimble
Cameron N. Tuck
Joseph K. Warner
Samuel A. Webster
Jonathan H. West
Jackson K. Wilt
Eric S. Wise
Matthew C. Yarbrough

Cum Laude

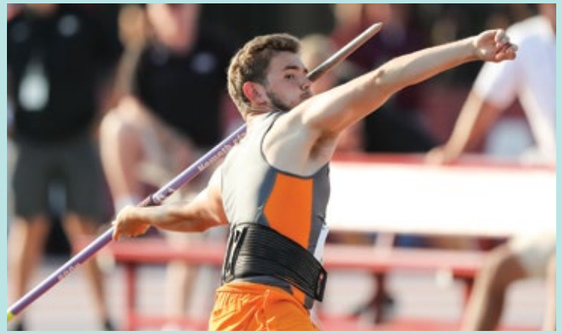
Aerospace Engineering
Sean M. Darling
Skylar D. Jordan
Andrew T. Kirk
Rion G. Longfellow
William J. Martindale
Kevin J. Mathew
Joshua A. Mohammed
Austin P. Springer
Jordan C. Stringer
Christopher W. Violet
Gabrel G. Waldrop
Logan D. Williams
Maria L. Zemke

Biomedical Engineering
Samantha Z. Bratcher
Kristina M. Bridgwater
Adam M. Cable
John T. Deinhart
Kara L. Delbridge
Kyle M. Elich
Celvin L. Fouse
Jade N. Hestand
Joshua S. Key
Matthew D. Lamsey
Colin M. Mann
John C. McDearman
Daniel C. Nalepa
Hannah N. Olsen
Debra R. Sagmiller
Jason S. Seinfeld

Mechanical Engineering
Alwalid Aljuaid
Nicholas A. Bales
Robert M. Bohn
Leegan M. Boudreau
Mallory N. Bowers
Seth E. Bowers
Connor G. Britton
Matthew C. Cagle
Robert L. Carlton
Riley A. Chambers
John Champlin
Davis C. Cole
Malik A. Crutchfield
Nicklaus W. Curtis
Sierra N. Ellis
Eric G. Evans
William C. Fair
Jacob G. Fowler
Mitchel T. Haendel
Michael P. Haines
Curtis A. Haley
Nicholas K. Hassler
Jonathon E. Hicks
Luke W. Hudgin
Imani S. Jackson
Patrick V. Jung
Hatim K. Kamal
Jonathan W. Martin
Matthew E. May
Nicholas R. McCormick
Chase F. Mcdaniel
Guzman Iris Melara
Zachary C. Nicely
Bradley T. Peckinpaugh
Jake H. Prophet
Matthew T. Puleo
Luke Randall
Holly J. Robbins
Seth L. Rogers
Richard A. Sample
Ryan C. Savery
Ryan A. Sayne
Austin M. Schmidle
Maximilian Smith
Tyler C. Smith
Terry L. Stewart
Shane C. Wood
Connor J. Zabo

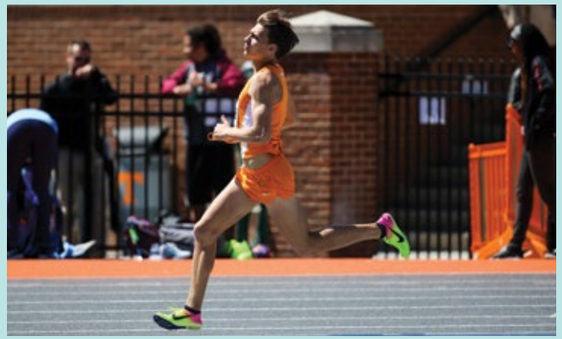
MABE Student-Athletes

Darryl Harris
Aerospace Engineering
Track & Field



Nicholas Hassler
Mechanical Engineering
Track & Field

Brandon Hines
Biomedical Engineering
Football



Adam Johnston
Mechanical Engineering
Track & Field

Timothy Raab
Mechanical Engineering Honors
Swimming & Diving

Redmond Walsh
Aerospace Engineering
Baseball

Parker Kaye
Mechanical Engineering
Swimming & Diving (not pictured)

Brow Returns to UT to Lead New Program

MABE alumna Mary Brow has returned to her alma mater to head up the new Integrated Business and Engineering Program (IBEP), a cross-discipline learning experience for undergraduate students in business and engineering.

The Tickle College of Engineering and Haslam College of Business are partnering on the program, which launched this fall. Selected students will learn how to apply engineering processes in a business setting.

As director, Brow's responsibilities include building the curriculum by developing program-specific courses, scheduling co-curricular activities, pairing students with companies for summer internships, and raising awareness about the program both on and off campus.

Brow received her bachelor's degree in biomedical engineering in 2007 and graduated from the Professional MBA Program in the Haslam College of Business in 2016. She is excited to be back at UT and leading the program.

"It feels great to be working with the two colleges I received degrees from," Brow said. "It is really nice to be familiar with the curriculum, campus, and faculty and staff."

Before joining UT, Brow worked in the medical device industry for over 10 years, starting out as a development engineer and then advancing to management positions.

"With the growing responsibilities I had in those positions, it became clear that knowing the engineering side of the equation wasn't enough if I wanted to make a true impact on the company. This real-world experience has a direct correlation to knowing what to include in IBEP."

Brow envisions the program helping students understand how companies work above and beyond engineering roles, equipping them with the skills to communicate with non-engineers, teaching them how to consider aspects of problem solving in addition to traditional science, and building professionalism.

Brow welcomes the opportunity to speak to anyone interested in the program.

"Alumni participation in this program will be extremely valuable. If you are interested in participating as a speaker, mentor, providing internships, hosting site visits, or any other way, please contact me."

Brow can be reached at ***marybrow@utk.edu*** or by phone at 865-974-2454.

Dobbs Drafted by Steelers

Joshua Dobbs, who received a lot of attention for being an aerospace engineering major and wanting to build airplanes, has put his engineering career plans on hold for now. Instead, he will be playing football for the Pittsburgh Steelers.

The former UT quarterback was the 29th pick during the fourth round of the NFL draft and signed a four-year rookie contract with the Steelers. He was one of six UT players to be drafted this year and the first UT quarterback to be selected since Jonathan Compton in 2010.

In Memoriam

MABE graduate and Hall of Fame member Richard "Dick" Rosenberg ('54) died on August 26, 2017, in San Diego at the age of 90. Rosenberg was one of the first four inductees in the department's Hall of Fame. His legacy will continue in MABE through the Richard Rosenberg Professorship in Mechanical Engineering, which was established in his honor in 2015. Rosenberg leaves behind his wife Esther and three daughters.

Send Us Your Photos

Do you have any photographs from your time at UT as a student? If so, we'd love for you to share them with us. MABE is collecting old photos of research projects, lab and classroom spaces, students, faculty, staff, and campus. Please send digital copies to ***williamk@utk.edu***. We look forward to rediscovering our past with your help!

Photo Gallery

The MABE Board of Advisors held their annual meeting in the spring. In the photo are (l-r) Sam Dougherty, Lee Martin, Jim Tevepaugh, Carol Tevepaugh, Matthew Mench, Jim Gray, Johney Green Jr., and Robert Wagner.

As an outreach project, the Graduate Association of MABE Engineers hosted students from John Haye Elementary. Students toured research labs and watched some really cool demonstrations.

Assistant Professor Reza Abiri hosted faculty and students from the University of Saint Thomas and gave them a tour of the Electrochemical Energy Storage and Conversion Laboratory. In the photo are (l-r) MABE Research Assistant Professor Doug Aaron, University of Saint Thomas Assistant Professor Katherine Acton and Professor Sarah Baxter, visiting students, MABE graduate student Philip Clarke, and Abiri.

We Need Your Help!

Our Professional Mentoring Program is growing and we need more mentors. If you have professional experience as an engineer, want to give back to MABE with your time, and have a desire to connect with our students and help prepare them for professional careers, you can be a mentor.

For consideration, sign up at ***tiny.utk.edu/MABEMentor***

Join Matthew. Join the Journey.

"Without this funding, I would not have been able to further the Advanced Manufacturing Makerlab. Thank you for your support. It is a pleasure to be able to invest in the lives of future engineers."

– Matthew Young, Eastman Assistant Professor of Practice

Invest in the journey and help others like Matthew provide experiences for UT students. Call 865-974-3011 or visit giving.utk.edu/faculty.

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Behind the scenes of the world-record-breaking Power T, ***page 2***.