KENTUCKY ENGINEERING JOURNAL

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We Are The Stanley and Karen Pigman COLLEGE OF ENGINEERING

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2024



THE STANLEY AND KAREN PIGMAN COLLEGE OF ENGINEERING

Because of the Pigmans, more Kentucky students — and Kentucky families — will discover what is wildly possible at UK. To memorialize their legacy and express our enduring gratitude, we are proud to name this college in their honor.

In September 2023, university leaders held a dedication ceremony to celebrate the renaming of the University of Kentucky College of Engineering in the honor of Stanley and Karen Pigman. For more than 20 years, the Pigmans have financially supported and mentored more than 200 engineering and computer science students through the L. Stanley Pigman Scholarship Program. Today, more than 120 undergraduate engineering students are supported by Pigman scholarships.



– Eli Capilouto President, University of Kentucky



STANLEY AND KAREN PIGMAN COLLEGE OF ENGINEERING

MESSAGE FROM THE DEAN



t the University of Kentucky Pigman College of Engineering, R we prepare the engineering and computer science talent that keeps the economy productive and society vibrant. We are also a hub for research and innovation that advances the science and technology enterprise in Kentucky, across the nation and beyond. In this issue of the Kentucky Engineering Journal, we are pleased to share some of our achievements and highlight a few of the individuals who make all of this great work happen.

In the pages that follow, you will get to know several of our distinguished alums. After a career at NASA, the Department of Defense (DOD) and Motorola, Sujit Sinha returned to Kentucky to earn the university's first Ph.D. in aerospace engineering. Alumnus Mike Castle, executive vice president and chief operations and financial officer at Alltech, Inc., shares his perspective on how passion, teamwork and commitment align to support professional success and organizational impact.

You will also learn about what is behind the expansion of the college's research enterprise. Professor Brent Seales is leading the global breakout in heritage science and opening the EDUCE Lab; a facility dedicated to understanding our cultural heritage through characterization and analysis of historical artifacts and antiguities. Also featured is Professor Ibrahim Jawahir, his team and partners at the University of Tennessee and the Army Research Laboratory, who are collaborating on a \$50 million investment titled, "Next Generation Materials and Processing Technologies," which is directed at improving U.S. manufacturing capabilities to advance production for DOD and civilian use.

You will also read about the activities and accomplishments that distinguish engineering education at Kentucky and make it great. From undergraduate research to award-winning faculty, to peer-to-peer support in our Living Learning Program, you will find examples of our holistic approach to developing professionals for their careers and preparing people for their lives.

I hope you enjoy reading about the activities and accomplishments of the college and the contributions of its people to make a world that works.

Sincerely,

Rudy Buchheit The Rebecca Burchett Liebert Dean



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> **KATIE EMMETT** B.S., Biosystems Engineering, 2021

STANLEY AND KAREN PIGMAN COLLEGE OF ENGINEERI

NEWS OF THE YEAR



Marlee Scholten Shines at Super Bowl LVIII

Scholten, a 2023 biomedical engineering alumna, landed a rather unique job for an engineer after graduation – Kansas City Chiefs Cheerleader! Being a professional NFL cheerleader is not her only job though, Scholten also works in the orthopedic medical device industry. This balancing act is nothing new for Scholten, who spent her college years excelling in both academics and athletics. In addition to being a member of the UK Dance Team and a Chellgren Fellow, she served the college as a member of the Society of Women Engineers, student ambassador, peer mentor and worked at the Innovation Center.

"At Kentucky, being an engineering major and being on a dance team prepared me to handle time management and networking."

Going for the Gold

Two Pigman College of Engineering students have received some of the nation's most prestigious nationally competitive awards.



Asa O'Neal

It was a busy year in 2024 for Asa O'Neal, a senior mechanical engineering and physics major. In the spring, he was announced as a Barry M. Goldwater Scholarship recipient. and over the summer. O'Neal was an intern at NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California. At JPL, O'Neal helped develop cryogenic CO2 scrubber technologies for human spaceflight. In the fall, he was announced as an Astronaut Scholar.

O'Neal, who plans to earn a Ph.D. researching spacecraft propulsion technologies and pursue a career in research, called the Astronaut Scholarship the most impactful award he's ever received.

"Receiving the Astronaut Scholarship is an incredible honor and brings me one step closer to my goal of becoming a researcher that contributes to space exploration," he said.



Harrison Yang

Harrison Yang is a senior biomedical engineering major and 2024 Barry M. Goldwater Scholarship recipient.

Yang, an active undergraduate researcher, intends to pursue cancer immunology research and bridge the gap between doctors and researchers to improve patient care.

"The inherently complex and confusing nature of this field always has me asking more questions that I hope to answer," he said. "I see graduating with a degree in biomedical engineering as a means of answering these questions."



Scott Berry Helping Society Better Prepare for Pandemics

Scott Berry, an associate professor in the Department of Mechanical and Aerospace Engineering, is the principal investigator of a nearly \$18 million award from the National Science Foundation (NSF) Predictive Intelligence for Pandemic Prevention (PIPP) program. The PIPP program, initiated during the COVID-19 pandemic to address both the immediate threat as well as the broad range of diseases that drastically impact life on Earth, is in its second phase, which established centers that house multidisciplinary research teams. UK is one of four institutions supported with this award and its center, the NSF Pandemic Environmental Surveillance Center for Assessing Pathogen Emergence (NSF ESCAPE), is focused on environmental surveillance by combining social science, engineering, bioinformatics and risk modeling. NSF ESCAPE expands on its team's previous work using wastewater testing to show the first signs of a disease outbreak in a community. Berry invented a new technology called exclusion-based sample preparation to create a fast and simple way to test samples.

In 2024, the White House Office of Science & Technology Policy invited Berry and his team to a roundtable focused on emerging technologies for preventing health emergencies. Wastewater surveillance for outbreak early warning was one of the four types of broad technology spotlighted in the discussions.



Scott Stephens Launches NASA **Propulsion Technology Outreach Program**

A collaborative effort between the College of Engineering, NASA Kentucky and L. Stanley Pigman's Lighthouse Beacon Foundation, spearheaded by Scott Stephens, professor in the Department of Mechanical and Aerospace Engineering, brought 34 high school juniors and seniors from Central and Eastern Kentucky to the NASA Marshall Space Flight Center and U.S. Space & Rocket Center in Huntsville, Alabama. The two-day trip included exclusive tours, lab activities and networking with alumni currently working for NASA.

"I wanted the students to meet engineers, scientists, technicians and others in STEM fields who have the same background as they do – who were born and raised in the same part of the Commonwealth with the same advantages and disadvantages and were able to achieve their dreams and goals in the aerospace industry," Stephens said.



Photo courtesy of SpaceLex

CREDIT:

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SpaceLex Wins National Competition

SpaceLex, the Pigman College of Engineering's student-led rocketry team, won the Friends of Amateur Rocketry (FAR-51025UNL) competition in the Mojave Desert in Randsburg, California. The team took an innovative approach to building its winning rocket, "Meridian," which took two years, integration of 3D-printed fins, a water ballast system and real-time video streaming from within the rocket.

"I hope to use our success at FAR to establish SpaceLex as a force in the competitive rocketry community and keep other teams interested in what we'll do next," said Lucas Stevenson, SpaceLex president.



UK Engineering Paducah Campus Launches Bachelor of Science in **Computer Engineering Technology**

Through a unique partnership between the Pigman College of Engineering Paducah Campus and the West Kentucky Community and Technical College (WKCTC), students can now earn an Associate of Applied Science through WKCTC and transfer to the UK Engineering Paducah Campus to earn a Bachelor of Science in Computer Engineering Technology. The innovative program aims to prepare students to work in a wide range of industries including aerospace, automotive, consulting, government, health care, manufacturing, industrial equipment design, IT, energy and environmental solutions.



Department of Computer Science adds AI Certificate

The Pigman College of Engineering, in collaboration with various colleges and departments across campus, has answered the call for AI talent in the workforce by adding an AI Certificate program to its Department of Computer Science. Starting Spring 2025, undergraduate students can enroll in the new 12-credit certificate program. The program offers mostly hands-on, in-person coursework and allows students to customize their learning experience to align with their personal goals and interests. The certificate, open to degree-seeking undergraduates from any UK college, gives students the chance to explore AI technologies from multiple perspectives.



Student Design Teams Take Home Top **Honors at National Competitions**

In consecutive years, student teams from the Department of Mining Engineering took home first-place wins from the Society for Mining, Metallurgy & Exploration Student Design Competition and the Metallic Student Design Competition. In 2023, both the student design team and the metallic student design team placed first in the final round. In 2024, the student design team was again ranked No. 1, and the metallic student design team placed third.

"This marks the third year in a row that one, if not both teams, have placed in the top three," Zach Agioutantis, Mining Engineering Foundation Professor and the chair of the Department of Mining Engineering, shared.

Tong, Yang and Yi winners in NIH TARGETED Challenge

The research team "ARENEX," from the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering were named winners in the Phase 1 competition of the National Institutes of Health (NIH) Targeted Genome Editor Delivery (TARGETED) Challenge. The team, led by Sheng Tong, associate professor of biomedical engineering, also includes Xiaoyue Yang, postdoctoral scholar and Zhongchao Yi, a graduate student. Tong and the ARENEX team proposed an innovative approach to develop artificially engineered exosomes that are functionalized to traverse the blood-brain barrier, thereby achieving efficient gene editing in neurons. This approach complements the ongoing NIH-funded in vivo gene editing work in Tong's laboratory.

"Our project aims to develop an innovative gene editing platform that can pass through the blood brain barrier and modify specific DNA sequences in the brain tissue," Tong said. "It holds the potential for broad therapeutic applications, including providing cures for many otherwise intractable brain-associated diseases, such as Alzheimer's and Parkinson's, through the modification of related genes."



Pigman College of Engineering Researchers Among Top 2% of World's Most-Cited

The University of Kentucky was well-represented on a list of the most-cited researchers in the world. In a database compiled by Stanford University in a partnership with Elsevier, 143 UK scientists and scholars appeared among the top 2% of the most-cited researchers across 22 disciplines. Of those 140 UK scientists and scholars, 22 were on the UK Pigman College of Engineering faculty.



LG&E and KU, EPRI, UK Engineering **Begin Industry-Leading Research**

Groundbreaking energy research that could lead to the first-of-its-kind deployment of carbon capture technology at a natural gas combined-cycle power plant is underway in Kentucky. The project is a collaboration between Louisville Gas and Electric Company (LG&E) and Kentucky Utilities Company (KU), Electric Power Research Institute and the UK Pigman College of Engineering, Bechtel, an engineering, construction and project management company, and the University of Michigan are also participating.

The project – funded primarily by a \$5.8 million grant from the Department of Energy (DOE) in 2022 – involves LG&E and KU's natural gas combined cycle (NGCC) facility, located at Cane Run Generating Station in Louisville. The NGCC, known as CR7, has been in operation since 2015 and is one of just two NGCCs in the country awarded DOE research funding. The project entails a front-end engineering design (FEED) study to evaluate the feasibility and approximate cost to pilot and deploy the UK-developed carbon-capture technology on CR7. The goal is to capture at least 95% of carbon dioxide from gases exiting the unit's stacks.

CR7 is representative of NGCC power plants in the Midwest and Midsouth – where geographical storage for carbon dioxide is limited. The results of this project are expected to yield valuable information relevant to retrofitting a carbon-capture process on other NGCC units. The study will lay the groundwork for a full-scale, 10- to 20-megawatt carbon capture sequestration pilot unit at Cane Run. If the unit is deployed as proposed by the group's FEED study, it would be the first of its kind in the world.

We Are RESEARCH

The 2024 fiscal year was the second-highest funding year in the college's history. Since the 2017 fiscal year, research awards have doubled. Engineering is one of the top three colleges at UK in research funding.

VICTORIA DUPLESSIS
 B.S., Mechanical Engineering, 2024
 Ph.D., Candidate in Aerospace Engineering

RESEARCH AWARDS

02.4M

in total research awards in FY'24

\$124

in research awards with engineering faculty as the PI

research proposals awarded FY'24

2024 INSTITUTE FOR SUSTAINABLE MANUFACTURING

Next Generation Materials and Processing Technologies Sponsor: Army Research Office **PI:** Ibrahim Jawahir

2024 KENTUCKY TRANSPORTATION CENTER



Kentucky Transportation Cabinet State Planning and Research Program

Sponsor: Kentucky Transportation Cabinet

PI: Steven Kreis

2024 KENTUCKY TRANSPORTATION CENTER

Development of the Kentucky Transportation Cabinet Knowledge Portal

Sponsor: Kentucky Transportation Cabinet

PI: Steven Kreis

2024 ELECTRICAL AND COMPUTER **ENGINEERING**

DOE EPSCoR: Light-Matter

Interactions in Artificial Spin Lattices Sponsor: Department of Energy

PI: Jeffery Hastings

2024 CIVIL ENGINEERING **Nutrition and Superfund**

Chemical Toxicity: CORE A Sponsor: Nutrition and Superfund Chemical Toxicity: CORE A

Advanced Computational

Sponsor: National Aeronautics and

Center for Entry System

Simulation

Space Administration

PI: Alexandre Martin

PI: Kelly Pennell

2024 MECHANICAL ENGINEERING

EPSCoR: Investigation of **Material Surface Erosion and** Failure due to High-Velocity **Particle Impact**

Sponsor: National Aeronautics and Space Administration **PI:** Alexandre Martin

2024 MECHANICAL ENGINEERING

NASA Kentucky Space Grant Consortium Program 2020-24

Sponsor: National Aeronautics and Space Administration

PI: Alexandre Martin

2024 MECHANICAL ENGINEERING 2024 INSTITUTE FOR **DECARBONIZATION AND ENERGY** ADVANCEMENT

CO2 Capture at LG&E Cane **Run NGCC Power Plant**

Sponsor: Electric Power Research Institute PI: Kunlei Liu

2024 INSTITUTE FOR DECARBONIZATION AND ENERGY ADVANCEMENT

The DAC Hub for Appalachian Prosperity

Sponsor: Department of Energy PI: Kunlei Liu

2024 INSTITUTE FOR **DECARBONIZATION AND ENERGY** ADVANCEMENT



Carbon Management Research Group

Sponsors: Multiple Industry Sponsors **PI:** Kunlei Liu

2024 INSTITUTE FOR DECARBONIZATION AND ENERGY **ADVANCEMENT**



Negative-Emissions Enabled **Direct Air Capture with Coupled Electro-Production** of Hydrogen at a 5 kg-perhour Scale

Sponsor: Department of Energy PI: Xin Gao

2024 COMPUTER SCIENCE



FABRIC Operations: Accelerating Innovation and Research

Sponsor: National Science Foundation

PI: James Griffioen



2024 BIOMEDICAL ENGINEERING

Noninvasive Noncontact High-Density Optical Imaging of Neonatal Intraventricular Hemorrhage

Sponsor: National Institute of Child Health and Human Develop

PI: Guogiang Yu

2024 BIOMEDICAL ENGINEERING

Perioperative Diffuse Optical Imaging of Tissue Blood Flow and Oxygenation for **Optimization of Mastectomy Skin Flap Viability**

Sponsor:National Institute of **Biomedical Imaging & Bioengineering PI:** Guogiang Yu

2024 MINING ENGINEERING



2024 MINING ENGINEERING

SynBREE: Synthetic Biology for Biomining of Rare Earth **Elements**

Sponsor: Lawrence Livermore National Laboratory **PI:** Rick Honaker

2024 COMPUTER SCIENCE

Mid-scale RI-1 (M1:IP) EduceLab - Infrastructure for **Next-Generation Heritage** Science

Sponsor: National Science Foundation PI: W. Brent Seales

Advancing Rare Earth Element Recovery from Coal Refuse Streams: An Ionic Liquid-Assisted Process Coupled with Molecular Dynamics Simulation-Supported Machine Learning for Novel Ionic Liquid Development

Sponsor: Department of Energy **PI:** Rick Honaker



BEYOND THE BREAKTHROUGH

How Brent Seales is pushing the boundaries of discovery through a new heritage science lab

BY LINDSEY PIERCY

ts influence is inescapable. Technology has reached nearly every corner of the globe — transforming the way we live, work and connect. But as technological advances continue to reshape society, the real challenge isn't simply "keeping up."

It's about daring to ask, "What comes next?"

From artificial intelligence (AI)-driven breakthroughs to the search for sustainable solutions, the future seems both imminent and more elusive than ever.

So, what's next?

That's exactly what the innovators, visionaries and disruptors — like Brent Seales — are setting out to discover.

Cracking the ancient code: Al unlocks secrets of Herculaneum scrolls

Last fall, a monumental breakthrough in the world of heritage science and modern technology made headlines around the globe.

On Oct. 12, 2023, a New York Times article read, "Scrolls That Survived Vesuvius Divulge Their First Word."

National Geographic posted, "Al Just

Deciphered Part of the Herculaneum Scrolls."

And Time Magazine wrote a detailed piece on the "Al Powered Race to Decode Ancient Roman Scrolls."

When we revealed the first few letters from the ancient Herculaneum scrolls, the momentum just exploded.

For the first time in 2,000 years, thesuccessfully extract letters and symbolsHerculaneum scrolls – long considered thefrom X-ray images of the unrolled papyri.most iconic and inaccessible of the world'sxast collection of damaged manuscripts –became readable.As part of the Vesuvius Challenge, Seales

Seales, a computer science professor in the Stanley and Karen Pigman College of Engineering at the University of Kentucky and visionary leader in the project, was at the center of the Vesuvius Challenge.

"When we revealed the first few letters from the ancient Herculaneum scrolls, the momentum just exploded," he said. "And it was thrilling to be at the center of it watching the world engage with ancient history."

For two decades leading up to this moment, Seales took on the "impossible."

What followed was a long, and often arduous, journey to create an AI program that could read the Herculaneum scrolls without ever physically opening them.

Fast forward to March of 2023, when Seales — along with Silicon Valley investors Nat Friedman (instigator and sponsor), Daniel Gross (sponsor) and JP Posma (project lead) — began leading a global competition to read the charred scrolls after he demonstrated an AI program can successfully extract letters and symbols from X-ray images of the unrolled papyri.

As part of the Vesuvius Challenge, Seales' team released its software and thousands of 3D X-ray images of two rolled-up scrolls and three papyrus fragments.

The two unopened scrolls, belonging to the Institut de France in Paris, are among hundreds unearthed in the 1750s when excavations at the buried villa revealed an extravagant library of Epicurean philosophical text. They are believed to have belonged to a Roman statesman possibly Lucius Calpurnius Piso Caesoninus, the father-in-law of Julius Caesar.

Even after being in the ground for 1,700 years, the carbonized papyri did not decay. Rather, they were entombed in the solid volcanic flow of mud, dirt, water and gases, then desiccated by the heat, carbonized and preserved.

The hope was that \$1 million in prizes would encourage global researchers and scholars to build upon the AI technology and accelerate the decoding.

"What the challenge allowed us to do was to enlist thousands of competitors to work on a problem that would normally have about five people working on it," Seales explained. "The competitive science aspect of this project is just fascinating."

Seales never doubted the Vesuvius Challenge would do just as it had intended.

However, even as the team expected the surge of success, witnessing it in action was profoundly emotional. "It felt like the first drop of a rollercoaster," he recalled.

"You know it's coming, but once you're in it, the excitement is overwhelming."

The global nature of the challenge captivated more than just the papyrology community. Through the Vesuvius Challenge, the intricate process of studying ancient texts — traditionally done behind closed doors — was on full display.

"We opened that door to the world. It was the first time in 2,000 years that anyone had looked inside these ancient scrolls, and everyone got to share in that discovery in real time," Seales continued. "It was an incredible, collaborative moment – no longer confined to academic papers but something that unfolded right before our eyes."

Six months into the competition, contestants virtually unwrapped many layers of papyrus from within by building upon Seales' software.

Together, the team presented the discovery, announcing an entire word has been read from part of the still-closed

Herculaneum scrolls, during a livestream event on UK's campus.

The Greek characters, πορφύρας, revealed as meaning "purple dye" or "clothes of purple," are among the multiple characters and Seales believes reading the entire collection of Herculaneum

It was an incredible, collaborative moment - no longer confined to academic papers but something that unfolded right before our eyes. 🗧

lines of text that have been extracted by Vesuvius Challenge contestants.

"We also acknowledge the many years of work that it has taken and the technological advances that have been applied to the problem of reading this material," Seales said in a previous announcement. "With humility, we acknowledge the nonlinear – and often unpredictable - outcomes of research, which is rarely expected, and not ever guaranteed, to lead directly to success."

All winning submissions have been made open source, so future contestants can use the body of work as a starting point.

Scan QR code to view video

Beyond the Breakthrough: What's Next for Heritage Science at UK



From left to right: Brent Seales, Federica Nicolardi , Luke Farritor, JP Posma and **Christy Chapman**

scrolls is not only possible but will be the largest discovery from the ancient world to date. In the meantime, his relentless pursuit of unlocking the past through innovative technology continues to drive new research and discoveries in heritage science.

UK's EduceLab: Bridging past, future through next-generation heritage science

Did you know, heritage science is all around us and has deep roots in the Commonwealth?

It's the signature on a bourbon barrel – it's the ancient footprints in Mammoth Cave. Kentucky's story begins in prehistoric times, when mammoths roamed the Ohio River Valley at Big Bone Lick.

Now, thanks to a \$14 million infrastructure grant from the National Science Foundation, UK is poised to tell that story in new,

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groundbreaking ways through the lens of heritage science.

Seales has gathered a team of experts from the Pigman College of Engineering and the College of Arts and Sciences to create EduceLab – UK's vision for next-generation heritage science.

"The word Educe means 'to bring out from data' or 'to develop something that is latent but not on its own explicit.' That's what we've been doing with our virtual unwrapping work. And that context has created an opportunity to expand the very focused question of, 'Can we read what's inside a scroll?' to a broader question of, 'What heritage science questions can we answer right here in Kentucky?' Seales explained. "My goal was to rally some of the best researchers here around that theme and build a world-class laboratory that allows us to pose and then answer some of those questions."

() interstation







"It may seem impossible to read a scroll without opening it. But tenacity, technology, and innovation can make audacious goals possible."

"The Vesuvius Challenge brought together world renowned leaders in papyrology, Al and the Silicon Valley ecosystem to celebrate the achievements of the contestants and to envision the future challenges posed by the Library of Herculaneum."









MICHAEL J. DETISCH Research Associate Senior

Research Associate Senior B.S., Physics, 2012 Ph.D., Materials Science and Engineering, 2020







From noninvasive data collection to AI-powered analysis, we're opening new doors into the past. We can uncover layers of history without ever damaging the objects we study, and we're connecting to the global community of heritage science in a big way.

Their research will combine engineering, the humanities and the sciences to enhance the understanding of our past, inform the present and guide our future.

"Our newly renovated space means that students can now participate in real-time, hands-on research. We've made it possible for them to witness – and take part in – studies on paintings, artifacts and other heritage objects right here on campus," Seales said. "Whether it's a sample from a museum or an analysis of pigments from a historical painting, students will see how these things work. I'm incredibly excited about the opportunities this creates."

EduceLab (located on Export Street in Lexington, next to the main campus) functions as a user facility for the heritage community. With cutting-edge equipment in artificial intelligence, machine learning and advanced data science, the lab will position UK as a leader in the emerging field.

"From noninvasive data collection to Al-powered analysis, we're opening new doors into the past," Seales explained. "We can uncover layers of history without ever damaging the objects we study, and we're connecting to the global community of heritage science in a big way."

EduceLab has four parts: BENCH, they decided to build their own. FLEX, MOBILE and CYBER

BENCH

how relics of our past were made. BENCH will work to acquire the instruments needed to conduct leading-edge materials science, which will help establish a comprehensive workflow.

FLEX

In 2016, Seales' team developed the Volume Cartographer, a revolutionary computer program for locating and mapping 2D surfaces within a 3D object. The software pipeline is used with micro-CT to generate extremely highresolution images – enabling the ability to displays for community involvement. read a document without ever needing to physically open it. The charred scroll from En Gedi was the first complete text to be revealed using the software.

While the first-of-its-kind software has profoundly impacted history and literature, not all damaged artifacts are created equal

Seales and his team have often found it difficult to use equipment that is poorly suited for the odd shapes and sizes – so

"With the FLEX cluster, we will have a prototype environment where we can Modern technology is key to understanding envision, build and test custom instrument configurations built around the heritage object under study," Seales said. "That is truly a novel approach not seen anywhere else at the mid-scale level."

MOBILE

It's one thing to bring an object into the lab. It's another to go to the object in the field. By setting up in the parking lot of a museum or by collecting data at an archeological site, the MOBILE team will take EduceLab on the road. Additionally, the MOBILE team will use external

MOBILE TO CYBER

While MOBILE oversees collecting data, CYBER will be tasked with generating and sharing the data. CYBER will be critical when helping to further drive technological advancements.



The Promise Moving Forward Daring to ask "what's next" is the driving force behind innovation and progress. It pushes the boundaries of what we believe is possible - opening new doors to discovery.

So, what's next?

Seales envisions even greater advancements for EduceLab in the coming decade

"There's no reason we can't expand with new imaging methods and Al-inspired approaches to existing fields – building new tools and insights to pose and answer important questions."

His goal is to ensure a sustainable future for EduceLab.

The Kentucky-based lab stands at the forefront of heritage science - poised to uncover even more secrets from the past.

"We're in a time now where our cultural heritage is the key to understanding our past," Seales said. "Focusing on heritage science can be key to unlocking, in a positive way, how that heritage can help us understand each other, collaborate and shape our future. We plan to keep showing the world what can be done - right here at UK."

More information about EduceLab can also be found online.

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We Are

Santa Cruz ELECTRONICS

In the Pigman College of Engineering, we are called to create, invent and imagine technologies that propel society forward. In 2024, UK engineering faculty received nine patents for inventions benefitting work in areas like medicine, energy, hydrology and manufacturing.

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- Keeneland . Donated by Stanley and Kare

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THE NEXT GENERATION OF ADDITIVE MANUFACTURING RESEARCH

BY LINDSEY PIERCY

n spring of 2024, the Pigman College of Engineering held a ribbon cutting ceremony to celebrate the opening of the Next Generation Additive Manufacturing Research Laboratory (NextGen AMRL), the newest addition to the Institute for Sustainable Manufacturing (ISM).

In July 2021, UK, the University of Tennessee, Knoxville (UT) and three partners. the U.S. Army Combat Capabilities Development Command's

Army Research Laboratory announced a five-year, \$50 million collaboration directed toward improving U.S. manufacturing capabilities.

Under the three-way partnership, UK's project, "Next Generation Materials and Processing Technologies" (NextGen MatProTech), will receive approximately \$24.5 million from the U.S. Department of Defense (DOD).

"As an institution driven by discovery and innovation, we are dedicated to advancing our community and the world. Through this partnership, we can harness our top talents to turn groundbreaking research into real-world solutions — achieving far more collectively than we ever could alone," UK President Eli Capilouto said. "As Kentucky's institution, we are stronger and more effective when we collaborate in meaningful ways. We are deeply thankful for members of our Congress who continue their steadfast support, which ensures we advance Kentucky and fulfill our promise."

NextGen AMRL features innovative additive and hybrid manufacturing machines, material characterization equipment and systems that facilitate collaborative research among the three partners.

Kentucky has a long history supporting our nation's defense, and this new lab at the University of Kentucky stands to deepen our state's important role in America's national security.

- U.S. Senator Mitch McConnell

ISM researchers are utilizing these new technologies to push the boundaries of innovation and help establish UK as a world leader in advanced additive manufacturing.

"The NextGen AMRL is a prime example of the type of cuttingedge, collaborative research happening in the UK Pigman College of Engineering," said Rudy Buchheit, Ph.D., the Dr. Rebecca Burchett Liebert Dean of the Pigman College of Engineering.

"Being home to one of the most advanced collections of additive manufacturing tools in an academic setting allows the college to establish itself as a leader in this crucial area of research."

Following the opening of the lab, UK researchers will work to develop novel materials processing and manufacturing technologies. The goal is to produce superior products and components for the DOD, as well as civilian use.





Register Pigman

Pign

In addition to increasing intellectual capital, generating new discoveries and identifying highpotential technological innovations, the project is also striving to meet the country's strategic research needs in materials and processes as identified by the National Academy of Sciences, the National Academy of Engineering and the National Academy of Medicine.

"Kentucky has a long history supporting our nation's defense, and this new lab at the University of Kentucky stands to deepen our state's important role in America's national security. In Washington, I've been proud to secure nearly \$25 million in federal funding to resource this project and support In addition to meeting the DOD's strategic goals, advanced education and training will be offered for undergraduate and graduate students. This will ultimately support and strengthen workforce development for next-generation manufacturing.

– I.S. Jawahir

nioma



UK's leadership in this space," Sen. Mitch McConnell said at the ribbon-cutting ceremony. "I'm grateful for the students, faculty and university leaders leveraging our state's advanced manufacturing expertise to assist the Army. For generations, research at our leading universities has fueled America's growth and secured victories abroad. Today, I'm a proud alum to see UK carry on this honorable tradition."

Research advances hold promise to address the DOD's growing needs to maintain global technological superiority by developing higher-performing materials and manufacturing processes. These advancements not only strengthen national security but also contribute to economic growth.

I.S. Jawahir, director of ISM, is the principal investigator and project director for UK. He also sees NextGen MatProTech, and NextGen AMRL, as a way to make substantial investments in the regional economy.

"The new project will provide tremendous opportunities for the

state of Kentucky and the surrounding region," Jawahir said. "In addition to meeting the DOD's strategic goals, advanced education and training will be offered for undergraduate and graduate students. This will ultimately support and strengthen workforce development for next-generation manufacturing."

The UK team has identified three primary research areas: advanced additive manufacturing; novel materials development; and modeling and manufacturing processes for extreme environments, such as hypersonic applications.

UK is also working closely with Flash Steelworks, a new multimillion-dollar plant in Bell County, Kentucky, dedicated to a novel material processing method called "Flash Processing."

Collaborating with Army engineers and scientists, UK researchers are pursuing new nano-structured metal alloys, and advanced composite materials, using scalable, smart and sustainable novel manufacturing methods.

We Are

BLAZING THE TRAIL

The Pigman College of Engineering is home to the only mining engineering program in the Southeastern Conference and one of only 13 in the nation. UK is one of just eight U.S. institutions with a doctoral program in mining engineering. WILSCATS

Witness.

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JHON SILVA Professor, Mining Engineering

ESTEPHANIA ARAMAYO M.S., Mining Engineering, 2023

JOSH CALNAN B.S., Civil Engineering, 2011 M.S., Mining/Explosives Engineering, 2013 Ph.D., Mining/Explosives Engineering, 2015

LAUREN SHIELDS B.S., Mining Engineering, 2017 Ph.D., Mining Engineering, 2024

LUIS VELASQUEZ M.S., Mining Engineering, 2023

STANLEY AND KAREN PIGMAN COLLEGE OF ENGINEERING 29

ISEE

From NASA aspirations to launching an enduring aerospace legacy at UK

BY LINDSEY PIERCY

rom the earliest days of childhood, there are those who seem to possess an unwavering clarity about their future.

Whether it's the child who dreams of exploring the cosmos or the budding artist who finds solace in strokes of color, there's a profound sense of direction.

It's as if the essence of who they are, their passions, and their talents, are woven into the very fabric of their being.

At just 7 years old, Sujit Sinha's aspirations were bold – and specific.

"My late mother always told me that I said, 'I'm going to work in mission control at NASA one day.'"

Despite growing up in the small town of Morehead, Kentucky, for

Sinha, working in aeronautics didn't seem out of reach

MISSION CONTROL CENTER

It was the summer of 1968. And of course, a must-stop was a visit to the Kennedy Space Center during the heyday of the Apollo program.

That spark of passion was further ignited during a family trip to the Sunshine State.

Photo courtesy of Sujit Sinha

"It was the summer of 1968. And of course, a must-stop was a visit to the Kennedy Space Center during the heyday of the Apollo program," he said. "We got to tour the historic mission control building, and that was all I needed to establish my ultimate career aspiration."

From that moment on, Sinha could often be found spending his free time building model planes and rockets.

"All the way through high school, I built rockets - striving to construct ones that flew higher and higher."

Sinha's desire to become a mechanical engineer was fueled by his unwavering determination. Yet, he recognized the importance of furthering his education, especially if he was going to land his NASA dream job.

That's when, in August of 1979, Sinha's journey as a Wildcat began.

"As with many students, the first two years were quite an adjustment. Since this was long before first-year engineering courses and living learning programs, it was difficult to meet other students in my major," he continued. "As time went on, the courses were a struggle. Then, sophomore year was one of those 'look into the abyss' moments, where you feel like you are just about to go into freefall."

With family support, Sinha completed those two years. And in his junior year, he found a second family at UK.



goals — and have just a bit of luck.

Photo courtesy of Sujit Sinha

"I met many other students in mechanical engineering, and we formed a study and social group," Sinha said. "Now, I always advise prospective students to join a study group."

He continued to excel socially and academically, and in 1983, Sinha proudly crossed the Commencement stage with a bachelor's degree in mechanical engineering.

Not unlike many recent graduates, Sinha was unclear about the path forward. He was both eager to begin his career and to continue his education.

"The education I received at UK provided me with the knowledge to take my career wherever I wanted," Sinha said. "I stress this fact with prospective UK students. But of course, you must also be relentless in the pursuit of your goals - and have just a bit of luck."

The education I received at UK provided me with the knowledge to take my career wherever I wanted. I stress this fact with prospective UK students. But of course, you must also be relentless in the pursuit of your I served on the Presidential Commission's Challenger Accident Analysis Team. As an engineer, I helped to identify and explain the technical failure that occurred, but what I did not readily comprehend was the managerial thinking that contributed to the failure.

As luck would have it, NASA came calling.

"I received a job offer from the Marshall Space Flight Center after only having a brief discussion with a NASA recruiter on campus," Sinha recalled. "But I learned the role was exactly the dream job planted in my mind back in 1968. It would put me in the Launch Control Center, interacting with the mission control team in Houston."

Those in mission control are often the underappreciated champions behind every successful space mission — navigating the intricate nuances of space travel with unparalleled precision.

At just 21 years old, Sinha found himself striving to anticipate challenges before they would arise and devising split-second contingency plans.

"During a launch, I managed the Main Propulsion System (MPS) console, with responsibility of fueling the large, brown shuttle external tank with liquid hydrogen and liquid oxygen," he explained. "Between launches, I designed the ascent flight trajectory for each space shuttle mission. Essentially, you need to get the shuttle into orbit without breaking the wings off of the orbiter, while keeping the aero-heating on the external tank (ET) within safety limits. You may recall, the reentry failure of the Shuttle Columbia was due to a piece of the ET coming off and hitting the wing of the orbiter during ascent. I also performed post-flight trajectory reconstruction after each shuttle mission."

During that time, NASA would pay for Sinha to get a master's degree in mechanical engineering. While completing evening courses at the University of Alabama in Huntsville, he also continued to excel in his career — holding many positions and filling many roles at NASA throughout the '80s. A turning point came on Jan. 28, 1986 – the day of the Space Shuttle Challenger tragedy.

"Everything changed," Sinha said.

The Challenger broke apart 73 seconds into its flight, killing all seven crew members aboard. The spacecraft disintegrated 46,000 feet above the Atlantic Ocean, off the coast of Cape Canaveral and was the first fatal accident involving an American spacecraft while in flight.

"As a result, I served on the Presidential Commission's Challenger Accident Analysis Team. As an engineer, I helped to identify and explain the technical failure that occurred, but what I did not readily comprehend was the managerial thinking that contributed to the failure," Sinha said. "Following the accident, I decided I needed to better understand how and why business and management decision-making differs from engineering and technical decision-making." After six years at NASA, Sinha left to pursue an MBA from the Wharton School of Business, at the University of Pennsylvania, which ultimately led to new ventures.

"I served as a civilian consultant to the Department of Defense at the Pentagon for a couple of years," he said. "I was mentored by a retired three-star general. He established many of the management principles for leading large organizations that I now call my own."

Despite aspirations to continue his education, life's demands and opportunities continued to lead Sinha down a different path — applying his mechanical engineering expertise in practical settings.

"In NASA terminology, the pursuit of a Ph.D. went into an 'unplanned 32-year hold.""

When asked about his career highlights, Sinha describes his time spent as a management consultant, which involved working with various high-tech and aerospace CEOs and senior executives.

"A few examples include: determining if a commercial helicopter manufacturer should introduce a new product to the market; assessing if a major aerospace firm should purchase a corporate jet maker; deciding how a U.S. commercial launch manufacturer should partner with a Russian launch provider; etc."

Sinha also led information technology strategy, architecture and innovation at Motorola, which invented cell phones. "Leading IT innovation was exciting, as I was able to introduce many new collaboration and mobile technologies globally," he said.

Sinha held numerous roles over the course of his illustrious career, applying his

expertise in diverse capacities. And before he knew it, years had gone by since he was an apprehensive graduate -40 years, to be exact.

Still, Sinha considered himself a lifelong learner. So, he "retired," began to focus more on work-life balance and contemplated his next move.

"I always had a desire to teach. So, I was definitely planning on continuing my

education and earning my Ph.D.," he said. "My parents always stressed the importance of education as a core family value. I figured that a Ph.D. was the highest degree that could be obtained in engineering, and therefore, I should certainly aim to seek this level of education."

In 2021, the Stanley and Karen Pigman College of Engineering launched undergraduate and graduate degree programs in aerospace engineering.



Aerospace plays a significant role in Kentucky's economy. In fact, aerospace exports are the top export in the state and number three in the United States behind only California and Washington. According to the Kentucky Cabinet for Economic Development, Kentucky exported more than \$14.6 billion in aerospace products in 2019.

Additionally, the Commonwealth is home to 79 aerospace-related facilities, which employ more than 19,000 people, including Belcan Corp., General Dynamics, General Electric, Lockheed Martin, Raytheon and Sikorsky Aircraft Corp.

Housed in the Department of Mechanical and Aerospace Engineering, the degree pathways foster research and innovation by enhancing collaborations between UK and the local aerospace industry.

"As a member of the engineering alumni board, over time, I learned about all of the great aerospace research going on at UK," Sinha said. "And I began to think, once again, about finishing my Ph.D."

So, after four decades, Sinha made the bold decision to return to UK and pursue his long-deferred dream.

Despite his commitment, being a student again wasn't without challenges.

"You have to remember, during my undergrad I didn't even have the internet," Sinha exclaimed. "But the biggest challenge was re-learning all the calculus. When I would study with the "kids," they would fly through the math associated with solving problems, so I would have to stop them and have them walk me through it. I certainly would have never completed my degree without the support of my fellow, much younger, and clearly smarter, students."

This time around, Sinha also had the support of his two sons who attended

college at the same time and graduated within a year of each other.

"There is an old tenet at the Pentagon that you should not ask the troops to do something that you are not willing to do — a leadership by example approach," he said. "This principle is another reason I went back to finish my Ph.D., since I wanted to show my boys that I was willing to challenge myself to study along with them."

Lastly, Sinha contributes his academic success to his mentors. "I actually had four advisors (Sean Bailey, Jesse Hoagg, Alexandre Martin and Suzanne Smith) for my Ph.D.," he said. "The support from the faculty and college administration was invaluable to completing my degree."

Following his Commencement in May 2024, Sinha realized that his time at UK was far from over.

He and his wife, Susan, made a lasting

Photo courtesy of Sujit Sinha

There is an old tenet at the Pentagon that you should not ask the troops to do something that you are not willing to do — a leadership by example approach. This principle is another reason I went back to finish my Ph.D., since I wanted to show my boys that I was willing to challenge myself to study along with them.





impact by endowing both the Sujit and Susan Sinha Aerospace Research Professorship and the Sujit and Susan Sinha System Analysis and Integration Laboratory, housed in the Grehan Building on campus.

"I've certainly been blessed to have the opportunity to achieve, and in many ways exceed, my initially expected career goals," Sinha said. "To get to the root cause of an outcome, there is an old management principle that you need to repeatedly ask the question 'Why?' seven times. In this case, asking 'Why?' seven times leads me to the education and experience I obtained as a graduate of the University of Kentucky as the root reason for my fortunate career. So, the donation is a means to give back to the university that launched (pun intended) me on my career trajectory."

Sinha also sees the institution as a key player in advancing aerospace research and innovation.

"We certainly have talented faculty, staff and students at UK," he said. "We believe the endowment will serve as a means to continually attract the best talent to conduct cutting-edge research and, consequently, cement and further raise awareness of UK's aerospace engineering prowess." As for Sinha's next career move — that also involves UK.

Next fall, he is working with the Department of Mechanical and Aerospace Engineering to take on the role of professor, a dream he's held since his undergraduate days.

"While I could have sought to teach without the completion of a doctorate, I felt I would not be able to adequately give students the education they deserve without refreshing my engineering knowledge and obtaining the highest level of academic credentials," Sinha said. "Now, I feel I'm ready to offer students a thorough and exhaustive education."

Sinha is ready to impart not just technical knowledge, but a deeper understanding of the high standards he has adhered to throughout his career.

"I believe it's my duty to inspire students to hold themselves to the highest technical, managerial, professional and ethical standards."

From the earliest days of childhood, Sinha seemed to possess an unwavering clarity about his future.



As for his definition of success, however, he now believes that comes in many forms.

Yes, Sinha's latest accolade could help advance his future career aspirations. But he says it was never about salary or status.

Instead, his degree represents something more intangible.

"When I started at UK almost 45 years ago, I could not have imagined in my mind nor even in any theoretical parallel universe — that I would be getting an aerospace Ph.D. from here and joining the faculty," Sinha said. "Much less to be the first recipient of the degree with an aerospace major. When you get older, you start to think about legacy, and this is a legacy that will endure."

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We Are COMMUNITY

The Pigman College of Engineering is home to the largest STEM celebration in the state of Kentucky. E-Day is a century-long tradition that invites community members and partners from across the Commonwealth to our campus. Thousands gather with us each February to celebrate the work of engineers and computer scientists, and to share in the magic of STEM education.

E-DAY Egg Drop Competition

3 10 3

100

How student-to-student support makes the Engineering Living Learning Program stand out

SUDEYS SAMAN

Junior, Mechanical Engineering Louisville, KY

INVOLVEMENT: Pigman College of Engineering Innovation Center, AICHE ChemE Car, Muslim Student Association, National Society of Black Engineers, Undergraduate Research Assistant for the Department of Mechanical and Aerospace Engineering

E.Pum

Cudeys Saman is a Resident Advisor (RA) and former peer Provide the second state of the second stat Learning Program (LLP).

Pigman

Sudeys joined the Engineering LLP as a freshman – a decision he describes as one of the best he's made in his academic career. The Engineering LLP provided him with a supportive environment to connect with fellow engineering students from day one, leading to friendships that remain some of his closest to this day.

Sudeys' ambitious itch to get involved in his campus community began in his very first year. His desire to put his time and effort into something

that felt impactful is what made his own peer mentor encourage him to apply to serve in his sophomore year. His palpable passion for working with peers from various backgrounds with differing needs, values, ambitions and talent made him a successful peer mentor. It is also what inspired him to take on the additional responsibilities that come along with his current title of RA.

His work in Pigman Hall, as a peer mentor and now an RA, has taught him some invaluable lessons he could not learn inside a

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classroom. Mentoring his peers through their daily real-world challenges has helped him strengthen his communication skills and also has taught him about himself. Through his peer support positions, Sudeys said he has learned a lot about his own limitations and how to balance his own needs with the needs of those who look to him for guidance.

When it comes to guidance, Sudeys has quickly learned that most often, the best way to help someone through a difficulty they are facing begins with listening to them. When he sees a first-year student struggling more than others, his inclination is to get to know them and provide a safe space for them to share.

"Oftentimes, just simply being there for someone and acknowledging their struggle is enough to help them," he shared.

Although he's got a few extra responsibilities, Sudeys is still very much a member of the community he serves and relishes the opportunity to be in the company of people sharing his experience. He recalls the feeling of "invigoration" he gets after

The unique bond in the engineering community, that simply doesn't exist elsewhere, is echoed perfectly by the Engineering LLP. This leads to a group of talented individuals, with ambitions like no other, seeking ways of bettering themselves and their environment.

hunkering down with friends in a study room, working on an engineering problem that no one in the room would be able to solve alone. The sense of hope he feels when he can collectively head-scratch with his peers is something Sudeys said he can imagine reminiscing on many years from now.

What's next for Sudeys? After completing his engineering coursework, he plans to earn his MBA at UK. From there. he hopes to either work as a mechanical design engineer or pursue another master's degree.

"The unique bond in the engineering community, that simply doesn't exist elsewhere, is echoed perfectly by the Engineering LLP. This leads to a group of talented individuals, with ambitions like no other, seeking ways of bettering themselves and their environment. It may be cliché to say this, but I truly believe there's something different about the people who make up the Engineering LLP. They are what make it special."

LIVING, LEARNING AND LEADING

4 MILDCH

CATHERINE CORNWELL

Senior, Mechanical Engineering Hazard, KY

INVOLVEMENT: Pi Tau Sigma Mechanical Engineering Society, Themed Entertainment Association, Tau Beta Pi Engineering Honor Society, Pigman College of Engineering Innovation Center, Society of Women Engineers, Phi Sigma Rho Sorority

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^bPigman

atherine Cornwell is a veteran peer mentor, entering her fourth year of service in the Engineering Living Learning Program (LLP).

Her journey within the Engineering LLP began in her first year, where she joined the campus' largest LLP in Fall 2020. Despite the obvious challenges the COVID-19 pandemic provided to communities like the Engineering LLP, Catherine said the amount of effort she saw the community put into making her experience as normal as possible had a profound impact on her This inspired her to return that support and connection to new engineering cohorts by applying to be a peer mentor her sophomore year.

In summer 2023, Catherine became a Women in Engineering (WiE) Wing coordinator. The Engineering's WiE Wing is a dedicated wing for first-year women in engineering and computer science majors and dedicated peer mentors, like Catherine, serve as wing leaders. In addition to the benefits of the Engineering LLP, residents of the WiE Wing also have access to special female-led engineering events and programming.

The co-curricular programming is a cornerstone of the Engineering LLP and Catherine says its networking events and opportunities - among peers and industry professionals - provides a unique



My favorite part about being a peer mentor is seeing my mentees not need me anymore.

advantage to students today to hone their teamwork and interpersonal communication skills and gain insight into the professional world before they arrive.

On a personal level, Catherine credits her years as a peer mentor in improving her public speaking and problem-solving abilities, in addition to her time management, planning, communication and social skills. The logistics of the job have presented her with many opportunities to problem-solve and get creative when a challenge arises, but the human element - figuring out how to connect with people from different places with different majors, interests and backgrounds - has been the most rewarding challenge.

As a peer mentor, Catherine can provide peer support to firstyear students because she has been in their shoes; however, sometimes she needs to provide support for a student whose shoes she's never been in. Although Catherine would say that one of the best things about the Engineering LLP is the convenience and how it can provide a closer-knit community on a very large campus, the campus as a whole provides a lot of ground to be covered. She must be aware of the many support offices and

> services the campus provides to connect first-year students to what they need. Some days, she needs to walk a lost student to a building, and others she needs to connect someone to the UK Disability Resource Center so they can get the necessary travel accommodations to make it across campus on time. This type of peer guidance has proven to be an invaluable resource to newly minted college students.

What's next for Catherine? After graduation, she is considering completing the one-year MBA dual degree program or directly pursuing a full-time position in aerospace.

"My favorite part about being a peer mentor is seeing my mentees not need me anymore. It sounds a bit backwards, but in the beginning of the year, I help them get familiar with campus and general college life, answer questions, invite them to events we host, etc. But as the year goes on, I see them start hanging out with groups of friends, attending events and having fun, so know they're doing well."

THE SEEKers OF **CIVIL ENGINEERING**

ivil engineering is vital to developing, maintaining and Growing a functional society. However, to recruit the next generation of civil engineers, high school students need to be introduced to the diverse field and the career paths it encompasses.

In summer 2024, the UK Pigman College of Engineering Department of Civil Engineering launched its inaugural Summer Engineering Exploration Kamp (SEEK). In its first year, the outreach program welcomed 40 rising high school seniors for the week-long, on-campus experience.

SEEK features hands-on learning opportunities, guest speakers from industry and field trips to active project sites. The high school students stay in UK residence halls along with civil engineering college students, who serve as mentors. Throughout the week, participants engage in activities that teach the fundamentals of civil engineering through experiential learning.

The highlight of the week is a visit to Kentucky Kingdom, where participants learn how civil engineers build and power the park and its operations. The high school students hear about the engineering necessary to construct the park, to develop and test the rides, to handle all the waste and to move people in and around the park. After learning about the civil engineering concepts that support and sustain the

park, the students are able to enjoy the park and its rides.

L. Sebastian Bryson, Ph.D, chair of the Department of Civil Engineering, said this effort to make civil engineering accessible to high school students across the state stemmed from the department's future forecasting.

"In the next 10 years, civil engineering is expected to be one of the fastest growing engineering disciplines in the U.S. because of the increasing infrastructure needs," Bryon stated. "By exposing STEM-focused high school students to engaging infrastructure-related activities and experiences, SEEK aims to develop a strong talent pipeline for civil engineering."

The call for bright and talented students from across the Commonwealth to become the next generation of infrastructure professionals was answered in the program's inaugural summer. For the June and July cohorts, each offering 20 spots, SEEK received 94 applications. Those cohorts represented 20 Kentucky counties, including Anderson, Boone, Estill, Fayette, Floyd, Harlan, Jefferson, Johnson, Kenton, LaRue, Laurel, Leslie, Letcher, Martin, Nelson, Rockcastle, Shelby, Union, Washington and Woodford.

To learn more about SEEK, visit engr.uky.edu/ce/seek.

In the next 10 years, civil engineering is expected to be one of the fastest growing engineering disciplines in the US because of the increasing infrastructure needs.







- L. Sebastian Bryson Chair, Department of Civil Engineering



STANLEY AND KAREN PIGMAN COLLEGE OF ENGINEERIN



ENGINEERING TAKES FLIGHT

The Pigman College of Engineering hosts Kentucky Army National Guard members as they land Black Hawk utility helicopters on campus at the "Engineering Takes Flight" event. UK offers the only undergraduate degree in aerospace engineering in the state and aerospace plays a significant role in Kentucky's economy. In fact, aerospace exports are the top export in the state and number three in the U.S. — behind only California and Washington.



Whistle While You You Work

Alumnus Mike Castle '02 understands the importance of loving what you do; his contagious zeal embodies the fulfillment that arises from aligning passion with purpose

BY DAN KNAPP

hough job satisfaction in America continues to climb, just 20-25 percent of workers say they genuinely love their work. E. Michael "Mike" Castle II '02, however, counts himself among the lucky few who do.

"Every day I get up with kind of a sense of pride — of belonging — and I've just always had fun," says Castle, the chief operations and financial officer of Alltech Inc., considered a global leader in animal nutrition and agricultural innovation. "My wife laughs. She says, 'Every day, you get up and you're whistling, you're smiling and you're excited to go into the office.'"

Castle's enthusiasm radiates as he tours the Nicholasville, Kentucky, headquarters — an elegant blend of marble, rich woods, glass and metal. The building, unveiled in 2020, boasts a gallery chronicling Alltech's legacy and game-changing influence on global agriculture.

There's this sense that we always have to do the right thing, and I found that very unique compared to other industries. That has always gotten me out of bed excited. It's just never been work. And I think that's the secret to success — happiness, just doing something you love.

Above the entrance, a crystalline equine-themed chandelier casts light across the space, a nod to Kentucky's racing heritage and the company's bright future. As he ascends the grand spiral staircase, Castle points out rooms themed after countries where Alltech operates, signifying its worldwide reach.

"When I think about our customers, suppliers, even competitors, there's this real sense of trying to make sure the world gets access to nutritious food that I think is just so unique compared to other industries," Castle said. "There's this sense that we always have to do the right thing, and I found that very unique compared to other industries. That has always gotten me out of bed excited. It's just never been work. And I think that's the secret to success — happiness, just doing something you love."

Although many consumers may not know Alltech, the company develops innovative solutions in animal and plant nutrition and health products across various agricultural sectors. Their work boosts productivity, improves livestock,



Alltech's business has been built around more of a natural or fermentation-based platform. We continue to build upon that. We can provide nutrition for animals and humans without using synthetic chemistry and pharmaceuticals. It's a real differentiator.

pet and crop health, and protects the environment, ensuring safer, more nutritious and responsibly produced food for consumers.

The positive impact that his employer is having on the world with their unique approach instills Castle with a sense of pride.

"Alltech's business has been built around more of a natural or fermentation-based platform," Castle said. "We continue to build upon that. We can provide nutrition for animals and humans without using synthetic chemistry and pharmaceuticals. It's a real differentiator." Castle serendipitously came to Alltech as an intern in the late 1990s. Still determining what career path he intended to follow, the internship was pivotal in his future success.

"I wasn't convinced when going to school what I would get into," Castle said. "I met [Alltech founder] Dr. Pearse Lyons through my uncle, and we just hit it off. He offered me an internship, and I just loved everything that Altech did. He was looking for chemical engineers because he wanted someone who could help design and build his fermentation processes and scale up technologies that he and the team were creating in the laboratories." The skillset Castle finessed at UK proved invaluable in helping him find his calling. He says that he advocates for the addition of diverse UK interns into the company because it provides essential, real-world opportunities for students looking to make an impact.

"All the products we make and sell are built on a natural or fermentation platform, so nonpharmaceutical, nonsynthetic chemistry-based," Castle said. "I – and the whole team – take great pride in the products we make and how we're trying to improve the food chain and provide better nutrition for all." Among Alltech's recent innovations is pioneering technology that helps farmers measure and reduce their carbon footprint, reduce pest incidence on their crops through biological pest control, and help animals maintain their health status to mitigate the harmful effects of viral challenges in their herds and flocks.

As Executive Vice President, Chief Operations Officer, and Chief Financial Officer, Castle supervises a diverse team of experts daily, requiring knowledge in agriculture, business, biological sciences, chemical engineering, law, manufacturing and economics. Previously living and working abroad for Alltech, he has played a key role in expanding the company's global presence abroad. He has travelled to more than 95 countries, led different business units for the company and many of its departments over the years.

To broaden his skill set, Castle earned a law degree from Washington University in St. Louis in 2005.

Despite his achievements, the Prestonsburg, Kentucky, native remains grounded, attributing much of his success to the teamwork of Alltech's employees. He appears somewhat amazed by how far his college internship has taken him.



"Coming from Kentucky, living in Kentucky, my wife and I — we laugh all the time," Castle said. "Who would have thought we would be working with this many cultures, this many people from around the world?"

I tell kids, 'Make sure whatever you do, whatever field of study you pick, you're having fun with it, and you're really passionate about it.

Castle fondly reflects on his UK experience and embraces the spirit of giving back to the community.

"There's a sense of loyalty...of pride... almost inclusiveness," Castle said. "Growing up, I was around family members who graduated from UK — my mother and many aunts and uncles — and we'd go to sporting events. UK would host alumni events, and there was just this sense of pride. Living in Kentucky and being a Kentucky grad — that's quite special." He and Alltech support various charitable causes, including sponsoring the Alltech Vocal Scholarship Competition for the UK College of Fine Arts and providing numerous scholarship opportunities. Castle also regularly speaks to students in the UK Gatton College of Business and Economics and UK Pigman College of Engineering, sharing advice to help them succeed.

"I tell kids, 'Make sure whatever you do, whatever field of study you pick, you're having fun with it, and you're really passionate about it." Castle said. "The second piece of advice I give is that you have to get experience; your education is just one piece. Education is lifelong, so you have to read, you have to educate yourself well beyond your formal education process. My view is to get work experience early on -it'sinvaluable – so l'm constantly pushing the young kids to get an internship, get the information and make sure the work experience matches their passion for the degree they're studying. Last but not least, you need to be diligent and put the time into your work. My parents stressed this growing up and they both set a great example of what you can achieve through hard work and dedication. I learned early on hard work will always distinguish you from others and its something that is within your control. I think if you do these things, you're going to be quite successful."

We Are PROBLEM SOLVERS

The Pigman College of Engineering houses 11 research centers, institutes and consortia, and is affiliated with six additional research centers. Our student and faculty researchers are discovering solutions in areas like energy, transportation, materials, metals and health care.

JENNA MONEY Senior, Mechanical Engineering

HANA KHAMFROUSH RECEIVES NSF CAREER AWARD TO DEVELOP DATA-DRIVEN, SMART TECHNOLOGIES FOR SUSTAINABLE LIVING

BY ERIN WICKEY



Hana Khamfroush, Ph.D., associate professor in the in the UK Stanley and Karen Pigman College of Engineering's Department of Computer Science, recently received the prestigious National Science Foundation (NSF) Faculty Early Career Development (CAREER) Award. The NSF will support Khamfroush with \$624,716 over five years for her research involving preprocessing data, while maintaining privacy, so that it can be trained for use in machine learning models for smart cities applications.

With eco-friendly practices as a priority, smart cities use data and technology to create more livable and sustainable urban environments.

"I think we are all used to the internet on computers and smartphones. But when we talk about the 'internet of things,' we are looking at every possible device becoming connected devices to the internet," Khamfroush said. "For example, we can have a smart thermometer that can just sense when we are out of the home to reduce the lights. This can help with energy consumption."

A big part of this project is about federated learning and federated data preparation. This means we are preparing data and training machine learning models without losing privacy because we are not sharing the data to a cloud. All the training is done collaboratively and locally on the devices.

The NSF-funded work will serve as a foundation for various emerging AI-based applications including smart traffic light systems. Many of these applications will require a huge amount of data to be automatically processed and some will need to be processed in real time.

"There is a lot of noisy data and missing data points," said Khamfroush said. "A big part of this project is about federated learning and federated data preparation. This means we are preparing data and training machine learning models without losing privacy because we are not sharing the data to a cloud. All the training is done collaboratively and locally on the devices."

Khamfroush's research was previously focused on distributed and edge computing systems. As machine learning becomes more and more developed, she says her research becomes more applicable in the domain of machine learning and distributed machine learning.





activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization," according to NSF. This material is based upon work supported by the National Science Foundation under Award Number 2340075. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

"I was looking for something that is more of interdisciplinary research. I thought about how I can bring in my previous research and add a flavor of machine learning to it."

"Dealing with the unknown is something that I really like," ske said. "I think doing research, especially in this very exciting field of machine learning and computer science, is something that I really like and appreciate because I can get creative. I can envision things that may be very ambitious. You may fail. But I just like dealing with the unknown and being able to deal with the challenges."

The CAREER Award is one of the "most prestigious awards in support of the early career-development

XUJIN RECEIVES NSF CAREER AWARD TO CREATE INNOVATIVE METHODS TO MAKE DRONES SAFER AND SMARTER

BY ERIN WICKEY



Xu Jin, Ph.D., assistant professor in the UK Stanley and Karen Pigman College of Engineering's Department of Mechanical and Aerospace Engineering, has received the prestigious National Science Foundation (NSF) Faculty Early Career Development (CAREER) Award. The NSF will support Jin with \$542,714 over five years for his research involving learning-based cooperative control algorithms for multi-agent systems to capture and manage target drones.

The drone industry is a multi-billion-dollar market, and affordable civilian drones are now widely accessible. However, increased drone usage has led to safety concerns such as unauthorized drones flying dangerously close to airports.

Jin's research focuses on utilizing multiple unmanned aerial vehicles that work together to capture and remove drones from the sky using nets.

"We want to use multiple unmanned aerial vehicles, what we call UAVs, to collaboratively and autonomously put the drone out of the sky with a capture net carried by these unmanned aerial We want to use multiple unmanned aerial vehicles, what we call UAVs, to collaboratively and autonomously put the drone out of the sky with a capture net carried by these unmanned aerial vehicles.

vehicles," Jin said. "We have mainly two major technical difficulties. One, of course, is the safety concerns. We want to capture the drone, which means we must fly close to the target drone. But we do not want to collide with the drone. We want to ensure safety."

Another technical difficulty is learning the target behavior.

"The target does not want to be captured. We must learn the target behavior, as well as to learn the environmental factors,"

said Jin said. "All these things must be taken into consideration by what we call 'deep neural network learning,' which mimics human brain behavior.

"At the end of the five years, hopefully we will achieve a few things," he continued. "We will hopefully bring low-cost, widely accessible technology to accomplish the mission of drone capturing for the civilian market. To achieve this, we will develop



The CAREER Award is one of the "most prestigious awards in support of the early careerdevelopment activities of those teacher-scholars who most effectively integrate research and education within the context of the mission of their organization," according to NSF. This material is based upon work supported by the National Science Foundation under Cooperative Agreement No. 2336189. Any opinions, findings, and conclusions or recommendations expressed

learning-based cooperative control algorithms for this kind of multiagent system collaboration."

"This award will also bring visibility to our research so that hopefully down the road, we will attract more contribution and collaboration from all over the country so that different people with similar interests can work together."



This material is based upon work supported by the National Science Foundation under Cooperative Agreement No. 2336189. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

NEWS & RECOGNITION

Professional Recognition



Zach Agioutantis, professor in the Mining Engineering Department, was named to American Rock Mechanics Association Board of Directors and received the 2024 Howard N. Eavenson Award from the Society for Mining, Metallurgy & Exploration.

Rodney Andrews, director of University of Kentucky Center for Applied Energy Research and professor of chemical engineering, was appointed to the Kentucky Nuclear Development Workgroup.

Fazleena Badurdeen, professor in the Department of Mechanical and Aerospace Engineering, was elected a fellow of the Institute of Industrial and Systems Engineers.

Christopher Barrow, a teaching assistant in the Department of Mechanical and Aerospace Engineering, received a 2023 College of Engineering Outstanding Teaching Assistant Award.

Scott Berry, associate professor in the Department of Mechanical and Aerospace Engineering, received a 2024 College of Engineering Excellence in Research Award.

Leonie Bettel, a teaching assistant in the Department of Civil Engineering, received a 2023 College of Engineering Outstanding Teaching Assistant Award.

Dibakar "D.B." Bhattacharyya, UK Alumni Professor in the Department of Chemical and Materials Engineering, was named as one of six 2023 Great Teachers by the UK Alumni Association.

BJ Brandenburg, director of student records, was awarded the 2024 UK College of Engineering Staff Excellence Award in the exempt category.

Yang-Tse Cheng, the Frank J. Derbyshire Professor of Materials Engineering in the Department of Chemical and Materials Engineering, was named an American Association for the Advancement of Science Fellow.

Aaron Cramer, professor in the Department of Electrical and Computer Engineering, received a 2024 College of Engineering Excellence in Service Award.

Elaine Duncan, adjunct professor in the University of Kentucky F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, was elected a fellow of Biomaterials Science and Engineering by the International Union of Societies for Biomaterials Science and Engineering.

Isabel Escobar, professor in the **Department of Chemical & Materials** Engineering, was the faculty winner at the 2024 Sarah Bennett Holmes Awards.

Jack Groppo, professor in the Department of Mining Engineering, was honored with a 2024 UK Outstanding Teaching Award.



Anastasia Hauser, lecturer in the Department of Chemical and Materials Engineering, received the 2023 College of Engineering Henry Mason Lutes Award for Excellence in Engineering Education and was honored with a 2024 UK Outstanding Teaching Award.

JiangBiao He, associate professor in the Department of Electrical and Computer Engineering, received a 2023 College of Engineering Excellence in Research Award and received a 2024 College of Engineering Excellence in Service Award.

David Herrin, professor in the Department of Mechanical and Aerospace Engineering, was elected an INCE Fellow.

Rick Honaker, a professor in the Department of Mining Engineering, received the 2024 Ivan B. Rahn Education Award from the Society for Mining, Metallurgy & Exploration.

Douglass Kalika, professor in the **Department of Chemical and Materials** Engineering, received a 2023 College of Engineering Excellence in Service Award.

Kimberly Kelley, administrative services assistant director of student records, was awarded the 2024 UK College of Engineering Staff Excellence Award in the nonexempt category.

Doug Klein, senior lecturer in the Department of Electrical and Computer Engineering, was recognized as a University of Kentucky 2023 Outstanding Teaching Award winner.

Kunlei Liu, associate professor in the Department of Mechanical and Aerospace Engineering, received a 2023 College of Engineering Excellence in Research Award.



Y. Charles Lu, director of the UK Engineering Paducah Campus and H.E. Katterjohn Professor of Mechanical & Aerospace Engineering, was named to the 2023 class of Society of Automotive Engineers Fellows.

Jack Maddox, associate professor in the Department of Mechanical and Aerospace Engineering, received a 2023 College of Engineering Excellence in Service Award.

KENTUCKY ENGINEERING JOURNAL 2024

Please send class notes to alumni@engr.uky.edu

BE INCLUDED

Mihir Malladi, a teaching assistant in the Department of Electrical and Computer Engineering, received a 2024 College of Engineering Outstanding Teaching Assistant Award.

Alexandre Martin, professor in the Department of Mechanical and Aerospace Engineering, received a 2023 College of Engineering Excellence in Research Award.

Alicia Modenbach, lecturer in the Department of Biosystems and Agricultural Engineering, received the 2024 College of Engineering Henry Mason Lutes Award for Excellence in Engineering Education.

Savio Poovathingal, assistant professor in the Department of Mechanical and Aerospace Engineering, received a 2024 College of Engineering Excellence in Research Award.

Steven Schafrik, associate professor in the Department of Mining Engineering, received awards from the Pittsburgh Coal Mining Institute of America and Society for Mining, Metallurgy & Exploration.

Tara Schuessler, college business analyst, was awarded the 2023 UK College of Engineering Staff Excellence Award in the nonexempt category

Brent Seales, professor in the Department of Computer Science, received a 2024 College of Engineering Excellence in Research Award.

Jeffrey Seay, the PJC Board of Trustees Engineering Professor in the Department of Chemical and Materials Engineering, was elected an American Institute of Chemical Engineers (AIChE) Fellow

David Silverstein, a professor of chemical engineering at the UK Pigman College of

Engineering Paducah Campus, won his third American Society for Engineering Education (ASEE) William H. Corcoran Award.

Reginald Souleyrette, professor in the Department of Civil Engineering, delivered the keynote address at the International Symposium for Railroad Operations Research.

Nikiforos Stamatiadis, professor in the Department of Civil Engineering, received the 2023 Transportation Research Board (TRB) Performance Effects of Geometric Design AKD10 Best Paper award.

Ben Stinnett, director of recruitment and career development at the UK Pigman College of Engineering Paducah Campus, was awarded the 2023 UK College of Engineering Staff Excellence Award in the exempt category

Sheng Tong, associate professor, Xiaoyue Yang, postdoctoral scholar and Zhongchao Yi, graduate student in the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, were named winners in NIH Targeted Genome Editor Delivery (TARGETED) Challenge.

Guogiang Yu, professor in the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, was named a 2024-25 University Research Professor.

Power and Energy Institute of Kentucky (PEIK) and SPARK Laboratory researchers received a best paper award at the 2023 International Conference on Renewable Energy Applications.

NEWS & RECOGNITION

Student Awards and Recognition

Rosemary Alden, a Ph.D. candidate in the Department of Electrical and Computer Engineering, received a 2023 College of Engineering Outstanding Ph.D. Student Award.

William Anderson, a graduate student in the Department of Mechanical and Aerospace Engineering, received a 2024 National Science Foundation (NSF) Graduate Research Fellowship.



Carter Boggess, electrical engineering sophomore, won the ACT Entertainment grand MA3 Programming Contest.

Cameron Brewer, a master's student in the Department of Mechanical and Aerospace Engineering, received a 2024 College of Engineering Outstanding Master's Student Award.

Daniel Dailey, a senior in the Department of Chemical and Materials Engineering, received a 2023 National Science Foundation (NSF) Graduate Research Fellowship.

Faraneh Fathi, a Ph.D. candidate in the Department of Biomedical Engineering, was awarded a Photonics Education Scholarship by SPIE, the international society for optics and photonics.

Clifton Grady, a graduate student in the Department of Mechanical and Aerospace Engineering, received a 2023 Torch Bearer award at the 32nd annual Lyman T. Johnson Awards program.

Emorie Jackson, a senior in the

Department of Computer Science, received a 2024 Torch Bearer award at the 33rd annual Lyman T. Johnson Awards program.

Donovin Lewis, a Ph.D. candidate in the Department of Electrical and Computer Engineering, received a 2024 College of Engineering Outstanding Ph.D. Student Award.

David Lu, a Ph.D. candidate in the Department of Chemical and Materials Engineering, was selected for a 2023 Reclamation Fellowship for Membrane Technology.



Rollie Mills, Ph.D. candidate in the Department of Chemical and Materials Engineering, received the Karen Wetterhahn Memorial Award from the NIEHS Superfund Research Program and received a 2023 College of Engineering Outstanding Ph.D. Student Award.

Ali Mohammadi, a Ph.D. candidate in the Department of Electrical and Computer Engineering, received the Best



Student Paper award at the 2023 IEEE

Transportation Electrification Conference

Steven Poore, a senior in the Department of Electrical and Computer Engineering, received a 2023 National Science Foundation (NSF) Graduate Research Fellowship.

Samaneh Rabienia Haratbar, a Ph.D.

candidate in the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, was the graduate student winner at the 2024 Sarah Bennett Holmes Awards.

Kate Rhoads, a Ph.D. student in the Department of Mechanical and Aerospace Engineering, received a 2024 National Science Foundation (NSF) Graduate Research Fellowship.

Ariel Robinson, a Ph.D. candidate in the Department of Civil Engineering, was honored with the award for most outstanding platform presenter at the Kentucky Water Resources Institute annual symposium.

Jared Schmal, a master's student in the Department of Mechanical and Aerospace Engineering, received a 2023 College of Engineering Outstanding Master's Student Award.

Alyssa Stubbers, a fourth-year Ph.D. candidate in Materials Science and Engineering, was the 2023 graduate student award winner at the Sarah Bennett Holmes Awards. **Eirini Stavropoulou,** a master's student in the Department of Civil Engineering, received a 2024 College of Engineering Outstanding Master's Student Award.

Tyler Stoffel, a Ph.D. candidate in the Department of Mechanical and Aerospace Engineering, received a 2024 College of Engineering Outstanding Ph.D. Student Award.



Heather Thompson, a doctoral student in the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering, received a 2023 National Science Foundation (NSF) Graduate Research Fellowship.

The UK AIChE student chapter won an Outstanding Chapter Award at the 2023 AIChE conference.

Biomedical Engineering Society won two 2024 UK Lead Blue student organization awards: Organization Innovation Award and Organization Milestone Recognition.

Two teams of College of Engineering undergraduate students claimed top honors at the 2023 Society for Mining, Metallurgy & Exploration Student Design Competition and the Metallic Student Design Competition.

The UK Engineering Institute of Electrical and Electronic Engineers (IEEE) student chapter placed first at SoutheastCon 2023.







ChemE Car Wins Regional Competition

The ChemE Car team was the Southern Region winner in the 2023 American Institute of Chemical Engineers (AIChE) ChemE Car Competition. The objective of the competition is for teams to design and construct a small chemicalpowered model car that will travel a given distance and stop via chemical reactions. The car must travel anywhere between 15-30 meters in under two minutes. The team that gets closest to the target distance wins. The distance for the competition, 20.13 meters, was announced just one-hour prior to the start time.

The UK ChemE Car, Kentucky Fried Chemicals, stopped just one centimeter from the target distance. For some perspective on the significance of this accomplishment, Anastasia Hauser, faculty advisor and chemical engineering lecturer, shared, "The winner of the national competition last November was 30 centimeters away from the target line."

DOUG KLEIN First-Year Engineering Senior Lecturer C

KENTUCKY ENGINEERING JOURNAL 2024

We Are EDUCATORS

Year after year our faculty are honored for their excellence in teaching. They are "Great Teachers" and "Outstanding Faculty" every day and recognized annually.

THE LIGHTHOUSE BEACON **FOUNDATION SCHOLARS**

hanks to the generous support of **Stanley and Karen Pigman** and Kentucky's Research Challenge Trust Fund (RCTF), engineering researchers are receiving additional annual funding to enhance the research priorities and programs of the Pigman College of Engineering.

Established in 2024, the Lighthouse Beacon Foundation Endowment supports faculty, research, graduate students, facilities and research infrastructure in the Pigman College of Engineering. In its inaugural year, the endowment has made \$160,000 in funds available for distribution, with a priority on faculty and research scholar support.

The Lighthouse Beacon Foundation Endowment created three

MARTHA GRADY ASSOCIATE PROFESSOR

ASSISTANT PROFESSOR

Aerospace Engineering

Department of Mechanical and

Project Title: "Predicting Thermal

Runaway in Electric Batteries"

Department of Mechanical and Aerospace Engineering

Project Title: "Laser Shock Peening of Additively Manufactured Metals"



HYUN-TAE HWANG ASSOCIATE PROFESSOR

Department of Chemical and Materials Engineering (Paducah Campus)

Project Title: "Fabrication of a Hydrogen Generator Prototype Using New Approach"



named Lighthouse Beacon Foundation Scholars.

research-enabling endeavors.

areas of opportunity for faculty and postdoctoral scholars.

Lighthouse Beacon Foundation Eminent Scholars, senior faculty

to \$50,000. Lighthouse Beacon Foundation Scholars, promising junior faculty, can receive five-year term-limited funding of up to

\$25,000. For postdoctoral scholars, to be known as Lighthouse

Beacon Foundation Post-Doctoral Fellows, up to \$20,000 of

annual funding is available for stipend enhancement or other

This year, eight Pigman College of Engineering faculty have been

researchers who are selected based upon sustained superior performance, can receive five-year term-limited funding of up

ASSISTANT PROFESSOR **Department of Mining Engineering**

Project Title: "Intelligent Surface Mining - Integration of Cyber-Physical System and Metaverse"



ASSISTANT PROFESSOR

Department of Chemical and Materials Engineering

Project Title: "Equipment for Organic Electrochemical Transistor Stability Tests"



JONATHAN ZUIDEMA

ASSISTANT PROFESSOR **Department of Mechanical and**

Aerospace Engineering

Project Title: "Biomaterials for Nervous System Repair'



receive this supplementary support.

The inaugural Lighthouse Beacon Foundation Graduate Fellows include:

: • • **ROSEMARY E. ALDEN •** PH.D. STUDENT **Department of Electrical and Computer Engi**

> **IFTEHER ALOM •** PH.D. STUDENT Department of Computer Science

MOHAMMAD DEHGHAN BANADAKI · PH Department of Mechanical and Aerospace E

CHOWDHURY AZIMUL HAQUE • PH.D. ST F. Joseph Halcomb III, M.D. Department of B

In addition, the Lighthouse Beacon Foundation Endowment and beyond through the discovery and innovation happening in provides support for RCTF-compliant cost-sharing for externally our laboratories." funded programs targeted at high-consequence, high-impact research that has a potential to stimulate socioeconomic The endowment will grow over the coming years, with annual benefits including job creation, higher standards of living and allocations growing to more than \$550,000 per year. expansion of the knowledge-based economy. The endowment also allows for research infrastructure support, like equipment, The Lighthouse Beacon Foundation Endowment is a part of the materials and supplies and other university-permittable research RCTF's Endowment Match Program, which creates research related expenses.

"The research portfolio of the Pigman College of Engineering has expanded significantly in recent years," said Rudy Buchheit, the Rebecca Burchett Liebert Dean of the College of Engineering. "The Lighthouse Beacon Foundation Endowment is further accelerating the positive impact we are able to make for Kentucky



ASSOCIATE PROFESSOR Department of Mechanical and

Aerospace Engineering,

Project Title: "Advanced Artificial Lung Research"

SAMANTHA ZAMBUTO

ASSISTANT PROFESSOR Department of Mechanical and Aerospace Engineering

Project Title: "Female Reproductive Tissue Engineering."

The endowment also provides up to \$10,000 per year in stipend enhancement or other research-enabling endeavors for talented graduate students, known as Lighthouse Beacon Foundation Graduate Fellows. This year, eight graduate students were selected to

neering	DONOVIN D. LEWIS • PH.D. STUDENT Department of Electrical and Computer Engineering
	STEVEN POORE • PH.D. STUDENT
.D. STUDENT naineering	ARIEL ROBINSON • PH.D. STUDENT
	PEGAH SAFAVI • PH.D. STUDENT
omedicarEngineering	F. Joseph Halcomb III, M.D. Department of Biomedical Engineering

support and opportunities at Kentucky universities. The RCTF is administered by the Council on Postsecondary Education and is designed to advance the economic success of Kentucky and its citizens through education and research. To qualify for the program, an endowment must support initiatives in STEM and health sciences and relate to one of UK's eight Research Priority Areas.

APPOINTMENTS



AARON CRAMER

TVA Professor of Electrical and Computer Engineering **Aaron Cramer** was named chair of the Department of Electrical and Computer Engineering. His appointment began Jan. 1, 2024.

Cramer is a member of the Power and Energy Institute of Kentucky and an active researcher, most recently receiving a \$398,746 award from the Office of Naval Research. He served as a UK trustee from 2022-23 and on the University Senate Council, where he held the title of chair, from 2020-22.

Cramer joined UK as faculty in 2010 and served his department as director of graduate studies from 2018-20. Since joining the university, he has received several teaching awards, including the College of Engineering Dean's Award for Excellence in Service and Outstanding Electrical and Computer Engineering Teacher Award.

Cramer earned his Ph.D. in electrical engineering from Purdue University in 2007 and his Bachelor of Science in electrical engineering from UK in 2003.

MIKE JOHNSON

Mike Johnson, professor and chair of the Department of Electrical and Computer Engineering, was named associate dean of undergraduate education and student success. His appointment began July 1, 2023.

Over the past several years, Johnson has guided his department in expanding academic programs, growing the faculty and strengthening the departmental research portfolio. He has also been a leader and contributor in several college-level projects as well as the recruitment of several high-level faculty and administrative positions.

In his new role, Johnson oversees and leads the college's undergraduate education programs, focusing on enhancing the academic experience and ensuring student success. His responsibilities include, curriculum development, student recruitment and retention efforts, and fostering an environment that supports students in their academic and personal growth.

Johnson received his Ph.D. in electrical and computer engineering from Purdue University. Throughout his career, he has earned accolades for both teaching and research and served in a wide range of leadership roles, most recently as president of the Southeast ECE Department Heads Association in 2021-22. His research work, which has resulted in more than 150 peer-reviewed articles and more than \$3.5 million of external funding, focuses on speech and language processing and automatic speech recognition systems.

JESSE HOAGG

Donald and Gertrude Lester Professor **Jesse Hoagg** was named chair of the Department of Mechanical and Aerospace Engineering. His appointment began July 1, 2023.

Hoagg has authored 135 peer-reviewed publications, and his research has been supported by more than \$7 million in extramural funding from various organizations, including the National Science Foundation, the NASA, the Department of Agriculture, the Air Force Office of Scientific Research, Kentucky Science and Engineering Foundation, and industry.

Hoagg joined UK in 2010 and has since advised 24 graduate students and many undergraduate research students. He received the UK College of Engineering Excellence in Research Award in 2020 and is a threetime recipient of Special Service Awards from the Department of the Air Force.

Hoagg earned his Ph.D. in aerospace engineering from the University of Michigan in 2006, where he also received his master's in mathematics and aerospace engineering. He earned his Bachelor of Science in civil and environmental engineering from Duke University in 2002.





ABHIJIT PATWARDHAN

Abhijit Patwardhan, professor and interim chair, was named chair of the F. Joseph Halcomb III, M.D. Department of Biomedical Engineering. His appointment began Jan. 1, 2024.

T

Patwardhan, director of the UK Cardiac Rhythm Lab, is an active researcher in the areas of cardiovascular control and signal processing. He has secured funding from top federal and private agencies throughout his career including the National Institutes of Health, National Science Foundation, NASA and the American Heart Association.

Patwardhan began his teaching career in the UK Center for Biomedical Engineering in 1996 and became a full professor in the Department of Biomedical Engineering in 2008. He served the department as interim chair and as director of graduate studies.

Patwardhan earned his Ph.D. in biomedical engineering in 1992 and Master of Science in mechanical engineering in 1988, both from UK. He earned his bachelor's degree in mechanical engineering in 1984 from the College of Engineering Pune, India.



ERIC SANDERS

Eric Sanders was named director of marketing and communication, effective July 1, 2023.

Sanders previously served as the college's associate director of media production, creating and managing the college's video production, photography and motion graphics.

In addition to his work on campus, Sanders has worked as an independent contractor in media production for clients across the television, film, music, and corporate industries. His creative contributions have earned him multiple accolades, including an Emmy® Award from the National Academy of Television Arts & Sciences Ohio Valley Chapter, as well as a national ADDY Award from the American Advertising Federation.

Sanders earned his Bachelor of Arts degree in media arts and studies from UK in 2015, his Master of Science in instructional systems design in 2020 and is currently pursuing an MBA.

2023 Marketing and Communication Award



The Pigman College of Engineering Office of Marketing and Communication was awarded a "Best of District" award from the 2023 Council for Advancement and Support of Higher Education (CASE) Awards in the category of video commercials for District III. The winning one-minute video, "A Community that Believes in You: UK College of Engineering," takes prospective students on a visual tour of what "community" looks like for UK Engineering students. The commercial was one of three honored in the Southeast (District III). District III includes higher education institutions from Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Virginia.

Scan QR code to view video





UK Engineering and Toyota Celebrate 30 years of Partnership

aunched in 1994, the True Lean Systems Program is a collaborative effort between the Pigman College of Engineering and Toyota Kentucky to study, implement and teach the Toyota Production System, commonly known as True Lean. Over the last three decades, the program has trained businesses, organizations and industry leaders to maximize value by reducing waste and continuously improving processes.

The UK-Toyota partnership also led to the introduction of the undergraduate Production Engineering Certificate and the Fujio Cho Department of Engineering Technology, which offers two undergraduate programs



KENTUCKY

In Kentucky, engineering jobs are projected to increase more than 11.2% by 2029. The approximate 3,000 additional engineering professionals needed in-state demonstrates a demand that is fulfilled by our mission.

OLUWATOFUNMI OYETAN B.S., Electrical & Computer Engineering, 2023

BRAYDEN REICHELDERFER B.S., Electrical Engineering, 2023 B.S., Computer Engineering, 2023

MASON WOOD B.S., Chemical Engineering, 2024

COLIN GREER B.S., Mechanical Engineering, 2023

We Are ADVANCING



ALUMNI CAREER SPOTLIGHT Robyn Williams University of Kentucky Engineering
Alumni Association (UKEAA)

Robyn Williams, a 1996 chemical engineering graduate hailing from Martin, Kentucky, has a UK Engineering story that has been woven by a common thread — scholarships. From the Henry Mason Lutes Scholarship that opened doors for her as an undergraduate to her years of dedication to scholarship work on the UK Engineering Alumni Association (UKEAA), Williams has been a testament to and an advocate for opportunity in engineering.

Williams, a Nashville resident and director of strategic projects for Vanderbilt University's Owen Graduate School of Management, furthered her commitment to the UKEAA when she began her tenure as president. Joining the scholarships committee in 2016 and then the UKEAA board in 2018, Williams has witnessed more opportunities than ever for alumnit to remain engaged with their alma mater, no matter their geography.

"Most of our alumni — me included — live outside Central Kentucky,

but we all have a vested interest in the sustained growth of the Pigman College of Engineering and the success of our Engineering students," Williams said.

As UKEAA president, Williams' primary intention has been to broaden the reach of the UKEAA. With opportunities for in-person support at events and virtual networking and mentoring programs with current students, there is no limit to involvement. To reach more students, Williams believes she must reach more alumni and she has outlined three important ways she and the UKEAA have been working to do this.

"My goals for the year are to 1.) expand awareness of the UKEAA, 2.) broaden participation in the Alumni Mentoring

Program and 3.) bring more visibility – and contributions – to our UKEAA Alumni Scholarship Program," Williams shared.

Williams has always felt an immense amount of personal pride for being not only an engineering graduate from the University of Kentucky, but one from Eastern Kentucky. This is what feeds her passion that is evident when she's cheering UK on from the

I want to see the UK Engineering brand continue to gain significance. It is invigorating to witness the physical changes on campus as well as the growth in global recognition of our engineering faculty, staff and students. sidelines at a game, serving the college in various roles and sharing her experiences with the impressive students she mentors. Bearing witness to the evolution of the college since her days in Anderson Hall has been a special experience for Williams.

"I want to see the UK Engineering brand continue to gain significance," she said. "It is invigorating to witness the physical changes on campus as well as the growth in global recognition of our engineering faculty, staff and students."

Beyond the pride she feels on a personal level, Williams is equally motivated by the shared pride and strong sense of community that is characteristic of UK Engineering alumni. In a room full of UK-educated engineers, Williams says there are no strangers.

"Show up to any Engineering Alumni event and you won't want for conversation," Williams quipped.

For more information or to get involved, visit engr.uky.edu/alumni-philanthropy/ukeaa.



YOUNG ALUMNI SPOTLIGHT

Austin Mitchell Young Alumni Philanthropy Council (YAPCO)

A ustin Mitchell is a 2018 civil engineering graduate from Louisville, Kentucky. He is also the current chair of the University of Kentucky Pigman College of Engineering's Young Alumni Philanthropy Council (YAPCO).

Mitchell, a project engineer in the transportation sector who was eager to remain engaged with his alma mater, became a member of YAPCO's inaugural class two years after graduation. He has continued to return the positive impact the college had on him in the years since and as a result, was selected for chair of YAPCO last spring by Dean Rudy Buchheit. Mitchell was honored and gladly accepted the responsibility that comes along with it due to his commitment to YAPCO's mission and fundraising model.

"I think the biggest draw to our council is that our funding goes directly into student initiatives and supporting them and the goals they are trying to achieve while here at UK," Mitchell shared.

YAPCO does not strictly benefit current students — it also provides many benefits to former students who make up the council. YAPCO provides a unique space for engineers early in their careers to network and build connections across a variety of fields. For Mitchell, this network of young professionals has helped him build awareness of work being done in engineering both domestically and abroad.

"The members of YAPCO are some of the most accomplished individuals I have had the privilege of knowing, and just being around them makes me realize that the sky is truly the limit in engineering," he said.

This network of young professionals is made up of alumni from the last 20 years. Unlike traditional alumni groups which span all decades, YAPCO created a space for recent graduates to stay connected with the college immediately after graduation. Mitchell thinks this proximity to their own time as students makes members uniquely dedicated to YAPCO's mission of supporting student opportunities and initiatives within the college.

A The members of YAPCO are some of the most accomplished individuals I have had the privilege of knowing and just being around them makes me realize that the sky is truly the limit in engineering. "YAPCO members are passionate about making sure that the next generation of UK Engineering students have the same, if not better, experiences than we had," Michell said. "Through our contributions, many engineering student organizations have been able to meet and exceed their funding goals and have used those resources to achieve amazing things."

Some of the amazing things Mitchell referenced include SpaceLex, the Biomedical Engineering Society, the ChemE Car team, the National Society of Black Engineers, the Society of Biomaterials, the Society of Women Engineers and American Institute of Aeronautics and Astronautics at the Pigman College of Engineering Paducah Campus. YAPCO is able to make a direct impact on so many organizations in a single year, like all of those from the last academic year listed prior, because its members make annual financial commitments to the council and the work it supports. Outside of their fundraising efforts, YAPCO members also provide mentorship to current students and share their own experiences to help guide and encourage the next generation of engineers.

If you ask Mitchell, what he gives back to the college pales in comparison to what he feels the college gave him. He cites the faculty, staff and world-class education provided by the college, along with the university, for developing him into the engineer he is today. On top of that, he feels immense gratitude to continue to be a part of the UK Engineering community. Surrounding himself with talented and hardworking individuals, who Mitchell says are as generous as they are kind, is why UK Engineering was his chosen community as an undergraduate and as an alumnus.

"What I value most about this community is the people," he shared. "Institutions are nothing but stones and bricks without people filling them and giving them purpose and life. The connections, memories and most importantly, friendships, are what I will always cherish."

For more information or to get involved, visit engr.uky.edu/alumni-philanthropy/yapco.



UNIVERSITY OF KENTUCKY **STANLEY AND KAREN PIGMAN** COLLEGE OF ENGINEERING



CLASS OF 2024

John Wesley Gunn, Class of 1890, earned the first engineering degree awarded by what eventually became the University of Kentucky. Since that modest beginning over 130 years ago, more than 28,500 individuals have followed his example and received degrees in engineering and computer science. Through their extraordinary achievements, our alumni have established a lasting legacy of excellence. Initiated in 1992, the Hall of Distinction recognizes and honors those alumni who have demonstrated distinguished professional accomplishments, outstanding character and commitment to community service. This recognition serves to encourage exemplary achievements by current students and others. It is a symbol of the respect and admiration held by the University of Kentucky Pigman College of Engineering for these esteemed individuals.

> Please submit Hall of Distinction nominations to engr.uky.edu/hod-nomination



J. CHRIS ADKINS

B.S. in Mining Engineering, 1993

Adkins began his over 27-year career with Massey Coal in 1985. By 2003, Adkins had worked his way through Massey, from an underground general laborer to chief operating officer and senior vice president, a role he held until 2011. His leadership led to several groundbreaking safety advancements, including the development of reflective safety stripes, which revolutionized worker visibility and saved countless lives across mining and construction industries globally. After Massey's \$7.6 billion sale in 2011, Adkins leveraged his expertise as a consultant within the mining and rock industry. He also designed, constructed, operated and sold a family amusement complex in the Smokey Mountains and successfully restructured operations in Chapter 11 bankruptcy. Adkins, known for his commitment to site safety, currently serves as CEO and partner at Clintwood JOD.

OLLIE JAMES AKEL

B.S. in Mechanical Engineering, 1954

Akel, who earned the rank of second lieutenant in the United States Army during service from 1956-58. spent the early years of his career in the aviation industry. In 1967, he began his nearly three-decade career with Exxon Corp. Through 1980, he worked as an engineer in New York, London and Saudi Arabia. From 1981-88, Akel served as president of Exxon Chemical, Belgium, Africa and Middle East. In 1988, he was appointed director of corporate communications at Exxon Chemical International, and in 1989, he was named president of Exxon Saudi Arabia. He made his final move in 1993, as president at Exxon Mexicana. In 1996, he retired. In acknowledgement of his industry successes, Akel was listed as a noteworthy oil company executive by Marguis Who's Who.





MAJ. GEN. TREY RAWLS B.S. in Electrical Engineering, 1992

Major General Rawls is culminating a 32-year career with the United States Air Force as one of the preeminent strategic experts in operational capabilities for fifth-generation warfare. As the commander of the Air Force Operational Test and Evaluation Center at Kirtland Air Force Base, Maj. Gen. Rawls is responsible for the operational test and evaluation of more than 98 major acquisition programs valued at more than \$1 trillion. Throughout his military career, he has been instrumental in shaping the functionality of some of the most advanced aircraft and associated weaponry ever developed. Prior to his current assignment, Maj. Gen. Rawls served as Commandant for the Air War College at Maxwell Air Force Base. He has commanded at the squadron, air expeditionary wing and air ground operations win levels, and is a four-time member of the U.S. Military Pentathlon Team.

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DAVID B. SERVIS B.S. in Civil Engineering, 1974, M.S. in Civil Engineering, 1976

Servis has spent his nearly 50-year career with Tetra Tech offices across the country. He joined Tetra Tech in 1976, and over the years, showcased his versatility working across multiple locations, including Washington, Arizona, Kentucky and Alabama. Throughout his tenure, he has undertaken various roles, from design to program management. His responsibilities have also included staffing, administration and contract compliance, with a portfolio spanning projects for municipal, federal government, industrial and private sector clients. Since his semiretirement in 2015, he has been reporting to the senior vice president of the waterdivision in Seattle, with his primary responsibilities being merger and acquisition support carried forward from 2013. Servis is a member of numerous engineering societies and organizations and a Fellow of the Society of American Military Engineers.

ANNA C. WORKMAN B.S. in Computer Science, 2004

Over the last 20 years, Workman has climbed the ranks in applications development at UPS, working in customs brokerage, ground transportation, aircraft maintenance and engineering and gateway systems, gaining a wide range of exposure to diverse technologies including legacy, cloud and integration systems, as well as mobile implementations. During this time, Workman was the application development manager responsible for Mobile Mechanic, the platform that moved mechanics onto tablets, and is currently used by 1,800 mechanics worldwide. Since 2020, she has served as vice president of Airline Systems, which includes 25 mission-critical applications. In this role, she has led the efforts to replace a 35-year-old crew management legacy system and deployed a configuration management system that replaced five older legacy systems.

CHARLES 'RUSTY' JUSTICE B.S. in Mining Engineering, 1983, B.S. in Civil Engineering, 1985

Justice has established himself as an innovator in design-build solutions across multiple industries. Since 1994, he has served as a managing member of Jigsaw Enterprises, a mid-sized applied engineering company. Jigsaw provides innovative, sustainable solutions for its clients, maintaining a deep commitment to strengthening the communities it serves. In 2014, Justice co-founded Bit Source in Pikeville, Kentucky, a pioneering software development and digital services company. Bit Source was Justice and his co-founder's response to the economic shift they were witnessing due to the downturn in the coal industry. Bit Source's workforce of coal-miners-turned-programmers remotely serves clients from across the globe. Over the last 10 years, Bit Source has ushered in a new era of career possibilities for Central Appalachia.





CELEBRATING 25 YEARS OF ENGINEERING IN WEST KY

Last fall, the Pigman College of Engineering Paducah Campus celebrated its silver jubilee in the heart of Paducah at the Carson Center. Featured speakers included UK President Dr. Eli Capilouto, Pigman College of Engineering Dean Rudoph Buchheit, Paducah Program Director Charles Lu and two students, Abby Tettleton and Joshua Hagan.

Since celebrating its 25th year, the University of Kentucky Stanley and Karen Pigman College of Engineering Extended Campus at Paducah launched a new degree offering, Bachelor of Science in Computer Engineering Technology, in partnership with West Kentucky Community and Technical College.

The new undergraduate degree joins the established Bachelor of Science Degrees in Chemical Engineering and Mechanical Engineering.

The UK Engineering Paducah Campus also offers professional certificates in aerospace engineering, automotive production engineering and environmental engineering.

The degree programs - created out of a need to retain talent in the area — not only add to the range of opportunities for students, but also meet the regional need for professional engineers in the highly industrialized part of the Commonwealth.

More than 500 students have graduated from the Paducah Campus, with an estimated direct economic impact on Western Kentucky of more than \$25 million annually. Two thirds of their graduates also remain in the Western Kentucky area.

As the Paducah Campus recently celebrated their 25th year, Y. Charles Lu, the H.E. Katterjohn Professor in Engineering and director of the Paducah Campus, said the CET program is a remarkable new addition.

"This achievement is indeed remarkable, since this is the very first new academic program in the school's 25-year history. It will have a huge impact on businesses, industries and students in the region," he continued. "I also want to express my deepest gratitude to the local community for supporting this new program. Without their generous support, it would not have been possible."





HAROLD DUNSMORE

Jan. 3, 1945 - July 17, 2023

B.S., Physics, 1968 B.S., Mechanical Engineering, 1973

Harold Dunsmore was born Jan.3, 1945, in Lexington, Kentucky, to Ed and Vena Coreman Dunsmore. From a young age, Harold exhibited an exceptional drive and talent. As a lineman for Versailles High School's 1962 football team, Harold helped lead his team to the Kentucky High School Football State Championship. His intellectual curiosity then led him to the University of Kentucky, where he graduated with bachelor's degrees in physics in 1968 and mechanical engineering in 1973. While at UK, Harold was also a member of the Alpha Tau Omega Fraternity and participated in Air Force ROTC.

Harold's professional career was defined by his 17 years of service at the University of Kentucky, where he worked in facilities administration, overseeing the construction of new buildings. His dedication and attention to detail were instrumental in shaping the campus infrastructure. Harold, although dedicated to excellence, always led with kindness, never complained and had the unique ability to be quiet when he needed to be. These qualities garnered him the respect of administrators, staff and contractors alike.

Harold was passionate about golf, travel and music. He was a Lexington Golf Tournament winner and enjoyed attending the Masters Tournament in Augusta, Georgia. His love for travel took him on nine trips to Europe, and many visits to the New Orleans Jazz Festival, which married his love of travel with his love of music.

Harold was deeply engaged with his community. Throughout his life he was an active member of several local churches and deeply guided by his faith. He was a Kentucky Colonel, University of Kentucky Alumni Association member, Kiwanis Club member, lifetime partner of WoodSongs Old-Time Radio Hour and a founding member of the Lexington Ski Club.

Through the ski club, Harold met his wife, Linda. On their first date, the proud UK alumnus and passionate fan of UK Athletics took Linda, a University of Tennessee alumnus and native of the Volunteer State, to a UK vs. UT basketball game. Despite the outcome of the game, Linda stuck around, and they were married for more than 30 years - of which, she never regretted a day.

Harold passed away peacefully on July 17, 2023. He is survived by his wife, Linda Carole Dowell Dunsmore, his sisters Mollyanne Showalter and Judith Wilson, and numerous nieces, nephews and great-nieces and nephews. He was a devoted husband, brother, uncle and friend who will be remembered for his humility, hard work and love for his family and community.

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Name	Degree Gi	rad Year
Robert Adams	Electrical Engineering	1959
David Aitken	Mechanical Engineering	1968
James Amster	Electrical Engineering	1961
Bobby Anderson	Mining Engineering	1984
Brian Austin	Mechanical Engineering	1996
Larry Barber	Mechanical Engineering	1963
Frank Barnett	Mechanical Engineering	1952
James Beech	Mechanical Engineering	1960
Lewis Biggerstaff	Mechanical Engineering	1950
Carl Bischof	Electrical Engineering	1958
Ronald Blackburn	Mechanical Engineering	1962
Glenn Bottoms	Civil Engineering	1960
Glenn Braden	Electrical Engineering	1963
Emmett Bryant	Mechanical Engineering	1949
John Calvert	Electrical Engineering	1959
Walter Cashen	Mechanical Engineering	1061
Thomas Caseada	Electrical Engineering	1066
Pobart Chinne	Civil Engineering	1900
Robert Chipps Bonald Conlay	Electrical Engineering	1050
Roman Conneg	Computer Science	1950
Norman Con	Computer Science	1979
Norman Cox	Civil Engineering Maakaasiaal Faasiaaasiaa	1951
Joe Craig	Mechanical Engineering	1950
John Cranfill	Chemical Engineering	1971
William Creel	Civil Engineering	1955
Robert Curtis	Chemical Engineering	1969
Jagjit Dade	Civil Engineering	1978
David Damron	Civil Engineering	1966
Charles Daniel	Mechanical Engineering	1961
R. C. Daniel	Mechanical Engineering	1968
William Davis	Mechanical Engineering	1952
Harry Tom Davis	Civil Engineering	1962
Roger Dickerson	Mechanical Engineering	1957
Kenneth Donahue	Electrical Engineering	1974
Larry Downey	Civil Engineering	1974
Kenneth Downs	Chemical Engineering	1973
John Drake	Civil Engineering	1980
E. Harold Dunsmore	Mechanical Engineering	1973
James Durall	Civil Engineering	1958
John Eyster	Civil Engineering	1980
George Fischer	Electrical Engineering	1952
Martin Ginocchio	Civil Engineering	1954
Marvin Graham	Electrical Engineering	1971
James Grant	Electrical Engineering	1959
James Green	Civil Engineering	1950
James Griffin	Civil Engineering	1967
James Guffev	Mining Engineering	1979
Bradley Guilfoil	Chemical Engineering	2004
Paul Haggard	Civil Engineering	1964
Samuel Haiois	Electrical Engineering	1960

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Susan Scott William Sears Kenneth Self William Simpson Brenda Simpson Gary Sisler George Slaughter Homer Smith **Dennis Sparks** Gordon Stacv Michael Stephens Christopher Sterged Frances Strader Gordon Taylor Anthony Thomas Albert Thompson Larry Thompson Brannon Thompson James Toombs Harold Turner Mary Van Arsdall Vincent Vonderheide John Walker Furman Wallace **Delbert Walls** Paul Walters Hugh Ward Donald Warner Joseph Wathen William Welch Gene Wells Gerald Wheele John Whitaker Thomas William **Richard Williams** James Witemyre McFarland Wood Leon Wood Chenault Woodford **Danny Woods** Robert Woods Creston Woodsor Delbert Young

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	Mechanical Engineerin	ıg	1985
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	Chemical Engineering		1980
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	Mining Engineering		1088
	Machanical Engineering	a	1063
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	Electrical Engineering		1901
	Chamical Engineering		2002
	Civil Engineering		1071
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	Mechanical Engineering	~	1950
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	Electrical Engineering		1962
	Civil Engineering		1955
	Civil Engineering		1957
	Metallurgical Engineerir	ng and	
	Materials Science		1966
	Mechanical Engineerin	ıg	1949
	Civil Engineering		1965
	Civil Engineering		1961
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	Civil Engineering		1978
	Chemical Engineering		2014
	Electrical Engineering		1970
	Mechanical Engineerin	g	1970
	Civil Engineering		1976

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John Zimmerman

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We Are

The Pigman College of Engineering is consistently ranked as the top engineering college in Kentucky by U.S. News & World Report.

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