

# NC STATE

## Engineering

MAGAZINE

### AI Drives a Revolution in Engineering

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## THINK AND DO TOGETHER TOWARD A NOBLE PURPOSE

Adm. **Daryl Caudle** '85 addressed NC State University's 6,898 newest alumni during the commencement ceremony on May 3.

**"Think boldly, think differently, think critically, think compassionately,"** Caudle said in his commencement address. **"Then, do with purpose, do with excellence, and most importantly, do with integrity, because when you Think and Do together toward a noble purpose, you change the world."**

A Winston-Salem native who holds a degree in chemical engineering from NC State, Caudle told the crowd that almost 40 years before, he was sitting at his own commencement ceremony, preparing to leave for Naval Officer Candidate School to be a junior officer in the United States Submarine Force, and thinking he had no idea what lay ahead — but that it was OK.

"Because NC State had prepared me, not just academically, but in mindset and mission, to face an uncertain world with confidence, clarity and courage," he said.

Caudle was confirmed in August by the U.S. Senate to his current position as Chief of Naval Operations, which is the highest-ranking officer of the U.S. Navy.

He previously led the U.S. Northern Command and the U.S. Strategic Command and served as the U.S. Strategic Command Joint Force Maritime Component commander. He had more than 125 ships, 1,000 aircraft and 103,000 active service members and government employees under his charge. ■



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a record number of students to  
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## FROM THE DEAN

Dear Wolfpack Engineering Community,

Against the backdrop of a rapidly changing world, the College of Engineering is expanding enrollment to provide the opportunity for more students to pursue computer science and engineering degrees while supporting faculty research that leads to meaningful advancements in science, technology and society.

Advancements like artificial intelligence (AI) are progressing rapidly and the College of Engineering is seizing the moment. You can read in this issue about the Applied AI in Engineering and Computer Science initiative and how Wolfpack engineers are putting AI to use to solve challenges across industries.

It's an exciting time at the College of Engineering as we welcomed our largest ever first-year class in August and are educating **more than 12,500 students** across **52 engineering and computer science programs** this academic year. Our over **400 full-time faculty** continue to guide our students toward success while balancing their own groundbreaking research. In FY25, we recorded almost **\$260 million** in research expenditures, which places us **among the top schools** in the United States.

As we get into this academic year, I am even more assured that a strong foundation in engineering and computer science from the College of Engineering at NC State is a differentiator. Our students leave here ready to serve the State of North Carolina and beyond.

I hope you enjoy reading more about NC's flagship engineering program. Thank you for your continued support. ■



*W. Pfaendtner*  
**Jim Pfaendtner, Ph.D.**  
Louis Martin-Vega Dean of Engineering





## A Wish Come True at Lampe Joint BME

**IN MARCH**, high school student Jayden got his wish: to create a new eye patch during a bootcamp at the Lampe Joint Department of Biomedical Engineering at NC State University and UNC-Chapel Hill (Lampe Joint BME).

Jayden's idea for his unique wish, which was granted in partnership with Make-A-Wish Eastern North Carolina, was sparked after he finished treatment for a brain tumor when he was 13. After multiple surgeries and radiation, he was no longer able to blink his left eye and could not find an eye patch that worked for him. He turned to local experts for help making his own.

Jayden spent two days with students and faculty members, learning about medical device product development and how to bring his idea to market.

"It's been a dream come true, being able to go to the campuses and look at these programs and labs, seeing my idea come to fruition," Jayden said.

He left the bootcamp with a functioning prototype and a 3D printer to refine his eye patch design at home – as well as a strong support network.

"The importance comes back to the core of what biomedical engineers do: help people," said **Devin Hubbard**, a teaching associate professor. "The possibility that Jayden would leave with a new perspective, a toolkit and a clear path forward on his project and direction aligns perfectly with my personal drive to help others and my professional drive to educate."

Jayden came to the 2025 Lampe Joint BME Student Design Symposium wearing a fully functional prototype.

"Hopefully, I want to bring [the eye patch] to everyone," said Jayden. "I want this to be something everyone in the world can use."

During his bootcamp, Jayden learned about what it takes to scale up a product. Students organized a roundtable with industry leaders to discuss entrepreneurship in the biomedical engineering field.

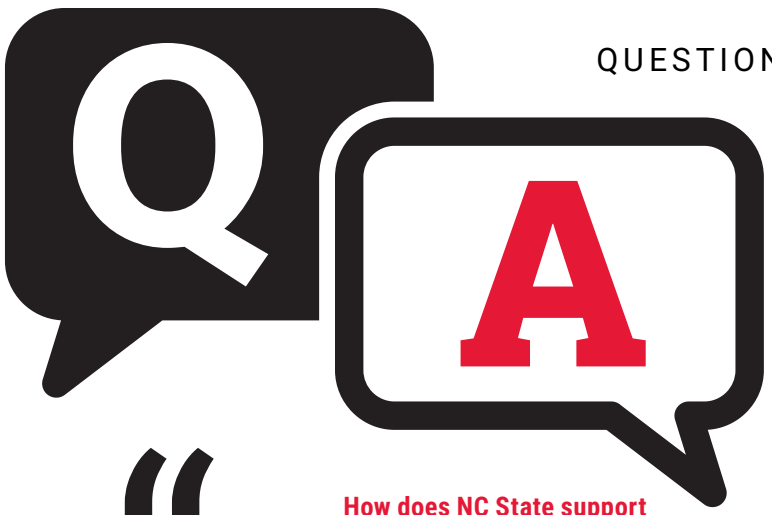
The panel was beneficial for the students, too.

"I'm interested in what technology can do for healthcare," said senior **Raghav Sriram**, who wants to attend medical school next year. "It's super meaningful for me to go and be a part of something like that for someone, for them to look up to what I have the privilege of doing every day." ■

Watch a video of Jayden's BME bootcamp at [go.ncsu.edu/jaydens-wish](https://go.ncsu.edu/jaydens-wish).



## PACK PROFILE



### QUESTIONS FOR KRISTA WALTON

**Krista Walton** started as Vice Chancellor for Research and Innovation and Distinguished Professor of Chemical and Biomolecular Engineering at NC State University on June 30. She was previously the Associate Vice President for Research Operations and Infrastructure at the Georgia Institute of Technology.



#### What motivated you to make the move to NC State University?

NC State's identity as a land-grant institution deeply aligns with my own personal and professional values. The opportunity to lead and contribute to the growing enterprise here was really compelling to me. In today's world, universities are among the few institutions that are dedicated to the mission of creating, interpreting and applying knowledge to drive change. I am excited to be a part of that mission at NC State.

#### How does NC State-driven innovation make an impact on North Carolinians and on society in general?

A core tenet of NC State's research enterprise is that we are training a future-ready workforce. NC State research projects support soldiers, from textiles for uniforms to ceramic coatings used on military planes. Our long-standing semiconductor research helps advance electronics that we use every day. We are improving outcomes for farmers. We are the pipeline for the applications and things that make our lives better every day.

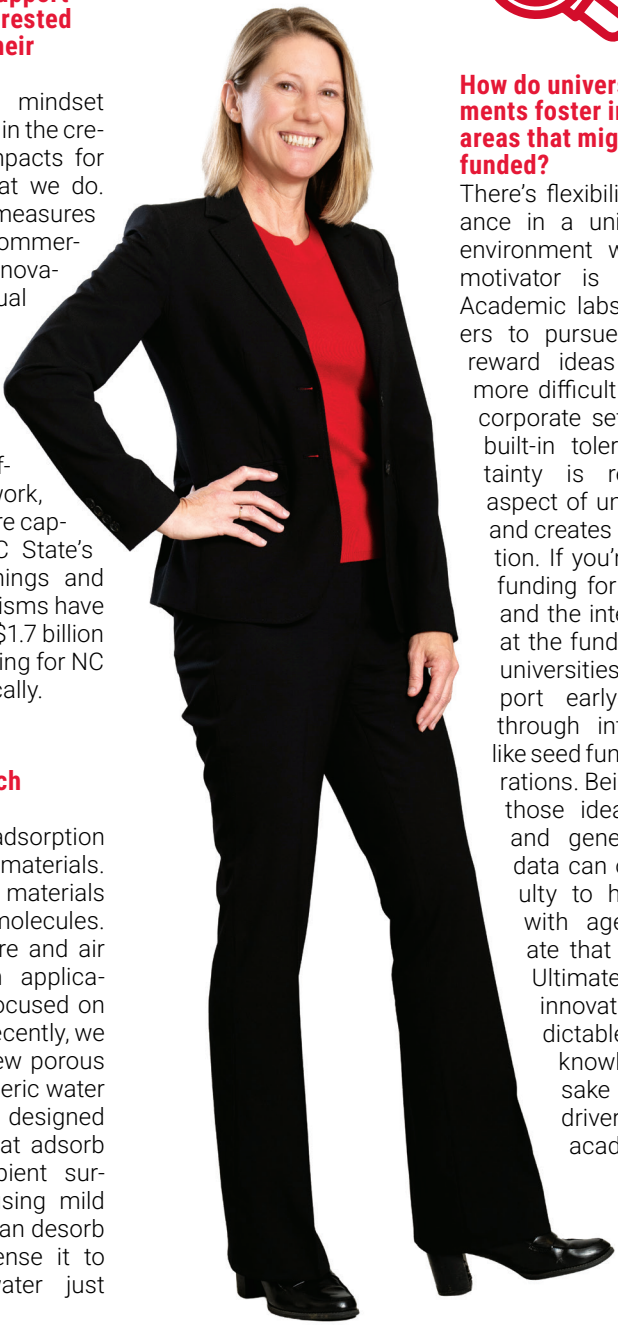


#### How does NC State support faculty members interested in commercializing their research?

Our Think and Do mindset means that we believe in the creation of real-world impacts for the research work that we do. One of the strongest measures of that is through the commercial development of innovative research intellectual property. Our office has helped create many of the university's 250+ start-ups and spinoffs. We developed the Wolfpack Investor Network, which connects venture capital investors with NC State's companies. These things and other funding mechanisms have helped to attract over \$1.7 billion in venture capital funding for NC State research historically.

#### What are your research focuses?

My expertise is in adsorption science and porous materials. You can think of these materials as sponges, but for molecules. Carbon dioxide capture and air purification are both applications my group has focused on over the years. More recently, we have been creating new porous materials for atmospheric water harvesting. We've designed specialty materials that adsorb water from the ambient surrounding air. Then, using mild heat or vacuum, you can desorb the water and condense it to produce drinking water just from humid air.



#### How do university environments foster innovation in areas that might be underfunded?

There's flexibility and risk tolerance in a university research environment where a primary motivator is training people. Academic labs allow researchers to pursue high-risk, high-reward ideas that might be more difficult to do in a more corporate setting. I think this built-in tolerance for uncertainty is really a special aspect of university research and creates space for innovation. If you're working to get funding for a specific topic, and the interest is not there at the funding agencies yet, universities can often support early-stage research through internal resources like seed funding and collaborations. Being able to pursue those ideas with trainees and generate preliminary data can often enable faculty to have discussions with agencies and create that funding interest. Ultimately, sources of innovation can be unpredictable and pursuit of knowledge for its own sake is a powerful driver of innovation in academia. ■





# Advanced Materials Hot Off The Press

**A NEW ADVANCED** manufacturing facility with a unique hot press system capable of reaching 2,000 degrees Celsius while applying 50 tons of pressure is open for use on Centennial Campus.

The hot press furnace processes advanced materials — including metallic and ceramic matrix composites, refractory metals and ceramics, advanced sensors, advanced alloys and composite metal foam — for structures exposed to extreme environments.

It is among the largest facilities of its kind in the United States and is open to researchers from different institutions and industries.

**Afsaneh Rabiei**, a professor in the Department of Mechanical and Aerospace Engineering and founder of Advanced Materials Manufacturing, led the efforts to bring the facility to NC State. She invented composite metal foam, a material as strong as steel and as lightweight as aluminum, and previously traveled to Maryland to access a facility large enough for her materials.

“We have never had something in this size and capacity and capability,” she said. “And we are very excited to add this outstanding unit to NC State’s portfolio for manufacturing advanced materials.” ■

# Becoming the Role Model She Once Needed



# Electricity-Generating Wearable Tech Is Also Comfortable



**RESEARCHERS AT NC STATE UNIVERSITY** have demonstrated new wearable technologies that both generate electricity from human movement and improve the comfort of the technology for the people wearing them.

The materials incorporate molecules called amphiphiles, which are often used in consumer products such as diapers to reduce friction against human skin. The research team first developed a model to provide a fundamental understanding of how

different amphiphiles affect the surface friction of different materials. Then, they started a series of experiments to see if they could incorporate amphiphiles into haptic energy harvesters.

The researchers found that some amphiphiles have electronic properties that allow them to “donate” electrons. And when these electron-donating amphiphiles were incorporated into the wearable materials, the end result was a material that was both comfortable and capable of generating electricity through friction produced by rubbing against human skin or other materials.

“The technology for harvesting static energy is well established, but

devices that can be worn for long periods of time are still missing,” said **Lilian Hsiao**, associate professor of chemical and biomolecular engineering. “In our proof-of-concept testing, we found these amphiphile materials not only feel good on the skin but could generate up to 300 volts, which is remarkable for a small piece of material.”

“We’re interested in doing more to make use of these materials, such as exploring how they can be incorporated into existing haptic devices,” said **Saad Khan**, INVISTA Professor of Chemical and Biomolecular Engineering. “And we’re open to working with industry partners on identifying new applications.” ■

**FIRST-GENERATION** college student **Madison Thompson** — whose many hats include Goodnight Scholar, Ben Franklin Scholar, Department of Computer Science Ambassador and co-president of a nonprofit — has a vision for the future. She’s bright, personable, passionate, incredibly hardworking and has created a path to success that most others can only dream of.

“I’m very passionate about everything I do — about science and engineering and my nonprofit in particular,” she said. “But mostly, I’m passionate about being the role model I once needed. So, it’s not that hard.”

Thompson grew up in an under-resourced area of Guilford County in a low-income, single-parent home. At 12, she started a multi-city service-learning initiative to dismantle harmful stereotypes toward unhoused populations. At 13, she started a tutoring business. At 19, she helped

found Students Leading Collaborative Computing Education, which brings computer science and electrical and computer engineering education to under-resourced high schoolers. All this while attending school, working and playing softball.

And all of that hard work has been paying off.

“When you’ve been working your entire life and then you get these scholarships, and the mentorship and support that comes with them, you realize, ‘Oh, I don’t have to work anymore,’” said Thompson. “In high school, I was working to help my mom, and also trying to go to class and figure out how to pay for college. But at NC State, I don’t have to do that. I can run my nonprofit and focus on research instead.”

Through Goodnight, Thompson learned about and was encouraged to apply to the Fulbright UK Summer Institute for U.S. undergraduate

students who have little to no travel experience outside North America. She was one of 42 students selected to participate.

Thompson chose the program at King’s College London, “Modern Britain: Institutions, Power, & People,” which offers an in-depth understanding of how Britain’s institutions, power and people have shaped a 21st century nation.

“If you are doing science without acknowledging the cultural and social context around the work that you’re doing, you’re probably not doing very good science,” she said. “The technology we create, the research we do doesn’t just influence our present, it shapes our future. I think every engineer should be required to take more ethics classes, to develop soft skills and learn how to relate to others better.” ■

Read the full version of this story at [go.ncsu.edu/madison-cs](https://go.ncsu.edu/madison-cs).







The Engineering Career Fair in the 2010s.

## COE Career Fair ‘Runs Like Clockwork’

Kaitlyn Gainey, far left, and Brian Koehler, far right, with student volunteers.

**SEEING THE NC STATE ENGINEERING CAREER FAIR** in action last fall was a full-circle moment for **Will Mullen** ‘13, now an engineering manager at Nation Ford Chemical and former student career fair volunteer.

“I just happened to be on campus [to give a talk] at the same time as the career fair, so I got to see everything,” said Mullen, who found his first job as a plant engineer at Praxair, Inc. through the career fair while a chemical engineering student at NC State University.

“The student management structure was very different,” he continued. “They made it their own and improved on issues we didn’t even see. Everybody had their job to do, and it was neat seeing it run like clockwork, coming in as somebody who helped set up that clockwork.”

The Engineering Career Fair debuted in the spring of 1998 as a

student-run endeavor. In 2001, the Office of Academic Affairs took over to put on a two-day event each fall and a one-day event each spring. While faculty and staff help, it’s the students who run what is now one of the largest student-run engineering career fairs in the United States.

**Kaitlyn Gainey**, a senior majoring in construction engineering, has worked for the career fair since her first year at NC State. She made connections that led to her internship with DPR Construction this summer. “Having a relationship with these recruiters has been really beneficial for me, networking-wise,” she said. “A lot of my friends got their internships from the career fair.”

Since the Office of Academic Affairs got involved, the Engineering Career Fair has more than quadrupled in size. The 1998 career fair hosted 58 companies and 1,500 students. The fall 2024 event

showcased 292 companies and over 6,000 attendees.

“A big decision early on was the audience,” said **Jerome Lavelle**, the college’s associate dean of academic affairs. “If we’re going to really make this a signature event and create value for our companies, we better make sure we’re putting a lot of students in front of them.”

This influenced the decision to open the career fair to the public in 2012. Today, students from all over the country join NC State students in attending the career fair.

“It’s a phenomenal opportunity for our Wolfpack family as well as other students from other universities,” said **Brian Koehler**, director of high-impact educational experiences. “We have the very best companies in the whole world here because they know that our students are the type who roll up their sleeves and get the job done.” ■

## Jie Yin Wins PECASE Award

**JIE YIN**, associate professor in the Department of Mechanical and Aerospace Engineering, received the Presidential Early Career Award for Scientists and Engineers, or PECASE, in 2024. The award is the highest honor given to emerging scientists and engineers by the U.S. federal government.

Yin’s research integrates the design principles of kirigami, which is similar to the Japanese art of origami but involves paper cutting in addition to folding, into engineering. He has applied these principles to robotics and materials, including robotic grippers gentle enough to lift egg yolks without breaking them



and to three-dimensional, reconfigurable building blocks. ■

## BTEC Boosts NC Biomanufacturing



**ON MAY 2**, Golden LEAF Biomanufacturing Training and Education Center (BTEC) faculty held a graduation ceremony for 83 students, bringing the total of BTEC alumni to 1,071.

“Reaching over 1,000 graduates is an incredible milestone for BTEC,”

said **Gary Gilleskie**, BTEC’s executive director. “It reflects our commitment to developing skilled biomanufacturing professionals, with nearly all our graduates launching careers in this vital industry.”

Over 80% of graduates from BTEC remain in North Carolina, fueling the

state’s booming biopharmaceutical manufacturing sector. BTEC, which provides educational and training opportunities for students studying biomanufacturing, also offers bio-process development and analytical services to customers from both academia and industry. ■





## Floss Your Teeth, Get Vaccinated

**IN THE FUTURE**, you might have the option to leave the dentist office vaccinated against the flu. Researchers at NC State University recently demonstrated a new vaccine delivery method using dental floss.

**Harvinder Singh Gill**, Ronald B. and Cynthia J. McNeill Term Professor in Nanomedicine at NC State, explained that the junctional epithelium — a thin layer of tissue located in the deepest part of the pocket between the tooth and the gum — can release immune cells to fight bacteria because it lacks the protective barriers found in epithelial tissues in our lungs and noses.

So he thought, why not try to reach that area with floss?

“Because the junctional epithelium is more permeable than other

epithelial tissues — and is a mucosal layer — it presents a unique opportunity for introducing vaccines to the body in a way that will stimulate enhanced antibody production across the body’s mucosal layers,” he said.

Gill and his team tested the technique by flossing the teeth of lab mice. The mice produced robust antibody responses in the bloodstream and across mucosal surfaces.

While the research is not yet in clinical trials and there are more questions to answer, the team also found promise in using floss picks to deliver vaccines to humans. Twenty-seven study participants used a floss pick coated in fluorescent dye, and researchers found about 60% of the dye deposited in the gum pocket. ■

## Transforming Battery Research With Quantum Simulations

**NC STATE UNIVERSITY RESEARCHERS** are developing new computer methods to simulate the behavior of materials — especially the kinds used in batteries.

The team, led by Goodnight Distinguished Chair in Quantum Computing **Sabre Kais**, is working to combine quantum-inspired algorithms with powerful graphics processors from NVIDIA.

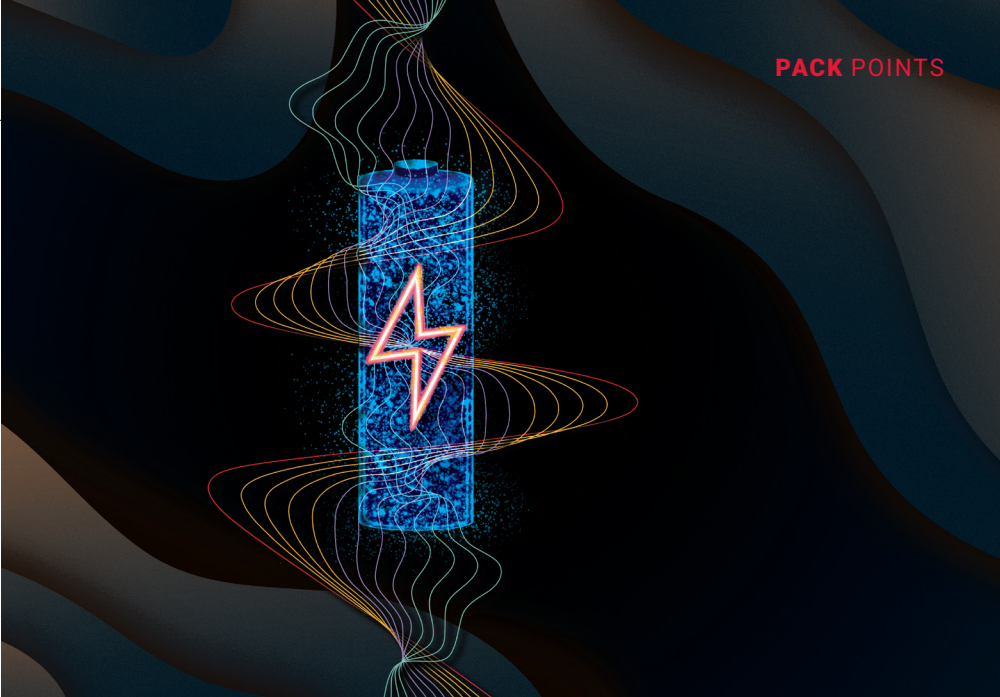
By leveraging the NVIDIA CUDA-Q

platform, Kais’ team has overcome computational bottlenecks in quantum chemistry and condensed matter physics to run more efficient and scalable quantum simulations. The algorithm creates models with the objective to extend these simulations to include more complex systems like transition metal oxides.

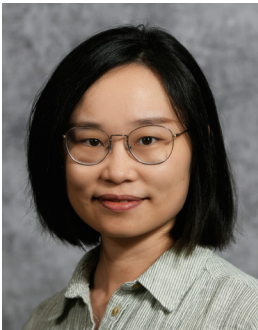
In the near future, Kais’ team will tackle LiCoO2, a critical battery material whose electronic structure is

extremely difficult to simulate due to the presence of strongly correlated transition metal electrons. The computational cost of simulating LiCoO2 using conventional methods is extremely high, making it an ideal test case for accelerated techniques.

The collaboration with NVIDIA marks a significant step toward scalable quantum simulations that could transform battery research and advance next-generation materials design. ■



## Four Receive NSF CAREER Awards



**THE NATIONAL SCIENCE FOUNDATION** Faculty Early Career Development award, also known as the CAREER award, is one of the most prestigious research awards for early-career faculty members.

**Andrew Lee**, Assistant Professor, Department of Mechanical and Aerospace Engineering

- Researching deployable shell structures that are critical to the future of space exploration, robotics and adaptive vehicles.

**Yuchen Liu**, Assistant Professor, Department of Computer Science

- Creating a resilience-native network paradigm called CatFly that will increase a network’s intelligence and speed in the face of challenges.

**Vijay Shah**, Assistant Professor, Department of Electrical and Computer Engineering

- Building intelligent, open and adaptive spectrum access frameworks that can keep pace with the evolving demands of emerging technologies like 6G.

**Ruijuan Xu**, Assistant Professor, Department of Materials Science and Engineering

- Creating strain-induced phase boundaries in lead-free ferroelectric oxide heterostructures and membranes, which are essential in applications including sensors, actuators and memory devices. ■

## Two Elected NAI Fellows



**MARTIN THUO**, professor in the Department of Materials Science and Engineering, and **Victor Veliadis**, professor in the Department of Electrical and Computer Engineering and the executive director and CTO of PowerAmerica, joined nine other College of Engineering faculty members as Fellows of the National Academy of Inventors. NAI Fellowship is the highest professional distinction awarded solely to inventors.

Thuo’s research led to the development of low-temperature

solders. He was recognized for his ability to minimize cost and complexity while providing efficient solutions to better human conditions.

Veliadis’ patent portfolio has been licensed for use in both commercial and military applications, such as powering long-range weather or aircraft radar systems.

The 2024 NAI Fellows — who come from 39 different states, 12 countries and 135 institutions worldwide — collectively hold over 5,000 issued U.S. patents. Their innovations have generated over \$3.2 trillion in revenue and generated 1.2 million jobs. ■





# AI DRIVES A REVOLUTION IN ENGINEERING

*The Applied AI in Engineering and Computer Science initiative is energizing the college.*

We live in an age when mobile phones recognize our faces and our laptops can guess our words in an email faster than we can type them. Self-driving robots zip through bustling cities to deliver fast-food orders to customers.

It's tough to go a day without encountering artificial intelligence, or AI. What was science fiction only a few years ago has seeped into everyday life.

NC State University's College of Engineering leaders and faculty are seizing the moment. Last fall, the college launched the Applied AI in Engineering and Computer Science initiative. Applied AI is the use of AI to find practical solutions to problems. The initiative integrates AI across teaching and research throughout the college's work, from boosting farmers' harvests to discovering materials at nanoscale.

It aims to elevate research scholarship, transform education and better prepare students

for the careers and problem-solving of an increasingly AI-driven future. The initiative's timing is right. Professionals across engineering disciplines are increasingly using AI to solve problems. North Carolina's government has committed to expanding engineering and computer science education in the state through its Engineering North Carolina's Future initiative. At the same time, businesses are increasingly asking their employees to use AI in their work.

"The AI revolution is bringing data to us at a scale that human brains can't comprehend," said **Jim Pfaendtner**, Louis Martin-Vega Dean of Engineering and professor of chemical engineering. "AI tools enable engineers to process that data more quickly and discover relationships hidden within it. Experts expect AI to produce gains like faster bridge design and construction, more efficient airfoils and smarter supply-chain models — an engineering revolution."

All undergraduate and graduate engineering students will see elements of applied AI in their classrooms and labs. In the research realm, faculty members are already forming teams that use AI to solve engineering's biggest challenges, guided by the college's disciplinary strengths.

The initiative is a natural part of fulfilling NC State's land-grant university mandate to benefit the people and communities of North Carolina — and of carrying out NC State's motto, Think and Do, Pfaendtner noted.

"We're at our very best when we're innovating," he said. "We're doing use-inspired research and development, and we're teaching students to use what they learn to solve big, thorny problems for the world."



# AI FOR LIFE

Researchers are using data to protect health, power communities and boost profitability.

The College of Engineering’s critical mass of AI research intertwines with NC State’s land-grant mission: to innovate and apply knowledge for public good. Real-world projects driven by AI are already touching lives across the state in ways that might surprise you.



The sweetpotato scanning equipment helps match the right potatoes to the right market.

## AI MEETS AGRICULTURE: Smarter Sorting for Sweetpotatoes

NC State researchers are taking the guesswork out of agriculture with AI — and their target is the humble sweetpotato, North Carolina’s nation-leading crop.

Led by electrical engineer **Cranos Williams**, Goodnight Distinguished Professor of Agricultural Analytics, the team is helping sweetpotato packers make more informed decisions about sorting and selling crops. The goal: maximize value and match the right potatoes to the right markets.

Sweetpotatoes vary in shape, size and skin — differences that influence how much they’re worth. Uniform ones head to grocery stores; irregular ones go to processors or even pet food makers. Each step down the value chain can mean up to a 70% drop in revenue.

Farmers store sweetpotatoes in 2,000-pound

bins with no clear view of what’s inside. Once washed, shelf-life plummets from 13 months to just three weeks. That’s where Williams’ team steps in. They’ve developed AI-driven imaging and sensor tools that analyze storage roots by size, shape and surface quality — and link that data to the fields they came from.

Because many smaller packers still sort by hand, AI-driven systems like these can also monitor accuracy and flag inefficiencies, such as quality lapses during shift changes.

To make the wealth of digital information accessible, NC State engineers built web dashboards that help users review data, track trends, align inventory with orders and optimize post-harvest decisions.

“It’s all about data-driven ways they can make normal, day-to-day decisions,” Williams said.

## BUILDING SMARTER: How NC State’s Kevin Han Uses AI to Revolutionize Construction

With energy demands rising nationwide, the U.S. Department of Energy (DOE), is investing heavily in next-generation nuclear reactors. Unfortunately, power plant builders are plagued by similar frustrations as the stereotypical American homeowner: construction setbacks.

In the United States and Europe, nuclear power plant construction projects typically lag eight years behind schedule and cost 2.5 times their estimates, according to the International Energy Agency.

Enter NC State’s **Kevin Han**. The associate professor and Edward I. Weisiger Distinguished Scholar in the Department of Civil, Construction, and Environmental Engineering is investigating AI tools to clear construction hurdles. The DOE funds much of his work.

Han’s smart systems flag trouble early or prevent it. At the heart of his research is a powerful idea: using AI to bridge the gap between a building’s digital blueprint and real-time construction progress.

A tool called Building Information Modeling (BIM) is often used to create digital models of planned structures. By employing drones, mobile robots and cameras, Han’s systems collect data on construction in real time.

Han’s systems use machine learning and computer vision to compare reality to digital models, looking for elements that are missing, behind schedule or faulty. Think of them as virtual project supervisors always on the lookout for trouble spots.

“My technologies can help de-risk cost and schedule issues by bringing transparency to construction performance and enabling streamlined design and construction processes,” Han said.

If builders embrace AI-boosted BIM and change traditional construction culture, utilities could reduce their capital expenses — and everyday customers could save on energy bills.

## WATER WISE: How AI Could Safeguard Water Quality

**Yara Yingling** has a message for North Carolinians: AI could help safeguard the state’s water..

As Kobe Steel Distinguished Professor and a materials science expert at NC State, Yingling uses AI to address one of North Carolina’s most pressing environmental challenges — safeguarding groundwater quality.

Groundwater supplies drinking water for roughly 2.4 million North Carolinians who rely on private wells, and it often contains pollutants that pose health risks. Through the National Science Foundation-funded Science and Technologies for Phosphorus Sustainability (STEPS) Center, Yingling partnered with environmental engineers at Arizona State University to study groundwater quality. Their AI-powered approach could save time and money for communities while also protecting the health of people and the planet.

As Yingling explains, government agencies have collected groundwater chemistry data for decades, but many regions lack complete groundwater-quality datasets due to the time and expense required to test for pollutants.

Yingling’s AI algorithms churned the incomplete data to predict levels of more than 20

compounds in groundwater at any site, based on chemical patterns. AI helped identify contamination “hotspots” and areas believed to be safe but warrant further testing.

Eventually, Yingling wants to build digital twins of U.S. groundwater and nutrient cycles — a convergence informatics approach that links water quality, materials science, and environmental policy. These AI models could test “what-if” scenarios and explore how changes in land use, fertilizer management, or cleanup efforts might affect water quality.

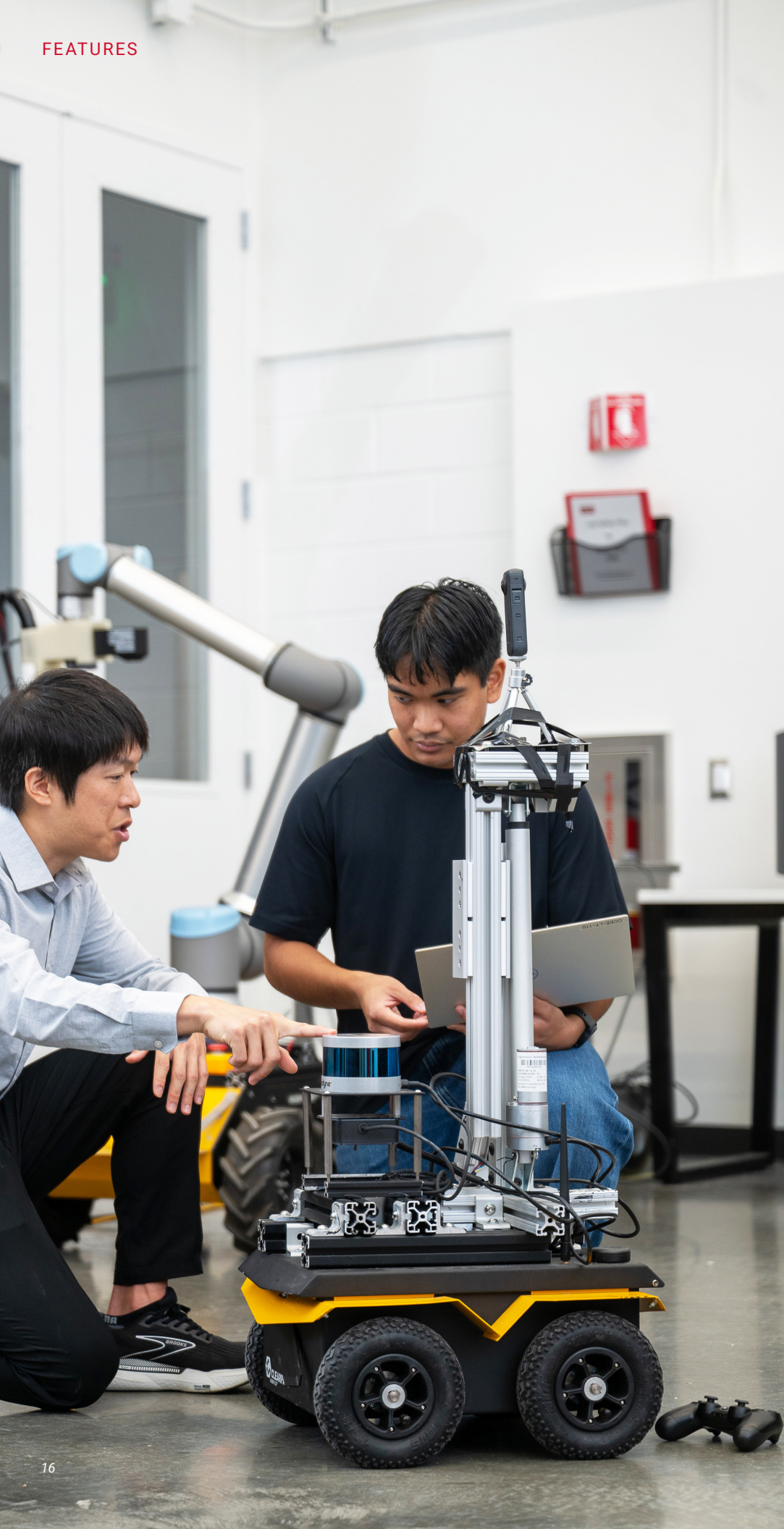
“The AI tool could tell a farmer, ‘It’s going to rain in a couple of days. Hold off on fertilizing, because the runoff is going to be too high and you’re going to waste all your fertilizer,’” she explained. That vision is becoming reality through a startup Yingling is launching to bring precision agriculture tools to farmers and wastewater engineers.

Fundamentally, Yingling emphasizes that people are the most important component of AI systems. “AI works best when it’s guided by human curiosity,” Yingling said. “Training the next generation to work hand-in-hand with these tools will help solve the challenges that define our time.”



Fourth-year Ph.D. student **Christina Bayard** at work on the GPU cluster powering research in Yingling’s AI and Materials Simulations (AIMS) Laboratory.





This robot can collect data from construction sites in real time to help prevent delays. From left: Associate Professor Kevin Han and **Nathan Libutan**, a junior computer engineering student.

## Teaching for a Data-Driven Future

NC State engineering students will see and learn about AI in every discipline through a new initiative.

Artificial intelligence is becoming a fundamental part of how the next generation of engineers is educated at NC State's College of Engineering. Through its bold Applied AI in Engineering and Computer Science initiative, the college is weaving data-driven tools into teaching for every discipline and creating a model that prepares students not just to adapt to the future, but also to shape it.

"We're committed to an expansive view of engineering education that includes data-driven practices," said **Jim Pfaendtner**, Louis Martin-Vega Dean of Engineering. "Engineers' training has been rooted in physics, math and chemistry for centuries, and that will continue. But we are excited about upskilling our students so that they can use data-driven tools to create structures and processes, rooted in the basic laws used to assess

whether these processes and structures are safe, profitable and effective."

The strategy's goal: Equip students with a mindset that enables them to evaluate engineering problems and apply the right AI technologies to solve them.

In August, first-year students enrolled in E298, Fundamentals of Applied AI for Engineering, a new course that introduces AI tools. It's the first phase of a two-course sequence that aims to evolve and grow along with AI and students' interests.

Their education starts by exploring relatable simulations — like how an online retailer fulfills customers' orders — and how AI fits into solving those engineering problems. No complex coding is involved. **David Roberts**, associate professor of computer science and one of the architects of the new courses, uses an analogy he credits to Pfaendtner. "If AI is a car, we don't need every student to be an automotive engineer," Roberts said. "They don't need to disassemble the engine and replace the crankshaft, but they do need to know a car has an engine and the role it plays in getting you down the road."

Under the applied AI initiative, every one of the more than 12,500 NC State engineering and computer science students will leave with the ability to think critically about AI and use it responsibly. Pfaendtner sees more data-driven electives and an AI minor in the future.

"AI is no longer something only computer scientists need to understand," Roberts said. "It's a tool every engineer will use. Our job is to ensure students know how to use it responsibly and effectively."

Ethics is a core component, thanks to collaboration with the College of Humanities and Social Sciences. Like so many engineering decisions, those informed by AI carry consequences — and legal liability. From environmental impacts to algorithmic bias, students are learning to navigate the risks and benefits of the AI technologies they use. Sometimes, AI is the wrong solution to a problem.

"We want them to know when to use it and when not to use it," said curriculum expert **Sarah Heckman**, Alumni Distinguished

Undergraduate Professor in the Department of Computer Science. "There are times when using an AI machine learning library isn't necessarily going to get you an answer quite as nicely as using a basic spreadsheet."

The initiative also invests in faculty development. Professors are encouraged to learn about AI from other faculty experts. The college launched an AI research accelerator this year, and Pfaendtner expects the number of data-driven engineering faculty members to grow.

Encouraging faculty creativity and involvement ensures AI fluency across disciplines. Already, courses across the college are pushing boundaries. Roberts' class on animal-computer interaction, for example, explores how dogs can interact with computer systems. He and his students talk about how to design buttons that a dog can actuate with its nose, he said, and "AI can be used to determine the dog's orientation to the button."

Faculty in different departments are also bringing their students together. In a special project supported by the National Science Foundation, students in data science, applied sciences and basic sciences are collaborating to solve agricultural challenges using AI.

The public mostly knows about AI because of image-generating apps and large language model-based apps like ChatGPT, but they're a small part of the AI universe. Machine learning and computer vision are often far more relevant to engineering, Heckman said.

"We're trying to get to the point where, first off, students realize that AI is more than generative AI and large language models. It's way more than that," she noted. "Then they can start thinking about the fundamental engineering problems they need to solve, and how AI can support that."

Ultimately, the college's vision is about teaching students to keep learning and adapting long after graduation.

"AI is not a siloed discipline. It now touches pretty much every discipline on the planet," Roberts said. "This is core to our approach, and our students are going to be better served in their careers as a result."



# Helen Huang: The Woman Pioneering Bionic Innovation



Helen Huang in one of her labs with a prosthetic leg she and her team developed.

For the more than 2 million Americans living with limb loss, walking can be one of life’s hardest challenges. That’s where Jackson Family Distinguished Professor **He (Helen) Huang** comes in.

A leading biomedical engineer, Huang is using artificial intelligence to transform robotic prosthetics into seamless extensions of the human body. It’s a calling that combines her intense curiosity with the gratification of seeing her work help people lead better lives.

Today’s robotic limbs already respond to electrical signals from remaining muscles. Huang’s innovation takes that further. She’s testing limbs that walk autonomously, using sensors and AI to coordinate the robotic limbs’ movements and help users avoid falls.

She’s also applying AI to speed up one of prosthetics’ most time-consuming steps: fitting. Typically, clinicians spend hours tweaking each robotic limb to match a patient’s gait. Huang’s technology lets the limb learn and adjust on its own — giving clinicians more time to focus on perfecting the way patients

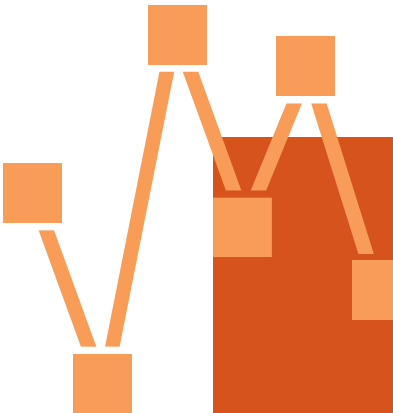
move. She hopes to participate in a clinical trial soon as the next step to getting these AI-optimized robotics to patients.

As an engineer, Huang is always looking to create better technology. But what does she describe as the “fun” part of her job? Her study participants. She is especially thankful to the community of volunteers in North Carolina who eagerly pilot-test every new bit of robotic limb technology. One of the participants has attended the dissertation defense of every doctoral student in Huang’s lab for the last five years.

“We really appreciate them. They see the importance of the work for the future, even if the research might not directly benefit them,” she said, pride rising in her voice.

“Engineers often think they have great solutions, but they may not meet actual user needs. The users give us feedback on what’s important, what works, and what doesn’t.”

Behind these advances is foundational support. Huang credits the National Science Foundation and the National Institutes of Health for taking early risks on ideas that sounded far-fetched at the time. “They’re critical to advancing the work.”



## Let’s Talk **Data**

AI experts come to campus, and students shine in symposia and seminar series.

AI is evolving quickly, and the NC State College of Engineering is growing its own AI ambitions alongside it. Thanks to the shared vision of faculty, the college is becoming a preeminent center for applied AI education and research in engineering and computer science.

Faculty, staff, students, alumni and industry leaders see momentum building through opportunities to hear from leading AI investigators and to share research.

The Dean’s Distinguished Seminar Series on Applied AI Futures attracts top thinkers and trailblazers to explore how AI can be used to solve the world’s toughest engineering problems. These conversations are sparking imaginations and new partnerships.

The creative exchange began with the first Applied AI in Engineering and Computer Science Symposium at the college a year ago. This kickoff event featured nearly 100 poster submissions

from faculty and students highlighting data-driven research in DNA storage, robotic limbs, autonomous vehicles, agricultural applications and materials discovery.

Engineers and computer scientists contributed strongly to this year’s University Research Symposium in March. Topics at the Research With AI: Navigating A New Age symposium included using AI to improve textile waste recycling processes and monitoring crop yields with data gathered by drones.

“There’s exciting work happening in every department,” Louis Martin-Vega Dean **Jim Pfaendtner** said, “So we are coalescing that at the college level around the applied AI initiative.”

The 2025 Applied AI in Engineering and Computer Science Symposium is Oct. 27.

To watch videos of previous applied AI speakers at the college and hear about upcoming seminars, visit [engr.ncsu.edu/applied-ai](http://engr.ncsu.edu/applied-ai). ■





# BRIDGING STUDENTS AND RURAL COMMUNITIES

**D**aniel Soutter learned a lot of skills this summer that went beyond his internship job description.

Soutter, a junior from Wake Forest, North Carolina, came up with a new equipment design, spent time on field work and traveled out of state as a product development engineer intern at Wind Solutions, a Sanford-based company that makes wind turbine parts.

This was the second internship he found through *Rural Works!*, an NC State University program that connects students to employers in rural communities through paid summer internships.

“I have seen the benefit of working in a manufacturing place in these rural areas,” he said. “Everybody wants to go work for a big firm, but it’s so cool that I was able to go to the shop floor and go see the products actually being physically made.”

*“I have seen the benefit of working in a manufacturing place in these rural areas.”*

DANIEL SOUTTER

Daniel Soutter gained field experience during his summer internship at Wind Solutions.



# MANUFACTURING NETWORKS



*Rural Works!* started in 2018 with four students. In 2025, 145 students worked in 43 counties at 81 companies in industries including electric, aerospace and renewable energy. Over seven years, more than 500 College of Engineering students have participated.

The organizations are often small, with fewer than 50 employees. Employers pay student interns a minimum of \$15 per hour. To ensure engineering students are paid wages comparable to those offered by larger or urban companies, the College of Engineering adds a stipend to make total pay equivalent to \$25 per hour.

“The students love it,” said **Phil Mintz**, who is the executive director of Industry Expansion Solutions (IES) at NC State. “The companies love it. There are graduates taking jobs in rural areas because they had this experience.

“Not being able to get an engineer in a factory in rural areas is a workforce issue that we hear about all the time,” he added. “There is an opportunity here for the companies to talk to students about what they want to do, give them something to do in the community. We have an interesting group of students coming out now and they want to do more in the community.”

Hiring engineers in manufacturing fields remains a top priority for rural employers. Through *Rural Works!*, NC State was one of the first universities to try to meet rural employers’ needs and address the shortage of engineers in these areas.

“These work experiences are important for students as they think about what their careers look like, but equally important is the program’s goal to build students’ understanding of the advantages of living and working in rural areas,” said **Jerome Lavelle**, associate dean of academic affairs at the College of Engineering.

“Growing up as a farm kid in a rural county in Ohio, the *Rural Works!* program has special meaning to me,” said Lavelle. “I understand both the beauty and the challenges that such communities face.”

# A Study in Community

When long-time industrial extension specialist **Phil Mintz** decided to start working on his Ph.D. in leadership studies at North Carolina Agricultural and Technical State University, *Rural Works!* became a natural focus.

Mintz is the executive director of NC State’s Industry Expansion Solutions (IES), which helps match students with rural companies.

“When [*Rural Works!*] was actually started, I thought, this might be an interesting study at some point,” Mintz said. “I’ve always wanted to complete my Ph.D.”

Mintz collected data from NC State and from peer universities with similar programs that connect students with meaningful work-based learning.

He found that students’ biggest concerns aren’t about salary, which surprised him. Instead, students worry about their social networks and doing engaging work.

“Just getting them there is not enough,” he said. “They want to be engaged, and they want to make a difference beyond their job, and that can happen in rural areas as well as urban areas, but it’s going to still take some commitment by leaders in the communities.”

Mintz has spent his career engaging with manufacturers and coming up with solutions to workforce issues. He found that students with experiences in rural communities — including through *Rural Works!* — were more likely to consider career opportunities in rural areas.

“People expect universities to do more things like this and not just focus on academics,” Mintz said. “They want to see universities do things that support societal issues more. [*Rural Works!*] represents something like that, which is kind of unique.”

# RURAL RETURNS



RayShaun Williams with components of an escalator.

Soutter, the junior mechanical engineering student, is one of many NC State students who find themselves interested in returning to the rural areas they’ve gotten to know.

At Wind Solutions, Soutter made a tangible impact on the company’s work. While the company is headquartered in Sanford, it makes parts for wind turbines all over North America, so Soutter took a trip to the rural community Algona, Iowa, to gain field experience replacing parts.

“They put me right into it all summer,” Soutter said. “The biggest thing I did was redesign presses.”

The press is used for busbars that go on various mechanical elements, from solar panels to wind turbines. With feedback from the Wind Solutions team, he created a new design.

“This new machine makes it so that it is almost impossible to hurt yourself as an operator,” he said.

Hands-on experiences like Soutter’s are what bring students back to rural areas, either for new internships or full-time positions.

“It gave me a brand new perspective on what engineers actually do,” said junior mechanical engineering major **RayShaun Williams**, who interned at Schindler Elevator Corporation in his hometown of Clinton, North Carolina, in 2024. “It’s different to be in class and have an idea than to actually be in the field, where you see how important the work is.”

**Casey Olson** ‘21, engineering improvement specialist with IES, completed her *Rural Works!* internship in Smithfield, North Carolina, in the summer of 2021. After graduating with her degree in industrial and systems engineering later that year, she returned to the company for a full-time position.

“I had multiple job offers before graduating that I would not have been able to get without *Rural Works!*,” she said. “I ended up creating and negotiating a job at the company where I did my internship. Without doing that internship, that job would not have existed.” ■





# ACCELERATING MOMENTUM

## Transformative Philanthropic Investments Lift College to New Heights

“

These are the kinds of gifts that usually only happen once every decade.

”

JIM PFAENDTNER

A few weeks into the spring 2025 semester, when classes were in full swing and the novelty of a new calendar year was starting to wear off, two announcements about alumni generosity transformed the trajectories of two NC State College of Engineering departments.

On Friday, Feb. 7, 2025, the university’s Board of Trustees approved two significant philanthropic investments from two alumni: **Ross W. Lampe Jr.** ’77 to name the Lampe Joint Department of Biomedical Engineering at NC State University and the University of North Carolina at Chapel Hill, and **Lawrence (Larry) Twisdale Jr.** ’69, ’70 to create an endowed department head position in the Department of Civil, Construction, and Environmental Engineering.

“These are the kinds of gifts that usually only happen once every decade. Being able to announce two in the same week was truly exceptional,” said **Jim Pfaendtner**, Louis Martin-Vega Dean of Engineering. “The impact will extend for generations to come.”

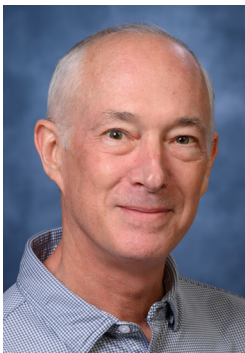


# ‘Truly Transformative Impact’



With this philanthropic investment from Lampe, the department plans to:

- Provide comprehensive support for faculty research and entrepreneurial efforts in biomedical microdevices, medical imaging, pharmacoengineering, rehabilitation engineering and regenerative medicine
- Establish an Innovation Fellowship program to enhance research translation, commercialization and entrepreneurship
- Provide resources for high-impact science with state-of-the-art infrastructure
- Build its national and international reputation through successful new initiatives
- Facilitate the allocation of new faculty positions, space and resources



The Lampe Joint Department of Biomedical Engineering’s mission is to unite engineering and medicine to improve lives — and Ross Lampe’s \$20 million investment will enhance the department’s work to translate its innovative research into solutions that help society.

For Lampe, a lifelong learner currently working on a Ph.D. in comparative biomedical sciences from NC State’s College of Veterinary Medicine, this gift is a testament to the dedication of the faculty he has observed.

“This gift is a leap of faith that I hope will inspire others,” he said.

The endowment establishes the third named department at NC State and is the second-largest gift in the College of Engineering’s history.

“The Lampe endowment is a once-in-a-lifetime opportunity, which will have a truly transformative impact on the Joint Department,” said **Paul A. Dayton**, William R. Kenan Jr. Distinguished Professor and department head and chair of Lampe Joint BME.

Lampe has deep ties to NC State. Some of his earliest memories are visiting campus to see his grandfather, **J. Harold Lampe**, who served as dean of the College of Engineering from 1945 to 1962.

Lampe earned his degree in industrial engineering from NC State in 1977, followed by master’s and doctoral degrees in electrical engineering from the University of Illinois. He founded SiteLink Software, a leading company supporting the self-storage industry, in 1998. He and his family have made several contributions to the college over the years, including four named professorships.

“The College of Engineering is very, very good,” Lampe said. “I want to help it keep growing to be first-class across the board. We have to get that critical mass of top faculty, resources and tools. That’s expensive.”

# ‘I Want NC State to Be the Best’



Larry Twisdale has always known NC State is excellent — and has the potential to be the best. He wants everyone else to see it, too.

He and his wife Fran made gifts totalling \$4 million to the Department of Civil, Construction, and Environmental Engineering. They established the

first named department head position in the College of Engineering — the Twisdale Family Civil, Construction, and Environmental Engineering Department Head — and created a second named professorship. He has also indicated plans for an estate gift aimed at attracting talented faculty and students to the department.

“I want NC State to be the best — academics, research, teaching, athletics, everything — and be recognized for it,” he said. “My NC State civil engineering education was excellent. I want to help the department grow, become more connected to alumni, and improve its national stature in academics, teaching and research.”



“Larry’s generosity exemplifies the profound connection between our alumni and the department,” said **Jacqueline MacDonald Gibson**, who now holds the title of the Twisdale Family Civil, Construction, and Environmental Engineering Department Head. “His philanthropic spirit inspires our researchers, donors and students, reinforcing the upward trajectory of our department, college and university.”

Twisdale earned his B.S. in civil engineering in 1969, followed by a Master of Civil Engineering in 1970, both from NC State. He received his Ph.D. in civil engineering from the University of Illinois.

He became a national leader in using probabilistic simulations to analyze the safety and reliability of 3-D structural systems, including nuclear power plants.

“A department needs sufficient funding for endowments, professorships, fellowships and scholarships to realize its potential and to strengthen its faculty and students,” Twisdale said. “I believe this gift will help in that regard. We have a large alumni base, so all gifts, large and small, can aggregate to something significant over time.” ■

With this gift from Twisdale, the department plans to:

- Provide new and recurring flexible resources that the department head can direct toward their vision and areas of greatest opportunity or need
- Support recruitment efforts for undergraduate students, as well as top graduate students — a collegewide priority to elevate its reputation and expand its research
- Invest in critical research to design and deliver solutions that power communities forward
- Support efforts to attract preeminent faculty members
- Foster alumni engagement to connect a strong North Carolina-based alumni group



Read the full feature at  
[go.ncsu.edu/lampe-bme-gift](https://go.ncsu.edu/lampe-bme-gift)

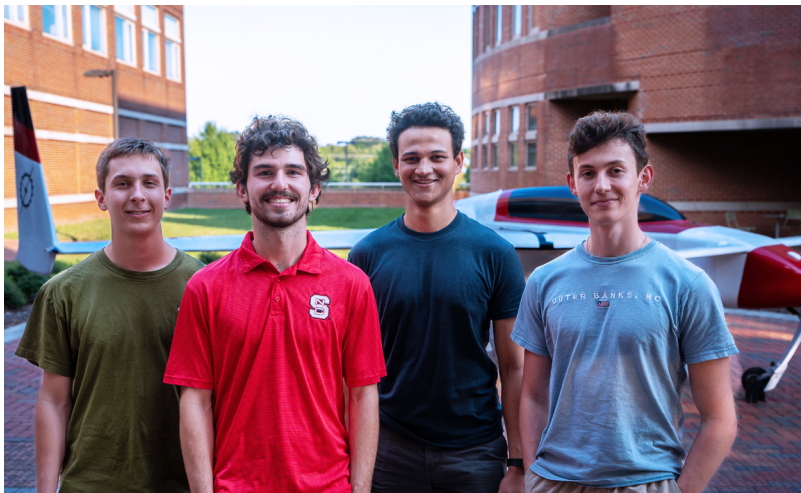
Read the full feature at  
[go.ncsu.edu/twisdale-ccee-gift](https://go.ncsu.edu/twisdale-ccee-gift)





# Launching Their Futures

For four first-year aerospace engineering students, their journeys at NC State University are only just beginning. But as recipients of the Pearce Aerospace Engineering Scholarship, they've already discovered a world of opportunities.



Max Langenbach, Addison Daniel, Ezra Maduskar and Christian Ramellini

**Addison Daniel**, from Moyock, North Carolina, wants to work on spacecraft propulsion systems or hypersonic propulsion systems.

*"This scholarship alleviates a lot of financial burden I would've had and allows me to have more free time to explore other activities such as clubs and sports on campus."*

**Max Langenbach**, from Cary, North Carolina, plans to attend graduate school and work for an organization advancing space exploration.

*"I've always been fascinated by ventures such as Voyager, Ingenuity, DART and Hubble, which take science off the surface of our planet to garner information about the universe around us. I want to contribute to the global collection of knowledge, and I want to do something that I will enjoy. Doesn't making things fly sound like a blast?"*

**Ezra Maduskar**, from Chapel Hill, North Carolina, has a goal to start his own company to make commercial air travel more efficient.

*"I'm looking forward to working with the supersonic wind tunnel and taking an interdisciplinary approach to research by combining my proficiency in musical instruments and knowledge of acoustics with engineering to develop surfaces that can minimize sonic booms."*

**Christian Ramellini**, from Clyde, North Carolina, aims to work for NASA or on commercial planes.

*"Without the scholarship I probably would not have been able to go to NC State. This scholarship will allow me to complete my four years without any debt for myself or my parents, which was incredibly important to me. I get to do the major that I wanted most at the school I wanted most to be in."*

## ABOUT THE PEARCES

**Lane Pearce** '70 and his wife Donna were childhood neighbors who started dating during his senior year at NC State.

Just six miles from his home and with a strong aerospace engineering program, NC State was the obvious choice during a time when the United States was working toward landing a man on the moon and returning him safely to Earth.

After graduating, he was employed by Teledyne Brown Engineering in Huntsville, Alabama. As a young engineer, he successfully developed the preliminary design of the Space Shuttle's Solid Rocket Booster's recovery system, which slowed and oriented the 100-ton boosters for a tail-first impact at ~75 feet-per-second to assure they could be safely recovered and launched again.

"That project sort of 'made my bones' with management," he said.

He worked on NASA space activities for 37 years and retired 18 years ago.

"We ... recognized NC State was a primary factor in our prosperity and financial security," he said. Lane and Donna decided to give back to the university, establishing a scholarship for aerospace engineering students to pursue their own contributions to the field. ■

**Michael Sanderson** '17, '24, finished his second degree from NC State University just last year — but his time with the Wolfpack is only getting started.

Sanderson, who currently works as a principal automation engineer at Pfizer, has a B.S. in chemical engineering and an M.S. in engineering and industrial management. He joined the College of Engineering's Young Alumni Advisory Board (YAAB) in 2025.

"I'm a member of the Lumbee Tribe of North Carolina," he said. "North Carolina has the highest Indigenous population east of the Mississippi, but that doesn't correlate to higher numbers in STEM or engineering. We usually don't graduate with those degrees, so there aren't a lot of voices for people from my community. When opportunities like this arise, I really like to represent my people a little bit more. If you're not at a table, you're not getting heard."

Sanderson is from Pembroke, North Carolina, which has a majority-Lumbee Indigenous population. NC State was the only university Sanderson applied to after he fell in love with chemistry at Purnell Swett High School.

Over 10 years after starting at NC State, Sanderson is still a dedicated member of the Pack. He's the vice chair for the YAAB philanthropy committee, as well as the vice president for the Native American Alumni

Network and the corporate advisor for the American Indian Science and Engineering Society (AISES) student chapter.

He's doing all of that for NC State on top of his full-time job, his role as the president for the AISES North Carolina Professional Chapter, his membership in the Triangle Native American Society and his duty as cofounder and global operations lead of the Global Indigenous Community Colleague Resource Group.

"I have people that I can rely on, and I can delegate," he said. "That's what we have calendars for. But I have a good support system, and I know that what I'm doing is meaningful. That definitely makes it all easier."

When he thinks of his time at NC State as a student, Sanderson said he thinks about those support systems. His favorite place on campus was D.H. Hill Jr. Library.

"Those were probably some of my favorite times, just hanging out with friends at the library," he said. "The last stretch of finals and everybody being in the library together. Those are pretty good memories." ■

## MICHAEL SANDERSON

*"...there aren't a lot of voices for people from my community. When opportunities like this arise, I really like to represent my people... If you're not at a table, you're not getting heard."*



Michael Sanderson with Chancellor Kevin Howell.

**ABOUT YAAB:** Formed in 2018 by the NC State Engineering Foundation, YAAB consists of NC State alumni who are fewer than 15 years post-graduation from their last degree earned. The program was created to encourage support from the growing population of COE young alumni who want to stay connected to the Wolfpack.

The board started with 12 members. Currently, there are 26 members on the board representing a wide range of engineering and computer science disciplines.

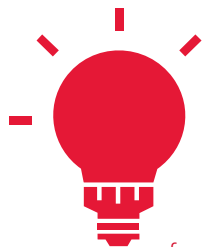


# Beyond the Day

On Day of Giving, alumni, parents, faculty and staff members, students and friends of the college gave **1,515 gifts totalling \$8,165,279**. But more important than the numbers are the spirit behind the gifts and the causes they go to support.

"On this **NC State Day of Giving**, we are proud to support a scholarship endowment within the Department of Electrical and Computer Engineering, honoring the incredible achievements within the College of Engineering and investing in the next generation of innovators. This endowment ensures that future students can carry forward our legacy, driving design and innovation beyond the walls of our university. **Together, we strengthen the Pack!**"

**Amanda Dixon '99**  
electrical engineering

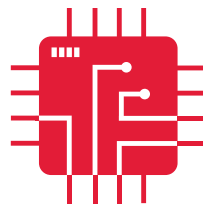


Electrical and computer engineering students work to increase access to STEM education for middle and high school students, develop new electric forms of transportation and track red wolves to help with the revitalization of their population.

"If you have a desire to give back, the first thing you need to do is learn more about the university, learn more about your department, learn more about what has changed. So **get engaged**. You'll get increased confidence through engagement and learning more about the tremendous value that your alma mater provides each and every day."

**Mark Wyatt '80**  
computer science

Endowed fellowships support graduate students' tuition, stipends, fees, research funding and conference costs, while endowed professorships support research, scholarly publications and hiring student researchers. Endowed support helps fund the development of new technologies to streamline guide dog training, clean oceans and expedite healing with electric bandages.



"In 1985, I ventured out from a quaint mountain town in North Carolina, embarking on a journey to North Carolina State University to pursue an electrical engineering degree. The early days were overwhelming, filled with eye-opening experience and invaluable education. Professionally, the rigorous academic training at NC State equipped me with the technical skills and problem-solving abilities needed to excel in my career. Today, I want to **give back and help accelerate future students' journeys**."

**Jim Smith '90**  
electrical engineering

Scholarships help students from all backgrounds, including first-generation students, rural North Carolinans and service members, access a quality NC State education. ■



**Mark your calendars for March 2026 when we're #GivingPack again.**

## Celebrating COE Distinguished Engineering Alumni

Three College of Engineering alumni received the 2024 Distinguished Engineering Alumni (DEA) Award.

**Tony McLean Brown '83**, earned his B.S. in computer science from NC State University and is a principal with the Public Consulting Group. He wrote *Happy Guide to a Short Life* in response to a book by Pulitzer Prize winner Anna Quindlen. Philanthropic efforts from this collaboration have generated more than \$2 million in donations to over 500 organizations.

**Tracy B. Doaks '95** earned a B.S. in industrial engineering from NC State. She is president & CEO of MCNC, the technology nonprofit focused on delivering high-performance protected internet and

networking, cloud services, cybersecurity and other essential technologies for communities throughout North Carolina.

**Lane Ross Miller '88** earned a Ph.D. in mechanical engineering from NC State. He is the retired vice president of global technology at LORD Corporation and promoted the introduction of LORD's active vibration control products. He is an inventor on more than 15 patents related to this product.

**Jerry Collier '67** and **Rashida Hodge '02, '03** are the 2025 DEA Award recipients. They were recognized at a universitywide celebration in September and will be honored by the college later this fall.

From left: Lane Ross Miller, Tracy B. Doaks and Tony McLean Brown



## FROM THE BOARD

The Engineering Foundation exists to enable NC State's place as one of the nation's premier public colleges of engineering. We support the College of Engineering in acquiring and growing the financial resources necessary to achieve this through alumni engagement, public/private philanthropy and personal giving. Our board is dedicated to this vision and mission.

Six alumni and one student representative joined the NC State Engineering Foundation (NCSEF) Board of Directors in 2025:

- **John Amein**, BSEE '84
- **Keisha Bickham**, BSEE '00
- **Matthew Coffey** (student), civil engineering degree expected 2026
- **Hakan Ozisik**, B.S. '82, M.S. '86, Ph.D. '89 in mechanical engineering
- **Dan Pleasant**, B.S. '72, M.S. '73 in civil engineering
- **Jerry Tillman**, BSCSC '03
- **John Wolf**, BSChE '95

Board members support the Foundation in a variety of ways. For example, two NCSEF board members hosted engineering alumni events this year. **Jennifer Rhatican** BSME '87, organized an event for Denver-area alumni to network and meet Louis Martin-Vega Dean of Engineering. **Jim Pfaendtner**, **Steffanie Easter** BSChE '85, put on a similar event in Washington, DC.

I have witnessed how the generosity of alumni directly benefits students and the college. I wish each of you could attend an endowment event and hear the student testimonials about how financial support for their education was lifechanging. If an NC State degree made a difference in your life, as it absolutely did in mine, I hope you will consider supporting the College of Engineering.

**Go Pack!**  
**Scott Stabler**  
BSME '82  
Board Chair ■

Get to know the NCSEF board:  
[go.ncsu.edu/ncsefboard](https://go.ncsu.edu/ncsefboard)





# A gift to the College of Engineering opens up pathways

For students, an engineering degree sets them and their families on a path of upward mobility. For faculty, working at NC State University provides the environment they need for their groundbreaking research.

Gifts from College of Engineering alumni like you keep our college moving forward.

## GIVE TO THE ENGINEERING LEADERSHIP FUND

- Gifts made to the Engineering Leadership Fund are used at the discretion of the dean and support college-level initiatives that help our students and faculty succeed. [go.ncsu.edu/engineering-giving](https://go.ncsu.edu/engineering-giving)

## JOIN THE DEAN'S CIRCLE

- Annual gifts of \$1,000 or more qualify for membership in the Dean's Circle, the college's leadership annual giving program. For alumni up to 10 years after graduation, gifts of \$250 or more qualify. [go.ncsu.edu/engineering-deanscircle](https://go.ncsu.edu/engineering-deanscircle)

## INCREASE YOUR IMPACT

- Explore your company's matching gift policy, which may greatly enhance the level of support you can extend to deserving students. Visit [matchinggifts.com/ncsu](https://matchinggifts.com/ncsu) and contact your human resources representative to learn more.

If you have already made your annual gift to the College of Engineering, please accept our sincere thanks. If you have questions or would like to learn more about your giving options, contact Assistant Director of Annual Giving Andrea Carvalho at [apcarvalho@ncsu.edu](mailto:apcarvalho@ncsu.edu).

### Go Wolfpack, Go Scholarships

Sophomore **Rylee Miller** is an NC State cheerleader who is double-majoring in chemical engineering and paper science and engineering. Her days are busy, and as a scholarship recipient, she doesn't have to worry about fitting a part-time job into her schedule.

"This will help free up my time to focus less on finances and more on being involved in things like career development events, interviews, service projects and more in the College of Engineering," she said.

Miller received the Dean's Circle Merit Scholarship, which is funded by donors who give annually to the College of Engineering. She is looking forward to taking more advanced courses this year while cheering on the Wolfpack and seeking out career development opportunities.

"My dream job is to work in a position that sees lots of innovation and change where I can serve in a hands-on role in progressing the company into the future and expanding our market share," she said. "I would love to work with developing energy technology, possibly as part of a capital projects team or in a startup company." ■

The Oval — one of NC State University's Hallowed Places — was abuzz for the **third annual POP Back** on Sept. 4. More than 7,000 students showed up to plunge their professors in the dunk tank, test their strength on a mechanical bull and beat their friends at cornhole and other games. Eight local food trucks provided meals and snacks, while two bands performed live music.

This year, POP Back brought together all of the colleges on Centennial Campus — the College of Engineering, Wilson College of Textiles, College of Humanities and Social Sciences, and College of Education — resulting in the **largest celebration yet** with more industry sponsors and campus groups than ever before.

The 2025 event was powered by Hitachi. Learn more about sponsorship opportunities and check out photos at [packtheoval.org](https://packtheoval.org). ■



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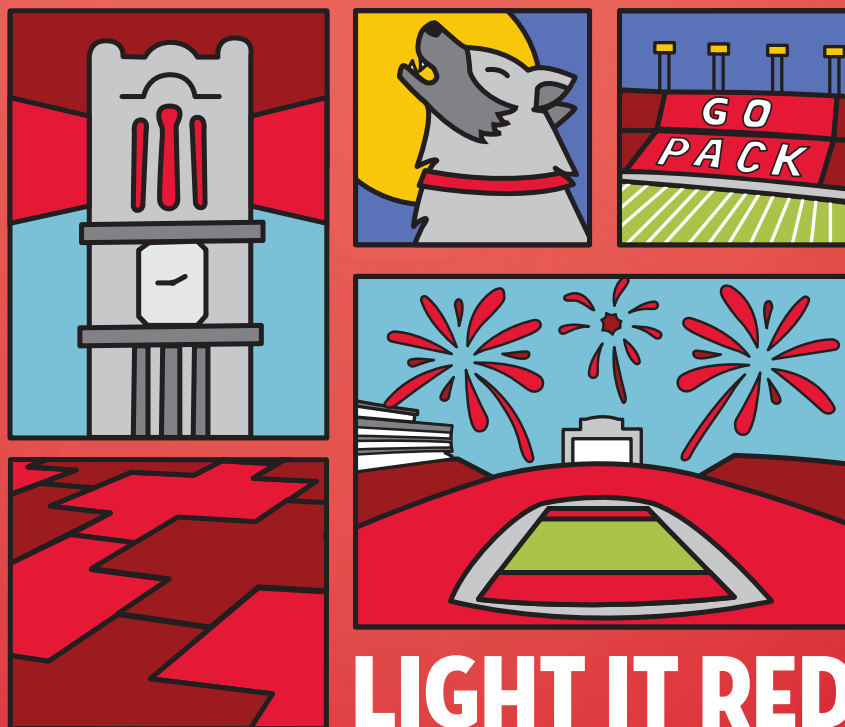
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