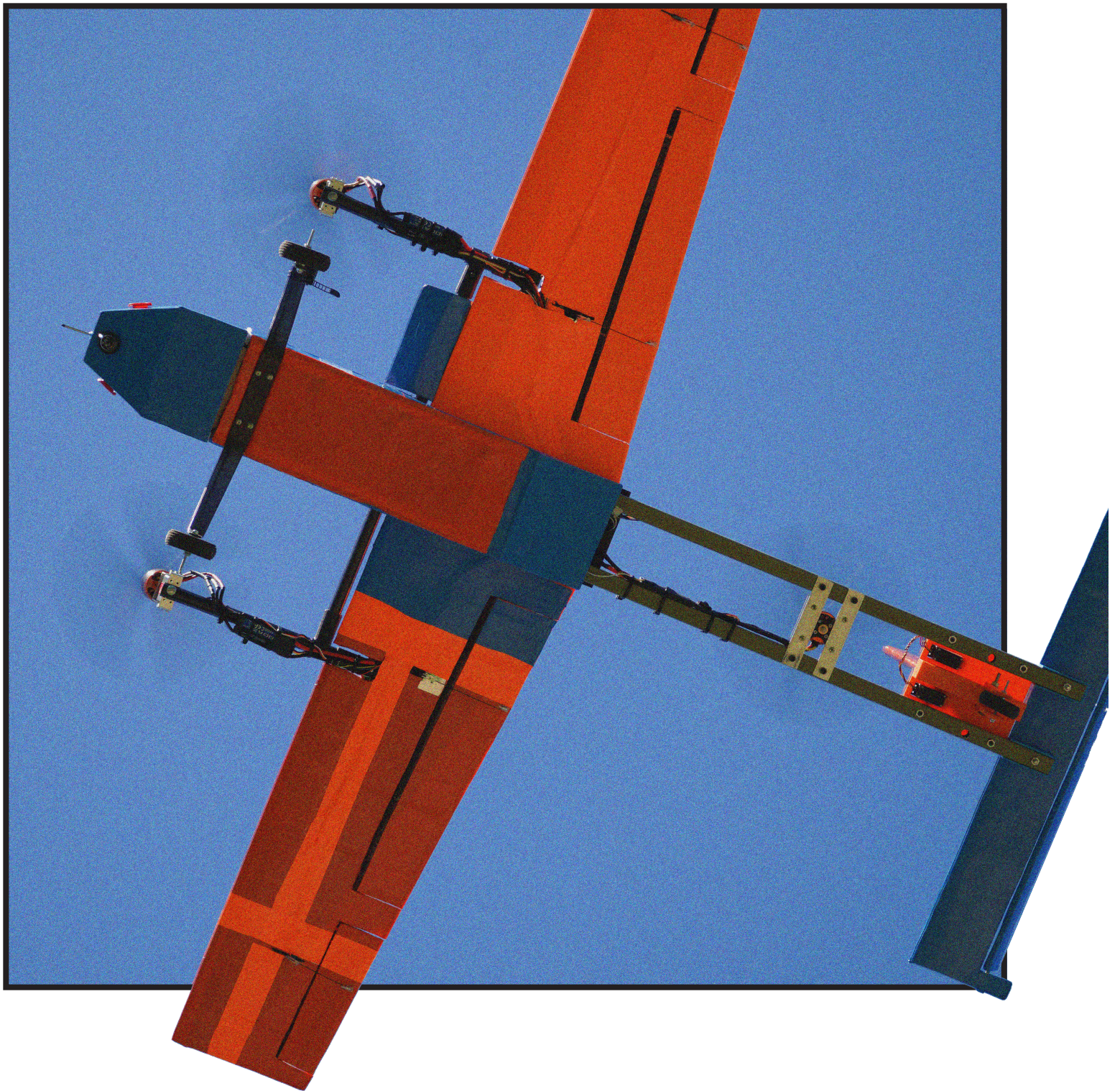


MAETRIX 2025



CONTENTS

MAE at a Glance	02	Student Teams and Clubs	18
Graduate Department Statistics	02	Pack Motorsports Baja SAE	18
Undergraduate Department Statistics	03	SolarPack	19
Department Updates	05	High-Powered Rocketry Club (HPRC)	20
A Letter From Department Head Srinath Ekkad	05	Aerial Robotics Club (ARC)	21
Graduate Department Update	06	Faculty	22
Undergraduate Department Update	07	Expanding Into MAE West	26
Senior Design	08	Hall of Fame	28
Mechanical Senior Design	08	How to Give Back to MAE	29
Aerospace Senior Design	12	Giving Stories	30
Faculty Stories	14	Basil Hassan's Gift Strengthens High-Speed Research at NC State MAE	30
Lee Receives NSF CAREER Award for Research on Deployable Shell Structures	14	Lane Miller's Gift Strengthens Commitment to NC State's Future	32
Yin Receives Prestigious PECASE Award	15		
Muller and Mamou Awarded \$2.65 Million NIH Grant For Lung Disease Research	16		

Maintained **graduate student population at ~400**

From **140 to 175 Ph.D. students**

Graduating:

- 150 AE and 350 ME in 2026 (from current 100 AE and 300 ME in 2024)
- 35 Ph.D. and 120 M.S. students every year (will grow to 50 Ph.D. and 200 M.S. in 2028)



Graduate Statistics

- 50.5 tenured and tenure track faculty
- 8 NTT teaching faculty and 3 lecturers
- 13 affiliate/adjunct faculty
- 1,458 undergraduate students (not counting freshmen)
- 420 graduate students (175 Ph.D. and 245 M.S. students)
- \$19M in research expenditures per year

From **1,200 to 1,430 undergraduate students**

From **47 to 59 faculty**

Projected growth to **1,800 by 2028** (Aerospace Engineering undergraduate population has already doubled)



Undergraduate Statistics

- Total enrollment: **1,485**
- BSAE enrollment: **383**
- BSME enrollment: **1,102**
- Average GPA: **3.43**
- Engineering First-Year MAE intended enrollment: **553**
- B.S. degrees conferred: **382**
- Average Change-of-Degree Application (CODA) GPA:
 - BSAE: **3.74**
 - BSME: **3.58**



Dear Friends, Students and Alumni of NC State MAE,

It has been another great year for the Department of Mechanical and Aerospace Engineering here at NC State University. Our programs continue to grow and attract the best students in the state of North Carolina and beyond. Last fall, we accepted the highest ever number of undergraduates in our program with over 550 students. This year, the number remains high with over 470 students. The incoming cut-off GPA for MAE programs remains around 3.5. This is the highest cut-off GPA in the College of Engineering. As we grow, our faculty and staff are determined to provide the best student experience possible. We continue to expand our labs and student club activities to benefit these large class sizes.

Our students continue to soar ahead in national and international competitions. MAE undergraduate student teams stand among the best in the nation. Our students are also winning top-notch competitive scholarships, in addition to best paper awards and poster presentations at conferences.

We continue to recruit excellent faculty. We hired Dr. Rohith Mittapally as a tenure-track Assistant Professor this year, and also attracted two fantastic teaching faculty members in Dr. Scott Kiefer and Dr. Ted Chapman; both received their Ph.D. from our department. Welcome home, Scott and Ted! We also congratulate Dr. Kevin Lyons, who retired on July 1, 2025 after 30+ years of service to NC State. Dr. Lyons led many of our combustion research efforts and was instrumental in developing novel combustion diagnostic tools. We wish him well!

Our alumni continue to support the department through philanthropy as well as student engagement and mentorship. I cannot thank our alumni enough for their contributions to our program. In this newsletter, we feature several alumni stories; read more to learn about why they choose to give back.

While the federal and state funding landscape continues to be challenging, our faculty members have stepped up; they continue to attract research, funding and awards from both federal and private agencies. MAE is leading efforts to build new research teams with target areas such as ultrasonics in biomedical applications, urban air mobility, hypersonics, advanced manufacturing and more. Many of these MAE-led efforts are inter-departmental, and have college, university and industry participation as well. You can read more about our research in this newsletter.

We hope you stay connected with the department and our activities, whether online or in-person at Open House, Senior Design Day or one of our seminars. We are constantly updating our website and social media; through this newsletter, we hope to inspire you with a few in-depth stories. If you ever want to stop by and visit us in Raleigh, please email me at sekkad@ncsu.edu.

Best Regards,

Srinath V. Ekkad
Department Head and RJ Reynolds Professor

Graduate Programs Growing and Supporting Community



Students are also enthusiastic about our new career services and professional development initiatives.

“We’re building new career resources for MAE graduate students, including one-on-one advising, tailored workshops and professional development support to help them succeed beyond the classroom,” said Riddell, the newest MAE Graduate Program Assistant. “I’m excited to be in this role and to support our students as they explore and pursue their goals.”

Our MAE Graduate Program has enjoyed an exceptional year with expanded programming and opportunities for our students. I want to acknowledge the hard work of our tremendous staff in the Graduate Office, led by Summer Fulcher (Graduate Programs Manager), and supported by Brandon Jones and Jay Riddell. Fulcher helms our demanding student support and operations needs, serving our almost 400 graduate students as they navigate their research and teaching assistant positions; this includes degree milestones such as preliminary exams and final defenses, as well as graduation and beyond. With updated handbooks and a refreshed MAE Grad Program web portal for our current and prospective students, the pathway to graduation has never been clearer.

Jones leads our recruiting and admissions activities, which we have expanded over the last year to include in-person recruiting at national conferences, such as the International Mechanical Engineering Congress and Exposition (IMECE) and the Society for Women Engineers (SWE). We also offer online webinars that provide admissions information for interested students across the globe. We’ve seen a significant increase in qualified applicants from top schools around the U.S. and from international regions, with applicants being drawn by our diverse research strengths and geographic position in the Research Triangle.

Riddell is helping M.S. and Ph.D. students shape their careers with personalized guidance, resume review (an online hub with career guidance resources), weekly workshops on professional development topics, and support for co-ops and internships. Recently, we hosted the inaugural MAE Career Fair to provide better connections between students and employers.

One of the things we’ve been working diligently on is building community among the students, faculty and staff. To that end, we have worked closely with our Graduate Student Association to identify ways that the students can be more involved in the academic fabric of the department.

For example, we have hosted research mixers between faculty and students to help students find a research lab, and provided students with the opportunity to network with our guest seminar speakers over lunch. We also hosted, “Ask Dr. Saul Anything”, an open forum to answer pressing questions about how things work (grant finances, degree timelines, academic vs. industry jobs and more), or offer suggestions on areas of improvement for the program.

It has been a fun year supporting our students, and I look forward to more growth and student success in the year to come.

Undergraduate Programs Thriving and Staying Strong



Student involvement in research labs has also been steady thanks to the Research Experience for Undergraduates (REU) program; REU draws more than 30 students, in addition to other students informally involved in research mentoring throughout our research labs. Our annual undergraduate research poster presentations are a testament to the quality of our students’ research and the positive involvement of our faculty.

Our diverse clubs, which compete in various competitions across the U.S., thrive on strong multi-disciplinary collaborations across the College of Engineering and beyond. Wolfpack Motorsports (Formula SAE and Baja SAE) and the NC State High-Powered Rocketry Club (Tycho Lycos) have been garnering top prizes in national competitions. Recently, team Tycho Lycos was ranked 2nd in the NASA Student Launch Competition and placed first in the Project Review Award. You can read more about their success in this newsletter. Another club, the Liquid Rocketry team, took third place in the team category at the 2025 American Institute of Aeronautics and Astronautics (AIAA) Region II Student Conference.

Student organizations, including the chapters of ASME, AIAA and ASHRAE, have provided a focal point for mentoring and networking. Recently, our AIAA student chapter earned national recognition as the Best Chapter Award Winner.

The student experience in our classrooms is hard to match, as compared to peer institutions. Student engagement in the classroom reflects the high quality of our instruction. Our faculty roster boasts numerous recipients of teaching and research awards, who remain committed to teaching and mentoring the next generation of mechanical and aerospace engineers. Our classroom and laboratory facilities are designed for effective teaching and provide a hands-on experience for our students to build and experiment. We look forward to another year of growth and success.

NC State MAE is the place to be these days. Our talented and highly motivated students leave their footprint beyond the classroom, from Senior Design shops to research labs, innovation and entrepreneurship lounges, and outstanding clubs and organizations. These different opportunities have forged close communities, allowing students to thrive in our large, dual program department.

Our two programs have experienced steady growth, fueled by growing interest in their broad disciplines. Interest in space and the reemergence of hypersonic flight are drawing an increasing number of students to the only such program in NC. Mechanical Engineering, which some consider to be the “liberal arts” of engineering, by itself, covers a broad range of disciplines that are characteristic of today’s engineering industry. As interest in robotics, manufacturing and clean energy has grown, Mechanical Engineering has become the major of choice for many.

To better adapt to the needs of our growing Aerospace Engineering program, the traditional single section for every core course is now transition to two sections. To maintain a high quality of instruction, we’ve been able to hire outstanding new faculty who have helped us expand into new areas, and strengthen our existing areas of concentration in research.



Each year, seniors from the Department of Mechanical and Aerospace Engineering at NC State University participate in Capstone Senior Design, where students build and showcase a variety of engineering projects throughout the academic year. The course is split into two parts: MAE 415 in the fall and MAE 416 in the spring, offering Mechanical Engineering and Aerospace Engineering students the opportunity to address real-world engineering challenges.

Mechanical Senior Design



In the 2024–2025 academic year, there were nine sections comprised of 247 total students. Four sections worked on industry-sponsored external projects, and five sections worked on departmental internal projects. In the fall, they worked on conceptual design through presentations, reports and computer simulations. In the spring, the students built the prototypes. The prototypes were tested twice with the second test providing statistical data showing robustness.

There were three Senior Design Days this year, held from April 16 to April 18. Each Senior Design Day was composed of formal presentation sessions in the morning and prototype demonstration sessions in the lab in the afternoon. It was overall a success. Over 90% of the prototypes worked. The others, though not completely, worked partially.

ABB's sponsored project was titled "Multi-point Latch (MPL) Door for Arc Resistant Switchgear." The purpose of this project was to design and construct a rigid multi-point latch door for ABB's SafeGear housing. The door will protect nearby operators and equipment in the event of an

internal arc fault, while also locking with one operation. The design will allow technicians to easily access the switchgear and maintain the high safety standards of ABB.

Corning sponsored a senior design project titled "Interferometer Optical Interface," which tasked students with developing a semi-permanent interface between the DataPixel DAISI-MT interferometer and the multifiber optical connector cable. The interface allows for precise evaluation, isolates the cable and minimizes calibration time. This new interface increases repeatability and life cycle compared to the existing solution without impeding measurements.

The Naval Surface Warfare Center Dahlgren Division sponsored a project titled "Terminal Ballistics Testing Projectile." The goal of the project was to design, manufacture and test a hypersonic projectile to be launched from a medium caliber electromagnetic rail gun at the Naval Surface Warfare Center. The projectile will act as a ballistic test vehicle for future experiments.



Zurn Elkay Water Solutions sponsored a project titled "Above Deck Sensor Faucet with Sustainable Power," which tasked students with designing a robust faucet that integrates a motor, ceramic cartridge, sustainable power source, rechargeable batteries and water-resistant control electronics. The faucet had to meet design goals for compactness, long battery life, reliability, serviceability and manufacturability, all while operating at 50 psi with a 0.5 GPM flow rate.

The first departmental internal senior design project was conducted in collaboration with the College of Veterinary Medicine and was titled "Transport of Livestock for Treatment." Students were challenged to design and construct a system for the safe transport of large animal patients in and around the Veterinary Hospital. The design had to require minimal manpower and training while aligning with the college's mission of world-class care.

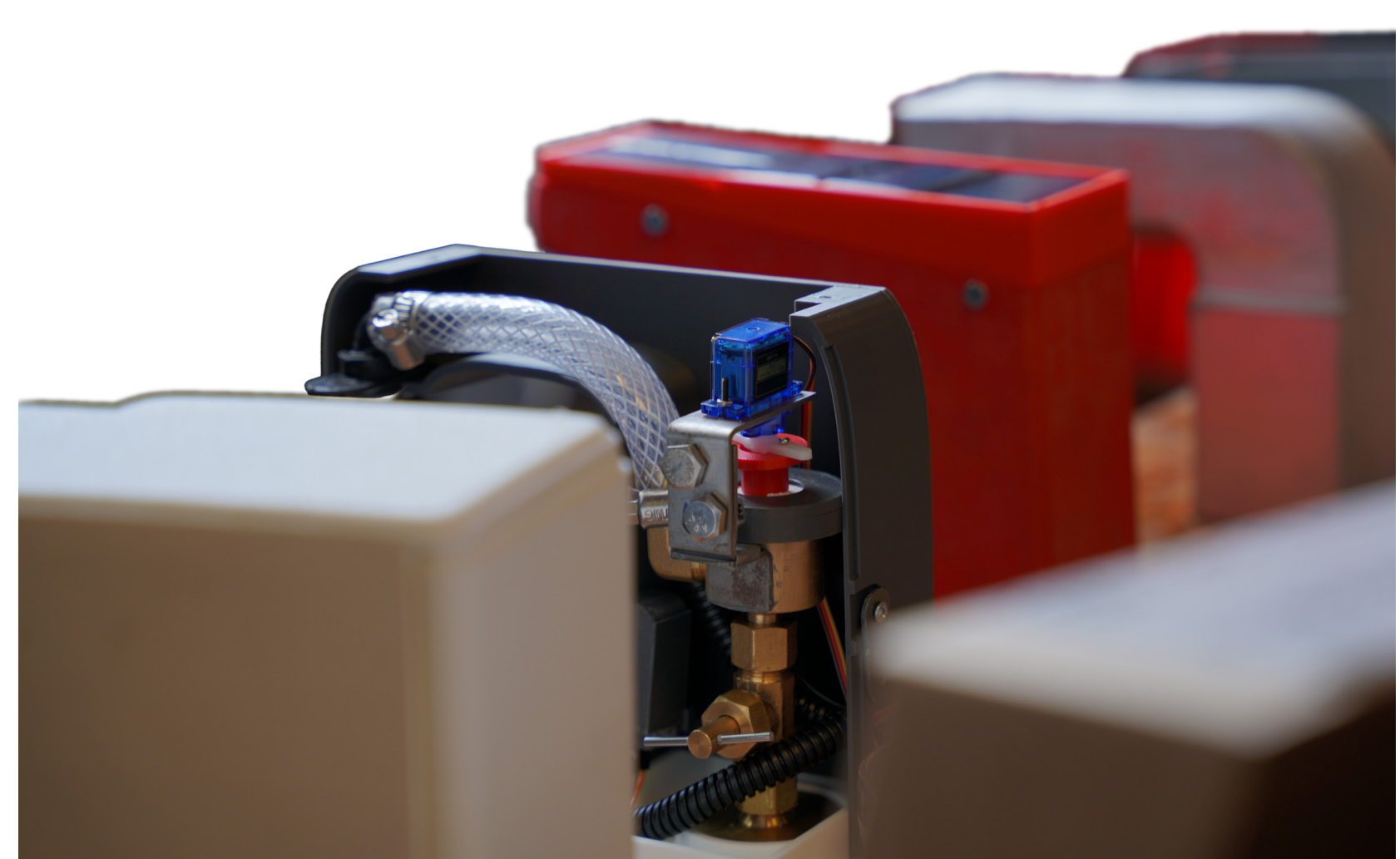
The Department of Horticultural Science sponsored a project titled "Mechanical Harvester for Open Field Tomatoes," which tasked students with developing a tomato harvesting system that could identify ripe round tomatoes by diameter or color and extract them from the bush. The aim was to create an efficient system to reduce labor costs in agricultural harvesting.

Another departmental project was titled "Small Fan Array Wind Tunnel (FAWT) Design," and called for the design of a small, portable wind

tunnel capable of generating controlled airflow for testing. The design needed to accommodate adjustable fan speeds, replicate various wind conditions, minimize noise, and fit within space, power and cost constraints.

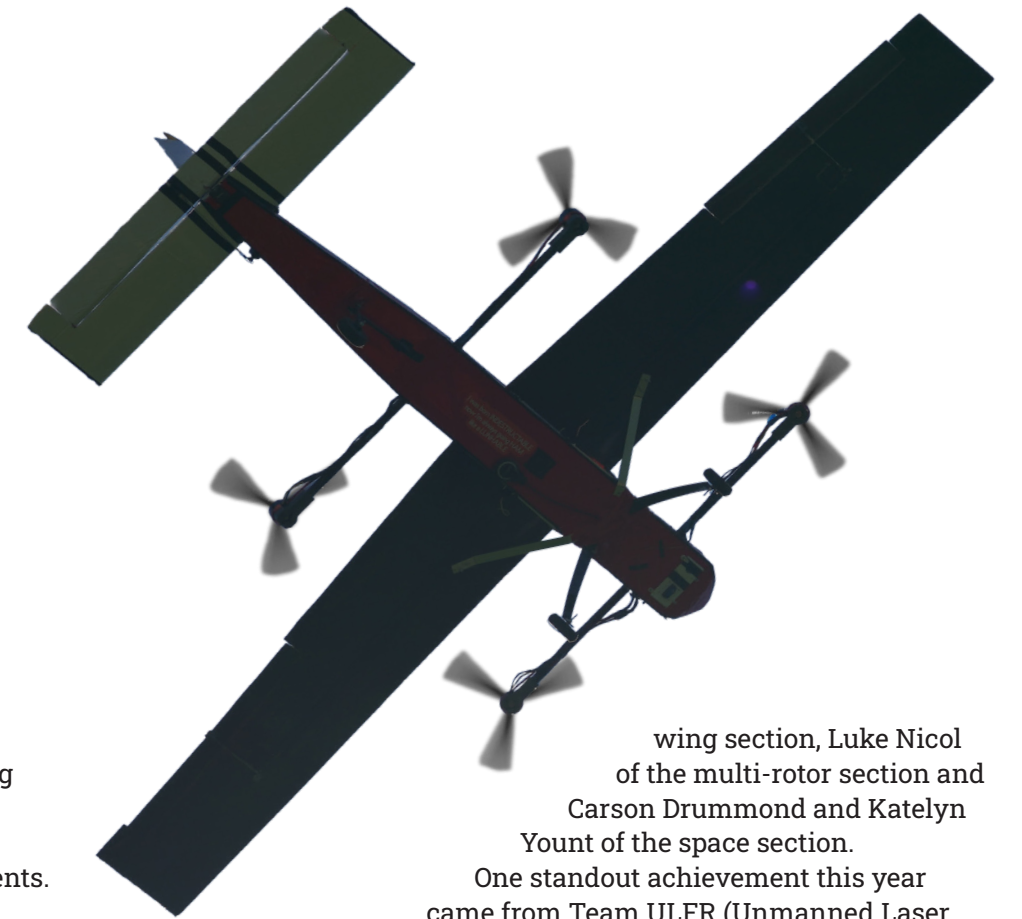
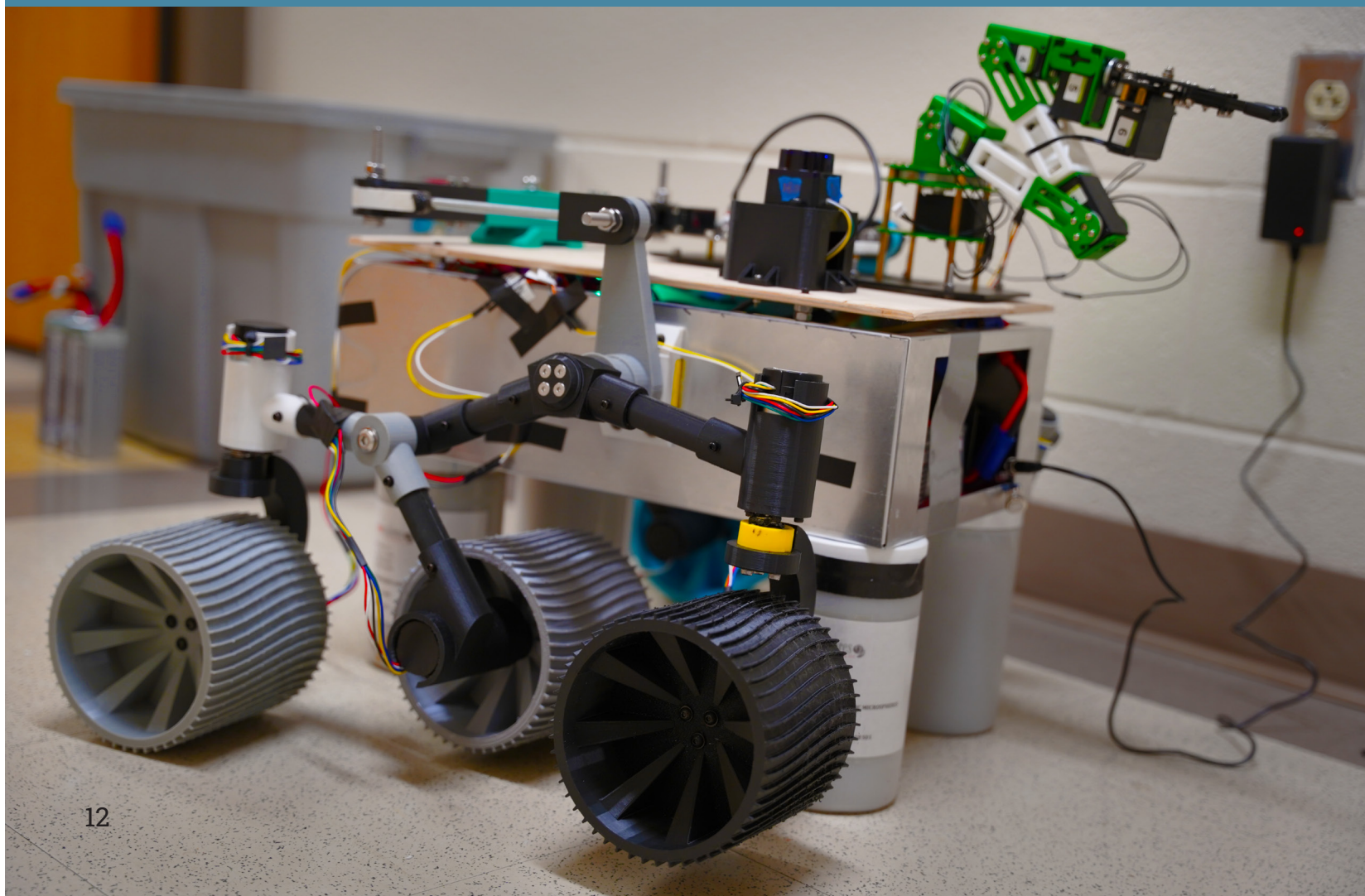
The ME Lab also sponsored a departmental project titled "Benchtop Wind Tunnel for Lift and Drag Measurements," in which students were tasked with designing a compact and intuitive wind tunnel that could be used in MAE 306 lab coursework. The wind tunnel needed to accurately measure lift, drag, and pressure on different aerodynamic bodies at speeds up to 22 mph, while being portable and easy to replicate.

The final internal project cluster came from Pack Motorsports and included multiple design challenges to support the Baja and Formula SAE teams. The Formula SAE team's projects included the design and construction of a modular pit cart for testing and competitions, a safe and robust car jack system for raising the vehicle and an accumulator battery segment capable of withstanding extreme forces. The Baja SAE team's projects included designing a torque converter system to optimize gear ratios and minimize power loss and constructing a pull-down corner testing rig to analyze suspension performance. These five design projects were completed by a combined group of 28 students across five teams and contributed to the performance of Pack Motorsports' 2024-2025 competition vehicles.



Aerospace Senior Design

Each year, seniors from the Department of Mechanical and Aerospace Engineering participate in Senior Design, in which students showcase a variety of senior design projects that they built throughout the semester. The course is split into a Mechanical Engineering Senior Design Course and an Aerospace Engineering Senior Design Course, both of which task students with specific issues they must solve by designing and building a prototype of a product or device that could aid in a variety of different applications.



In the 2024–2025 Aerospace Engineering Senior Design course, there were 17 teams comprised of 110 students. Seven of those teams were assigned space-related projects: four teams developed Mars Rover concepts for the RASC-AL Competition, two teams designed CubeSat missions for the UNP Mission Concept, and one team built a solid-fueled rocket to compete in NASA's Student Launch. Six teams developed fixed-wing unmanned aerial vehicles (UAVs), five of which were entered into NASA's Gateways to Blue Skies competition and the AIAA Design-Build-Fly (DBF) challenge. Four teams constructed multi-rotor UAVs, including two for the Blue Skies competition, one for the Vertical Flight Society's DBVF challenge and one under the Liquid Rocketry Lab's Advanced Projects initiative.

As in years past, Aerospace Engineering Senior Design Instructor Dr. Felix Ewere presented three Outstanding Project Manager Awards in recognition of team leads who went above and beyond in leading their teams through complex design and prototyping efforts. This year's honorees were Galen Day of the fixed-

wing section, Luke Nicol of the multi-rotor section and Carson Drummond and Katelyn Yount of the space section.

One standout achievement this year came from Team ULFR (Unmanned Laser Farming and Reconnaissance Vehicle), which won the fixed-wing category. The team was led by Hannah Nguyen, marking the first time in the program's history that a female project manager led the overall winning team in the fixed-wing category. In the multi-rotor category, Team VFS DBVF, competing in the Vertical Flight Society's Design Build Vertical Flight challenge, took top honors. In the space section, the winning team was Team CLEOSATRA (Computational Low Earth Orbit SATellite for Reliable Accessibility), which designed a mission to enhance satellite-based accessibility in low Earth orbit.

These three teams were selected by a panel of judges as the top performers of their respective categories during the annual Aerospace Engineering Senior Design Symposium, held on April 8. To earn their distinctions, teams delivered formal 15-minute presentations in the morning and participated in interactive poster sessions in the afternoon, where friends, family, faculty and industry partners gathered to see the culmination of their efforts.

Lee Receives NSF CAREER Award for Research on Deployable Shell Structures



“The outcomes are anticipated to include new design principles for future deployable and adaptive structures that will advance the frontiers of space exploration, robotics and morphing vehicles.”

Andrew Lee, an assistant professor in the Department of Mechanical and Aerospace Engineering at North Carolina State University, has received a highly competitive Faculty Early Career Development (CAREER) Award from the National Science Foundation to support groundbreaking research on the behavior of deployable shell structures—innovative systems critical to the future of space exploration, robotics and adaptive vehicles.

The award supports Lee’s project, which seeks to unravel the fundamental mechanics behind propagating instabilities—the complex folding and motion behaviors that occur during the deployment of tightly packaged thin-shell structures. These shells are valued for their exceptional stiffness-to-mass ratios and potential to stow elastically and self-deploy efficiently, but excessive packaging can lead to unpredictable, chaotic motions that risk failure or damage.

“The outcomes are anticipated to include new design principles for future deployable and adaptive structures that will advance the frontiers of space exploration, robotics and morphing vehicles.”

Lee’s team will use a combined experimental and computational approach to produce motion

response maps and strain energy stability landscapes that reveal how instabilities propagate, interact and can be controlled. These maps will explore key behaviors such as fold convergence, divergence, reflection and bifurcation. A second phase of the research will explore packaging strategies and material design modifications that mitigate chaotic deployment and improve reliability, particularly in composite and curved shell structures.

The broader impacts of the award extend beyond academia. Lee’s program will also provide research internships for high school students, hands-on experiences for undergraduate researchers and interactive exhibits at local STEM events and museums, inspiring future generations of engineers and scientists.

The NSF CAREER Award is one of the most prestigious honors in support of early-career faculty who exemplify the role of teacher-scholars through outstanding research, education and the integration of both.

This award was granted based on NSF’s criteria of intellectual merit and broader societal impacts, reflecting the agency’s mission to support work that advances science and benefits the public.

Yin Receives Prestigious PECASE Award



Jie Yin, an associate professor in the Department of Mechanical and Aerospace Engineering (MAE) at North Carolina State University, has been named a recipient of the Presidential Early Career Award for Scientists and Engineers (PECASE), the highest honor bestowed by the U.S. government on early-career scientists and engineers. President Joe Biden announced the nearly 400 recipients of the 2024 awards during a ceremony recognizing their groundbreaking contributions to science and technology.

Established in 1996, PECASE highlights the achievements of exceptional scientists and engineers who demonstrate innovative and far-reaching potential in their research. The award not only honors individual contributions but also emphasizes the critical role of science and technology in addressing national and global challenges.

The recognition of Yin among the nation’s top early-career scientists underscores NC State’s commitment to fostering research excellence. The MAE department, known for its contributions to engineering innovation, is proud to support researchers like Yin, whose work pushes the boundaries of knowledge and delivers tangible benefits to society.

The PECASE recipients’ contributions exemplify the intersection of innovation and societal impact, this marks a significant milestone

in Yin’s career and further cements NC State’s reputation as a leader in engineering research and education. Yin is the second faculty member from MAE to win a PECASE award, joining Associate Professor Hsiao-Ying Shadow Huang as a member of this elite group of researchers .

Currently, Yin’s Research focuses on mechanics and design of mechanical metamaterials, mechanics guided design of soft robotics and multifunctional interfacial materials. He studies reconfigurable kirigami-based architected materials for achieving unprecedented properties and functionalities. He also studies the mechanics guided design of high-performance soft robotics in both manipulation and locomotion for achieving high force, high speed and high strength. Another topic is shape-morphing materials and structures for sustainable energy and environments. All of these topics are investigated through combining theoretical modeling, numerical simulation and experimental techniques.

PECASE recipients are selected by 14 federal agencies, including the Departments of Defense, Energy, and Transportation, NASA, the National Science Foundation, and the Environmental Protection Agency. The award recognizes efforts to expand the scientific missions of these agencies, promotes societal awareness of science and technology careers and ensures a brighter future through cutting-edge research.

Muller and Mamou Awarded \$2.65 Million NIH Grant For Lung Disease Research

Marie Muller, an associate professor in the Department of Mechanical and Aerospace Engineering at North Carolina State University, and Jonathan Mamou, a professor of electrical engineering in radiology at Weill Cornell Medicine, have been awarded a \$2.65 million R01 grant from the National Institutes of Health. Their project, titled "Quantitative Ultrasound for Interstitial Lung Diseases," aims to develop advanced methods for diagnosing and monitoring lung diseases.



and systems. We hypothesize that this approach will allow for sensitive and specific diagnoses of interstitial lung diseases."

Traditionally, conditions like pulmonary edema and fibrosis have been diagnosed using chest X-rays, CT scans or invasive pulmonary function tests. These methods are not ideal for frequent monitoring due to high costs, exposure to ionizing radiation and significant inter-observer variability. Pulmonary function tests are effort-dependent and can yield inconsistent results in patients with symptoms like coughing or shortness of breath. This underscores the need for a noninvasive, real-time, point-of-care method that does not expose patients to radiation.

"Ultrasound propagation in the lungs is complex due to the strong scattering properties of air sacs," Muller said. "In this project, we'll leverage sophisticated, physics-based approaches to quantify single and multiple scattering events. This will enable us to extract lung-quantitative ultrasound biomarkers that reflect the lung microstructure, particularly air content. These QUS parameters could provide valuable diagnostic insights."

The work led by Muller and Mamou has the potential to transform the diagnosis and monitoring of interstitial lung diseases, offering a safer, more practical alternative to current diagnostic tools.

Traditional ultrasound methods are unable to quantitatively evaluate conditions such as pulmonary edema and fibrosis. Muller, the grant's contact principal investigator, and Mamou seek to create quantitative ultrasound (QUS) techniques to measure pulmonary edema severity in heart failure patients and to monitor their responses to diuretic treatment. They will also explore the potential of these techniques to assess pulmonary fibrosis.

"Currently, expert clinicians rely on visible artifacts in lung ultrasound images to diagnose interstitial lung diseases. However, these artifacts can vary depending on ultrasound imaging settings, and their interpretation is often subjective," Mamou said. "In collaboration with Dr. Muller, we will move away from imaging altogether, instead using ultrasound data to measure lung-quantitative ultrasound parameters linked to lung microstructure. These parameters are independent of users



Pack Motorsports Baja SAE

The Pack Motorsports Baja team designs and builds a vehicle each year to go to competition (sponsored by the Society of Automotive Engineers, or SAE). This 2025-26 season marks the team's 50th anniversary. In 2024-25, the car featured a fully customized continuously variable transmission (CVT), born out of the previous year's senior design project.

The team traveled to Baja SAE Maryland in June of 2025; there, for the first time since 2016, NC State placed in the top 10 at an SAE competition!



"Not only was this a big manufacturing feat, but it was an even bigger technical advancement, leading us to place 9th out of 98 in the acceleration event and top 15 in all other dynamic events amongst teams from North and South America, India and Canada," said team member Dillon Hull. "When I saw the checkered flag in the four hour endurance race, I couldn't believe that a transmission I helped make lasted the torture of an entire Baja event while performing amongst the top teams."

In a testament to the team's growing popularity, in 2020, Baja had roughly 10 returning members; in 2025, the team had over 50 returning members! The team looks forward to competing in the Baja SAE Carolina Competition in October, 2025.

- 8th** Overall
- 9th** in Acceleration
- 12th** in Maneuverability
- 7th** in Suspension and Traction
- 11th** in Endurance
- 14th** in Hill Climb



SolarPack



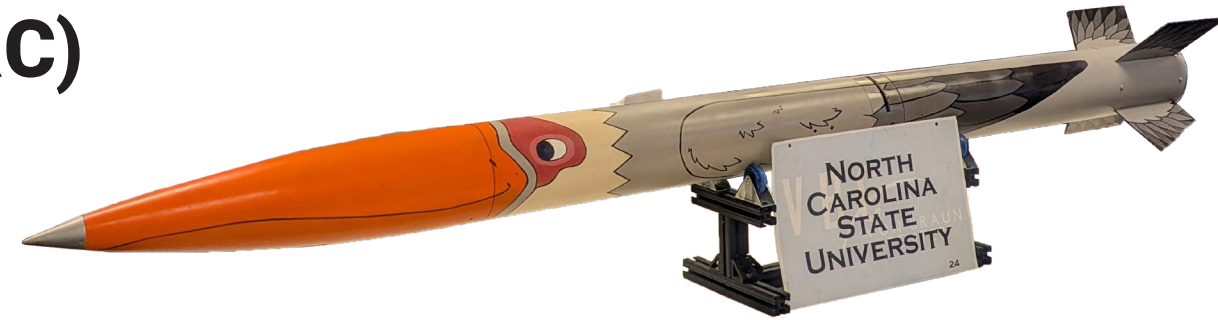
SolarPack works to create vehicles powered by solar energy. This summer, the team attended the Electrek Formula Sun Grand Prix 2025 in Kentucky. Although SolarPack did not take to the track for competition, the team is gearing up to compete in 2026 with their new solar car, Fenrir.

At this past year's Sun Grand Prix, SolarPack members connected with other teams and expanded their knowledge within the solar powered vehicle industry. This included "Scrutineering", where teams and their cars underwent several days of scrutiny from the event's technical staff.

In preparation for next year's Sun Grand Prix, the team has made improvements to Fenrir including: welding a custom chassis made from mild steel, upgrading the car's battery pack and making the car lighter. For added charm, the team installed an Apple CarPlay sound system along with a subwoofer and programmable LED lights – not just for aesthetics, but to help the car stand out in competition.

Next steps for the team include manufacturing an aeroshell and attaching solar cells to the car. Come 2026, Fenrir will be ready to lead the pack in competition!

High-Powered Rocketry Club (HPRC)



NC State's High-Powered Rocketry Club (HPRC) designs and creates rockets to send to launch. This past year, their goals focused on planning, documentation and innovative design.

This past year, HPRC competed in the 2025 NASA Student Launch Challenge; over the course of nine months, the team focused on the planning, documentation and innovative design of their rocket. In May, 2025, the team traveled to Huntsville, Alabama for the culmination of the Launch Challenge.

The competition rocket included a new airbrakes system that allowed its apogee to be controlled, plus an updated fin system that made changes possible in case a fin was damaged in

flight. The rocket ended up weighing 39.8 lbs, was 93.75 inches tall and was launched on an L1520T.

NASA's 2025 challenge was to collect relevant flight data during launch and transmit it back to a receiver upon landing. Eight data points were measured, and the NC State team correctly collected and transmitted all of them to the NASA receiver.

HPRC placed 2nd overall in the Launch Challenge, the highest the team has ever placed in competition. The team also placed 1st in the Project Review Award, 2nd in the AIAA Reusable Launch Vehicle Innovative Payload Award, and 2nd in the Safety Award.



Aerial Robotics Club (ARC)



NC State's Aerial Robotics Club (ARC) designs and builds autonomous search and rescue aerial systems. The team competed in the 2025 Student Unmanned Aerial Systems (SUAS) competition in Maryland over the summer. Out of 49 teams, NC State placed 25th in the competition, flying Kavik V2.

Engineering Kavik V2 was a huge accomplishment for this year's team. Because ARC had previously competed in SUAS, the team was able to gear their design changes to create a UAS system that could be easily transported and fly more slowly for better accuracy.

Overall, Kavik V2 was designed to meet competition requirements while also seeking to improve mission performance – a fantastic accomplishment for the 2025 Aerial Robotics Team!

A meaningful moment for the team was Kavik V2's first and only flight test – the only test the team flew before heading to the competition. V2's successful test inspired confidence and excitement within the team to show off their hard work. Here's to V3 and next year's team of innovators!

25th Overall out of 49 teams



Sajjad Bigham
Associate Professor



James Braun
Assistant Professor



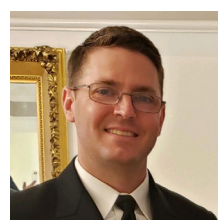
Matthew Bryant
Associate Professor



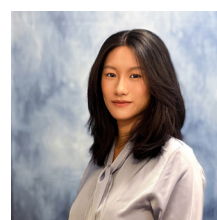
Gregory Buckner
Professor



Darius Carter
Assistant Professor



Edward Chapman
Teaching Professor



Chuyi Chen
Assistant Professor



Mingtai Chen
Assistant Teaching
Professor



Tarek Echecki
Associate Department
Head



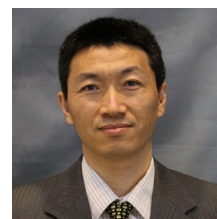
Jack Edwards
Director of Aerospace
Research



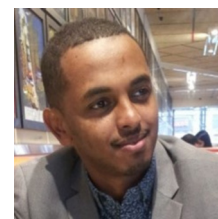
Srinath Ekkad
Department Head



Felix Ewere
Associate Teaching
Professor



Tiegang Fang
Professor



Etana Ferede
Assistant Teaching
Professor



Scott Ferguson
Associate Professor



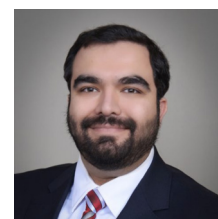
Farhan Gandhi
Hassan A. Hassan
Distinguished Professor



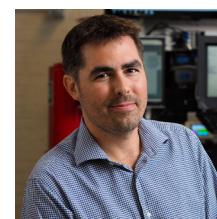
**Ashok
Gopalathnam**
Professor



Landon Grace
Associate Professor



**Mohammad
Heiranian**
Assistant Professor



Tim Horn
Assistant Professor



Anna Howard
Teaching Professor



Jingjie Hu
Assistant Professor



**Hsiao-Ying Shadow
Huang**
Associate Professor



Xiaoning Jiang
Dean F. Duncan
Distinguished Professor

Faculty



Scott Kiefer
Associate Teaching
Professor



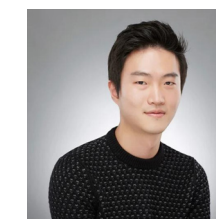
Arun Kumar Kota
Associate Professor



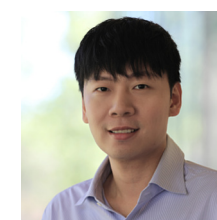
Andrey Kuznetsov
Professor



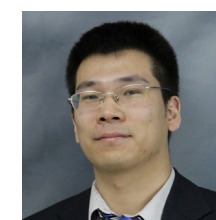
Andrew Lee
Assistant Professor



Donggun Lee
Assistant Professor



Jaemin Lee
Assistant Professor



Jun Liu
Associate Professor



Hong Luo
Professor



Andre Mazzoleni
Professor



Mehran Mirramezani
Assistant Professor



Rohith Mittapally
Assistant Professor



Nancy Moore
Associate Teaching
Professor



Mark Moretto
Assistant Professor



Marie Muller
Associate Professor



**Venkat
Narayanaswamy**
Professor



Gracious Ngaile
Professor



Brendan O'Connor
Professor



Laura Paquin
Assistant Professor



Kara Peters
Distinguished
Professor



Afsaneh Rabiei
Professor



Jong Eun Ryu
Assistant Professor



Susmita Sarkar
Assistant Professor



Katherine Saul
Professor



Alexei Saveliev
Associate Professor



Larry Silverberg
Professor



Hooman Tafreshi
Professor



Chau Tran
Associate Teaching
Professor



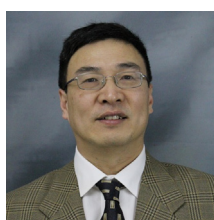
Cheryl Tran
Director of
Undergraduate Advising



Jay Tu
Professor



Henry Ware
Assistant Professor



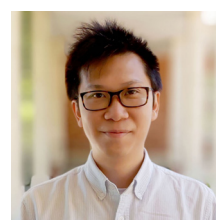
Fen Wu
Professor



Liming Xiong
Associate Professor



Cheryl Xu
Professor



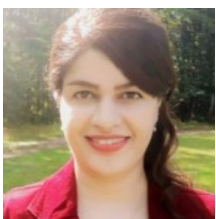
Chi-An Yeh
Assistant Professor



Jie Yin
Associate Professor



Fuh-Gwo Yuan
Samuel P. Langley
Distinguished Professor



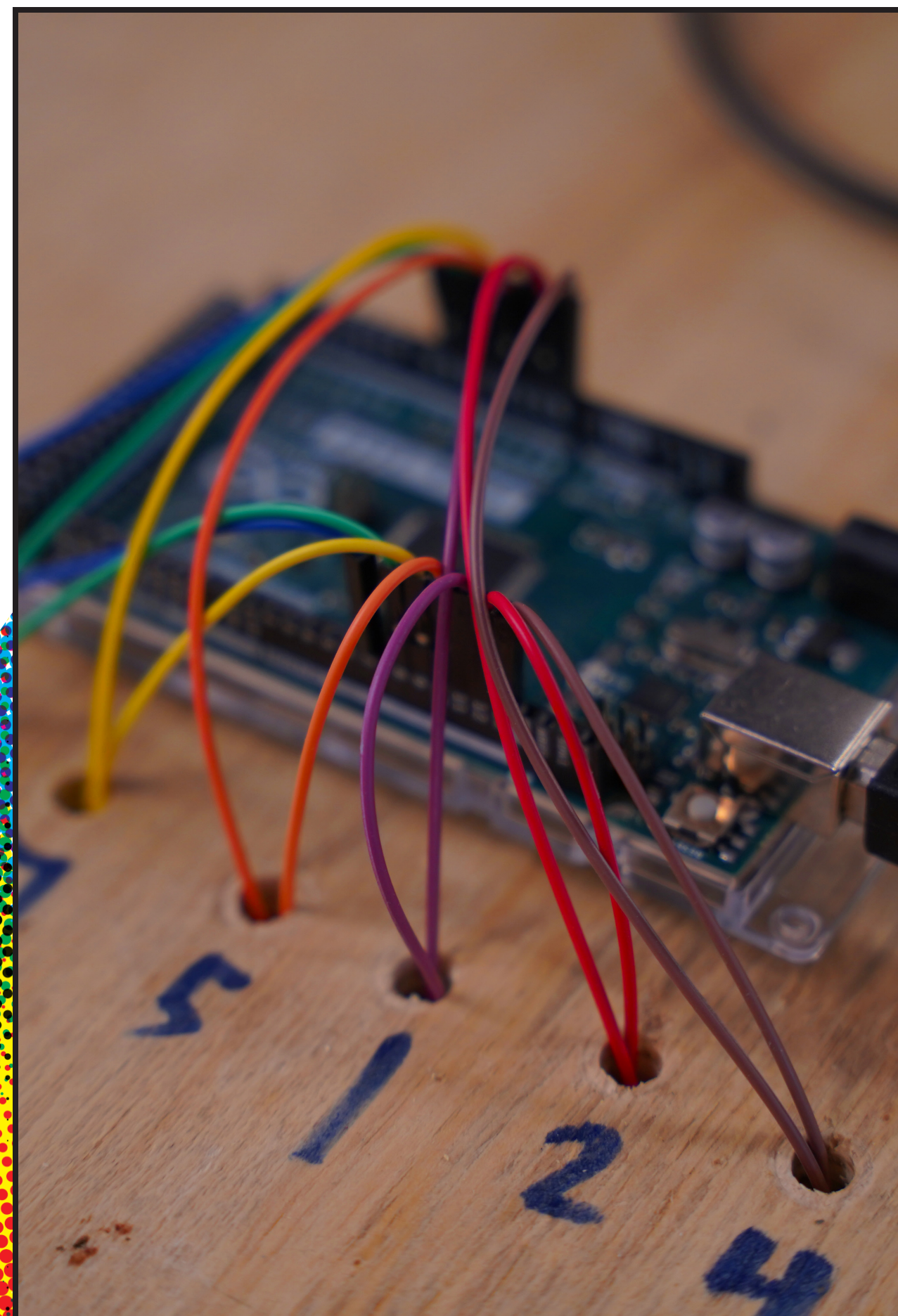
Mary Zadeh
Assistant Teaching
Professor



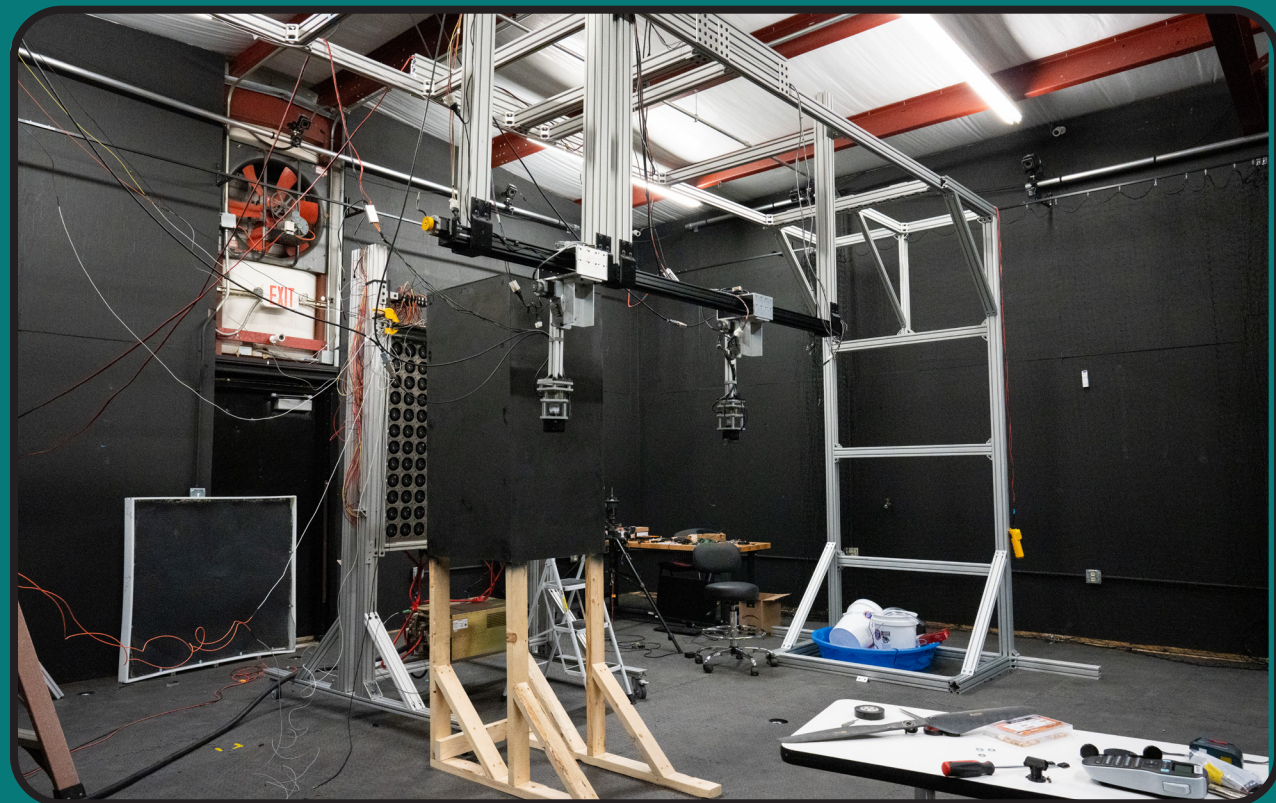
Yong Zhu
Associate
Department Head for
Research and Faculty
Advancement



Mohammed Zikry
Zan Prevost Smith
Professor



MAE West



At NC State MAE, space is always a consideration. Not just aerospace, but working space for our hundreds of researchers, faculty, students and more. That's why we're so excited to showcase our growing spaces at MAE West.

MAE West, located on the west side of campus near the NC State Fairgrounds, boasts 6,600 square feet of lab space, 850 square feet of office space and 500 square feet of conference and meeting room space.

MAE West supports all types of cutting edge mechanical and aerospace research, from combustion to high speed aerodynamics, heat transfer, advanced manufacturing and more!

Of particular importance is MAE West's hypersonic tunnel. The tunnel, which is capable of reaching speeds up to Mach 6 (six times the speed of sound), simulates high-speed flight conditions for up to 10 seconds – long enough to see how materials and flight controls behave during realistic flight situations.



2024 Hall of Fame

Built upon their common educational foundation at NC State University, the MAE Alumni Hall of Fame was established in 2012 to inspire our current students and to celebrate the accomplishments of our extraordinary graduates who have used their education to excel in a profession, career or service. This nomination is based on professional and service achievement, entrepreneurship and contributions to professional societies making this a truly noteworthy distinction.

With over 12,000 MAE alumni, only 170, including this year's class, have been inducted into the MAE Hall of Fame. The MAE Department is honored to celebrate this prestigious ceremony with the 2024 class.



Ryan Bond



John E. Bradford



Katya Casper



Renato M. Cotta



Richard L. Gaffney Jr.



J. Budd Hipp Jr.



Wooseung Kim



Alvin A. Mason III

How to Give Back to MAE

MAE engages with alumni, friends and companies because we know that strong partnerships are imperative and help fuel success. In addition to financial support, you can give back to MAE by mentoring a student, volunteering for one of our advisory boards, recruiting students to your company or partnering with faculty to support their research. By partnering with MAE, you will gain access to top students and faculty at one of the premier MAE departments in the country.

There are many ways to give back to the MAE Department that help our students and faculty:



By making a gift to the MAE Enhancement Fund, you are helping to fund some of the greatest needs within the department that directly support student programs and faculty research.



Give a gift to name a space in Engineering Building III to help support critical research and learning experiences for our faculty and students.



Establish an endowed scholarship, graduate fellowship or professorship that will generate support in perpetuity for our students and faculty.



Your company can give back by becoming a member of the MAE Corporate Partners program through sponsorship of a senior design project or by making a corporate contribution to the department.

Basil Hassan's Gift Strengthens High-Speed Research at NC State MAE



NC State University's Department of Mechanical and Aerospace Engineering (MAE) will soon honor alumnus and longtime supporter Basil Hassan with the naming of its high-speed laboratory in the MAE West Annex. Hassan, a distinguished aerospace engineer and NC State graduate, has made a significant gift to the department, furthering his commitment to advancing aerospace education and research.

The newly named high-speed lab, which houses the department's hypersonic and supersonic wind tunnels, will bear the Hassan name, marking another milestone in Hassan's legacy of philanthropy. The lab's formal title is still being finalized in collaboration with department leadership, but it will reflect its critical role in aerospace research.

This gift continues Hassan's deep ties to NC State and the aerospace program, which were first established by his father, Hassan A. Hassan. A pioneering figure in NC State's aerospace engineering program, the

elder Hassan helped lay the foundation for what is now one of the leading aerospace programs in the country. Through past philanthropic efforts, the Hassan Family has established scholarships, a lecture series, and other funds to honor his father's contributions. Now, he is making his own mark by naming the high-speed lab.

"I wouldn't be here today if it wasn't for what I received from NC State," Hassan said. "This is my time to give back, and this is my time to ensure that hypersonics at NC State is successful."

A Passion for Aerospace

Hassan's journey in aerospace engineering began in childhood, inspired by his father's work and experiences such as attending the 75th anniversary of the Wright Brothers' flight in 1978. As a student at NC State, he immersed himself in hands-on experiences, including working in the low-speed wind tunnel, contributing to the AIAA student section and collaborating with faculty mentors who shaped his future.

"I wouldn't be here today if it wasn't for what I received from NC State. This is my time to give back, and this is my time to ensure that hypersonics at NC State is successful."

During his academic career, Hassan interned at NASA Langley Research Center, where he spent multiple summers conducting research. "That was a really great program because it gave us the opportunity to work on real-world problems alongside NASA engineers," he said. "It ideally prepared me for a career at a national lab like Sandia."

A Lasting Impact

Now a leader at Sandia National Laboratories and a past president of AIAA, Hassan remains committed to ensuring future aerospace engineers have the same opportunities he did. His philanthropy has primarily supported hands-on student experiences, funding aerospace projects, conference travel and essential equipment.

"I want the students of today to experience the same thing I have, because they will ultimately see how it will have a positive impact on their professional careers," he said. "The high-speed lab will allow students to better understand the physics behind hypersonic flow, which is critical for making future aerospace systems safe and effective."

As the aerospace industry continues to evolve, Hassan sees NC State as a key player in future research and education. "The Research Triangle area has unique capabilities across aerospace, mechanical systems, controls, and computing," he said. "NC State's ability to integrate these disciplines makes its future in aerospace engineering incredibly bright."

With this latest gift, Hassan continues to support the next generation of aerospace engineers while strengthening the foundation his father helped build. More than just a name on a lab, his contributions will provide students with critical resources to innovate and lead in a rapidly advancing field.

"This is about creating opportunities," Hassan said. "Thirty years from now, I hope to see students who benefited from this support excelling in their careers and saying, 'That experience made a difference for me.' That's what really matters."

Lane Miller's Gift Strengthens Commitment to NC State's Future

"I owe it to the department. They helped me be who I am."



For Lane Miller, supporting NC State University's Department of Mechanical and Aerospace Engineering (MAE) is more than a philanthropic act—it's a heartfelt tribute to the institution that shaped his career, his family and his enduring belief in the power of education.

Miller, a distinguished alumnus, recently made a significant gift to Professor Greg Buckner's lab as part of NC State's 2025 Day of Giving. His contribution underscores a deep commitment to fostering innovation and ensuring future generations of engineers have access to the same rigorous education that propelled his own success.

"I owe it to the department. They helped me be who I am," Miller said.

A Lifelong Connection

Miller's journey with NC State began in the early 1980s when he relocated to North Carolina to work at Lord Corporation, a global leader in motion and vibration control technologies.

He pursued his Ph.D. in mechanical engineering while working full-time, a non-traditional path that required immense dedication.

"The quality of the teaching, the quality of the classes, and the flexibility of the faculty to work with me in kind of a

non-traditional way meant a lot," he said. "I was working, had a wife and my daughter was born as I was taking my oral examinations. It was a challenging but rewarding time."

Despite his busy schedule, Miller always maintained strong ties to the university, both as an alumnus and through his professional work. Over the years, he remained actively involved, serving on advisory boards and forging connections between NC State and industry partners.

"I have always maintained contact with the department, regardless of who was at the top. I've seen firsthand how NC State graduates contribute to the industry, and I'm always impressed," Miller said.

A Family Legacy

Miller's commitment to NC State took on an even more personal dimension when his son, Sam, pursued a Ph.D. under Professor Buckner's guidance. The experience solidified Miller's high regard for Buckner's dedication to students and research.

"I always thought Greg was a great graduate advisor. He cares about his students, and they produce great research results," Miller said. "An element of this gift is, of course, Greg being an excellent advisor to my son. But the majority of my motivation is all the students he has mentored—many of whom worked for me at Lord Corporation."

Throughout his career, Miller recognized the vital link between a strong educational foundation and success in engineering and business. As the former Vice President of Global Technology at Lord, he championed investment in research and development, knowing firsthand how critical well-educated engineers are to industry advancement.

"The linkage between our success and the quality of our engineers and scientists was so obvious. That's why I always maintained close relationships with NC State and other universities," he said.

Faith in the Future

Miller's recent gift is a direct investment in the future of engineering at NC State. His decision to donate without restrictions stems from his deep trust in Buckner's leadership and the department's mission.

"I just have confidence in Greg that he's going to use the money wisely," Miller said. "I told them I don't want to place any constraints on how it's spent. He knows what his needs are better than I do."

Miller believes that alumni play a crucial role in sustaining the university's excellence, particularly in research and innovation.

"It's critical to the country and to humanity that we continue to advance technologies," he said. "You don't do that without highly

educated, highly motivated professional scientists and engineers."

While he acknowledges challenges in higher education, such as political pressures and funding uncertainties, Miller remains optimistic about NC State's trajectory.

"Clearly, dealing with increased enrollment is critical, and the department must continue to be both a fine research institution and a fine educational institution," he said. "But in the end, the real product of NC State is its students—their impact on the world is what truly matters."

Miller's faith in NC State students is unwavering, a sentiment shaped by years of working alongside graduates who impressed him with their skills and work ethic.

"I meet these kids, and all I can think of is, 'Oh my goodness, I am so glad I don't have to compete against these guys,'" he said. "The quality of the hires we had from NC State was outstanding. Anyone who thinks today's students don't measure up hasn't met these engineers."

As Miller enjoys his well-earned retirement in Montana, skiing in the mountains and reflecting on a career well spent, his legacy at NC State endures—through his service, his advocacy, and now, his generous gift to the next generation of engineers.

"It's a way of saying thank you," he said. "And I hope it helps keep NC State strong for years to come."

"It's critical to the country and to humanity that we continue to advance technologies."



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