

Longhorn

# LIFTOFF

**LAUNCH TEXAS  
BRINGS STUDENT  
SPACE TECH  
ENTREPRENEURS  
TO CAMPUS**

PAGE 10

**ASE/EM MEMBERS  
ELECTED TO  
NATIONAL ACADEMY  
OF ENGINEERING**

PAGE 3

**LEADING REMOTE  
SENSING FOR  
NASA'S ICESAT-2  
MISSION**

PAGE 18



The University of Texas at Austin  
**Aerospace Engineering  
and Engineering Mechanics**  
*Cockrell School of Engineering*



## CONTACT US

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### LONGHORN LIFTOFF

Longhorn Liftoff is published for alumni and friends of the Department of Aerospace Engineering and Engineering Mechanics in the Cockrell School of Engineering at The University of Texas at Austin.

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### FROM THE CHAIR

# COMING TOGETHER

So much has happened in the past year since we returned to campus for in-person learning. We formally inducted the Classes of 2020, 2021 and 2022 of the ASE/EM Academy of Distinguished Alumni, the new Launch Texas space tech entrepreneurial program is taking off, and our faculty and students continue to demonstrate excellence in both research and teaching activities.

I hope you'll take some time to read this issue of Longhorn Liftoff and enjoy these inspirational stories of members of our community – stories that include alumni who are carving their paths through entrepreneurship, faculty and graduate students whose research is changing the world, undergraduate students who are collaborating on senior design – and so much more.

We're planning many events over the next year as well, including alumni happy hours and on-campus events, so please remember to keep in touch. Send us your updates, check your email regularly and follow us on social media. I look forward to meeting many of you in person in the near future and invite you to stop by campus and say hello next time you're in town.

*Hook 'em*

**CLINT DAWSON**

CHAIR, DEPARTMENT OF AEROSPACE ENGINEERING AND ENGINEERING MECHANICS  
J.J. MCKETTA CENTENNIAL ENERGY CHAIR IN ENGINEERING



We enjoyed welcoming the new ASE/COE Class of 2026 during Gone to ASE and at the Engineering Fair during the first week of classes!

VIEW MORE PHOTOS:

[flic.kr/s/aHBqjA5wJQ](https://flic.kr/s/aHBqjA5wJQ)



# NATIONAL ACADEMY OF ENGINEERING ELECTIONS

*Professor Karen Willcox and alumnus Michael Watkins were elected to the prestigious National Academy of Engineering for 2022. Election to the academy is among the highest professional distinctions bestowed upon an engineer.*



## KAREN WILLCOX

Willcox, a professor in the Department of Aerospace Engineering and Engineering Mechanics and the director of the Oden Institute for Computational Engineering and Sciences at UT Austin, was elected “for contributions to computational engineering methods for the design and optimal control of high-dimensional systems with uncertainties.” Her research has produced scalable computational methods for design of next-generation engineered systems, with a particular focus on model reduction as a way to learn principled approximations from data and on multifidelity formulations to leverage multiple sources of uncertain

information. Prior to joining UT Austin in 2018, Willcox spent 17 years on the faculty at the Massachusetts Institute of Technology, where she served as the founding co-director of the MIT Center for Computational Engineering. She is a fellow of the Society for Industrial and Applied Mathematics and the American Institute of Aeronautics and Astronautics as well as a member of the American Society for Engineering Education.

## MICHAEL WATKINS

Watkins (B.S. ASE ‘83, M.S. ASE ‘85, Ph.D. ASE ‘90) is a professor of aerospace and geophysics at the California Institute of Technology, following five years serving as director of NASA’s Jet Propulsion Laboratory. He was elected “for leadership in the development of space geodesy and leading robotic missions for exploration of the Earth and planetary bodies.” Prior to joining JPL as director, Watkins was a professor in the Department of Aerospace Engineering and Engineering Mechanics and director of UT’s Center for Space Research. Before that, he spent 22 years at JPL, where he led some of NASA’s most high-profile missions, including the Mars Curiosity Rover and the Cassini, Mars Odyssey and Deep Impact probes, in addition to leading the science development for the GRAIL moon-mapping satellites. Watkins, who is a pioneer in the development and use of gravity data in science applications, also originated the concept for the GRACE and GRACE Follow-On missions, which use twin satellites to measure Earth’s gravity field. ■



## TABLE OF CONTENTS

### ON THE COVER

#### PAGE 10

##### READY FOR LAUNCH

Launch Texas aims to give students the entrepreneurial education needed to start their own space tech companies

### DEPARTMENT UPDATE

#### PAGE 15

##### A CLOSER LOOK

ASE/EM facts and impact numbers

### FACULTY & RESEARCH

#### PAGE 3

##### NEW NAE MEMBERS

Karen Willcox, Michael Watkins join NAE

#### PAGE 6

##### HEART OF THE MATTER

Rausch’s RO1 supports biomechanics study of tricuspid valve leakage

#### PAGE 14

##### NEWEST FACULTY MEMBER

Jin Yang

#### PAGE 18

##### MAGRUDER MAKING MOVES

ASE/EM leads remote sensing for ICESat-2

### STUDENTS

#### PAGE 8

##### SENIOR AIRCRAFT DESIGN

Aerospace and computational seniors collaborate for this year’s challenge

#### PAGE 20

##### STUDENT RECOGNITION

#### PAGE 22

##### GPS-FREE DRONE

Undergraduates win NASA design proposal

### ALUMNI

#### PAGE 4

##### SKYROCKETING TO SUCCESS

Meet alumnus Payam Banazadeh

#### PAGE 24

##### BLAST FROM THE PAST

#### PAGE 26

##### ACADEMY OF DISTINGUISHED

ALUMNI INDUCTEES

5 QUESTIONS ? 5 QUESTIONS ? 5 QUESTIONS ? 5 QUESTIONS ? 5 QUESTIONS ?



## 5 QUESTIONS WITH CEO AND FOUNDER OF CAPELLA SPACE

*In just eight short years, Payam Banazadeh (B.S. Aerospace Engineering 2012) skyrocketed from a passionate high school student sitting in an astronomy class to becoming the founder and CEO of Capella Space, the first commercial space company to launch and operate Synthetic Aperture Radar (SAR) satellites. Since Capella's start in 2016 the company has been rapidly expanding, adding several new employees per month to their current 170-person roster and recently making news for raising an additional \$97 million, bringing their total capital raised to date more than \$170 million to expand their operations.*

Banazadeh has always been fascinated with the science and physics behind astronomy, taking interest in how the planets and Earth rotate around the sun and stars. He chose to pursue his bachelor's degree in aerospace engineering from UT Austin and then went on to earn his master's degree in business and management from Stanford University.

Banazadeh recently returned to the Forty Acres to meet with students and faculty and gave a talk, "Prepare to Launch: How to Build a Space Company Out of Your

### A LESSON LEARNED AT UT AUSTIN

**"From an excellent education to build my foundational understanding of science and engineering to hands-on experiences, UT gave me the tools I needed to kick-start my career."**

Capella Space

# SKYROCKETING TO SUCCESS

Dorm Room.” We sat down with him before he took the stage to hear what it’s like to be a young entrepreneur and what advice he has for other entrepreneurially minded engineers who may be interested in starting their own ventures.

## **WHAT WERE SOME OF THE MAIN PRINCIPLES YOU INCORPORATED INTO YOUR BUSINESS PLAN AND VISION WHEN YOU WERE BUILDING CAPELLA?**

The only thing that’s certain about startups is that things are going to change. Whatever you plan on day one is not going to be what you end up doing on day 30, nor is what you end up implementing and selling as a product going to be what you initially conceptualized. With that said, one of the main focuses for me was getting the right team together who had the right expertise and would be committed to the idea of the startup and then building a culture around that team. We’re very intentional with our culture at Capella – we’re collaborative, we take a lot of risks, we never say no – and that has helped us get through a lot of challenges to get to where we are today.

## **“NEW SPACE” IS A FAST-PACED, EVER-CHANGING FIELD CHARACTERIZED BY RAPID, LARGE-SCALE INNOVATION. AS CEO, HOW DO YOU KEEP CAPELLA RELEVANT WHILE ALSO ANTICIPATING THE NEEDS OF THE FUTURE?**

We try to stay as vertically integrated as possible. We try to do everything from end to end in-house at the company. That means we build satellites, we build the sub-systems that go into our satellites and, while we don’t launch it, we do operate our satellites once they’re launched, build products from the data we collect from our satellites and have our sales and product team taking that data into market. Because of this vertical integration, we have visibility into the full spectrum and lifecycle of a project, from its conceptualization to creation and use. It’s beneficial because it allows us to bring the feedback from our customers immediately back into our lab and quickly iterate on something that our customers may want changed. Listening to your customers and being able to quickly act on that feedback is crucial to our success.

## **HOW DO YOU NAVIGATE THE STRESSES OF RUNNING A COMPANY?**

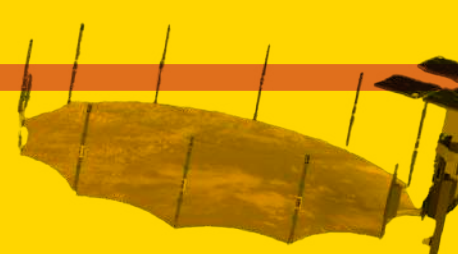
As an entrepreneur, no matter what your title is in the company – because not all entrepreneurs are going to be the CEO, and that’s fine – you’re dealing with problems, especially if you are the CEO. After all, if the problems were easy to solve, they would’ve been solved before they got to you. If that’s all you’re thinking about every day – the difficult problems – it gets really challenging. You must force yourself to step back, look at the big picture and remind yourself of how far you’ve already come to find the motivation to keep going. Taking a big picture perspective to the day-to-day work has helped me stay focused.

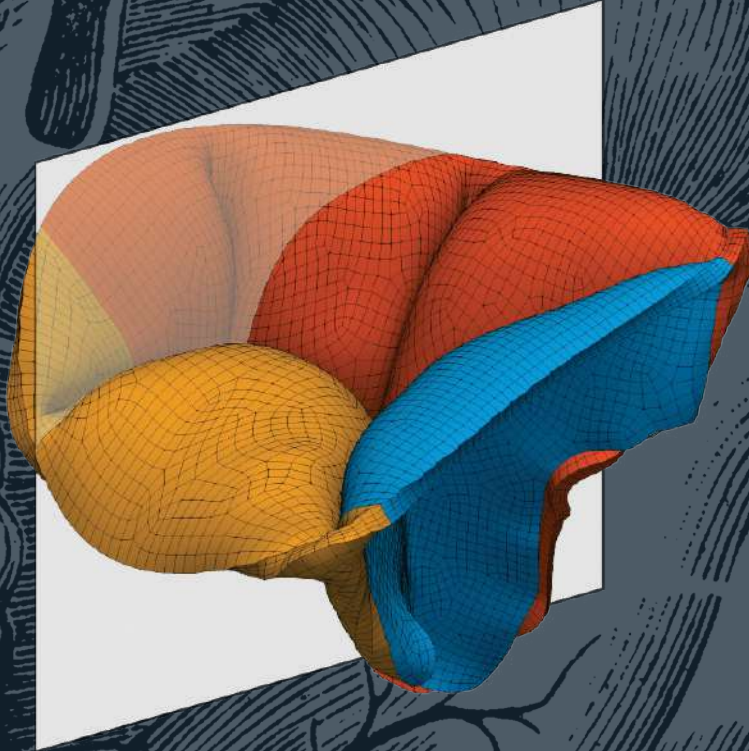
## **WHAT CHARACTERISTICS DOES AN ENTREPRENEUR NEED TO BE SUCCESSFUL?**

First and foremost, you have to want it, and want it really, really bad. That “it” can be your mission or the product that you believe needs to be in the world. In my opinion, that’s the only reason you should become an entrepreneur – because you’re fervently passionate about creating a product or acting on a mission. Becoming an entrepreneur for any other reason, like money or fame, doesn’t necessarily mean you won’t be successful, but your “why” won’t hold up as strongly when you hit the inevitable walls all entrepreneurs face, and you’ll be more at risk to give up because you don’t believe in a greater purpose.

## **WHERE DO YOU FIND INSPIRATION?**

I’m an immigrant, and as an immigrant, you go through quite a bit of sacrifice, both personally and socially, to move to a new country and establish yourself. Everything is brand new. So I get a lot of inspiration from my family, particularly my parents and my grandparents. My parents were also immigrants and they went through quite a bit of sacrifice to allow me to immigrate. Reflecting on their sacrifices makes me want to be sure I’m using my opportunity and the hand I’ve been dealt in the best way possible. ■

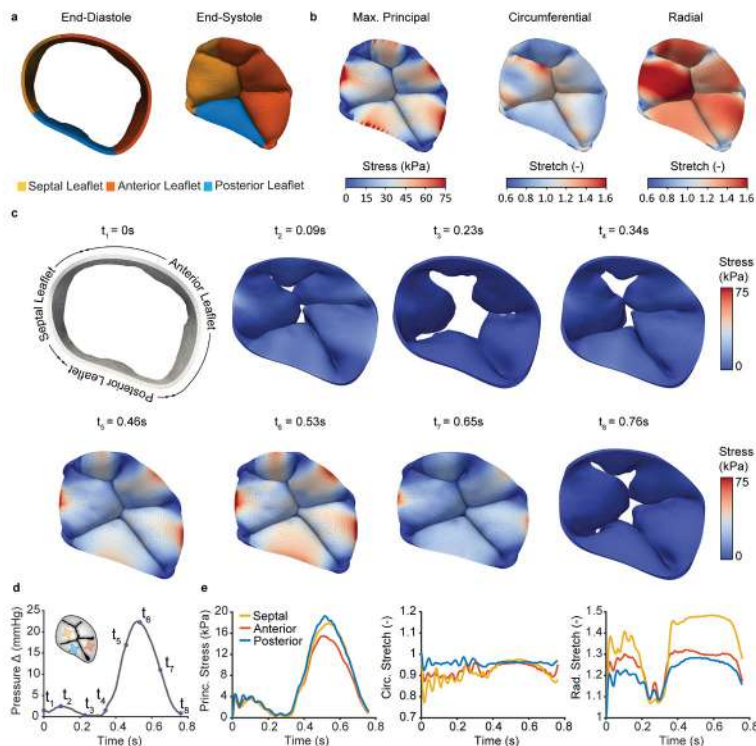




# HEART OF THE MATTER

## MAKING THE WAY FOR EARLY INTERVENTION OF TRICUSPID VALVE LEAKAGE

Manuel Rausch, an assistant professor of aerospace engineering and engineering mechanics at UT Austin, has received a prestigious R01 grant from the National Institutes of Health in the amount of \$3.9 million. He will use the funding to lead a study of the heart's tricuspid valve to better understand functional tricuspid valve regurgitation (FTR) – a condition that causes leakage of the valve located between the right atrium and the right ventricle of the heart.



#### ◀ TEXAS TRIVALVE

Texas TriValve 1.0, a reverse engineered computer model of the human tricuspid valve, faithfully captures the kinematics and kinetics of the healthy tricuspid valve at peak systole and over the complete cardiac cycle. Development of the computational model was led by graduate researcher Mrudang Mathur.

#### LED BY WORLD-CLASS EXPERTS

This animation represents a finite element simulation of MitraClip repair on a human tricuspid valve with functional tricuspid regurgitation, a condition of the heart that causes leakage of the valve located between the right atrium and the right ventricle of the heart.

[bit.ly/R01-Rausch](https://bit.ly/R01-Rausch)



It is estimated that 1.6 million Americans will suffer from significant FTR and that of those patients, only approximately 8-10 thousand are surgically treated, leaving a large number of patients who are untreated. If left untreated, severe FTR can cause pressure to rise in the right chamber of the heart and in worst case scenarios, might eventually result in heart failure.

The main function of the tricuspid valve is to avoid backflow of blood when the heart contracts, Rausch said.

“When the heart contracts, the right ventricle contracts, and then it should propel the blood into the lungs. The blood, which comes from the body’s systemic circulation, should not be pushed back from where it came from,” Rausch said. “And that’s where the tricuspid valve comes in – it prevents the blood from being pushed back. It does so through small leaflets or flaps that come together to seal the passage between right atrium and right ventricle.”

Until recently, it was believed that when the tricuspid valve fails, it does so without showing any damage to the leaflets themselves. However, Rausch and colleagues showed over the past few years that this may not be so. In fact, they showed that the valve leaflets stiffen and thicken when they leak. These changes may contribute to FTR; thus, rendering tricuspid valve regurgitation not so functional after all.

“The research supported by this grant is essentially trying to identify what causes the thickening and stiffening on these leaflets,” Rausch said. “We want to look into the stimuli and demonstrate that stiffening and thickening of the valves actively contributes to their dysfunction. Neither for the tricuspid valve, nor for other heart valves has this been directly shown.”

The team also aims to show that early intervention might prevent this phenomenon from happening in the first place.

Currently, the standard treatment for FTR involves a surgical approach known as tricuspid annuloplasty, which is invasive, does not have a great long-term success rate and fails approximately one third of the time. Rausch’s work could motivate earlier intervention with less invasive procedures and treatments, such as drug-based therapeutics or catheter-based technology. ■

**“ULTIMATELY, IT’S OUR HOPE THAT WE ARE ABLE TO IDENTIFY A MECHANISM THAT CONTRIBUTES TO THE PROGRESSION AND SEVERITY OF THE DISEASE AND THAT THIS MOTIVATES A REASON FOR EARLY INTERVENTION.”**



— Manuel Rausch

# COLLABORA



*Lift and Drag Queens and Assuming Incompressible – for those familiar with senior aircraft design at UT Austin, these clever team names probably don't seem that out of the norm. But it's not just the team names that make them unique.*

After spending last fall semester learning how to apply systems engineering processes and principles to aircraft design, these teams of aerospace engineering (ASE) seniors brought their own aircraft to life this spring. Each team selected a ready-to-fly radio control model aircraft based on their design requirements. Students then modified various parts of the aircraft including the wings, mission and power systems and avionics to meet mission requirements.

Final touches to the airplanes included a myriad of vibrant colors and designs and students created t-shirts to match their team's "personality." The shirts were a bonus and provided by Greg Zwernemann, a professor of practice in ASE/EM who has been teaching the aircraft system engineering design capstone course since the fall of 2018.

# ATING

## TO SOLVE REAL-WORLD CHALLENGES

### AEROSPACE AND COMPUTATIONAL ENGINEERING SENIORS COLLABORATE ON AIRCRAFT SYSTEMS DESIGN

For the first time ever this year, computational engineering (COE) seniors collaborated with ASE seniors to help develop each team's unmanned aerial system (UAS).

Raghav Mahalingam, an ASE/EM lecturer and the COE senior design course instructor, said that these collaborative projects include significant technical challenges related to software and hardware that require real-time deadlines and efficient coordination and communication for success – all common themes in real-world design settings. Computational seniors developed three teams to serve as “subcontractors” for the aircraft teams and also attended the fly-off to demonstrate their technology.

“The collaboration created an opportunity for COE students to work on projects that required them to deliver working prototypes of systems to help aircraft design teams meet their mission goals of automatic target recognition and precision payload delivery for search and rescue,” Mahalingam said.

### THE MISSION AND FLY-OFF

This year's UAS mission involved using a case scenario of flooding in the Austin area – the Austin Fire Department (AFD) receives reports of water levels rising above the level of homes and directs the UAS contractor (ASE student teams) to search for people in need of assistance on roof tops of homes surrounded by water. First aid kits are dropped for people in need of immediate assistance and the AFD uses the data supplied by the UAS contractor to perform rescue operations.

After a nearly full day of flight testing and last-minute tweaks to their aircraft, both teams finally competed against each other to perform their fly-off missions on the afternoon of April 27 at the Austin Radio Control Association airfield.

Due to the accuracy of their mapping and payload drops, Lift and Drag Queens were the overall winners, even though Assuming Incompressible had the better system

effectiveness score (cost to build, weight, payloads, endurance, etc.). And the seniors, who seemed somewhat anxious shortly before the fly-off began, seemed to enjoy the event and feel that the experience will benefit them when preparing for future roles as engineers.

“I have always been interested in leadership roles within engineering, so I believe this really allowed me to see how it fits into the engineering process,” said Grace Kirk, the project manager for Lift and Drag Queens. “It was also really rewarding to use skills and knowledge learned in previous classes and apply them to our project. I never would have thought I would need to use equivalent beam theory ever again, but that was one of the first steps in analyzing our wings' structural integrity.”

Zwernemann said that the collaboration with the COE senior design students provided multiple benefits, including achievement of the highest fly-off competition scores to date and lessons learned on program execution.

“I'm very proud of the outcome achieved by this student collaboration and I'm confident that the lessons learned will benefit their future career growth,” Zwernemann said. ■

### READ THE FULL STORY:

[bit.ly/ase-coe-design](https://bit.ly/ase-coe-design)



Team Lift and Drag Queens



Team Assuming Incompressible

# READY

FOR




Welcoming its first cohort this fall, Launch Texas aims to give students the entrepreneurial education needed to start their own space tech companies and be part of the catalyst to grow the Texas space economy, bringing together the aerospace community, academia and VCs.


*Hailey Nichols is part of a new movement of entrepreneurial engineers coming out of the Cockrell School of Engineering. She built her own path to a master's degree while launching a startup company, Locus Lock. This summer she received her M.S. in aerospace engineering and will transition to a full-time role as CEO and founder of Locus Lock, a startup spun out of the Radionavigation Lab of aerospace engineering professor Todd Humphreys. Locus Lock makes a next-generation GPS receiver that provides high integrity positioning solutions for customers globally.*

*To get to this point, Nichols created her own "a la carte" program focused on both engineering and entrepreneurship. In addition to core aerospace engineering classes, her coursework also included both law and business offerings.*

# LAUNCH



Nichols will help mentor eight incoming master's and Ph.D. students in the inaugural cohort of the Launch Texas program. A collaboration between the Department of Aerospace Engineering and Engineering Mechanics and the Texas Innovation Center, Launch Texas aims to give students a well-rounded education with aerospace engineering and entrepreneurship components. The goal is to encourage students to start their own space tech companies, get involved with the startup scene or join a large space tech company.



ties to eventually help build the Silicon Valley of space right here in our backyard," said Van Truskett, executive director of the Texas Innovation Center.

## SPACE CENTRAL

Texas has for decades been associated with aerospace. The Johnson Space Center in Houston is perhaps the most famous example. It's the epicenter of the Texas space community, serving as a primary NASA location for training, research and flight control for more than half a century.

But over time, the Texas space industry has started to spread out, and Austin is reaping the benefits. The Department of Aerospace Engineering and Engineering Mechanics is among the 10 best programs in the country for both graduates and undergraduates.

The Austin area is home to several promising startups such as rocket maker Firefly Aerospace, which has already partnered with the Cockrell School of Engineering and the Texas Rocket Engineering Lab, and Icon, a 3D-printing company that is working on structures for astronauts exploring the moon.

Perhaps the biggest recent development in Austin's evolution as a burgeoning aerospace hub was the news that SpaceX is planning a major facility in the area. It's a sign that the city is becoming a major draw not just to tech companies but also aerospace.

"Once you have that critical mass, then that breeds other companies that start here or want to move here from other places," said Clint Dawson, professor and chair of the Department of Aerospace Engineering and Engineering Mechanics.



**"I AM A TRAINED ENGINEER, SO HAVING THE TEXAS INNOVATION CENTER AND LAUNCH TEXAS TO SUPPORT ENGINEERS DIPPING THEIR TOES INTO ENTREPRENEURSHIP, LEARNING MORE ABOUT WHAT THAT LOOKS LIKE IN PRACTICE AND GETTING ADVICE FROM INDUSTRY EXPERTS IS REALLY VALUABLE," NICHOLS SAID.**

Launch Texas is a multi-pronged effort. The first is the educational component. The second focuses on facilities and tech tools that allow students, faculty and researchers to build and refine their ideas. And the third involves creating relationships with venture capitalists and companies to help students get comfortable with the core components of funding and growing startups.

Leaders of the effort envision Launch Texas being the hub that brings together academia, the startup community and industry to create an ecosystem of aerospace innovation in Austin, the same way that Stanford University was instrumental in galvanizing the tech boom around the San Francisco Bay Area.

"We want to stand up a program that works together with the greater Austin and Texas aerospace communi-



Members of the inaugural Launch Texas cohort gathered together in August where they learned about the startup experience of one of their team members. Four of the students are taking their first McComb's entrepreneurial class this semester and they are all eager to explore and learn what entrepreneurship will mean and be to them as they push their comfort zones.

*Pictured from left to right: Aanu Adeloje, John Stuart Murray, Yoo-Jin Ahn, Dillon T. Ellender, Alex Nettekoven, Benjamin Diaz Villa, Ruairi O'Connor*

## A NEW KIND OF AEROSPACE ENGINEER

The aerospace engineering department has always prepared students to work at large government organizations like NASA or some of the bigger aerospace companies, such as Lockheed Martin and Boeing. Through Launch Texas, students will gain the tools to work at space startups and create their own companies.

The first cohort of Launch Texas graduate students, which just started this fall, is taking core classes in aerospace engineering, of course. But they will also be given the building blocks of how to start a company. That includes entrepreneurship courses, finance courses and more.

“We want to train students so they have all the engineering fundamentals, but also have some business skills and the skills to present themselves to venture capitalists and the public to sell their ideas,” Dawson said.

As part of that, the program plans to bring in local space entrepreneurs and investors to help students get ready to enter into that orbit. Students who have learned about the business side prior to the creation of Launch Texas will help out as well.

Alexander Nettekoven is closing in on completing his Ph.D. work at UT Austin. He is the CEO of the UT startup MultiAI, which focuses on strategic decision making for autonomous vehicles, such as drones, satellites and ground robots. While not taking classes as part of Launch Texas, Nettekoven will help mentor other students and share his experience launching a company.

When building their companies, both Nichols and Nettekoven worked closely with the Texas Innovation Center to learn the fundamentals of commercialization. Both startups have participated in and won pitch contests. They are getting invaluable knowledge about the process, learning how to talk to investors and deliver winning pitches. Getting this experience has been crucial for student entrepreneurs like Nettekoven, and bringing all of that together as part of an academic program will help the next generation get their feet under them.

“Having a program where students, faculty and industry come together helps people understand all the elements involved with creating a startup,” Nettekoven said. “It can help narrow the gap between what is going on with the research side and what is happening in the industry.”

## A PLACE TO INNOVATE AND COLLABORATE

In a lot of ways, aerospace is unlike other engineering disciplines. Aerospace engineers build big things — rockets, satellites, etc. Naturally, Launch Texas is pursuing private funds to build facilities that would give students a place to work on the projects that will someday be the starting place for startups.

But it wouldn't be just for students and faculty. The facilities would be open to local entrepreneurs to build prototypes that will help them grow their companies.

“Having such a space would be unique and truly enabling of innovation in space tech,” said Noel Clemens, a professor in the Department of Aerospace Engineer-

ing and Engineering Mechanics and one of the leaders of Launch Texas. “It can be an important reason for new startups to establish themselves in Austin.”

### THE NEXT SILICON VALLEY?

Big tech cities like San Francisco, New York and LA have built up strong innovation ecosystems. These hubs run well when every player in the ecosystem of creating and growing companies are working together. That includes academia, where all the deep tech discovery that enables these startups happens. And it also includes the big companies in the area, venture capital firms and accelerators and incubators designed to help companies grow.

Andrew Kirima sees this type of synergy developing in Austin. He is an analyst for Cantos, a VC firm based in San Francisco that invests in the near frontier, but he resides in Austin and is a mentor at the Texas Innovation Center.

Cantos has invested in several aerospace startups, one of which is based in Texas named Venus Aerospace. Kirima noted the culmination of government funding from wartime incentives married with a shifting tax environment created a high-risk long-tail venture finance model. Venture capital was initially formed to proliferate advanced technology in the aerospace industry. Finance coupled with abundant technical talent from Stanford, would give birth to Silicon Valley.

“Austin’s innovation ecosystem is cultivating a similar zeitgeist,” Kirima said. “And the city has all the right ingredients to be at the pinnacle of space innovation: Top ranking aerospace department for students and research; burgeoning space tech industry; growing investor community; and strong support from state and local government.” ■

### GET INVOLVED

**Thanks to seed funding from ASE alumnus Thomas McKnight and his wife Mimi, Launch Texas is making its way off the ground.** But building a space ecosystem takes time and investment. And we are calling on our community to get involved, whether that’s through gifts or through volunteering to speak about your own experiences of entrepreneurship.

*For more information, contact Sarah Welbes at [sarah.welbes@austin.utexas.edu](mailto:sarah.welbes@austin.utexas.edu).*

**Launch Texas is also looking for the next cohort of students.** Though the first group is made of master’s and Ph.D. students, Launch Texas would also like undergraduate seniors to get involved.

*For more information, visit [ae.utexas.edu/launch-texas](http://ae.utexas.edu/launch-texas).*

# HAILEY NICHOLS

## ALUMNA, MENTOR AND ENTREPRENEUR



Hailey Nichols, who recently graduated with a master’s in ASE, won first place in UT Austin’s inaugural Female Founder Pitch Competition. She is also the first student to receive a Launch Texas Commercialization Fellowship to advance her startup, Locus Lock. Learn more about her experience as a graduate student and entrepreneur:

### 5 QUESTIONS WITH HAILEY

[bit.ly/3wY3acO](https://bit.ly/3wY3acO)

### LOCUS LOCK VIDEO

[youtu.be/2Xxx-wAlc00](https://youtu.be/2Xxx-wAlc00)

# MEET JIN YANG

Jin Yang joins us in the Department of Aerospace Engineering and Engineering Mechanics at UT Austin as an assistant professor this fall.

The Yang Research Group missions include developing analytical tools and experimental techniques to study viscoelastic materials behavior, dynamic instabilities and material failure under extreme loading conditions. Yang's research activities include investigating the high-strain-rates of soft material which can undergo extremely large deformations and can be easily damaged such as hydrogels, tissues, and foams; and developing fast and accurate digital image/volume correlation methods, which Yang refers to as a powerful experimental technique, for quantitatively measuring 2D and 3D full-field deformations in solids.

Yang uses a combination of experimental loading to develop measurements and theoretical framework to better understand the mechanics of the materials he is investigating. Examples of real-world applications of his work include gaining a better understanding of human tissue, which could aid in the treatment of laser eye surgery, breaking up kidney stones, and even understanding brain injury, along with many other types of engineering applications where fluid-solid interaction resulting in cavitation collapse might cause irreversible material erosion.

Yang earned his Ph.D. at the California Institute of Technology in solid mechanics under the supervision of Kaushik Bhattacharya. Most recently he worked with Christian Franck at the University of Wisconsin-Madison as a postdoctoral research associate.

## WHAT ATTRACTED YOU TO TEXAS ASE/EM?

This department is very famous in the area of mechanics. ASE/EM alumni have big names and I knew about those alumni even while I was pursuing my Ph.D. at Caltech. Also, the Cockrell School is a highly ranked engineering school – currently number six in the U.S. So, I knew this was a good department with a high-quality reputation for both faculty and students.

There are also a lot of opportunities for collaboration and I will have the ability to attract graduate students who can help me reach our group's research goals. Also, Austin is a very nice city!

## WHAT DO YOU ENJOY MOST ABOUT YOUR RESEARCH?

First of all, I love exploring new things, such as discovering new mechanics. I find solid mechanics, which was my Ph.D. major, very interesting. Materials can have a wide variety of behaviors such as buckling, instabilities or even fractures or fatigue, and these behaviors are quite different depending on whether they are under slow or fast loading rates. Materials also have so many uses – from building secure bridges on Earth to launching satellites to space, to developing medical applications that are safe for patients. So, it's very important to understand the mechanics of these materials. I know mechanics and I know the math, which helps me to understand the mechanics of these materials. I can then use this knowledge to help people.

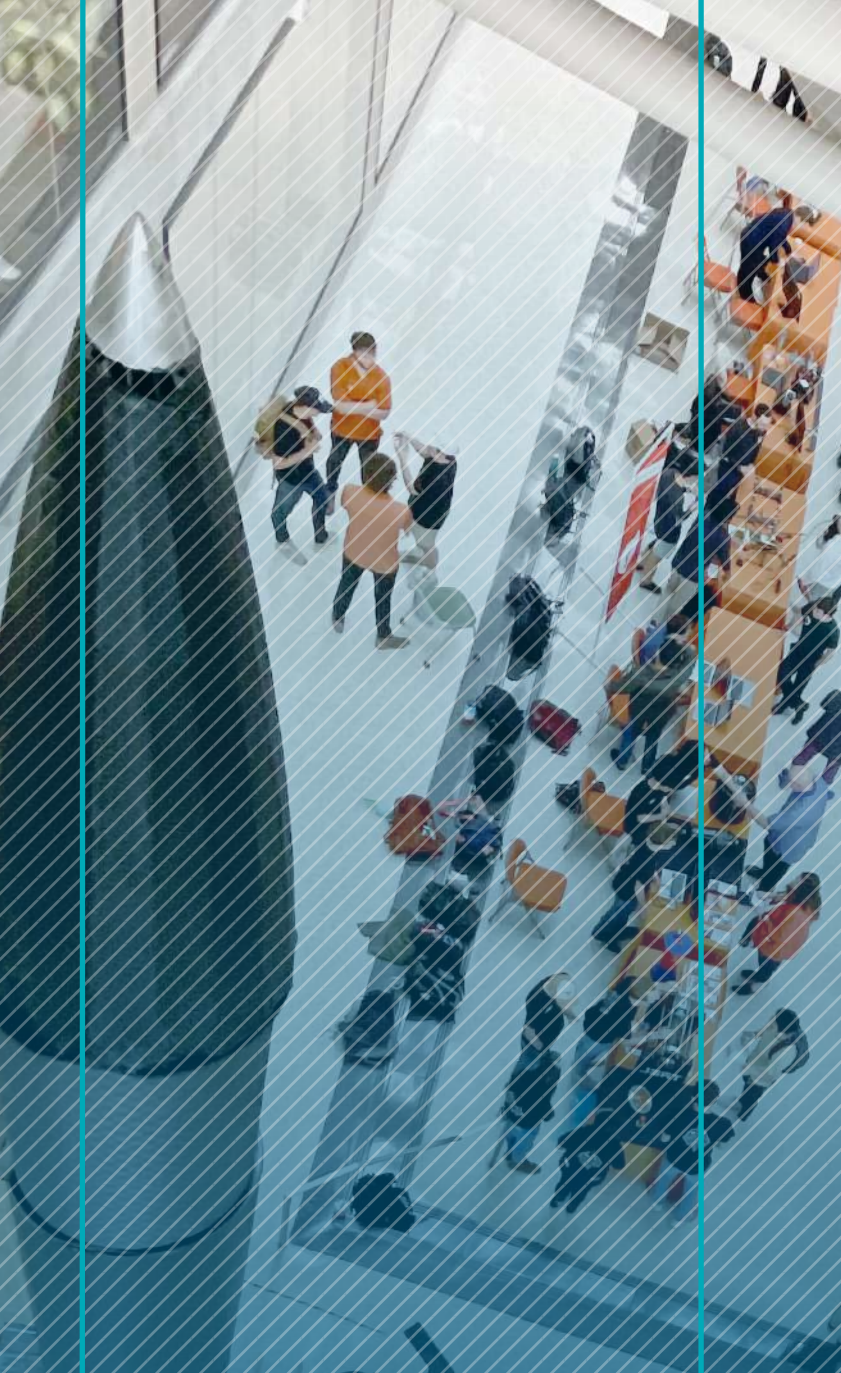
## TELL US ABOUT YOUR TEACHING PHILOSOPHY.

I will be teaching the statics course to undergraduate students my first semester. My teaching philosophy depends on whether I am teaching an undergraduate or graduate course. For the undergraduate courses that usually include students from many majors, I work to make sure these students understand the core concepts of the course – or the “big picture” – and how it applies to their major. In my graduate courses I will be teaching much smaller classes and they will cover more advanced, research-based topics. Maybe there will be some open questions for students that can be combined with their own research projects. I am also very excited to mentor undergraduate students who are interested in research.

## HOW DO YOU LIKE TO SPEND YOUR FREE TIME?

In my leisure time, you can find me in a gym lifting weights or jogging along the street. I also enjoy reading books when I am free. ■





## AUSTIN'S SPACE AGE



Central Texas an emerging hub in aerospace industry. Read the full story in the Austin American Statesman: [bit.ly/spacetechn-statesman](http://bit.ly/spacetechn-statesman)

## STUDENTS

### UNDERGRADUATE

<b>ENROLLMENT</b>	<b>662</b>
Aerospace Engineering (ASE)	544
Computational Engineering (COE)	118

### UNDERREPRESENTED POPULATIONS

Aerospace Engineering	33%
Computational Engineering	25%

### WOMEN

Aerospace Engineering	25%
Computational Engineering	31%

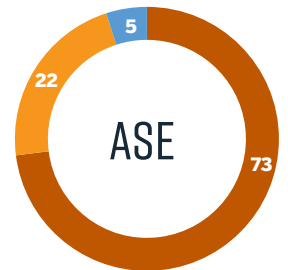
### DEGREES AWARDED 2020-2021

Aerospace Engineering Bachelor's	95
Computational Engineering Bachelor's	19

### AFTER GRADUATION

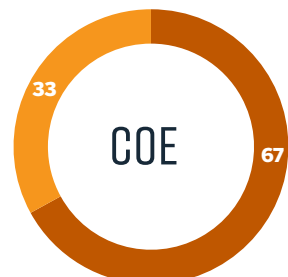
#### ASE

<b>\$74,500</b>	<b>average starting salary</b>
73%	employed
22%	graduate school
5%	unknown



#### COE

<b>\$84,000</b>	<b>average starting salary</b>
67%	employed
33%	graduate school



# A CLOSER LOOK AT TEXAS ASE/EM

DEPARTMENT OF AEROSPACE ENGINEERING  
AND ENGINEERING MECHANICS

# A CLOSER LOOK AT ASE/EM

## STUDENTS CONT.

### GRADUATE

#### ENROLLMENT

	<b>187</b>
Aerospace Engineering	165
Engineering Mechanics	22
Average GPA of admitted students	3.85
Ph.D. students receive full funding	92%
Women	18%
International	40%

#### DEGREES AWARDED 2020-2021

Master's	42
Doctoral	27

## ALUMNI

5,907

alumni around the world



#### OUR GRADUATES ARE LEADERS IN:

- research
- government
- industry
- academia
- military
- and more

#### LEARN HOW OUR ALUMNI ARE CHANGING THE WORLD:

[ae.utexas.edu/alumni/profiles](http://ae.utexas.edu/alumni/profiles)

#### HOME TO



## FACULTY

TENURE/TENURE-TRACK FACULTY **38**

### HONORS AND AWARDS

- 9 Winners, *National Science Foundation CAREER Award*
- 6 Fellows, *American Institute of Aeronautics and Astronautics*
- 6 Fellows, *American Society of Mechanical Engineers*
- 5 Members, *National Academy of Engineering*
- 4 Fellows, *Society for Industrial and Applied Mathematics*
- 4 Winners, *AFOSR Young Investigator Program Award*
- 3 Fellows, *American Academy of Mechanics*
- 3 Fellows, *American Astronautical Society*
- 2 Winners, *Office of Naval Research Young Investigator Program Award*
- 1 Member, *National Academy of Sciences*
- 1 Winner, *Presidential Early Career Award for Scientists and Engineers*
- 1 Winner, *American Heart Association Career Development Award*
- 1 Winner, *DARPA Young Faculty Award*

### FEATURED AWARDS

**Maruthi Akella** was elected a fellow member of AIAA “for sustained outstanding scholarship, leadership, and high-impact contributions in the field of aerospace guidance and control” and was named a fellow member of IEEE “for contributions to spacecraft control systems.”

**John-Paul Clarke** was appointed a member of the NASA Advisory Council. In this roll he will provide leadership counsel and advice on agency programs and priorities which include climate change, DEI, partnerships, collaborations and more.

**Noel Clemens** was awarded the AIAA Aerodynamic Measurement Technology Award “for the development and application of innovative laser-based imaging techniques to bring new insight into the physics of complex turbulent flows.”

**Thomas J.R. Hughes** was awarded the William Benter Prize in Applied Mathematics by CityU for his significant contributions to applying mathematics to solving cross-disciplinary problems, and Georgia Institute of Technology’s Monie A. Ferst Award for “notable contributions to the motivation and encouragement of research through education.”

**Nanshu Lu** received the Thomas J.R. Hughes Young Investigator Award from the Applied Mechanics Division of the American Society of Mechanical Engineers for her achievements in applied mechanics.

**Moriba Jah** was named chief scientific advisor for Privateer, a company led by Apple co-founder, Steve Wozniak, to lead the company’s efforts to help keep space safe, secure and sustainable.

## RESEARCH ON THE RISE

### RESEARCH AREAS

- Aerothermodynamics and Fluid Mechanics
- Computational Engineering
- Controls, Autonomy and Robotics
- Orbital Mechanics
- Solids, Structures and Materials



**\$20 MIL**

in research expenditures

### RESEARCH HIGHLIGHTS



Rausch

**Manuel Rausch** received a National Institutes of Health **RO1 grant in the amount of \$3.9M** to lead a study of the

biomechanics of tricuspid valve regurgitation – a condition that, if left unchecked, could eventually lead to a more serious heart condition. Learn more on page 6.

**Brandon Jones** is leading research **funded by the U.S. Space Force** to develop an approach to Rapid Initial Orbit Determination (RIOD) that combines advanced methods of uncertainty propagation, space-object track initialization, and sensor tasking which will allow the U.S. Space Force to rapidly react to newly detected space objects.



Jones



Clemens

**Noel Clemens** is collaborating on a **\$1.5M University Consortium on Applied Hypersonics** grant with UT San Antonio to study the modeling and experimental measurements of hypersonic separation events.

IN THE U.S.

**NO. 8 AEROSPACE ENGINEERING**  
GRADUATE PROGRAM

**AEROSPACE ENGINEERING**  
UNDERGRADUATE PROGRAM

**NO. 8**

U.S. News and World Report



Founding partner of **Launch Texas**, a world-class space tech entrepreneurial education program

**Nanshu Lu's team** developed the **first-ever medical "hybrid" sensor** that has the ability to withstand pressure without losing sensitivity and is now working on ways to allow sensor materials like these to wrap about almost any object to give it the sensitivity of human skin.

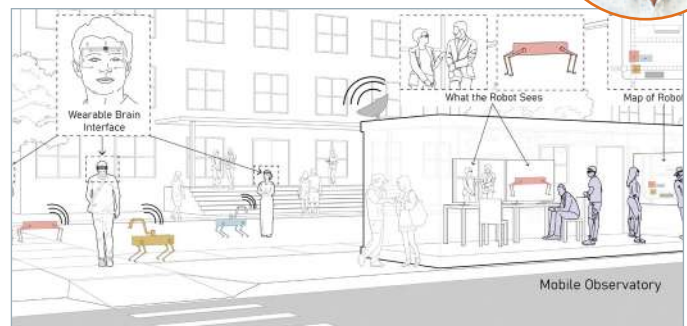


Lu

**Luis Sentis** is leading a **\$3.6M NSF-funded project** to lay the foundation for robots working in communities by developing a test-bed observatory of autonomous delivery robots in a campus setting.



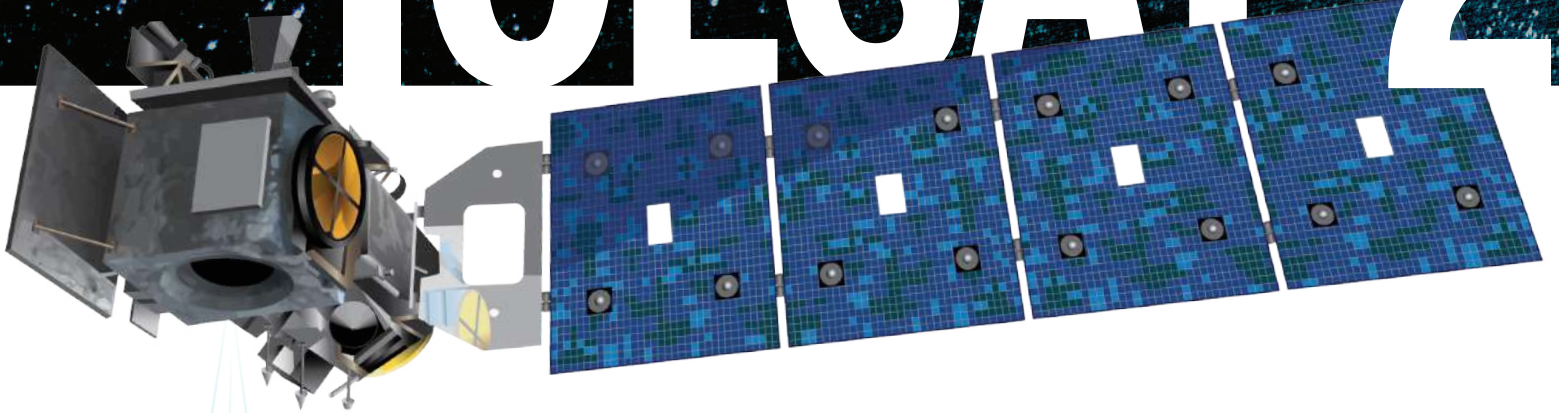
Sentis



**VIEW A RECENT RESEARCH GRANT LISTINGS AT**  
[bit.ly/ASE-EM-Grants](https://bit.ly/ASE-EM-Grants)

LORI MAGRUDER PLAYS CRUCIAL ROLE IN NASA'S

# ICESAT-2



The second generation of NASA's Ice, Cloud and land Elevation Satellite (ICESat-2) is responsible for taking important measurements of our planet's key climate indicators, including ice sheet mass balance, depth of bodies of water, atmospheric structure, as well as ecosystem characteristics.

And, it also, from time to time, turns up some fun and entertaining images from around the world — such as an old airplane hangar in Germany that has been converted into a water park (more on that later).



Learn more about Lori Magruder's work in her 3D Geospatial Laboratory at

[magruder3dgl.com](http://magruder3dgl.com)

September 15 marked four years since ICESat-2 launched. It is the descendant of the original ICESat, and the satellite provides scientists with key information about how the planet is changing in response to a rapidly evolving climate. And leading scientific development of this important program is Lori Magruder.

Magruder joined the Department of Aerospace Engineering and Engineering Mechanics as an associate professor in 2020. Prior to that, she was at UT Austin's Applied Research Laboratories for 14 years. She has been an integral part of the ICESat-2 team for the last eight years, leading the Science Definition Team to support mission development and early on-orbit operations for ICESat-2.

Magruder is an expert in remote sensing. And one of her many important jobs with ICESat-2 is geolocation validation.

# MISSION

**“THAT MEANS THAT WE MAKE SURE THINGS ACTUALLY ARE WHERE ICESAT-2 SAYS THEY ARE,” SAID MAGRUDER.**

To test this, Magruder travels to White Sands Missile Range in New Mexico frequently. There, she places a series of corner retroreflectors, small cubes about 8 millimeters in diameter, around the site. She notes where they are and compares them to where ICESat-2 measures them to be.

These little reflectors are a very important part of Magruder's work. So much so, that she had a pair of them made into earrings.

Magruder moved over to the Cockrell School because she wanted to teach and foster greater student involvement in her research. She developed a new graduate level introductory 3D remote sensing course that focuses on lidar and photogrammetry systems, data analysis and applications. As part of her research, students are developing new concepts for future missions, 3D data fusion and analysis, laser altimetry techniques for Earth science and satellite system performance assessments.

Since ICESat-2 has been on-orbit, Magruder has published 15 papers related to ICESat-2 design and discovery. They've covered a variety of aspects of the satellite, including data quality and several other earth science contributions.



Like most everyone else, the ICESat-2 science team worked remotely during the height of the pandemic. To spice up the spring meeting last year, Magruder challenged team members to pick their favorite world landmark, or fun offbeat place, and see if it had been captured by ICESat-2.



#### ◀ REMOTE SENSOR CHIC

Lori Magruder created a pair of earrings with the same sensors used to analyze the accuracy of ICESat-2's geolocation operations.

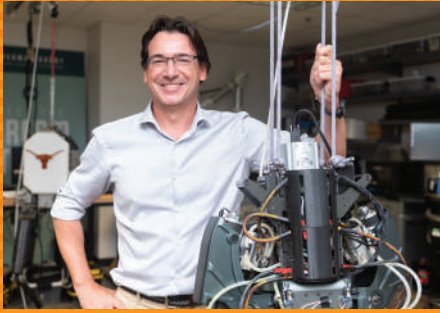


The pool in Krausnick, Germany, the world's largest indoor waterpark, was the winner of the contest.

The team also presented snapshots of breathtaking features, including the collapse of the Pine Island Glacier, the fastest melting glacier in Antarctica; the first underwater post office off the coast of Australia; the pyramids in Egypt; Fenway Park in Boston; and Nikumaroro Island, the possible landing spot of aviation legend Amelia Earhart, who disappeared on a flight in 1937. The competition was a morale booster and also an interesting demonstration of all that the satellite has, and has not, captured during its time in orbit.

Most recently Magruder has received new grants from NASA and the National Geospatial Intelligence Agency to use ICESat-2 in novel ways that include using it to improve existing global terrain elevation maps and explore concepts for future mission implementation.

Magruder is also affiliated with UT's Center for Space Research where she serves as associate director for research relations and communications. ■



### Faculty Promotions for 2022-23 🙌🚀

Congratulations to three of our faculty members who have been promoted this year! **Nanshu Lu** and **Luis Sentis** have both been promoted to full professor and **Fabrizio Bisetti** has been promoted to associate professor.

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# STUDENT RESEARCH RECOGNITION

Students Win Prestigious Fellowships and Awards for Research

## BROOKE OWENS Fellowship



**SHREYA BHATTACHARJEE**  
Aerospace Engineering Senior



**AZZURRA DEMARIE**  
Aerospace Engineering Senior

Bhattacharjee and Demarie were both selected to receive 2022 Brooke Owens Fellowships, which were created to inspire students pursuing careers in the aerospace industry to recognize “exceptional undergraduate women and other gender minorities with space and aviation internships, senior mentorship, and a lifelong professional network.”

FOR MORE NEWS AND UPDATES  
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## GRAHAM F. CAREY Computational Science Scholarship



**HARRISON JIN**  
Computational Engineering Senior

Jin is interested in the autonomous robotics side of computational engineering (specifically control theory) and is the recipient of the 2022 Graham F. Carey Computational Science Scholarship.

## NSF Graduate Research Fellowship Program Awards



**ZOELLE WONG**  
B.S. Aerospace Engineering 2022

Wong worked as an undergraduate researcher developing computational

models to understand European surface morphology and is now pursuing a Ph.D. in aerospace engineering at Georgia Tech as a President's Fellow under Juergen Rauleder. Her research will focus on fluid-structure interactions and turbulence modeling.



**BENJAMIN DIAZ VILLA**  
**ASE Ph.D. Program/Space Tech Entrepreneurship**

Diaz Villa is conducting research under professors Noel Clemens and Jayant Sirohi. His research is focused on applying aerothermodynamics to hypersonic aeroelasticity where he will be investigating the fluid-structure interaction of a full 3D hypersonic vehicle configuration using UT Austin's Mach 5 Wind Tunnel.

**NASA**  
**Space Technology Graduate Research Opportunities Fellowship**



**SOFIA CATALAN**  
**ASE Ph.D. Program**  
**Faculty Advisor: Brandon Jones**

Catalan is conducting research on data processing and computer vision to enable position, velocity and attitude estimate of on-orbit satellites. This research will enable researchers to better characterize satellite motion with better accuracy because of the improved data rates.



**NOAH LIFSET**  
**ASE Ph.D. Program**  
**Faculty Advisor: Ryan Russell**

Lifset is researching spacecraft trajectory optimization methods, as well as ways to leverage high performance computing, like parallelization, which will allow for more efficient and potentially wider-ranging space missions as low-thrust engines and small spacecraft become more common.



**RACHEL MAMICH**  
**ASE Ph.D. Program**  
**Faculty Advisor: Renato Zanetti**

Mamich is conducting research to develop a navigation algorithm for two spacecraft that are not in communication with another to perform rendezvous and docking, while also allowing for both spacecraft to maneuver.



**COREY MARCUS**  
**ASE Ph.D. Program**  
**Faculty Advisor: Renato Zanetti**

Marcus is focusing his research on guidance and navigation for autonomous landing. This will help to enable future missions to hazardous locations such as the Lunar South Pole, Titan or Europa.



**JONATHAN SIPPS**  
**ASE Ph.D. Program**  
**Faculty Advisors: Lori Magruder and Tan Bui-Thanh**

Sipps is developing computationally efficient tools and surrogate models for faster and more accurate distributed spacecraft missions design, enabling mission planners to take advantage of modern spacecraft technology, launch capabilities and remote sensing instruments for the exploration of Earth and beyond. ■

“RECEIVING FELLOWSHIP OFFERS FELT AMAZING BECAUSE IT MEANT THAT THERE’S A REAL INTEREST IN WHAT I’M DOING FOR MY RESEARCH AND THAT THE APPLICATIONS OF MY WORK CAN HAVE A REAL IMPACT IN THE SPACECRAFT NAVIGATION COMMUNITY.”

—Sofia Catalan, ASE Ph.D. Student



TO SUPPORT OUR STUDENT PROGRAMS, VISIT  
[ae.utexas.edu/giving](http://ae.utexas.edu/giving)

# GPS-FREE DRONE TECH

## PROPOSAL LANDS UNDERGRADS SPOT IN NASA RESEARCH CHALLENGE

Drones, like most people these days, rely heavily on GPS for navigation. However, there are some tricky situations, such as dense urban environments, where GPS isn't available, and the drones need another method to get around.

A group of aerospace engineering students was recently selected to the annual NASA University Student Research Challenge, where they will explore this challenge. Their proposal focuses on “space-based state estimation techniques,” for drones, which involves using algorithms and the sensors to pinpoint their location in situations where GPS is not available. This would give them a more accurate picture of crowded environments and make it easier for them to navigate autonomously.

The project looks toward a future where drone delivery and other applications are more popular, and these systems aim to help drones avoid repeated crashes that could cost companies millions and endanger people on the street and other aircraft in the sky.

“Our research seeks to aid in the expansion of drone delivery services for companies such as Amazon and Walmart,” said Lauren Byram, an aerospace engineering senior. “An increase in the accuracy and ability of estimating the state of drones will allow these services to move into more urban and densely populated areas.”

Undergraduate aerospace engineering seniors Byram, Melissa Pires and James Mitchell Roberts, student principal investigator on the project, wrote the proposal as part of the Spacecraft Mission and Design course taught by Adam Nokes, a lecturer in the Department of Aerospace Engineering and Engineering Mechanics and the team's faculty advisor.



PHOTO: NASA

Beyond the big problem the students are tackling, the project is notable because it is led by undergraduates. The NASA challenge field is almost exclusively graduate teams, and this group is one of very few in the history of the ASE/EM department at UT Austin to reach this level of funding and achievement as undergrads.

The project includes \$60,000 in funding, and the students are required to raise funds as well. The three student leaders will be assisted by approximately 20 other students from the incoming cohort of the design course.

The students will operate a fleet of drones that don't have knowledge of each other's location close together. Simultaneously, they will create visualizations of each drone's error ellipsoid, which is the zone of probability where the drone is located. Since there's no GPS, it's not possible to be 100% certain of the drone's location.

The team proposes to apply an extended Kalman filter algorithm to the drones to help the devices narrow down this location zone. This technique is popular with orbital spacecraft, and it is starting to show up in commercial aircraft more often. By applying it to multiple drones, they could create more accurate data about dense

**“OUR RESEARCH SEEKS TO AID IN THE EXPANSION OF DRONE DELIVERY SERVICES FOR COMPANIES SUCH AS AMAZON AND WALMART. AN INCREASE IN THE ACCURACY AND ABILITY OF ESTIMATING THE STATE OF DRONES WILL ALLOW THESE SERVICES TO MOVE INTO MORE URBAN AND DENSELY POPULATED AREAS.”**



— Lauren Byram,  
an aerospace  
engineering senior

areas and help each other navigate and avoid crashes.

“In terms of safety, we look forward to ensuring safe separation between aircraft to eliminate collisions,” said Pires. “I am excited about figuring out how we will utilize the extended Kalman filter to estimate the state of the drone.”

Ultimately, state estimation data could be used to create a centralized air traffic control system for drones, similar to the ones that keep airplanes safe in the sky. This system could be almost completely

autonomous, making it easier for them to fly when out of sight and potentially removing another hurdle holding back wider regulatory approval.

“Solving the issue of drone usage in high-density, non-GPS environments will likely have a significant economic benefit to many industries worldwide,” Roberts said. “In addition, if developed properly, this technology could be used in a variety of ways to increase safety with drone usage globally.” ■

### GET INVOLVED AND DONATE

As part of the challenge each team must raise \$2,000, but because the project is highly technical, the team's stretch goal is to raise \$30,000.

Help this team of talented undergraduates make a statement in this prestigious challenge against mostly graduates and even some doctoral students. Donate to the effort here ▶



# BLAST FROM THE PAST

**NICHOLAS AUFIERO, B.S. COE '22** is a National Merit Finalist. He served as president of UT Men's Soccer and an officer for the Society of Plan II Engineers. After graduation, he joined LinkedIn as a site reliability engineer.



Experiences of an Overachiever,” describing his educational, engineering and teaching careers focused on how and why he became a college professor.

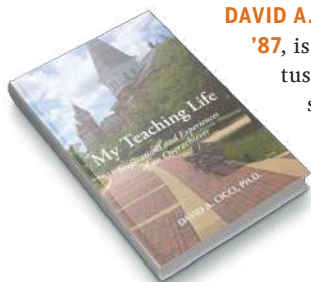
**ZACK BASSETT, B.S. ASE '16**, works as a fluid controls engineer in Avionics, Instruments & GNC III for Blue Origin's New Glenn in Kent, Washington.



Zack Bassett at the Blue Origin Orbital Launch Complex (LC-36) where New Glenn will be launched.

**CHARLES H. BLACKNALL, SR., B.S. ASE '85**, is an instance adjustor instructor at Jet Adjusters, LLC.

**DAVID A. CICCIO, PH.D. ASE, '87**, is a professor emeritus at Auburn University. He recently published the memoir, “My Teaching Life: Inspirations and



He details the time he spent earning a Ph.D. in orbital mechanics at UT Austin (under Dr. Byron Tapley) and his distinguished teaching career as a professor in the Department of Aerospace Engineering at Auburn University. He also discusses his teaching experience teaching mathematics at Austin Community College while a graduate student and his time serving as the resident expert at CIA Headquarters during a year-long sabbatical from Auburn.

**“AFTER I FINISHED WRITING, IT OCCURED TO ME THAT MY EXTENDED FAMILY, FRIENDS AND EVEN SOME OF MY FORMER STUDENTS MIGHT FIND THIS BOOK INTERESTING. I HOPE EVERYONE ENJOYS READING IT AS MUCH AS I ENJOYED WRITING IT.”**

**ALYSSA GARZA, B.S. ASE '22**, is the recipient of UT Austin's Impact Scholarship, which includes \$48,000 over the course of four years of study, making them one of UT's largest awards offered to incoming freshmen. She was also named to the Equal Opportunity in Engineering Hall of Fame and served as an officer of the Women in Aerospace for Leadership Development (WIALD). After graduation she accepted a position at Raytheon Intelligence and Space as a systems engineer.



**JOSEPH GAUTHIER, B.S. ASE '11**, is a field applications engineer at Boston Dynamics in Waltham, Massachusetts.

**EDUARDO HERNANDEZ, B.S. ASE '22**, is an acoustics engineer at Boeing in Everett, Washington.



**MIHIR KAMBLE, B.S. ASE '22**, was the recipient of the T. W. Whaley, Jr.

Friends of Alec Endowed Scholarship during his undergraduate studies at UT. He also served as the flight software lead for the Texas Spacecraft Laboratory, the internal systems team Lead in UAV Austin, an officer of Tau Beta Pi and an ASE/COE peer advisor and coordinator. This fall he began attending graduate school at Stanford University to pursue a master's degree in aeronautics and astronautics with a focus on systems and controls.



Mihir Kamble

**“WHAT STARTS HERE CHANGES THE WORLD – BUT MIGHT ONE DAY ALSO HELP US LEAVE IT,” SAYS KAMBLE.**

**UTBAH MASUD, B.S. ASE '12**, is working as a senior consultant at Deloitte Consulting.

**ROSHAN NAIR, B.S. ASE '19**, finished a master's degree in aeronautics and astronautics in 2021 and is now working full-time at Hermeus on hypersonic commercial vehicles.



Roshan Nair (B.S. ASE '19) and Katie Layton (B.S. ASE '22) show their Longhorn pride with the first Quarterhorse prototype.

**WILLIAM "CHRIS" NIEDZWIECKI, B.S. ASE '97, M.S. EM '00**, is a senior structural analyst at Hutchinson Aerospace in Burbank, California.

**LAKSHMI "MYTHRI" PALURI, B.S. ASE '22**, received a Cockrell School Alec Whaley Engineering Honors Scholarship during her time at UT. She also served as a project manager for the SCOPE Mission in the Texas Spacecraft Lab, as the Women in Aerospace for Leadership and Development (WIALD) president and as the Class of 2022 representative on LUNAR Council.



She began pursuing her master's degree in aerospace engineering at Stanford University this fall.

**JAYANT SHARMA, B.S. ASE '87, PH.D. ASE '95**, is working as a technical staff member at the MIT Lincoln Laboratory in Lexington, Massachusetts.

**EVRIM SOLMAZ, M.S. ASE '18, PH.D. ASE '22**, is working as a research scientist at Tokyo Electron, U.S. in Austin.

**PATRICK SVATEK, B.S. ASE '96, M.S. ASE '01**, is working as a launch site director for Relativity Space in Cape Canaveral, Florida. ■



## JILL MEYERS

### HONORED FOR INSPIRING YOUNG WOMEN

Distinguished alumna **Jill Meyers** was recognized by the National Aeronautic Association with the Katharine Wright Trophy "for her 40 years of dedication to the aerospace industry and her tireless commitment as a volunteer and role model, working to educate and inspire young girls around the globe."

## SPEAKER SERIES

### "LOOK BEFORE YOU LEAP – AN UNINTENTIONAL ENTREPRENEUR'S CAREER JOURNEY"

with distinguished alumnus **George Davis**, founder and CEO of Emergent Space Technologies



WATCH:  
[bit.ly/3KaM2X1](https://bit.ly/3KaM2X1)

# ASE/EM ACADEMY OF

CLASS OF  
**2022**  
INDUCTEES



# DISTINGUISHED ALUMNI

*Ten Texas Engineering alumni of the Department of Aerospace Engineering and Engineering Mechanics at The University of Texas at Austin were elected to the ASE/EM Academy of Distinguished Alumni for 2022. On April 22 these new members, as well as members of the 2020 and 2021 classes, were inducted to the academy at in-person ceremonial banquet.*

Inductees are recognized and honored by the academy for leading distinguished careers that include outstanding technical contributions, excellence in leadership and dedication to improving communities. Learn more about the academy at [ae.utexas.edu/alumni/ada](https://ae.utexas.edu/alumni/ada)

## THE MEMBERS ELECTED TO THE ASE/EM ACADEMY OF DISTINGUISHED ALUMNI FOR 2022 ARE:

---

### THOMAS J. ELLER

Professor, United States Air Force Academy (Retired)

### RONALD "RON" FARRIS

Colonel, United States Air Force & GS-15, NASA (Retired)

### GEORGE K. GAFKA

APT Research, Chief Executive Officer; NASA Senior Executive (Retired)

### BING-JEAN LEE

President, Feng Chia University and Professor of Civil Engineering

### JIMMY NARRAMORE

Founder, Narrfoil LLC (Retired)

### CASSIDY NORMAN

Commanding Officer, USS John C. Stennis (CVN 74), United States Navy

### LESLIE PHINNEY

Manager, Sandia National Laboratories

### JANA REBMANN

President, Odyssey Space Research, LLC

### TRACY VOGLER

Distinguished Member of the Technical Staff, Sandia National Laboratories

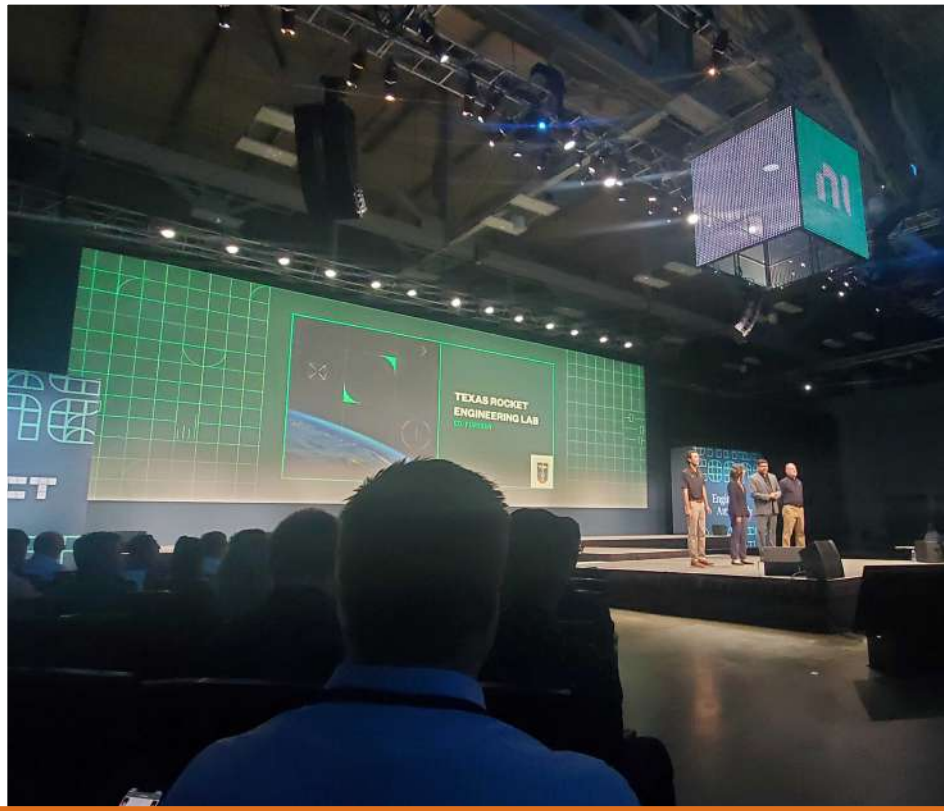
### WALTON "WALT" E. WILLIAMSON JR.

Professor Emeritus, Department of Engineering, Texas Christian University

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#### TREL AT NI CONNECT

This spring the Texas Rocket and Engineering Lab (TREL), a UT Austin interdisciplinary student research lab that focuses on applied rocket science, was invited to speak at National Instrument's (NI) Connect event in Austin. The team's director of operations Urvi Alamela and previous lead of corporate development Gregory Gaasche took the stage to share how NI's technology has helped further propel the progress of their rocket engineering project Halcyon, a student-designed liquid propellant rocket that is being built using the most advanced technologies, with the goal of launching to the edge of space.

Watch the presentation (starting at 1:03): [bit.ly/3QTKM1Z](https://bit.ly/3QTKM1Z)

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