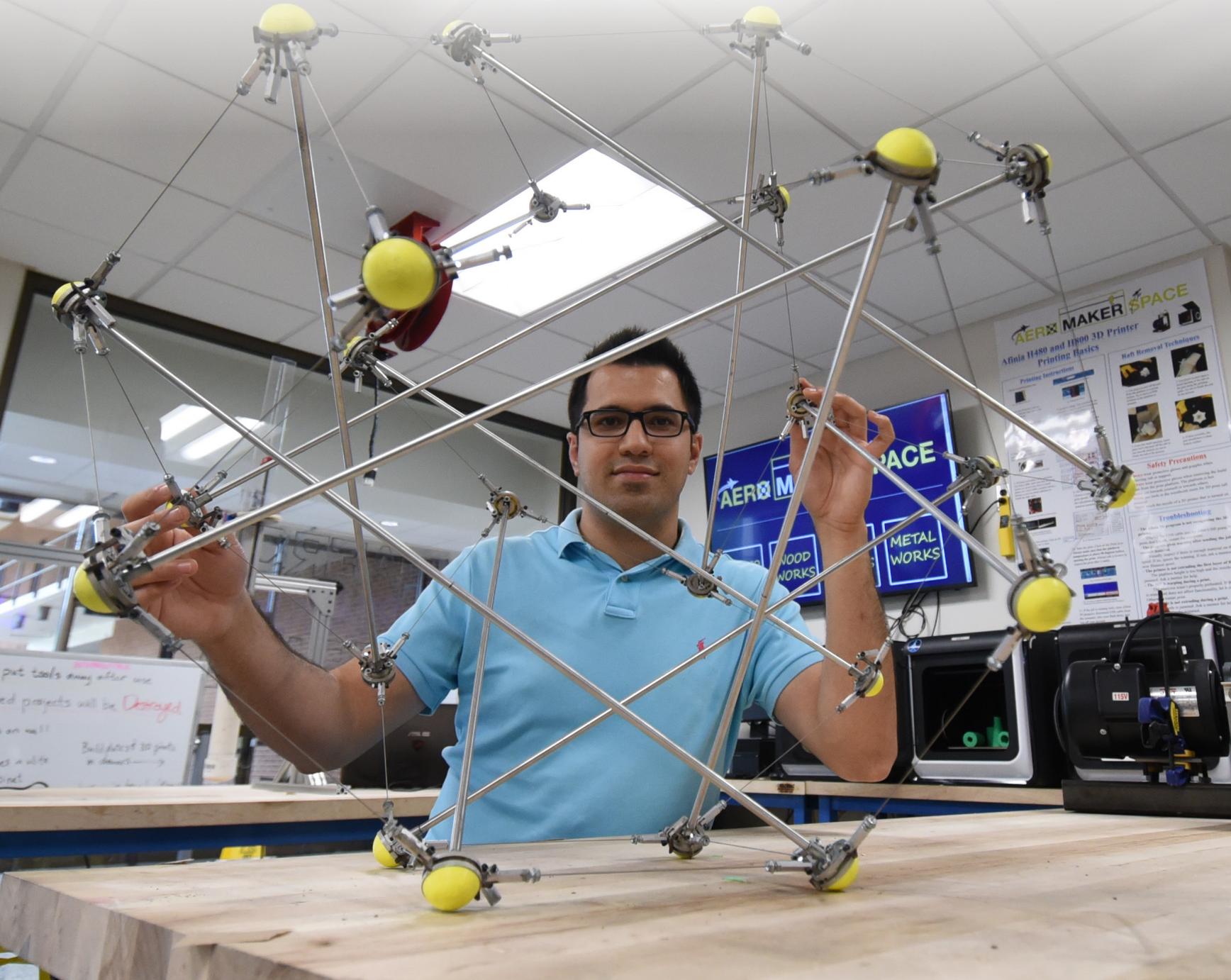


# *Inspire.* EXPLORE. **Lead.**



## Inspire. Explore. Lead.



Throughout the AE School's history, these three words have defined our mission. **Inspire** ambition. **Explore** new opportunities. **Lead** the way to innovation. They were the foundation of our earliest efforts – instructing military personnel in basic aeronautics in 1917. And they framed the legacy of one of our most successful endeavors to date – the Aerospace Systems Design Lab (ASDL), which has educated hundreds of leaders in our field and has just celebrated its 25th year as a part of the AE family.

Nowhere are these three words more descriptive than in the newly revitalized AE curriculum, which will produce its first graduates in a few months.

**Inspiring.** To inspire today's students, the new AE curriculum had to be intellectually engaging, and relevant to the demands of a changing industry. That meant expanding our courses to include areas that are becoming fundamental to the aerospace field – like autonomy, data science and technology, and design – and revising the core offerings to redefine fundamental skills in nearly 100 areas. It also meant offering more multi-disciplinary and hands-on laboratory experiences earlier in the curriculum sequence – freshman and sophomore years.

**Exploring.** The field of aerospace engineering has never been static. Neither should we. The new AE curriculum has incorporated a more flexible class sequence and reduced core requirements, thus allowing our students greater freedom to explore specialized areas and to customize their educational experience. Students can study abroad, pursue an academic minor, or earn a certificate in a related field -- all within the eight-semester timeframe. The expansion of the option requirements has allowed several undergraduates to more quickly attain graduate-level depth in a chosen specialization.

**Leading.** Curricula are neither simple nor obvious to create. In their steadfast and thoughtful overhaul of the curriculum, the AE faculty truly demonstrated educational leadership. They boldly defined the subjects, skills, and perspectives that will allow AE grads to drive the field forward. They established core courses that demand mastery, and options courses that promote depth in specialized areas.

Above all, they anticipated **change** – in the topics, challenges, and opportunities that lay ahead in aerospace engineering.

In the coming year, when the AE School moves forward to recruit additional faculty, we will be searching for visionary thinkers like the ones who crafted this curriculum.

If you know any, please send them my way.

**Vigor Yang**

**William R. T. Oakes Professor and School Chair**



*Happy Birthday ASDL*

# STUDENT HIGHLIGHTS

*Aviation Week* magazine and AIAA named AE doctoral student **Braven C. Leung** to its 20 Twenties ranking of the nation's top graduate and undergraduate students of 2017. Leung also received a National Defense Science Engineering Graduate Fellowship, the Dale Margerum Memorial Award for outstanding leadership, and the NASA SpaceOps Student Award for technical and scientific excellence .... Three AE students



Jillian Uricich



Nathaniel Brown



David Jovel



Kreston Barron

received National Science Foundation Research Fellowships: **Jillian Uricich**, **Nathaniel Brown**, and **Aaron Blacker**. Uricich will focus on developing algorithms that optimize the vehicle dynamics of satellites – things like fuel consumption, best routes, desirable speeds, preferred attitudes, targeted locations. Brown will use his NSF funding to push the boundaries of electric propulsion. Blacker will focus on longitudinal combustion instabilities in liquid rocket engine chambers at Purdue University .... Doctoral student **Shahzad Virani** received a four-year, \$153,000 National Defense Science and Engineering Graduate (NDSEG) fellowship, to support his research on low signal-to-noise ratio electro-optical detection and tracking .... A 2017 NASA Space Technology Research Fellowship (NSTRF) will enable first-year graduate student **Jack Ridderoff** to focus exclusively on his doctoral research in entry, descent, and landing....Graduate student **David Jovel** received a GEM Fellowship to support research on the performance of Hall effect thrusters for space vehicles. **Kreston Barron** also received a GEM which he will use to pursue doctoral research on In Situ Resource Utilization technology to harness energy from the atmosphere .... His work designing and testing a novel magnetohydrodynamic generator for upper-state rocket engines earned **Nicholas Branch** the title of top undergraduate aerospace researcher in the College of Engineering's 2017 Undergraduate Research Symposium



## Designed, Built, & Flown with Pride

*As in past years, AE students learned a lot from competing with their peers in design, build, fly competitions around the country. Also, as in past years, they took home a lot of the hardware from those competitions:*

- The AE team placed first in the 2016 Society of Automotive Engineers (SAE) Aero Design competition in both the Advanced and Micro divisions;
- AE's RoboBoat team placed first in the 2016 RoboNation RoboBoat competition;
- AE's team placed second in the 2017 AIAA design competition;
- Graduate researchers from AE placed first in the 2017 Airbus Design Challenge;
- The AE team received NASA's Blue Marble Award for demonstrating exceptional environmental leadership in support of NASA's missions

.... The FAA's Center of Excellence for Alternative Jet Fuels & Environment joined the DOT and the Council of University Transportation Centers (CUTC) in naming AE doctoral student **Nicholas Rock** as its Student of the Year. Rock's research seeks to identify the mechanism(s) that trigger engine-stopping 'lean-blow-outs' in airplane engines .... Graduating AE senior **Julia Macon** was selected as the 2017 Student of the Year for the Southeast Region by Sigma Gamma Tau, the aerospace engineering honor society. She is the fourth Georgia Tech aerospace engineering student in as many years to claim the title .... Doctoral student **Miad Karimi** received the Southwest Research Institute's \$13,500 2017 UTSR Gas Turbine Industrial Fellowship to support his research with Prof. **Wenting Sun** focusing on supercritical carbon dioxide gas turbine power systems.



## Celebrating Scholarship

This spring, nine AE students were singled out by the Georgia Tech Women in Engineering scholarship program for their outstanding performance and potential. They are (*back row*) Sabrina Herman, Karena Z. Fiore, Quinn M. Larimer, Emily V. Hale, Jessica R. Jourden, (*front row*) Erica Hulette, Savannah J. Langer, Elizabeth P. Halloran, Jiayi Zhang. Funds for the scholarships were provided by the Boeing Company, United Technologies Corporation, and the George Family.

# AE SCHOOL HIGHLIGHTS

*The foundation of the AE School's reputation is established by the hard work, innovative thinking, and impactful research of our faculty. In that regard, Fiscal Year 2017 was like many before it ....* Professor **Stephen Ruffin** joined the AE School leadership team, assuming the title of associate chair for graduate programs. His colleague, Prof. **Jeff Jagoda**, was named to the newly



Prof. Stephen Ruffin

created position of associate chair for administration .... Three faculty were promoted to the rank of full professor: Dr. **Mitchell Walker**, Dr. **Eric Johnson**, and Dr. **Amy Pritchett**. Following her promotion, Pritchett was recruited to become the next chair for the aerospace engineering school at Penn State .... Dr. **Julian Rimoli**



Prof. Massimo Ruzzene

was promoted to the rank of associate professor .... Professor **John-Paul Clarke** was appointed to the College of Engineering's Dean's Professorship .... Prof. **Massimo Ruzzene** was awarded the first-ever Pratt & Whitney Professorship in Aerospace Engineering .... Prof. **Dewey Hodges** and Prof. **J.V.R. Prasad** were chosen to receive the first-ever Oakes Faculty Fellowships, awarded by the AE chair to recognize and support teaching and research....Prof. **Karen Feigh** and Prof. **Brian German** were each named AIAA Associate Fellows .... Prof. **Mark Costello** was elected to Fellow by ASME and was also chosen for a two-year program manager appointment to DARPA ....



Prof. Marcus Holzinger

The Center for Enhancement of Teaching and Learning (CETL) named Prof. **Jerry Seitzman** for the 2016 Class of 1940 Course Survey Teaching Effectiveness Award .... Sigma Gamma Tau, the aerospace engineering honor society, named Prof. **Jeff Jagoda** as the 2017 Most Valuable Professor .... Prof. **Marcus Holzinger** was selected to attend the NAE's 2017 Frontiers of



Prof. Karen Feigh

Engineering Forum, to be held in September .... The Air Force Office of Scientific Research also selected Holzinger to receive a three-year, \$360K Young Investigator Research Program grant to further his work on space situational awareness .... Prof. **Karen Feigh** received a two-year, \$600K NASA Early Stage Innovation (ESI) grant to support her research "Technologies for Mixed-Initiative Plan Management for Human Space Flight," which examines on board planning and mission adjustment issues for long-term space flight .... TARGIT, a small satellite under development by Prof. **Brian Gunter's** research group, was granted a launch slot aboard a scheduled NASA mission in the next two years. The solar-powered vehicle seeks to advance topographical mapping capabilities using LiDAR imaging .... Prof. **Marilyn J. Smith** was elected

to a two-year term as the southern regional director for the American Helicopter Society International ....

"Dynamics of Phononic Materials and Structures: Historical Origins, Recent Progress, and Future Outlook," a paper co-authored by Prof. **Massimo Ruzzene**, received the 2016 Lloyd Hamilton Donnell Applied Mechanics Reviews Paper Award from the editorial board of *Applied Mechanics Reviews* .... Prof. **Eric Feron** was a part of the collaborative



Prof. Jerry Seitzman

team that authored, "The Robotarium: A Remotely Accessible Swarm-Robotics Research Test Bed," which won the Best Multi-Robot Systems Paper Award at the 2017 IEEE International Conference on Robotics and Automation .... Prof. **Evangelos Theodorou** teamed up with CoC professor **Jame Rehg** to propose "Autonomous Racing Using Deep Learning and Game Theoretic Optimization," a project that received a \$100K innovation fellowship from Qualcomm .... Professors **John-Paul Clarke** and **Julian J. Rimoli** received a \$103K NASA grant to support their "Evacuated Airship for Mars Missions" project, a gas-free space vehicle the two have designed .... Working with the Combustion Group, Prof. **Tim Lieuwen** has taken advantage of recent advances in additive manufacturing to develop fundamentally new high efficiency combustion systems .... Prof. **E. Glenn Lightsey** began coordinating the Institute's involvement in Cupid's Arrow, a collaboration with CalTech and JPL that will eventually deploy a small satellite from a Mars-bound space vehicle to collect atmospheric data on Venus.



Prof. J. P. Clarke



## New \$7.5M research partnership at AE

Under the terms of a new \$7.5 million partnership with Airbus, AE will soon provide access to new, world-class capabilities and design insights to support the acceleration of product development cycles. AE faculty, researchers, and students are expected to gain valuable insight into complex industrial problems as they help Airbus build up new design methodologies. The agreement, which extends for a minimum 5-year period, was finalized and signed by Interim CoE Dean Laurence Jacobs, (above far right) at the Paris Airshow in June.

# CHANGE CAN BE GOOD. AMBITION IS **ALWAYS** TIMELESS.



If you haven't visited the AE School lately, I want to invite you. Come hear a lecture from a visiting scholar. Take in a presentation from a student researcher. Sit in on a class.

It won't take you long to see why the Daniel Guggenheim School of Aerospace Engineering is ranked #2 in the nation. The best and the brightest – *our faculty and students* – are constantly pushing ahead with innovative research and scholarship.

*Some things never change.*

When you visit, you might notice something else: the AE School's aging facilities do not measure up -- not to our legacy, nor to the boundless talents of our faculty and students. *That's about to change.*

With the help of AE's many supporters, the School will begin upgrading its classrooms, labs, offices, and other spaces over the next few years. The results will establish a more modern, cohesive AE Campus at Georgia Tech. You may not recognize some parts of the School, but you will recognize one pillar we will never change: ambition.

*Some things are timeless.*

**John E. Laughter, B.S. AE '93**

Chair, Aerospace Engineering School Advisory Council

## 2016-2017 AESAC Members



**Ron Bessire**  
Vice President,  
Engineering &  
Technical Operations  
Lockheed Martin  
Aeronautics



**John W. Elbon**  
AE '82  
Vice President &  
General Manager,  
Space Exploration  
The Boeing Company



**Philip A. Fawcett**  
AE '89, '92  
Principal Director,  
Advanced Research  
and Engineering  
The Aerospace  
Corporation



**Ram Janakiram**  
AE '76  
Manager, Flight  
Technology  
The Boeing Company



**R. Steven Justice**  
AE '80  
Executive Director  
Georgia Centers of  
Innovation



**Catherine Kilmain**  
AE '95, '98  
CEO  
KIACS Innovations



**Nick Lappos**  
AE '73  
Senior Technical Fellow  
Sikorsky Aircraft  
Corporation



**Leslie Livesay**  
Director for Astronomy  
and Physics  
Jet Propulsion  
Laboratory



**Robert G. Loewy**  
Former AE Chair  
AE Professor Emeritus



**Sandra H. Magnus**  
MSE '96  
Executive Director  
American Institute  
of Aeronautics &  
Astronautics



**Jaime Peraire**  
Dept. Head and  
H.N. Slater Prof.  
of Aeronautics &  
Astronautics, MIT



**Thomas W. Prete**  
Vice President of  
Engineering - Military  
Engines  
Pratt & Whitney



**Guruswami  
Ravichandran**  
John E. Goode, Jr. Prof.  
of Aerospace & Mechanical  
Engineering,  
Otis Booth Leadership  
Chair, Engineering and  
Applied Science



**Don W.  
Richardson**  
(Chair Emeritus)  
AE '51  
President and COO  
Donrich Research Inc.



**Alton Romig**  
Executive Officer  
National Academy of  
Engineering



**Chris Singer**  
Deputy Chief Engineer  
NASA  
(retired)



**Rafael Spears**  
Chief Operating Officer  
Alpha Research &  
Technology



**Joseph D.  
Stewart**  
AE '64, '65, '67  
Associate VP  
for Research,  
The University of  
Tennessee



**W. Stoker**  
AE '89, '90, '96  
Senior Manager-  
Product Development,  
Collaboration,  
Commercial Airlines  
The Boeing Company



**Gary Weissel**  
AE '93  
Managing Officer  
Tronosjet Aviation  
Consulting, Inc.



**Stephanie  
Wojcik**  
AE '03  
Engineering Operations  
Integrated Defense  
Systems,  
The Boeing Company



**John J. Young, Jr.**  
AE '85  
AESAC Chair Emeritus  
Former Undersecretary  
of Defense, Acquisition,  
Logistics, Technology



**Stephen M. Younger**  
Vice President and Chief  
Technologist  
Northrop Grumman  
Technical Services

## RESEARCH HIGHLIGHTS

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### Evangelos Theodorou: The Statistical Physics of Stochastic Optimal Control and Learning

Prof. **Evangelos Theodorou** is generating new interest in the re-integration of research methods used by physicists and control theorists – all with an eye towards developing new, more efficient algorithms for control of complex dynamical systems in autonomy, robotics, and biology.

Theodorou's work took off last year when he was chosen to convene an Army Research Office-sponsored workshop that brought together nationally recognized experts in the areas of statistical physics, stochastic control, and dynamical systems theory.

"We investigated open questions and future research directions at the intersection of our respective fields – from both a theoretical and an application perspective," he said. "We all agree that there are laws that apply across the disciplines, and if you apply them, you can have a much wider impact. You can create scalable algorithms that allow you to control many things, from active matter systems on the micro-scale to, on the

macro scale, UAVs that drive or fly fast and humanoid robots."

A report on the workshop, "Statistical Physics of Stochastic Optimal Control and Learning" has inspired participants to further refine its findings and created new research avenues. Theodorou is focusing his efforts on model-predictive control problems, such as those faced by autonomous vehicles.

"We can use physics to create sampling-based algorithms that can direct a car around a racetrack in variable conditions," he says, gesturing to video of the same. "Parallel computing allows us to sample multiple models of the car's trajectory every 40 milliseconds, so we can make allowances for changing conditions while they are happening."

**Find out more:** [robotics.gatech.edu/faculty/theodorou](https://robotics.gatech.edu/faculty/theodorou)



Prof. Evangelos Theodorou

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### Julian Rimoli: Using Tensional Integrity to Explore Distant Worlds in Space

Prof. **Julian J. Rimoli**, head of AE's Computational Solid Mechanics Lab, has received a Grainger Foundation Grant to apply his tensegrity research to the construction of a hybrid vehicle that will allow scientists to land on asteroids, moons, and comets.

Awarded by the National Academy of Engineering, the \$30,000 grant supports Rimoli's collaboration with Stanford University professor Marco Pavone on the development of an unmanned vehicle capable of landing and controlling itself in the low-gravity, rough terrain environments typically found on asteroids, comets, and irregular moons.

"The exploration of these smaller bodies can help us better understand the origins of the solar system and improve our

understanding of planetary processes," Rimoli said. "And controlled mobility in low-gravity environments is one of NASA's high priorities for technology development."

Rimoli's work explores the capabilities of compliant tensegrities -- sparsely built skeletal systems of floating rods that are housed inside a net of continuous tension. Though they look like a child's jungle gym, these structures could play a singularly important role in the development of a versatile and economic space vehicle: they are able to store large amounts of strain energy upon impact with minimum structural mass, significantly reducing the cost and complexity of their transport.

**Find out more:** [rimoli.gatech.edu](https://rimoli.gatech.edu)



Prof. Julian Rimoli

## Wenting Sun: Making Turbines More Efficient

Prof. **Wenting Sun**'s research focuses on improving the efficiency of gas turbines and reducing carbon emissions from fossil fueled energy. The arrival, this year, of a new shock tube has given his efforts a huge boost.

The 69-foot, eight-ton tube will allow Sun and his colleagues to obtain higher quality, more accurate data from their work in combustion kinetics at conditions which were not explored before.

"There really isn't one this large, doing this kind of research. And it really wouldn't be possible in most other labs that I know about," says Sun.

"Using this, we can explore a combustor's properties at new, more extreme, conditions – much higher pressure. We can experiment with different gases. And I will be able to isolate the conditions, which is important because I need to know the exact conditions to validate kinetic models for gas turbine combustors."

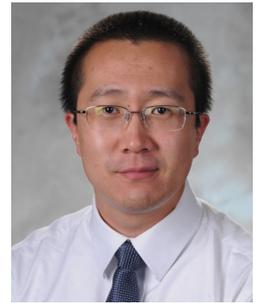
The precision of the shock tube's engineering is key. Its structure and capacity allow Sun and his colleagues to extract

information they can use to create and validate new models for combustors.

"The conditions we are targeting are around 300 atmospheres [atm], and between 800 and 2500 Kelvin," said Sun. "We want to mimic conditions for next generation of gas turbines because we want to have greater efficiency, and greater carbon sequestration. If we can capture the carbon, we can stop it from being emitted."

Sun oversaw the installation of the mammoth tube as part of a \$1M grant he received for a three-year study of oxy-combustion technologies capable of high-efficiency, low-cost carbon dioxide (CO<sub>2</sub>) capture from coal and natural gas-fired power plants. Oxy-combustion represents one of the most promising methods for removing carbon dioxide from gas and coal-fired power plant exhaust gases. Unlike conventional combustion processes that utilize air as the oxygen source, oxy-combustion utilizes pure oxygen for combustion.

Find out more: [sun.gatech.edu](http://sun.gatech.edu)



Prof. Wenting Sun

## Saleh and Walker: Making A Propelling Argument

A study by professors **Joseph H. Saleh** and **Mitchell L. R. Walker** could open up some value-enhancing design choices for the satellite industry.

Summarized in "Electric Propulsion Reliability: Statistical Analysis of on-Orbit Anomalies and Comparative Analysis of Electrical versus Chemical Propulsion Failure Rates," their findings give satellite manufacturers, insurers, and operators evidence-based support to pursue electric (EP) over chemical propulsion (CP) technology for future spacecraft.

Using 18 years worth of satellite data, Saleh and Walker conducted what amounted to an epidemiological study of the on-orbit anomalies and failures of EP. They produced a comparative analysis of EP and CP reliability in spacecraft and examined data by orbit type, technology, severity of the anomalies experienced, and launch date. They also looked at the average time it took for anomalies to occur, the relationship of the time to event, and the anomaly rates.

Among the many results, their study revealed that, post-2005, EP technologies (Hall thrusters and gridded ion engines) have consistently out-performed chemical propulsion in terms of reliability - a crucial consideration for spacecraft. Their analysis also revealed that Hall thrusters exhibit minor anomalies very early on orbit ("infant anomalies"), a problem that could be addressed through improved ground testing and acceptance procedures. Gridded ion thrusters, on the other hand, exhibited both infant anomalies and wear-out failures – conditions that would benefit from a reliability growth program. The team found strong evidence that EP anomalies (onset and likelihood) and orbit type are dependent – a condition that is likely mediated by either the space environment or differences in thrusters' duty cycles.

Read the paper: <http://www.sciencedirect.com/science/article/pii/S0094576516313650>



Prof. Mitchell L. R. Walker II and Prof. Joseph H. Saleh

## The Aero Maker Space Comes of Age

In the year since it opened, the Aero Maker Space (AMS) has become a second home, a hang-out even, for hundreds of restlessly creative Georgia Tech students. You could boastfully call them the ‘makers of the next’ and not get any argument from AE professor **Claudio Di Leo**, who oversees the operation.

“The Aero Maker Space labs have really embodied our mission as an engineering school in the 21st century,” he says of the bustling new labs in the Weber and Knight buildings. “They are collaborative manufacturing environments that support the pillars of our work: education, research, and innovation. And it doesn’t hurt that they are a lot of fun.”

### Teaching

The Aero Maker Space is transforming the way classes are taught, Di Leo says, by allowing professors to incorporate manufacturing and testing components into the curriculum. First-year students in AE 1601 laser cut balsa wood flyers for competition. Structural analysis students in AE 3160 design, laser cut, and test truss structures, while more advanced students have worked on the mechanics of carbon-fiber composites. The opportunity to translate a design into a reality is critical to gaining a solid foundation in engineering, Di Leo points out, but it also sparks more curiosity.

“What they see, pretty quickly, is how theory deviates from practice, and how different conditions need to be considered,” says Di Leo. “When a project doesn’t perform the way you expected, you get more questions to explore. That curiosity puts them – and the School – at the forefront of the discipline.”

### Research

Prototyping has always been a critical part of research for engineers. The AMS has made it more accessible and much less costly—two factors that have changed the way AE faculty frame their research proposals.

“Sponsors know that AE researchers can use the AMS to design, iterate, and learn a lot faster. We have people trained to use water jets, laser cutters, foam cutters, 3D printers, and much more. They know that AE has the capacity to try different approaches and to test them, in-house, using our own prototypes.”

For the last 18 months, Di Leo has been working in the AMS with Prof. **Mark Costello** on a \$2 million DARPA-funded project to develop new robotic landing gear for a UAV rotorcraft in the 400-pound weight class. The ‘legs’ that they design and manufacture in the AMS will eventually be integrated to a commercially manufactured rotorcraft and flight tested. “They really wanted to minimize the weight of this

landing gear, so it was crucial that we use carbon fiber reinforced polymer (CFRP), a material that is more and more in demand in aerospace engineering,” said Di Leo. “For the manufacturing of the CFRP, we were able to use 3D printed tooling – rather than machining it on a CNC, which is expensive. This use of additive manufacturing to manufacture carbon-fiber composite parts has allowed us to rapidly manufacture and test a number of fully-function robotic landing gear designs.”

### Innovation

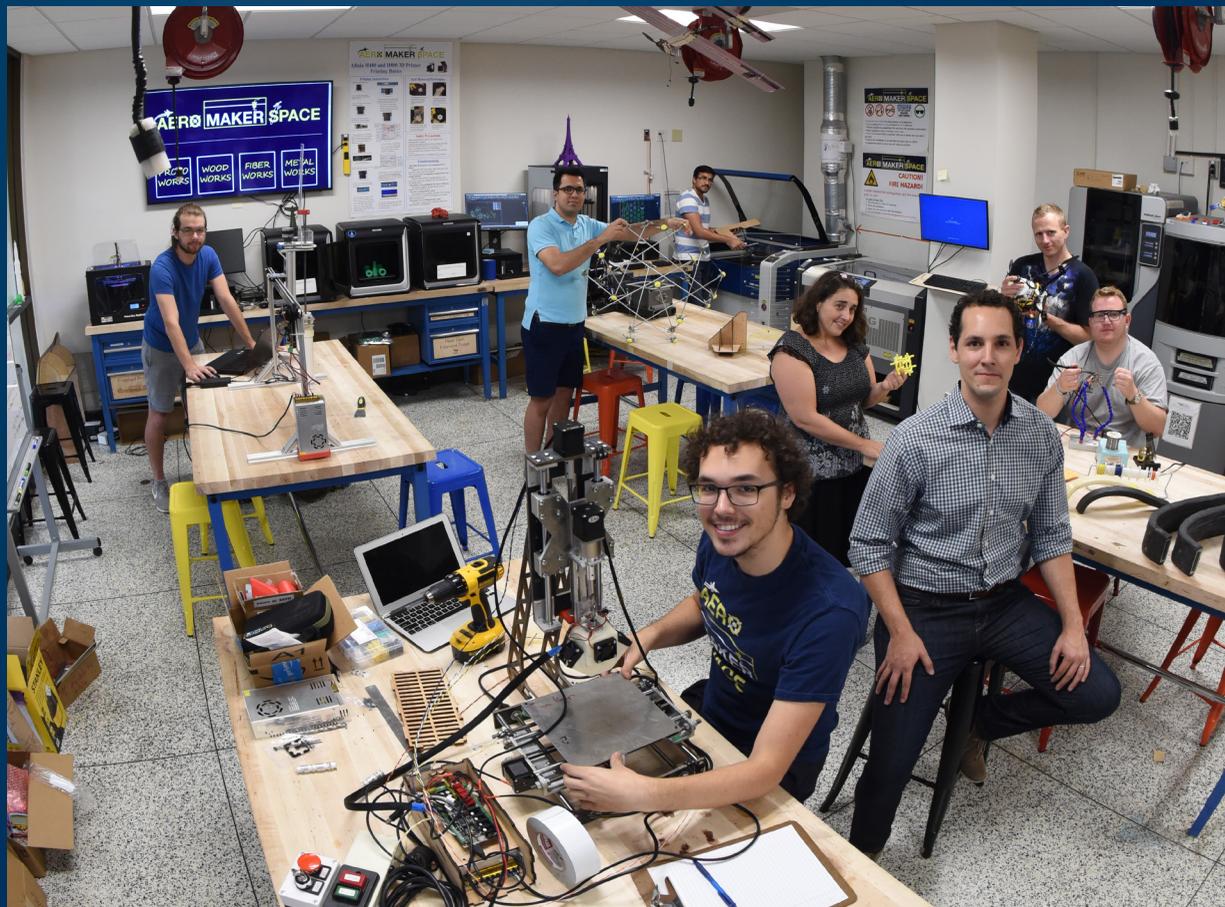
**Sam Kemp** had already built a 3D printer in his Gainseville, GA garage before he transferred to GT-AE in the fall of 2016. What he was looking for was an environment that would demand more from him – technically, and intellectually. The AMS was his Promised Land.

“I answered an email to get a job here, showing other students how to use the machines, but, really, I just wanted to have 24-7 access to the Maker Space so I could experiment with different projects.” Kemp found what he was looking for – and then some. He has worked with two classmates to design and build a 3D printer that uses Martian soil to produce concrete for the Red Planet. In addition, he is the lead student on a Service Learn Sustain grant to design and fabricate a 3D printer that allows users to manufacture new projects using recycled plastic – from bottles, flatware, and even old (or rejected) 3D-printed projects. Like any good engineer, he started with some dead-ends.

“At first, I thought I could manufacture a plastic filament [cable] that would feed into our existing 3D printers, but I found that creating filament would require more room than we have here. So I settled on creating a new printer that would accept pellets or shredded plastic. And then I used the water jet to build a shredder out of A36 cold-rolled steel.”

The result, says Di Leo, is more than a new piece of equipment.

“When students put their minds to innovations like this and we can give them the means to make them happen, we are all winning. This is what engineering is all about.”



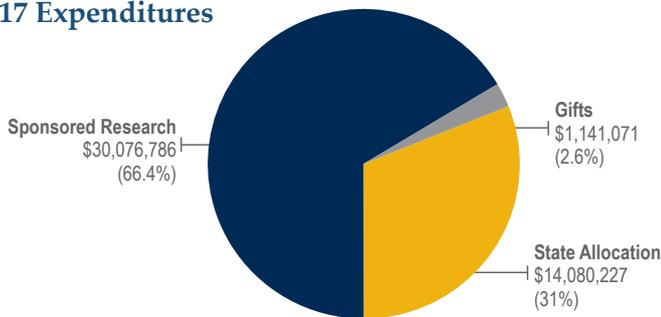
# FINANCES

In FY17, the Daniel Guggenheim School of Aerospace Engineering had expenditures of \$45,298,084 which were funded by a combination of the School's state allocation from the Institute, sponsored research contracts, and gifts. A large percentage of the total expenditures went to support salaries of faculty, staff, research faculty, and graduate researchers.

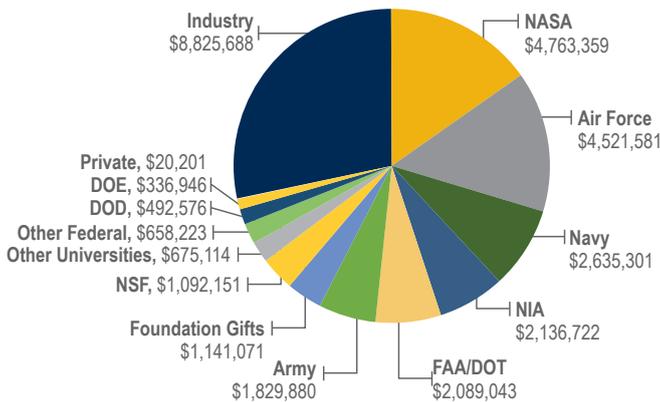
Most of AE's other expenses were for materials, supplies, travel, and equipment in support of the School's research and teaching mission.

Research funding from outside sources in FY17 totaled \$31,217,857: \$19,897,561 from the federal government; \$8,825,688 from industry; \$675,114 from other universities; \$1,141,071 from foundation gifts; and \$678,424 from other sources (e.g. local, state, and other governments). AE's state allocations were \$14,080,227 for our teaching mission, general operations, and funding in support of new faculty, renovation, furniture, and equipment needs.

## FY17 Expenditures



## FY17 Research Funding



# THANK YOU

*The enduring legacy of the Guggenheim School is the story of the more than 6,000 men and women who earned degrees here. In saluting the following two alumni, we celebrate them all. Time and time again, our alumni show us that the success of a few has the power to inspire the dreams of many.*

In April of 2017, **Al West**, B.S. AE '64, Ph.D. (Hon.) '10 was inducted into the Georgia Tech College of Engineering's Hall of Fame, an honor reserved for alumni who have made meritorious engineering and/or managerial contributions during their careers. The founder, chairman, and CEO of SEI Investments, Al has repeatedly helped Georgia Tech strengthen its legacy for future generations - chairing the silent phase of the \$1.8 billion Campaign Georgia Tech; serving as a trustee for both the Georgia Tech Foundation and the Georgia Tech Advisory Board; and playing a leadership role in the Campaign for Georgia Tech. Al previously received the Alumni Association's 2006 Joseph Mayo Pettit Distinguished Service Award.



Al West

**Andrew C. Ollikainen**, B.S. AE '07, was inducted into the CoE Academy of Distinguished Alumni in April. A senior structural integrity engineer at Northrop Grumman, Andrew holds two master's degrees and is working on his doctorate.



Andrew C. Ollikainen

Honored numerous times by the Air Force Civilian Service, Andrew has dedicated much of his career to the safety of service men and women flying into harm's way. His current work focuses on the methods of determining the airworthiness of composite aircraft structures. In a gesture of lasting gratitude to his alma mater, he and his wife, Stephanie, entrusted their final estate to the Daniel Guggenheim School.

Find out how you can support the Guggenheim School of Aerospace Engineering. Contact Farah Kashlan at [farah.kashlan@ae.gatech.edu](mailto:farah.kashlan@ae.gatech.edu)

## Contact Us

Georgia Institute of Technology • Daniel Guggenheim School of Aerospace Engineering  
270 Ferst Drive • Atlanta GA 30332-0150  
Phone: 404.894.3002 • Fax: 404.894.2760

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**Georgia Tech Daniel Guggenheim School of Aerospace Engineering**

## FY17 AT A GLANCE

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No. **2**

2017 ranking for undergraduate program, *U.S. News & World Report*

No. **2**

2018 ranking for graduate program, *U.S. News & World Report*

**1,441**

494 Graduate & 947 Undergraduates enrolled in GT-AE, Fall 2016

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**For more than a decade GT-AE's undergraduate and graduate programs have been ranked in the top 5, nationally.**

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~**35%** of eligible GT-AE undergrads involved in research

~**31%** of eligible GT-AE undergrads involved in internships/co-ops