CornellEngineering

Sibley School of Mechanical and Aerospace Engineering

MAE

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WINTER **2024**

CornellEngineering

SIBLEY 150

Celebrating 150 Years of Mechanical Engineering

Message from the director:
David Erickson

Dear Sibley School Alumni and Friends,

As I write this letter, I am filled with an overwhelming sense of pride and excitement, for we find ourselves at a truly momentous juncture in the storied history of the Sibley School. This year marks the grand celebration of our 150th anniversary, a remarkable milestone that we are jubilantly observing through our year-long #Sibley150 festivities.

Cornell University, with its rich legacy dating back to 1865, is indeed an institution steeped in tradition. What many might not fully grasp, however, is the profound impact mechanical engineering has had on this venerable institution. Nestled in the heart of Cornell, the Sibley School of Mechanical and Aerospace Engineering traces its roots to the early 1870s, not far from where it stands today.

In those nascent years, the notion of a Mechanical Engineer was still taking shape. Unperturbed, Cornell forged ahead, proudly conferring our inaugural bachelor's degrees in mechanical engineering during the 1873-74 academic year. To contextualize the rapid strides we made, consider that, a mere decade later in 1885, one in every five mechanical engineers in the United States had received their training right here at Cornell.

To unfold the captivating narrative of our journey, we invite you to engage with our LinkedIn, Twitter, and Instagram feeds, where we regularly share glimpses into our illustrious history.

As we marvel at our legacy, we're preparing to host a grand birthday bash on April 25, 2024 – a day when the Sibley School turns 150. Our illustrious alumni, including luminaries like Bill Nye '77, NASA's Swati Mohan '04, and SpaceX's Bill Riley '99, are joining us to partake in the festivities. The celebration promises a convergence of minds, a poster competition, presentations from our students, alumni, faculty, and college leadership, culminating in a keynote address from the Science Guy himself, Bill Nye.

This jubilee is not just about reveling in the past; it's about gazing into the future with anticipation and wonder. Our #Sibley150 cover story contemplates the next 150 years of mechanical and aerospace engineering. What advancements will define our future? Will we witness a lunar campus, AI-driven instruction, or robotic companions integrated into our daily lives? We invite you to share your vision and play a pivotal role in shaping the trajectory of our institution.

In this spirit of forward-thinking, we envision a Cornell Engineering Lunar Lab, where the Sibley School could establish a "permanent" presence on the moon. The prospect of a lunar campus, made feasible by the decreasing cost of lunar launches, holds tremendous potential for scientific experimentation, technology development, and student engagement.

Our commitment to "Any person, any study," as envisioned by Ezra Cornell, resonates profoundly through initiatives like the Cornell MAE Future Leader in Mechanical and Aerospace Engineering (FLAME) program. Launched in the summer of 2022, FLAME is designed to propel students into a Ph.D. program through a two-phase process, emphasizing intensive mentoring and community development.

Moreover, we are championing expanded access and affordability through the generosity of donors like yourself. Your support, whether through small dollar donations or endowments, plays a pivotal role in realizing Ezra Cornell's vision of an inclusive education.

On a contemporary note, our esteemed faculty members, Elaine Petro and Mason Peck, have ventured beyond conventional academia, launching the "Spaceflight Mechanics: The Cornell Space Technology Podcast." Their initiative encapsulates the ethos of our school – a relentless pursuit of knowledge and a commitment to sharing it with the world.

In the same vein, we are honored to welcome back Kris Young '06, M.Eng. '07, Director of Space Operations at SpaceX, as a member of the Sibley School's Advisory Council. Kris exemplifies the profound impact a Cornell education can have on one's trajectory, evolving from a student involved in the Cornell University Satellite (CUSat) program to a leader in the aerospace industry.

As we bask in the glory of our 150th year, I invite you to join us on April 25th, 2024, for a celebration that promises to be as historic as the journey that brought us here. Let us commemorate our past, revel in our present, and chart the course for an even more illustrious future together.

Best regards,

David Erickson
SC Thomas Sze Director and Sibley College Professor
Sibley School of Mechanical and Aerospace Engineering

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Support MAE

Support our future with a gift to the Sibley 300 Future Fund

As we mark the Sibley School's 150th anniversary, we stand at the threshold of a new era in mechanical and aerospace engineering at Cornell. To propel us into the next 150 years of innovation, I invite you to contribute to the Sibley 300 fund.

Your support is crucial in sustaining our legacy of excellence, fostering groundbreaking research, and empowering the engineers of tomorrow. By investing in the Sibley 300 fund, you become an integral part of shaping the future of mechanical and aerospace engineering at Cornell.

Let's unite to ensure that the Sibley School continues to lead in the ever-evolving landscape of technology. Your generosity will make a lasting impact, reinforcing our commitment to innovation and propelling us toward new heights of excellence.

Join us in charting the course for the next 150 years. Contribute to the Sibley 300 fund and be a driving force behind the continued success of our esteemed institution.

CornellEngineering SIBLEY 150

https://www.mae.cornell.edu/mae/alumni/giving-opportunities

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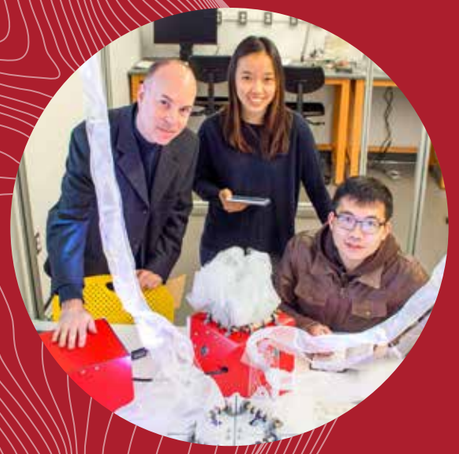
Space-making 'robot rooms' promise practicality, escape



Keith Evan Green, left, director of the Architectural Robotics Lab, with students in the lab.

In millions of homes today, voice commands prompt "smart" devices to turn on lights, change the temperature or deliver weather forecasts, while robotic vacuums autonomously hunt for crumbs and dust bunnies.

But what if robots and computer intelligence weren't just in the room – they were the room?

Supported by a new three-year, $600,000 National Science Foundation grant and an industry partner, Cornell researchers and collaborators are working on what they say is a next frontier in domestic human-machine interaction, a new category of space-making robots that people will inhabit.

Keith Evan Green, director of the Architectural Robotics Lab, calls them "robot rooms": reconfigurable, intelligent environments that will surround and support people occupying small spaces, from high-rise studios and hospital rooms to self-driving vehicles and spacecraft.

"We're working on a room of multiple robot surfaces that make one room, many rooms," said Green, professor in the College of Human Ecology's Department of Human Centered Design and the College of Engineering's Sibley School of Mechanical and Aerospace Engineering. "But we can also create a space that transports you to another place psychologically, a portal to somewhere else."

GE Aerospace Fellows bring unique experiences to engineering

Cornell Engineering has announced its first three GE Aerospace Master of Engineering Fellows, who are bringing a diverse array of experiences to the college and to the field of engineering.

The fellowship offers selected students fully paid tuition for a one-year M.Eng. degree as well as an optional paid internship at GE Aerospace, which is funding the fellowships along with support from Cornell Engineering.

The Cornell M.Eng. degree immerses students in a learning environment where they are trained to have an impact in industry. The 30-credit professional degree can be completed in two semesters and is embedded with practical experience, professional development, and project-based coursework.

One goal of the fellowship is to provide the M.Eng. experience to talented students who may not have otherwise considered the degree. The concept came from Mohamed Ali, Ph.D. '97, vice president and general manager of engineering for GE Aerospace, who said he was inspired by his late mother, who placed Ali's education above her own needs as a single parent.

The first three students selected as GE Aerospace M.Eng. Fellows are Molly Drumm '23, Nicholas Sabella, and Joash Shankar.

Soft robot detects damage and heals itself

If robots are going to venture into remote environments that humans can't reach, such as deep underwater or distant outer space, they won't only require power and a means to get there. They'll also need to take good care of themselves.

To that end, a team led by Rob Shepherd, associate professor of mechanical and aerospace engineering in Cornell Engineering, combined optical sensors with a composite material to create a soft robot that can detect when and where it was damaged – and then heal itself on the spot.

Their paper, "Autonomous Self-Healing Optical Sensors for Damage Intelligent Soft-Bodied Systems," published in Science Advances. The lead author is doctoral student Hedan Bai.

"Our lab is always trying to make robots more enduring and agile, so they operate longer with more capabilities," Shepherd said. "The thing is, if you make robots operate for a long time, they're going to accumulate damage. And so how can we allow them to repair or deal with that damage?"

Researchers installed SHeaLDS – self-healing light guides for dynamic sensing – in a soft robot resembling a four-legged starfish and equipped with feedback control. After the researchers punctured one of its legs, the robot was able to detect the damage and self-heal the cuts.

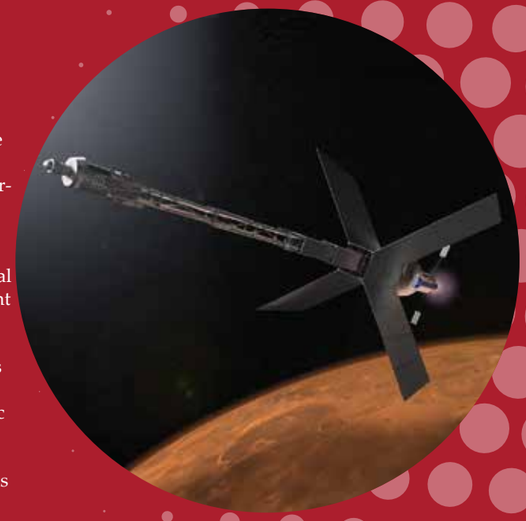
Researchers explore nuclear power cooling with NASA grant

As space exploration becomes more ambitious, Cornell Engineering researchers are using a NASA grant to investigate technologies for the vital energy systems that will enable missions to last longer and go farther, including nuclear power-enabled missions.

A NASA Space Technology Research Grant is funding a project dubbed AdVECT – Additive Vehicle-Embedded Cooling Technologies – led by Sadaf Sobhani, assistant professor in the Sibley School of Mechanical and Aerospace Engineering. Co-investigators on the grant include assistant professor Elaine Petro and senior research associate Andrew van Paridon, both of the Sibley School.

The project aims to produce novel ceramic heat-rejection technologies suitable for nuclear power systems, including fission surface power, which could one day enable operation of a moon base, and nuclear electric propulsion, which could efficiently thrust rockets to Mars.

Sobhani and collaborators will develop new ceramic resins and additive manufacturing techniques to 3D print components such as porous ceramic radiators with embedded heat piping. X-ray imaging, thermal analysis and vacuum chamber testing will be employed to optimize the mechanical strength and other properties of the ceramics.



The Additive Vehicle-Embedded Cooling Technologies project at Cornell is being funded by NASA to advance the future of space exploration, including nuclear power-enabled missions.

Petro earns Air Force award to research next-gen spacecraft propellants

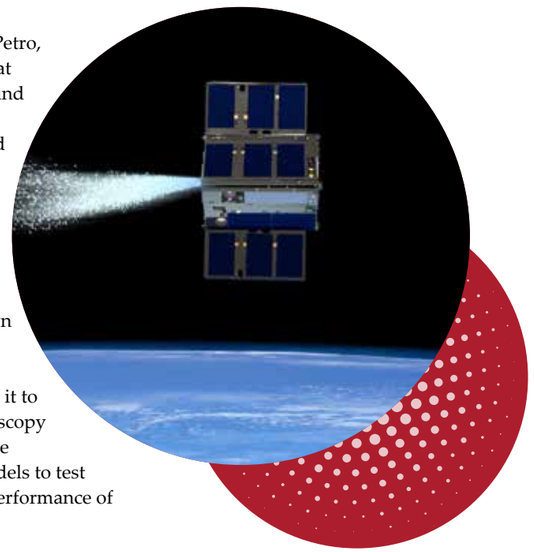


Illustration depicting a small satellite propelling itself in low-Earth orbit.

The Air Force Office of Scientific Research has selected Elaine Petro, assistant professor of mechanical and aerospace engineering at Cornell, for a Young Investigator Program Award that will fund research into next-generation propellants.

Her application, "Investigating the chemical stability of ionic liquid ions," was chosen for funding in the program area of Propulsion and Power.

Petro has proposed a three-year research plan to learn more about how these propellants may react under realistic operating conditions. The first step will be to take existing models and methods created by Petro and her group and apply them to these new propellants. Her theory is that some of the molecules in the propellant are breaking down in the plume and reacting with each other in ways not predicted. Her model will be able to evaluate this theory's viability.

Once she feels her model has captured these reactions, she will use it to compare simulations of various propellant plumes with optical spectroscopy and Raman gas analyzer data from actual propellant plumes. "When we understand the behavior of molecules in the plume, we can use the models to test the many possible lab-synthesized propellants and help optimize the performance of these propulsion systems," Petro said.

Members of the Alpha CubeSat team – from left, João Maria de Mesquita '20, doctoral student Joshua Umansky-Castro, and Stephanie Young '23 – look at a hologram that features a sculpture created by Ithaca-born artist C Bangs.

Postcards from Earth: Hologram project showcased at Intrepid

A yearslong effort to launch Cornell-made satellite technology into a neighboring solar system made a terrestrial stop at the Intrepid Sea, Air and Space Museum in New York City.

The exhibit, "Postcards from Earth: Holograms on an Interstellar Journey," which opened in 2023, showcased the project, in which a small, low-cost satellite – i.e., CubeSat – will be released into low Earth orbit and will deploy a "light sail" that is only 0.18 mm thick. This feat of aerospace engineering, which will demonstrate the potential of making the 40-trillion-mile trek to Alpha Centauri, will have an equally inventive stowaway: the CubeSat and the light sail will be adorned with holographic art.

Just as late Cornell astronomer Carl Sagan's Voyager Golden Record sent thoughtfully curated artifacts of human culture into the cosmos, these holograms will deliver their own message of inspiration, with a distinctly local twist. The holograms feature sculptures created by Ithaca-born artist C Bangs around the theme of earthling DNA: a fish, a man, a woman and a moth.

Made in the shade: Growing crops at solar farms yields efficiency

In the threatening trouble of climate change, growing commercial crops on solar farms is a potentially efficient use of agricultural land that can both increase commercial food production and improve solar panel performance and longevity, according to new Cornell research.

The group published research in Applied Energy.

"We now have, for the first time, a physics-based tool to estimate the costs and benefits of co-locating solar panels and commercial agriculture from the perspective of increased power conversion efficiency and solar-panel longevity," said lead author Henry Williams, a doctoral student in Cornell Engineering.

"There is potential for agrivoltaic systems – where agriculture and solar panels coexist – to provide increased passive cooling through taller panel heights, more reflective ground cover and higher evapotranspiration rates compared to traditional solar farms," said senior author Max Zhang, professor in the Sibley School of Mechanical and Aerospace Engineering, "We can generate renewable electricity and conserve farmland through agrivoltaic systems."

Cornell leads NYS consortium for space tech development

Cornell is spearheading the New York Consortium for Space Technology Innovation and Development – a new initiative aimed at bolstering U.S. space technology research and manufacturing capabilities by uniting industry, academic and government partners across New York state.

Funded with a $5 million grant from the Defense Manufacturing Community Support Program run by the U.S. Department of Defense and $1.8 million from Cornell, the consortium is a collaborative effort led by Cornell's Sibley School of Mechanical and Aerospace Engineering in partnership with the Cornell High Energy Synchrotron Source (CHESS) and the Cornell Center for Materials Research (CCMR).

"We're creating a capability for New York and our collaborators in industry to design, build, test, integrate and maybe even operate space technologies that are going to make a difference in those companies' ability to compete nationally and internationally," said consortium executive director Mason Peck, the Stephen J. Fujikawa '77 Professor of Astronautical Engineering.

Some of the funding will be used to upgrade facilities for research, development and testing of space technologies and related applications in Cornell's High Voltage Laboratory, a 14,000-square-foot facility located on Mitchell Street. Funding will also be used to provide small business assistance to consortium members along with specialized training and education through academic fellowships, internships and annual competitive grants for research and development.

Students build and test spacecraft inside Cornell's Space Systems Design Studio, one of several facilities that position the university to be the nexus of the New York Consortium for Space Technology Innovation and Development.

Combustion powers bug-sized robots to leap, lift and race

Cornell researchers combined soft microactuators with high-energy-density chemical fuel to create an insect-scale quadrupedal robot that is powered by combustion and can outrace, outlift, outflex and outleap its electric-driven competitors.

The project was led by Rob Shepherd, associate professor of mechanical and aerospace engineering in Cornell Engineering, whose Organic Robotics Lab has previously used combustion to create a braille display for electronics.

"Being powered by combustion allows them to do a lot of things that robots at this scale haven't been able to do at this point," postdoctoral researcher Cameron Aubin said. "They can navigate really difficult terrains and clear obstacles. It's an incredible jumper for its size. It's also really fast on the ground. All of that is due to the force density and the power density of these fuel-driven actuators."

The actuator design also enables a high degree of control. By essentially turning a knob, the operator can adjust the speed and frequency of sparking, or vary the fuel feed in real time, triggering a dynamic range of responses. A little fuel and some high-frequency sparking makes the robot skitter across the ground. Add a bit more fuel and less sparking and the robot will slow down and hop. Crank the fuel all the way up and give it one good spark and the robot will leap 60 centimeters in the air, roughly 20 times its body length, according to Aubin.

The researchers envision stringing together even more actuators in parallel arrays so they can produce both very fine and very forceful articulations on the macro scale. The team also plans to continue work on creating an untethered version. That goal will require a shift from a gaseous fuel to a liquid fuel that the robot can carry on board, along with smaller electronics.

This combustion-powered quadrupedal robot is capable of multi-gait movements and can leap 60 centimeters in the air, or roughly 20 times its body length.

Varda was founded by Cornell alumni Will Bruey '11 M.Eng. '12 in 2020 and has already raised more than $100 million in seed funding and grants from investors who are confident the technology will succeed. While at Cornell, Bruey was active in Professor Mason Peck's Space Systems Design Studio, as was Varda's director of autonomous systems Wendy Shimata '09.

Alumni place Varda's first spacecraft into orbit

Varda Space Industries—a California start-up with deep roots in Cornell's Space Systems Design Studio—launched its first test mission on a SpaceX rocket on June 12.

Varda's goal is to create a fleet of satellites that will be used to carry out pharmaceutical research in the microgravity of Earth's orbit. In the recent test, Varda's 200-pound satellite successfully separated from the rocket.

Eventually, Varda will have a fleet of research and production capsules that will grow specific protein crystals while in space. These capsules will then de-orbit and parachute back to Earth, where the pharmaceutical materials inside will be used to make prescription drugs. Past studies have shown that growing some protein crystals in space leads to more perfect structures than shown by crystals grown on Earth. The more perfect structures have a positive effect on the pharmaceuticals these crystals are used to create.

Interdisciplinary group creating biolubricants to combat arthritis

An interdisciplinary research team received a five-year, $2 million grant from the National Science Foundation to develop a new generation of biosynthetic lubricants that have the potential to treat arthritis and reduce the painful friction of artificial joints.

The Leading Engineering for America's Prosperity, Health and Infrastructure (LEAP Hi) program is led by Lawrence Bonassar, the Daljit S. and Elaine Sarkaria Professor in Biomedical Engineering and in Mechanical and Aerospace Engineering, in collaboration with David Putnam, professor in the Meinig School of Biomedical Engineering and Smith School of Chemical and Biomolecular Engineering, Matthew Paszek, associate professor in the Smith School of Chemical and Biomolecular Engineering, all in Cornell Engineering; Heidi Reesink, Ph.D. '16, associate professor in the Department of Clinical Sciences at the College of Veterinary Medicine; and Roberto Andresen Eguiluz, Ph.D. '15, an assistant professor at the University of California, Merced.

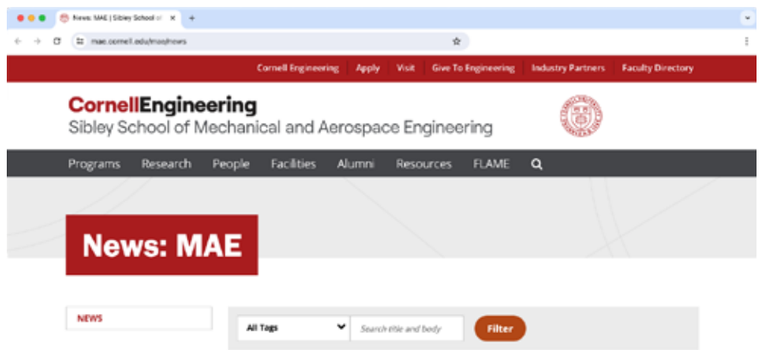
"As we collaborated and began to meet regularly, it occurred to me, this is such a critical mass of people with unique skill sets," Bonassar said. "We have the ability to work as a group in a way that is much more effective than four of us working in parallel. There's the possibility of Dave and Matt designing new molecules, we test them for their lubricating ability in vitro, and Heidi tests them for their therapeutic potential in vivo. And we can use that to go around this design loop to continue to optimize and make better and better lubricants for different applications."

In addition to treating arthritis and joint pain, biosynthetic lubricants could address a host of physical ailments, from dry eyes and skin abrasions to inflammatory bowel disease and certain digestive and reproductive issues – essentially anything involving mucosal layers that are unable to localize water to a surface.

The Bonassar Research Group uses a custom tribometer to measure the frictional properties of soft materials and tissues, including biosynthetic lubricants.

"We hope that five years from now we've got great candidates for injectable treatments for arthritis, that we have compelling data in animals to say that these could move forward in the developmental process, and that we have general paradigms we can use and export to think about tailoring different lubricants for other kinds of medical applications," Bonassar said.

To read all the news from MAE click the link below or scan the QR code



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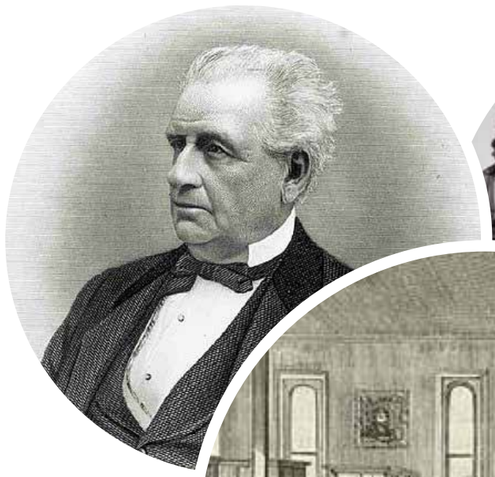

SIBLEY CornellEngineering 150

Celebrating 150 Years of Mechanical Engineering

By Chris Dawson

There are certain privileges you earn when you turn 150 years old. One of them surely must be the right to throw yourself a birthday party, and that is exactly what Cornell's Sibley School of Mechanical and Aerospace Engineering is doing on April 25, 2024.

Cornell was founded in 1865 by Ezra Cornell, and less than ten years later the Sibley College of Mechanic Arts began offering a four-year Bachelor of Mechanical Engineering degree in the 1873-74 academic year. In the 150 years since, Cornell and the Sibley School have played a leading role in the teaching, research, and application of mechanical engineering.

We have enlisted some of our well-known alumni to come and help us celebrate our storied past and we are inviting you to help us imagine what the next 150 years of mechanical and aerospace engineering might look like.

Bill Nye '77 will be on hand, as will NASA's Swati Mohan '04, SpaceX's Bill Riley '99, and a host of other alumni leaders in industry and academia. The event will include a poster competition, presentations from students, alumni, faculty, and college leadership, a networking reception, and a keynote address from Science Guy Bill Nye.

The school has identified four priority areas to focus on in this celebration year and you can read about each below.

Sibley 300

While the April event will celebrate the long history of mechanical engineering at Cornell, it will also look ahead to what the future might hold. Mechanical Engineering has changed a lot over the first 150 years of the Sibley School. Our first graduates invented milling machines and new techniques for grinding ball bearings. Our recent graduates are sending rockets into space and developing biomaterials to fight infectious diseases.

What will Sibley School graduates in the class of 2174 do?

Technological change happens quickly, and the Sibley School has kept pace with the innovations in machines, materials, and processes that have characterized the past 150 years. In many cases, Cornell mechanical and aerospace engineers have been at the leading edge of these innovations.

What do the next 150 years of mechanical and aerospace engineering look like? Will there be a campus on the moon? A.I.-based instruction? Robotic helpers in our houses, offices, stores, and hospitals? Let us know what you think the future holds and help shape the instruction, research, and applications that come out of Upson Hall and wherever else we may be (see Lunar Lab, below).

The exciting thing is, we can't really say what comes next in terms of specific technologies. But we feel confident that

Cornell's Sibley School will continue to play a leading role in developing the innovations that make the technologies possible and in educating the engineers who will create the future.

Cornell Engineering Lunar Lab

150 years ago, as Cornell was getting ready to confer its first Bachelor of Mechanical Engineering degree, powered flight was something people only dreamed about. Just thirty years later the Wright Brothers managed to fly their Kitty Hawk Flyer 180 feet in 12 seconds, ushering in the Age of Flight. Sixty-six years after that in 1969, humans walked on the moon. The advances made possible by mechanical and aerospace engineers have been breathtaking—and Cornell has played a huge role in these advances every step of the way.

As we look to the future of powered flight and the engineering necessary for exploration and possible settlement of asteroids, comets, moons and planets, we have our sights set on our nearest neighbor—Earth's moon. We can imagine a day when Cornell Engineering has a permanent Lunar Lab, and professors and students do research that isn't possible on Earth.

What would it look like for the Sibley School to have a "permanent" presence on the moon? With the reduction in cost-of-launch, we are on the cusp of permanent, sustainable lunar settlement that will be used as a proving ground for exploration of Mars. A laboratory station could enable some long-term scientific experimentation and discovery, technology or prototype development and validation, and student engagement via telepresence lab activities and experiential learning.

Expanding Access and Affordability

When Ezra Cornell founded the university that bears his name, he committed Cornell to the principle of "Any person, any study." This idea is still a central tenet of the Sibley School today.

One way we are living out this commitment is through the Cornell MAE Future Leader in Mechanical and Aerospace Engineering (FLAME) program, which began in the summer of 2022. The goal of the program is to help students launch into a Ph.D. program through a two-phase process.

FLAME follows an exciting new model that combines some of the best elements of summer research programs and longer-duration bridge programs to provide selected students with intensive mentoring and community development experiences. The program also offers participants a subsequent fast-tracked and prioritized admission into the Cornell MAE Ph.D. program with tailored programmatic and financial support.

Another way to ensure expanded access and affordability is through both small dollar donations and endowment opportunities for people wishing to contribute more. Money is certainly not the only or the best solution for most problems, but in the case of making college more affordable, small and large donations are exactly what is needed to help the school stay true to Ezra's vision.

Learning Studios

The Sibley School is developing a new vision for how we do experiential learning – through the development of learning studios. These studios are an entirely new way of conducting undergraduate instructional labs allowing students to look at how they learn from a system level, with real-world systems. These studios aim to become integrated learning spaces with enough complexity to serve a wide range of students, from first-year students to seniors.

Our first learning studio has been up and running successfully since April, 2022. It is the Forklift Learning Studio on the first floor of Thurston Hall. It was created with invaluable support from Toyota Material Handling of North America, and our students have benefitted greatly.

Junior Emma Sudmann said "I learned so much, whether it was seeing this big machine get broken down and understanding how its systems work together, or getting it set up on the engine dynamometer. I can't wait to see all the labs we get to do in my next couple years, and see how this really changes others' and my time at Cornell."

You are invited!

Whether you graduated in 1963 or 2023, as alumni you already know how demanding and rewarding a Sibley School education can be. It pushes you to learn, challenges you to grow, and opens doors to exciting careers. We hope you will come back to Ithaca on April 25 to join us in celebrating 150 years of mechanical engineering at Cornell. In the end, the Sibley School is not the buildings or the technology—it is the people. We are proud of the many world-changing innovations and technologies that have come out of the school, but we are even more proud of you—our alumni.

Come and help us celebrate!

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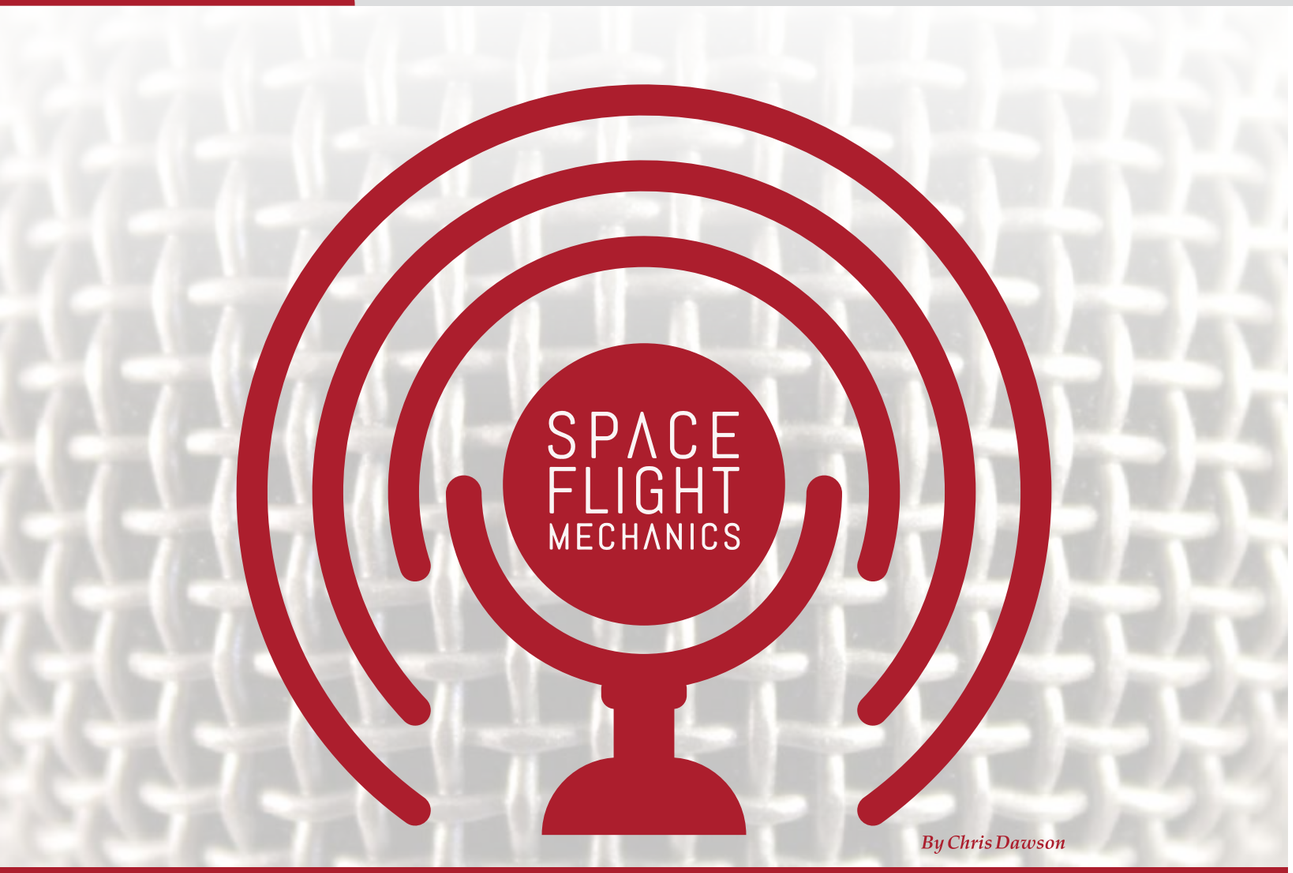

By Chris Dawson

MAE professors launch Spaceflight Mechanics podcast

Elaine Petro and Mason Peck didn't want to start a podcast—they simply wanted to start a kind-of seminar series. It would feature experts on all aspects of spaceflight technology talking about what they do in a way that wasn't oversimplified. And rather than presenting a scripted talk, the series would be more like a conversation between Petro, Peck, and a guest.

Peck and Petro know a fair bit about spaceflight technology themselves, so they would be right up there onstage asking questions, digging into the details, and creating a place where interested people could truly learn things about all aspects of spaceflight.

Each time they would describe their idea for the series, the person listening would nod along excitedly and then respond with some version of the comment, "Oh, you mean like a podcast?"

They heard this answer so often that eventually they gave up on thinking of their idea as a seminar and went all in on a podcast idea. They got microphones, found studio space, lined up some guests, hired a producer, and got to work.

The resulting podcast, "Spaceflight Mechanics: The Cornell Space Technology Podcast" launched officially on Monday, November 27 on the Buzzsprout platform. It is now available on all the popular podcast sources.

To celebrate the launch of "Spaceflight Mechanics" Peck, Petro, and their producer Claire Peck were joined by two of the podcast's first guests for a launch/listening party in the Upson Lounge on the day of the first episode's release. Peck, who is the Stephen J. Fujikawa Professor of Astronautical Engineering, and Elaine Petro, assistant professor of mechanical and aerospace engineering at Cornell, were joined onstage by Sibley School Assistant Professor Gregory Falco and Associate Professor Dmitry Savransky.

What followed was an entertaining half hour that featured Peck and Petro recounting the genesis of the podcast, Savransky and Falco discussing their experiences as guests on the show, amusing outtakes that will not make it to air, and some questions from the students, faculty, and staff in the audience.

In response to one question about what brought each of the four researchers to the study of space, Savransky summed it up nicely for everyone: "Space is awesome," he said. "It is objectively cool. I challenge anyone in this audience to walk up to that microphone and say that space isn't cool. They would be wrong."

Petro and Peck are confident that many people share this feeling and will tune in to "Spaceflight Mechanics" to join their deep dive into a fascinating realm. Other episodes in the initial season feature experts in space cybersecurity, nuclear propulsion researchers, at least one CEO of a space startup, and other innovators. The hosts have already started contacting experts in the field to be guests for Season Two.

New Faculty

Gregory Falco

Gregory Falco graduated from Cornell with a B.S. in hotel administration in 2010. It is not likely at the time that Falco would have predicted he would be starting as an assistant professor of mechanical and aerospace engineering at Cornell in 2023. But given his wide range of interests and abilities, he might not have dismissed the idea out of hand, either.

While majoring in hotel administration, Falco also took classes in energy control systems while working as business manager in an applied mechanics lab. "I found the idea of 'any person, any study' really holds true at Cornell," Falco said. "I majored in hotel administration, but I took classes all over the university. The people skills I learned from the hotel school were equally important and useful to the technical skills I picked up in engineering and sciences courses."

One of the things Falco learned at the time was what an amazing place NASA's Jet Propulsion Lab (JPL) in Pasadena is. "I kept hearing it from all these engineers in the lab," Falco said. "they'd come back from a summer JPL internship and all they could talk about was what a cool place JPL was. I decided then and there that I needed to get to JPL and check it out for myself."

It didn't happen right away, but eventually Falco was able to confirm that yes, indeed, JPL is "the best place to work. Ever."

When he left Cornell, Falco worked for the consulting firm Accenture while simultaneously earning a master's degree in sustainability management from Columbia University. After Accenture he decided to go back to school for a doctorate in cybersecurity and ended up at MIT. While there, he took part in a hacking competition sponsored by JPL. He did well in the competition and that led to a conversation with JPL representatives and that led to JPL funding Falco's Ph.D. studies.

Those studies focused on the intersection of critical infrastructure and cybersecurity. In spite of the importance of keeping critical infrastructure systems safe, there was not a lot of research or funding being directed at the area. "My advisors at MIT took a chance on me and JPL saw the value of the research in the context of securing their space systems and they stepped up with support and guidance and I managed to do some important research," Falco said.

In 2021 Falco joined the faculty of Johns Hopkins University and in 2023 he moved to Cornell Engineering's Sibley School of Mechanical and Aerospace Engineering. His lab, the Aerospace ADVERSARY (Autonomy, Defense, and Vulnerability Exploitation for Resilient, Secure and Assured Risk/Yield) Lab, now has several projects with a common goal: to break aerospace systems. A guiding principle of the work is "if you don't know how to break it, you don't know how to fix it."

Cornell is an excellent fit for his work and Ithaca is an excellent fit for his family. "The people we have met and live near in Ithaca truly seem to care about the community," Falco said. "And the community of researchers here is such a good fit for me. There are a lot of people whose work overlaps with mine either a little or a lot. When I talk about space systems design here, people understand what I am talking about."

At Cornell, Falco is focused on the security of space systems. As you might imagine, this covers a wide array of technologies and environments. Some key parts of space systems are based on the ground. Others are in space. Some of the systems handle communications. Others provide power or capture images. Broadly, Falco and his students take an adversarial approach to each system and every component, asking 'if somebody were intent on breaking this thing, what might they do?' And then they engineer solutions to these threats.

Their work includes helping to formulate policies that will make the possibility of a bad actor breaking or hijacking a system less likely. The team includes lawyers, political scientists, computer scientists, and of course, engineers. Falco is also open to working with undergraduates in his lab. "There is a big pool of aerospace engineers here and I am very excited by that prospect," Falco said.

When not thinking about how to break things in service of making them safer and stronger, Falco spends a fair amount of time on weekends using the remnants of his skills from the required culinary class he took at the hotel school, baking for his family.

MAE Advisory Council

The mission of the Sibley School of Mechanical & Aerospace Engineering is to conduct research, produce creative work, and disseminate knowledge in mechanical sciences and engineering for the benefit of our students, professions and most importantly for the common good. The MAE Advisory Council's goal is to serve as the primary source of external guidance to the director of MAE, facilitate engagement opportunities for MAE faculty and students outside the university, and provide a channel of expertise and counsel between MAE and alumni.

2023-24 Advisory Council Members

Richard A. Aubrecht
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Portfolio Manager, Navy Enterprise and Sea Systems (NESS), the Mitre Corporation

Timothy Fisher
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Steve Fujikawa
New Space Entrepreneur

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President and CEO, Toyota Material Handling North America

Kristopher Young
Director of Space Operations, SpaceX

Two Sibley School students chosen for Isakowitz Fellowship

Two Cornell Engineering students are among just 30 chosen nationally for the 2023 Matthew Isakowitz Fellowship Program.

Emily Matteson, a senior in Cornell's Sibley School of Mechanical and Aerospace Engineering, and Julia Proctor '22, an M.Eng. student in the Sibley School, were selected from more than 250 applicants representing more than 90 colleges and universities.

Matteson and Proctor will receive paid internships at commercial space companies and one-on-one professional mentorship from accomplished members of the space community. In addition, they will participate in a summit with activities, speakers, and space industry guest attendees.

The Matthew Isakowitz Fellowship was created in 2017 in memory of space engineer Matthew Isakowitz, who died that year at the age of 30. It is open to college juniors, seniors and graduate students pursuing a career in the commercial spaceflight industry. Proctor and Matteson are the fourth and fifth Cornellians to receive this honor.

Proctor, who earned her Bachelors in engineering physics at Cornell and is now working on her M.Eng. in aerospace engineering, will intern at the communications satellite company Astranis. As an undergrad Proctor was an aerodynamics engineer on the Cornell FSAE Racing student project team.

"I first heard about the Isakowitz Fellowship from Professor Savransky a few years ago. And then a mentor at my internship with ABL Space Systems brought it up again this summer," Proctor said. "She was an alumna of the program and recommended it strongly. So I applied. And then I was at the Cornell-Harvard hockey game and got a call from Steven Isakowitz telling me I was one of the winners. It was so exciting and such an honor—I didn't even care about the game after that."

Matteson, whose internship will be with the space payload delivery company Impulse Space, is currently Chief Engineer for the Cislunar Explorers Research Team in the Space Systems Design Studio of Mason Peck, (the Stephen J. Fujikawa '77 Professor of Astronautical Engineering), as well as a former subteam lead on the Cornell Rocketry student project team. She is also an alumna of the Cornell Engineering Leadership Certification Program and past winner of the Brooke Owens Fellowship placed at The Aerospace Corporation.

"This is not only a chance to gain practical experience while interning at a cutting-edge space company, but it's also an extraordinary opportunity to engage in conversations with space industry leaders, seek guidance and feedback, and gain exposure to other aspects of the space industry," Matteson said. "I am deeply honored to have been chosen to honor the memory of Matthew Isakowitz, an aerospace engineer whose passion for space led to advancements in the commercial space industry. I hope to inspire all who know me just as Matthew inspired all who knew him."

Sibley School Professor Dmitry Savransky knows Matteson and Proctor and is familiar with the Isakowitz Fellowship. "I am incredibly proud of both Emily and Julia—they are highly deserving of this opportunity and I expect them to do great things in their future careers," Savransky said. "I think the fact that we've had multiple Isakowitz Fellowship recipients in the last few years is really a testament to the quality of our students. Not only their outstanding academic performance, but their clear passion for the spaceflight industry."

To Mason Peck, it is no accident that Cornell students are chosen for fellowships like the Matthew Isakowitz and the Brooke Owens. "Cornell's students have had lots of success in aerospace. Our graduates include VPs at SpaceX, founders of space startups, and thought leaders in space technology at government and industry labs. Cornell's reputation, and that of our many students in this field, continue to reinforce one another. I expect that this newest generation of future leaders will continue that tradition."

Sibley sophomore wins Brooke Owens Fellowship

Nidhi Sonwalkar, a sophomore in Cornell's Sibley School of Mechanical and Aerospace Engineering, has been selected as a 2023 Brooke Owens Fellow.

Sonwalkar joins 46 undergraduates from around the world chosen for recognition by the nationally-acclaimed nonprofit program.

Sonwalkar, who is integration and test lead of the Cislunar Explorers CubeSat research team in Cornell's Space Systems Design Studio, a member of the Cornell Mars Rover student project team, an intern at NASA Goddard's Direct Readout Laboratory, and a John McMullen Dean's Scholar, will receive an aerospace internship, senior mentorship and access to a lifelong professional network that now numbers close to 300 former and current "Brookie" Fellows.

Brooke Owens was a pilot and space policy expert who died in 2016 at the age of 35. The eponymous fellowship

was started in 2017 to honor the good work done by Owens in her career at NASA, the FAA and the White House.

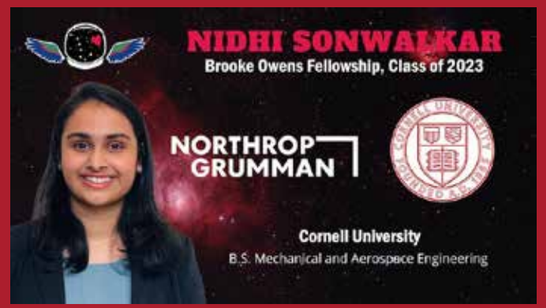
Sonwalkar said she was waiting in the car while picking up her younger brother at school back in December when her phone rang. She answered and learned the good news that she had been chosen for the competitive fellowship which, in Sonwalkar's case, comes with a summer internship at a Northrup Grumman design facility in Virginia.

Sonwalkar has been intrigued by space since she was young. It started with an interest in the stars and astronomy, which grew into the wish to go to space. "And as I started taking more math and physics classes," Sonwalkar said, "I started to get very interested in the applications side of the equation—how to design and build things to get us into space."

This interest led her to Cornell, where there are many options to follow her curiosity and deepen her knowledge about the mechanics and astronautical engineering aspects of space travel.

Mason Peck, (the Stephen J. Fujikawa '77 Professor of Astronautical Engineering at Cornell) started the school's Space Systems Design Studio where Sonwalkar now spends much of her time. He spent several years as NASA's Chief Technologist and knows a thing or two about working in the space industry.

"It can be difficult to know where to begin one's career in the large aerospace ecosystem of the U.S. These experiences help students start their career with their eyes open to the possibilities," Peck said. "Cornell aerospace students are likely to receive job offers even without this background, since the aerospace job market has been quite hot for several years. However, there are some truly extraordinary job opportunities in space these days, and having had these fellowship experiences ultimately makes students more competitive in getting those jobs—the ones they will find fulfilling."



Women of Aeronautics and Astronautics group takes flight at Cornell

The Women of Aeronautics and Astronautics Cornell chapter started out slowly during the COVID-19 closures and restrictions, but now, with the help of Assistant Professor Elaine Petro and the financial support of Boeing, the group is flying high.

As an undergraduate and a doctoral student majoring in aerospace, aeronautical and astronautical/space engineering at the University of Maryland, Elaine Petro was active in the local chapter of Women of Aeronautics and Astronautics. When she joined the faculty of Cornell's Sibley School in the summer of 2020 Petro found there was no Cornell-affiliated chapter of WoAA.

In the fall of 2020 Petro put out the word that there would be a meeting for anyone interested in starting a Cornell chapter of WoAA, and eight or nine people showed up at that first virtual gathering and got the ball rolling.

One of the students at that meeting was Jordan Sandell, who was a sophomore at the time majoring in mechanical engineering. "It was great to find a group of people with similar interests," Sandell said. "But it was also hard to do much more than meet on Zoom that first year because of COVID." The group struggled to attract members because all the usual ways of recruiting were temporarily shut off.

The 2021-22 academic year was a different story. Many of the campus's COVID restrictions were eased, allowing in-person meetings and recruiting. Just as importantly, the Boeing Company decided to sponsor the group financially. "The funding from Boeing completely changed the game for us," Sandell said. "Before that, we really didn't have any money and couldn't host events or activities."

Boeing's support allowed members of the group to attend the November 2022 Bessie Coleman Women in Aerospace Conference at the University of Michigan, which proved to be a milestone event. Twelve Cornell WoAA members packed into three cars and road-tripped to Ann Arbor.

In Ann Arbor they met with students from other, more established chapters and had the chance to ask them about their challenges and successes; they networked with industry representatives from many of the major aerospace firms; and they bonded with each other in ways only a long road trip can truly make possible. "We came back from that conference with all sorts of ideas and excitement about growing the chapter," Sandell said. Many of those ideas worked, and from that initial group of fewer than ten students in 2020, the Cornell chapter of WoAA now has 70 student members and several active alumni members.

The group recently launched a new website, where their mission is clearly stated prominently on the homepage: "We are a group of students at Cornell who share a passion for aero and a mission of creating a community of like-minded individuals on our campus and beyond. We work to support the professional and technical development of members to help them achieve their aspirations." Cornell's WoAA has general membership meetings, organizes information sessions with aerospace professionals, travels to conferences, and provides a place for members to share their interest and excitement about aeronautics and astronautics.

This mission resonates with sophomore electrical and computer engineering major Angela Zhang, who first heard about WoAA at Clubfest in the fall semester of her first year at Cornell. She decided to join in order to meet people who shared her interest in space and as a way to learn more about the space industry and the career paths available. "Being part of WoAA has been a great experience for me," Zhang said. "Through WoAA, I was able to form friendships and connections with other students that I might not have met otherwise. I've had the opportunity to attend conferences and network with industry professionals who shared their experiences in the field with me. These opportunities have been invaluable in helping me build a strong professional network and land internships and scholarships."

Professor Petro has stayed involved with Cornell WoAA as their faculty advisor and has been thrilled to see their progress. "Even though Cornell Engineering is close to 50/50 by gender, women are still severely underrepresented in the field of aerospace engineering, "Petro said. "Having a student organization dedicated to promoting women in aerospace will help to recruit students into the field and will provide a support network they can use throughout their careers."

With a few years of experience under their belts, an expanded membership, and continued support from Boeing the stars are the limit for the future of the Cornell chapter of WoAA.

SpaceX Kris Young Q&A

By Chris Dawson

Kris Young ’06, M.Eng. ’07 was a program manager of the Cornell University Satellite (CUSat) program in 2006-07 as he earned his M.Eng. degree in aerospace engineering. His first job after college was with Northrop Grumman, where he had a hand in the James Webb Space Telescope, among other projects. Today, he is director of space operations at SpaceX. He is also a new member of the Sibley School’s Advisory Council and will be a featured speaker at the Sibley 150 celebration on campus in April. He sat down with us recently for a discussion of his path from smalltown Williamson, New York to Cornell and on to SpaceX.

Where did you grow up?

I grew up in Western New York State in a very small farm town called Williamson, just outside of Rochester. Not too far away from Ithaca, in fact. My dad’s family were mostly farmers, but many of them were also individuals who liked to tinker with mechanical systems and built a lot of things on their own. My grandfather had a large farm in the area with a lot of cherry trees; cherries are very time consuming to harvest – you have to pick each one individually and place it in a bucket. It’s a painstaking process. And that led him to build one of the first automated cherry shaking machines that is still used today. The device grabs the trunk of the tree and shakes it so a whole bunch of cherries fall all at once. It saves so much time. But this wasn’t something he went out and bought the blueprints for. He just figured it out himself and built it.

And I’d say that mentality perpetuated itself through my dad’s generation of the family. He has a number of siblings that are also engineers. And then it passed down to both me and my brother. We both worked on the farm, and with farm work, there’s a point where it’s really good for you and you stay active. But it can also be very laborious. As a kid, I was devising different mechanical systems to pick up all these clippings from trees to make it easier for myself.

So I’d say engineering was very much in our blood. I have a couple of older brothers, the eldest of whom was focused on electrical engineering and software. When I was in high school they taught me how to build a computer. So I came to engineering pretty naturally.

When you were looking at colleges, what interested you in Cornell University and, in particular, Cornell Engineering?

Cornell has an incredibly rich history of agricultural research and I was familiar with that reputation because throughout my childhood, my dad worked with agents from the Cornell Cooperative Extension who would introduce us to new types of fruit trees and farming techniques.

An appreciation for Cornell was in my blood from early on, understanding that there’s this place that can innovate and bring in new ideas. I looked around and I wanted to find the best place for me. I wanted to be around the best people. And clearly, for me, that place was Cornell.

I did electrical and computer engineering as my undergrad. I think that was probably because of the influence of my older brothers. As an undergrad my interest tended toward control system types of problems that are similar to what’s taught in MAE. And so it was later, during my M.Eng., that I swapped over to the Sibley School. I was working on CUSat and I loved the interplay between all the different systems and areas of expertise. The boundaries between fields were not cut and dried. It’s a lot like industry where there is an interplay between technical disciplines. They all have to work together to solve complex problems

At Cornell we started with the fundamentals – math, science, physics – that became a foundation that really allowed me to learn a lot of different areas.

Can you tell us about your journey to this point in your career? What was your trajectory into your current position?

Once I finished my M.Eng. I wanted to get my hands dirty. I wanted to have a part in designing, building, testing and redesigning stuff that was going to space. The iterative part was really super fun. The CUSat project and aerospace engineering M.Eng. program had a number of industry partners. Northrop Grumman was one and they had a very large aerospace arm with several capacities: a satellite division a ground systems division, military technology divisions, and more.

Through that connection I took a position in their space technology division and worked on a couple of different satellite programs. In 2007, I moved out to Los Angeles for that job and have been in California ever since. I was working initially on the James Webb Space Telescope, so it was really cool to see that launch a couple of years ago. It is very satisfying to see all of the amazing science it has enabled since launch. It was an excellent way to start my career.

About four years later, a colleague of mine left Northrup to join a small, relatively unknown company called SpaceX that was right down the road from where I was working in L.A. I knew the typical career progression at Northrop, and through my friend, was able to see the types of opportunities at SpaceX,

especially all of the cool things he was doing. And that's when I decided to join the SpaceX team.

I guess you could call me a little bit impatient, and I wanted to be challenged professionally – to grow, learn, and do new things. I have always been very motivated by human spaceflight in particular. At the time, SpaceX had just won contracts with NASA to provide cargo transportation services to and from the International Space Station. And I knew the end objective for SpaceX was to make humanity multiplanetary. We didn't just want to fly cargo – we wanted to fly humans to the space station and eventually to other planets. For me, that was an extremely inspirational goal, and to be a part of that would be my absolute life's dream. So I applied at SpaceX and ended up transitioning over there back in 2011.

It's been a whirlwind since then, with a lot of challenging, tough problems to solve. For four years I worked as flight systems manager for the Dragon Commercial Resupply Services program building and integrating the vehicles, and then I was senior manager for Dragon Development Engineering for almost another four years responsible for the engineering development of the Dragon crew spacecraft program.

Once I finished the development and production of the first Dragon spacecraft for human spaceflight, I was looking to get more involved in the operations; luckily a position opened up for the director of space operations and I got it. In this role, I am responsible for all of our human spaceflight operations at SpaceX. My team consists of engineers who develop the mission plans; software engineers who build all of the mission planning and console tools; engineers who train the operators and astronauts; a team of doctors who oversee crew medical care; and the flight controllers who fly the mission from our mission control center. I've overseen all 11 of our human spaceflight missions we've conducted thus far.

I've always been a space geek. So for me, this is an absolute dream to be able to play a small part in this program.

How did Cornell prepare you for what you are doing now?

I left Cornell with two fundamental skill sets I didn't have going in, and together, they are the foundation of everything I've done. Number one is that I learned how to work super hard and number two, I learned how to solve problems. These may sound like very basic things (and in some ways they are), but they are also essential to what I do—and to what engineers do. I graduated knowing I wasn't the smartest person at Cornell. I'm also not the smartest person at SpaceX. But I know that if I work super hard, I can always solve the problems in front of me. Cornell taught me how to do that, and I am forever thankful for that experience.

And then in terms of problem-solving, there are so many times we're faced with problems – not just in the professional capacity, but also simply in life. I know I can solve these problems. Cornell gave me that skill, and I think it gives everyone that skill. We learn how to break the problem down. We can figure out how to solve it piece by piece, and we can drive to a solution.

It's an incredibly valuable life skill. I have a profound comfort being uncomfortable and facing situations where the answer isn't easy or immediately obvious. Cornell helped me build that skill. I went in and took all of these hard classes and I was getting my butt kicked in the beginning years of school. But that built the resiliency and intellectual fortitude that are essential for success.

What made you say yes to joining the MAE Advisory Council?

I want to give back. Like I said, I wasn't the smartest, the strongest, or the best person at Cornell.

Cornell, however, invested in me and gave me the time to learn and to grow, and I want to give back by sharing what I've learned throughout my career. It's an opportunity for me to help shape a curriculum that matches what the workplace demands and to provide opportunities to students.

What are you looking for when you are recruiting new talent? What insights can you give current Cornell Engineering students?

A team's greatest asset is always its people. I spend a lot of time focusing on recruiting and bringing in quality team members – it's the only way we succeed in solving the impossible. The two most important things for me are a strong command of math, physics, and the engineering fundamentals, along with a deep immersion in the hands-on process of building something, testing it and making it better.

These are important because I can't tell you the problem you're going to be working on in six months or two years or five years down the road in your career. But if you have a really strong command of engineering fundamentals, chances are you'll be able to figure out a good solution. And if you have the hands-on experience of building something, trying it out, seeing when it doesn't work, breaking it and then fixing it and making it better, you'll be an incredibly valuable team member. I don't want someone who has just written something down on paper as a concept. I want to see that you built the idea, tested it to see what worked and what didn't, determined how to make it better, and then took that extra step to actually make it better.

What makes you proud to be a Sibley School alum?

There is such a long history of mechanical and aerospace engineering at Cornell, so it feels good to be a part of that, and not in an arrogant sort of way. I can look back and know that there's this place where I learned and grew. It pushed me to be a better engineer and a better person and what I learned at Cornell helped with how I approach life every day. That is where my pride and my continuing connection to the Sibley School are rooted.

Kris Young will be on campus for the Sibley 150 Celebration on April 25, 2024.

Awards and Honors

Nelly Andarawis-Puri

C. Thomas Avedisian

Lawrence Bonassar

Mark Campbell

Macy Castaneda

Grace Genszler

Maha Haji

Atieh Moridi

Elaine Petro

Dmitry Savransky

Rob Shepherd

Sadaf Sobhani

Zhiting Tian

Jingjie (JJ) Yeo

K. Max Zhang

Nelly Andarawis-Puri, Clare Boothe Luce Associate Professor, was named to the American Institute for Medical and Biological Engineering 2023 College of Fellows "for outstanding contributions to the understanding of the pathogenesis of tendinopathy and identifying mechanism to promote repair of injured tendons." Election to the AIMBE College of Fellows is among the highest professional distinctions accorded to a medical and biological engineer.

C. Thomas Avedisian, professor, was elected a member of the 2023 cohort of Fellows of the Combustion Institute "for pioneering experiments on droplet combustion that have informed detailed numerical modeling of combustion of liquid transportation fuels."

Lawrence Bonassar, professor, and his startup company had their clinical trial for a 3D-bioprinted ear featured in the January/February print edition of Discover magazine as a scientific highlight of 2022.

Mark Campbell, John A. Mellowes Professor in Mechanical Engineering, won a College Teaching Award from Cornell Engineering.

Macy Castaneda, doctoral candidate, was selected for induction into the Cornell chapter of the Edward Alexander Bouchet Graduate Honor Society.

Grace Genszler, doctoral candidate, was selected for a 2023 Zonta International Amelia Earhart Fellowship.

Maha Haji, assistant professor, was awarded an Affinito-Stewart research grant from the President's Council of Cornell Women (PCCW).

Atieh Moridi, assistant professor and Aref and Manon Lahham Faculty Fellow, was featured as one of "6 Women in STEM On a Mission to Change the World" by Johnson & Johnson. Moridi was also awarded the 2024 Minerals, Metals and Materials Society (TMS) Early Career Award. The award recognizes "an assistant professor for his or her accomplishments that have advanced the academic institution where employed, and for abilities to broaden the technological profile of TMS". Awardees are evaluated based on their personal achievements and ability to broaden the existing technological profile of the society, among other qualifications.

Elaine Petro, assistant professor, received a 2023 Air Force Office of Scientific Research Young Investigator Research Program Award for her proposal "Investigating the chemical stability of ionic liquid ions during energy transfer events." Petro was also selected for an Air Force Office of Scientific Research Young Investigator Program Award that will fund research into next-generation propellants.

Dmitry Savransky, associate professor, was named a senior member of SPIE, the international society of optics and photonics. Savransky was also named a member of NASA's Science, Technology, Architecture Review Team as part of the Great Observatory Maturation Program, and was named a Senior Member of the AIAA.

Rob Shepherd, associate professor, was chosen for the 2024-26 cohort of the Defense Science Study Group, which introduces outstanding science and engineering professors to the United States' security challenges.

Sadaf Sobhani, assistant professor, was selected for a 2023 NASA Early Career Faculty Award. NASA will be funding Sobhani's research proposal titled "Precision Ionic Liquids for Advanced Spacecraft Thermal Management (PLASMa)."

Sobhani is also principal investigator on a NASA Space Technology Research Grant funding a project dubbed AdVECT – Additive Vehicle-Embedded Cooling Technologies.

Zhiting Tian, associate professor, was selected by the Defense Advanced Research Projects Agency (DARPA) to receive a 2023 Young Faculty Award. DARPA will be funding Tian's research proposal titled "Transient, nanoscale temperature mapping of active RF devices." Tian and her team of AFRL, BNL, Columbia University, NRO and Northrop Grumman researchers received a Prototyping Research Innovation Award from the Air Force Research Laboratory Mid-Atlantic Regional Hub. She also received a DURIP grant from the U.S. Department of Defense to purchase a vacuum-ultra-violet laser system to study thermal properties of ultrawide bandgap semiconductors.

Jingjie (JJ) Yeo, assistant professor, won a College Teaching Award from Cornell Engineering.

K. Max Zhang, professor, was elected the Irving Porter Church Professor of Engineering, effective April 1, 2023, and won a 2023 Cornell Engineering Research excellence Award.Zhang and teaching assistants **Haomiao Wang** M.S. '22 and **Alex Coy** '21, and students **Jerry Jin** '23, **Canwen Zhang** '23, **L.M. Nawrocki** '23, **Felipe Santamaria** '23 and **Alfredo Alberto Rodriguez**, M.S. '22 were honored with a 2022 Town-Gown Award. The group partnered with Mutual Aid Tompkins to fight food insecurity in Tompkins County.

Select awards and honors are highlighted from 2023 and are abbreviated from detailed announcements. Visit Cornell Engineering News or the Cornell Chronicle online for more awards and honors received by faculty and students.

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