THE OFFICIAL MAGAZINE OF EMBRY-RIDDLE AERONAUTICAL UNIVERSITY | FALL 2023

BREAKING GROUND IN

STELLAR RESEARCH

LEARN HOW THIS YOUNG SCIENTIST UNEARTHED A COSMIC SECRET

CLARISSA PAVAO '23

NEW IN AEROSPACE ENGINEERING

Eagles Design, Build New Rocket Fuel Feed System

NEW IN AVIATION

Leading-Edge Flight Simulation Center Comes to Prescott Campus

NEW IN ENGINEERING

Degrees Help Eagle Get Wired Into The Boeing Company

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EMBRY-RIDDLE Aeronautical University





ALTITUDE

FALL 2023

VOLUME 02 ISSUE 02

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EDUCATIO ALTITUDE

AT EMBRY-RIDDLE AERONAUTICAL **UNIVERSITY, DARING TO THINK BIG** AND PUSH BOUNDARIES IS A WAY OF LIFE.

Since 1926, Embry-Riddle has been the leader in aviation and aerospace education. Our degree programs are consistently ranked among the best in the nation, with several routinely landing in the top 10 and others soaring straight to number one.

Embry-Riddle has been at the forefront of groundbreaking aeronautical milestones since the early days of flight, and today we are renowned innovators in the fields of Applied Science, Aviation, Business, Computers and Technology, Safety, Security and Intelligence, Engineering and Space.

Our mission is to teach students the science, practice and business of aviation and aerospace, preparing them for leadership roles in industry, government agencies and the military.

Our students are also an integral part of pioneering research that has the power to change the world, and Embry-Riddle partners with key stakeholders to develop new insights and solutions that help meet the challenges of today and enhance the opportunities of tomorrow.

Embry-Riddle faculty members are active leaders in their respective industries and share the knowledge and key connections they've gained from decades of experience to ensure our graduates have a vital competitive edge in the workforce.

We are also proud of our diverse student body, which today represents some of the best young minds from all around the globe.

Our residential campuses located in Daytona Beach, Florida, and Prescott, Arizona, offer you the choice of living and learning in a spectacular beach setting or a scenic mountain community.

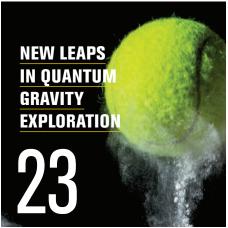
As a distance learning leader, our Worldwide Campus features award-winning technology that leverages online and face-to-face instruction through a network of locations designed to support student advancement in the U.S. and abroad.

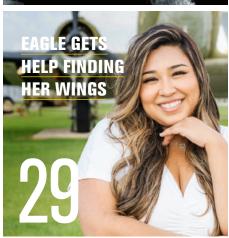
What will you discover at Embry-Riddle?

Put your passion into practice.









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Aerospace & Occupational Safety			
Air Traffic Management			
Applied Biology			
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Aviation Maintenance			
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Project Management			
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Whether it's launching rockets from the world's northernmost settlement, exploring the potential of fusion as a future power source or building hardware for satellites that will orbit Mars, the Space and Atmospheric Instrumentation Lab (SAIL) offers opportunities for students to get their hands on the future — literally.

"SAIL is one of the most research-rich laboratories on the Embry-Riddle campus," said Dr. Aroh Barjatya, professor of Engineering Physics and the lab's founder and director. "Hard-working, capable and bright students have an opportunity to either join the ongoing research or propose their own."

SAIL was started in 2007 when Dr. Barjatya arrived at the university, and its mission was to give students pursuing degrees in Engineering Physics, Space Physics, Electrical Engineering, Mechanical Engineering and Aerospace Engineering a place to do hands-on research work and get the practical experience that today's top flight employers are looking for.

"Dr. Barjatya has built a world-class lab in space and atmospheric research," said Dr. Peter Hoffmann, dean and professor of Physics at the College of Arts & Sciences. "The most impressive and important feature is how student-driven it is. Students design, build and deploy the hardware around the world to do cutting-edge research. This is a prime example of how Embry-Riddle and the College of Arts & Sciences provide opportunities for students that would be difficult to find anywhere else."

The lab, located in the College of Arts & Sciences building, has since grown to include two more faculty members, Dr. Jeremy Riousset and Dr. Byonghoon Seo, along with Research Scientists Dr. Robert Clayton and Dr. Shantanab Debchoudhury.

SAIL has a long history of research and engineering milestones that have helped students land rewarding careers with stellar employers that include Google, Lockheed Martin, the Goddard Space Flight Center and MIT's Lincoln Labs, to name a few.

The lab's full suite of equipment and facilities also allows students to pursue research in a variety of ground-based vacuum and plasma chambers or onboard many different types of high-altitude balloons, suborbital sounding rockets and orbital satellites.

"We have opportunities for doing plasma physics modeling or atmospheric physics modeling, as well as a large dataset from past missions to pursue unanswered science questions related to terrestrial weather and space weather phenomenon," Dr. Barjatya added.

For those students who arrive at Embry-Riddle within the next two years, the SAIL schedule is already packed with opportunities for research and fieldwork that would not be available to undergraduates at any other school.



A Refusal to Quit

Being chosen for the 2023 Patti Grace Smith Fellowship is one of many testaments to the resilience of Homeland Security & Intelligence senior Stanley Tucker, who overcame extraordinary obstacles to earn his degree at Embry-Riddle.

Tucker was hit on his motorcycle in 2021 by an impaired driver. Doctors told him he would likely never walk again or would need a walker if he did. Leaving the hospital after six surgeries, Tucker remembers thinking that he could use the trauma as an "opportunity to beat the odds."

By the summer of 2022, Tucker had landed an internship at Leading Edge Aerial Technologies. He also ramped up his physical therapy, and in November, he ran a 5K race and launched an outreach program to help underprivileged youth get started in aerospace.



Housing Supervisor Extraordinaire

With a can-do attitude and a willingness to embrace trying new things, Rash knows that new passions can be found in the most unexpected places.

Rash has been a Campus Ambassador, a resident advisor (RA) and an active member of the Women's Ambassador Association on the Prescott Campus. Her senior year, she became a housing supervisor, where she oversaw 10 RAs, who in turn oversaw about 250 students.

Rash says that housing is where she found her passion. Her favorite aspect of the job? The opportunity to mentor those she supervises.

"It's amazing to see their professional growth and development and to lead and mentor them through something I've been through. But we're also still learning together! It's a fun adventure."

Her advice to fellow students is, "Get out there, experience meeting new people... and listen to your RA!"



Prince Anselmo '23

AERONAUTICS

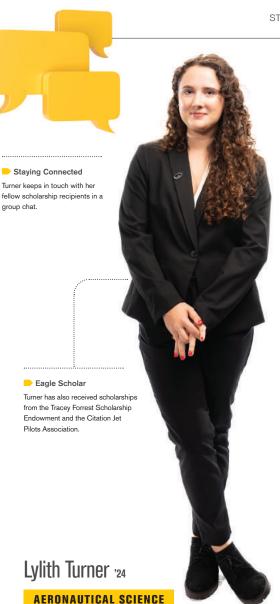
Taking Charge

While studying Aeronautics with minors in Applied Meteorology and Air Traffic Control, Prince Anselmo improves the campus via clubs.

As President of the Prescott Student Government Association (SGA) for the 2022-23 year, OctoberWest director and leader in several other organizations, his efforts have been focused on not only benefitting current students but also leaving a legacy for future students.

"I was always looking for an opportunity to give back to the community of Embry-Riddle and bring people back together, especially after the pandemic," he said. "Seeing the impact of my work was really amazing."

He says that his leadership roles and club involvement have helped him grow as a person, learn more outside of the classroom and prepare him for his career as a pilot.



Women Inspiring Women

Aeronautical Science major Lylith Turner was a recipient of an International Aviation Womens Association (IAWA) scholarship awarded at the organization's annual scholarship conference, which took place in Lisbon, Portugal, an experience she described as "incredible."

"The community of women was so welcoming and full of wisdom," she said.

She met other scholarship recipients from all over the world and felt a sense of community and support among them.

"I made invaluable connections and left feeling inspired," she reflected. "I will forever be grateful for the women that shared their experiences with me and how I can achieve my dreams."

Turner also appreciates those who believed in her enough to bestow such a prestigious honor on her.



A Foundation for Flight

For Juan Andres Mesa Sanchez, the Embry-Riddle experience was everything he hoped it would be — and then some.

Mesa earned his B.S. in Aeronautics from Embry-Riddle's Worldwide Campus, which combined with his off-campus flight training, brought him closer to his goal of becoming a professional pilot, a journey that began when his family moved to the U.S. from Colombia more than a decade ago.

"Embry-Riddle's unique ability to provide an unmatched educational experience has made the steps needed to achieve my dream both realistic and efficient," Mesa said. "As someone who grew up an ocean away in a country where dreams like mine are much less realistic, I can attest to how impactful this institution can be in helping someone make their dreams a reality."

Earning Her Wings

Dual Enrollment student Michelle Tahor earned her associate's degree from Embry-Riddle's Worldwide Campus before she graduated high school, and the 18-year-old already has more than 200 hours of off-campus flight training and her pilot's license in hand.

"Growing up and experiencing my dad's love for aviation showed me how rewarding hard work is," said Michelle, whose father, Jason Tabor ('19), another Worldwide Campus alumnus, is a pilot and a Boeing 777 instructor for United Airlines.

Michelle Tabor is now pursuing her B.S. in Aeronautics at Embry-Riddle, working toward the ultimate father-daughter dream of piloting a commercial aircraft together with one in the left seat and the other in the right, a flight that would culminate years of shared passion and encouragement.





My favorite part was... when we talked with the community about what we had done and what our plan is. Everyone was so grateful... we can really make a difference in these people's lives."

Izel Tuncer '25Aerospace Engineering



SUPPORT OUR MISSION

Type "Engineers Without Borders" in the designation portion on the givingto.erau.edu page!

For Aerospace Engineering major Izel Tuncer ('25), joining Engineers Without Borders (EWB) at Embry-Riddle was an obvious choice. The organization offers aid to communities in need and gives members an opportunity to practice their engineering skills and gain valuable knowledge in a real-world setting.

"Engineers Without Borders is here to help build a better world. This is the heart of engineering; using our skills to help those who need it most," Tuncer said, thinking of the organization's purpose. "We're able to build connections and find solutions for communities."

To receive assistance from Engineers Without Borders, communities in need must reach out and request it. El Túnel, Nicaragua, reached out to EWB about five years ago, was approved for assistance and assigned to work with the Embry-Riddle chapter. The problem in El Túnel: lack of accessibility to clean water.

In early 2023, the EWB Embry-Riddle chapter finally traveled to Nicaragua to begin surveying the land and testing the soil and water, led by Dr. Jeff Brown, professor of Civil Engineering. To prepare, the group not only spent time fine-tuning their surveying and engineering skills but also completed crucial health, safety, CPR and first-aid training. The end goal is to provide the El Túnel community with a well and a steady supply of clean water.

Next steps for the project include finalizing design plans and hiring a remote team to complete the well digging and implementation process before deciding if they'll need to add another well. At the end of 2023, they plan to take a larger team back to El Túnel.

EWB is not only making impressive strides in developing relationships between communities in need and those who can assist them but also in inclusion within their own organization. According to the impact page on EWB's website, "More than 40% of EWB-USA's student member engineers are female, which is more than double the 14% industry average."

"I'm continually inspired and motivated by the thought that I can make a difference, no matter how small I am in the grand scheme of things," said Tuncer.

A SPACE WHERE **STARS ARE BORN**

STAR Lab

The Small Teams Analog Research (STAR) Lab on Embry-Riddle's Daytona Beach Campus offers students the chance to be part of cutting-edge research using human subjects to investigate and better understand the psychology of teams.

Teamwork makes the world work, and exploring how diverse groups of people mesh in a range of situations is vital for discovering ways that enable today's teams to function with enhanced cohesion, synergy and safety.

"The STAR Lab allows us to study teams in a more experimental setting which gives us a lot more control," said Dr. Joseph Keebler, the lab's director and associate professor of Human Factors and Behavioral Neurobiology in the College of Arts & Sciences. "Students get the whole gamut of doing experimental research on teams - from designing experiments to analyzing data and writing up articles and conference presentations - while working under us. Even if they don't do this as a scientific endeavor, they gain practical knowledge and skills as well."

Located in the College of Arts & Sciences building, the STAR Lab was established in 2015 to help conduct human factors research for NASA and is part of the Game-Based

Education & Advanced Research

Studies (GEARS) suite of labs.

STAR Lab research has immediate real-world applications and offers practical experience that sets Embry-Riddle students apart when it comes to launching their careers or pursuing advanced degrees.

Says Dr. Keebler: "If you want to study teamwork at the intersection of modern technology and applied systems, I cannot think of a better program in the world than ours."

At the cornerstone of such diverse industries as aviation and healthcare, teamwork can make or break success. None of us will find ourselves working alone. We will all be part of a team. which makes the work that Dr. Keebler and others do in the STAR lab essential."

> **Dr. Scott Shappell** Professor and Chair of the Department of **Human Factors and Behavioral Neurobiology**





A LEARNING SPACE THAT SUITS YOU

EagleSat Lab

Building from the successful 2017 launch of EagleSat 1, students working in the Prescott Campus EagleSat Lab are now preparing for the upcoming launch of EagleSat 2, a 3U CubeSat that will carry two scientific payloads, one designed to detect and track cosmic rays and the other to test how radiation in space affects various types of computer memory.

EagleSat is a research and design lab for the EagleSat Space Grant project, and students are tasked with designing and building small satellites for orbital missions as part of NASA's CubeSat Launch Initiative.

NASA's Space Grant project is a network of colleges and universities, such as Embry-Riddle, that are expanding opportunities to take part in some of the agency's projects.

Incoming Embry-Riddle students will likely work on EageSat 3, the successor to EagleSat 2. It is currently in a system development phase where lab members are writing requirements for the satellite, which will be hosting the Laser Interferometer Gravitational-wave Observatory (LIGO) experiment.

Opportunities for hands-on experiences such as this are among the features that set an Embry-Riddle education apart from the rest. Working alongside like-minded peers also enhances the experience and helps students reach heights they could never achieve working alone.



The EagleSat launches are part of NASA's Educational Launch of Nanosatellites (ELaNa), a program designed to attract and retain students in the science, technology, engineering and mathematics disciplines. The first EagleSat was launched as part of the ELaNa-14 mission.



A CubeSat is a class of miniaturized satellite that usually consists of 10 cm cubes. CubeSats have a mass of no more than 2 kg per unit. Once launched, the satellite ground station on campus will be able to communicate with this satellite for nine minutes every day as it passes overhead.



Tools for Success at Your Fingertips

VECTOR Program

Embry-Riddle Aeronautical University's Worldwide Campus is dedicated to ensuring that all students have the resources they need to excel academically - and that's the mission of the Virtual Environment for Communication: Teaching, Outreach and Research (VECTOR).

Housed within the College of Arts & Sciences, VECTOR provides support through its Virtual Communication Lab (VCL) by offering free tutoring, workshops and online resources.

Our tutors can help with any communication-related project, and we can support you at any stage of the composing process — from brainstorming your speech topic to revising a draft of an essay to helping you design effective visuals for your personal website or e-portfolio.

In addition to one-on-one tutoring, the VCL also offers a variety of online resources with tips on topics such as grammar, presentation techniques and APA formatting guidelines that you can access anytime, anywhere.



FIND OUT MORE

Learn more about the henefits of Worldwide's VECTOR program.

SPACE PHYSICS STUDENT FOLLOWS HER RESEARCH TO

ASTELLAR DISCOVERY

After crunching a mountain of astronomy data, Space Physics major Clarissa Pavao ('23) submitted her preliminary analysis. Her mentor's response was swift and in all caps. "There's an orbit!" he wrote.

That was when Pavao, an undergraduate student at Embry-Riddle Aeronautical University's Prescott, Arizona, campus, realized she was about to become a part of something big — a paper in the peer-reviewed journal Nature that describes a rare binary star system with uncommon features.

The paper was published Feb. 1, 2023, and was co-authored with Dr. Noel D. Richardson, assistant professor of Physics and Astronomy and Jan J. Eldridge from the University of Auckland. It describes a twin-star system that is luminous with X-rays and high in mass. Featuring a weirdly circular orbit — an oddity among binaries — the twin system seems to have formed when an exploding star or supernova fizzled out without the usual bang, similar to a dud firecracker.

The binary's round orbit was a key clue that helped the Embry-Riddle researchers identify the second star in the binary system as a depleted or "ultra-stripped" supernova.

The binary system's name sounds like a license plate: CPD-29 2176. Researchers estimate that there are probably only about 10 such star systems in the galaxy at present. By studying it, they are unraveling new clues to our earliest beginnings as stardust.

→ Explore more on the following pages



This incredible opportunity started when Pavao stopped by Richardson's office in hopes of getting more research experience.

"I said, 'Please give me any research,'" Pavao recalled.

Richardson happened to have data, captured by the Cerro Tololo Interamerican Observatory's 1.5-meter telescope in Chile, from a bright star known as a Be-type star.

Pavao plotted the spectra of the Be star, but first, she had to clean the data of visual "noise." She managed to learn more about data processing and computer coding so that she could analyze the stellar spectra.

After quickly fitting Pavao's data into a special computer program, Richardson realized they had found an orbit for the star, but it was different than expected. Further data-crunching revealed that one star was indeed tracing a circle around the other one every 60 days or so.

Pavao recalls Richardson saying, "This is not just a simple binary system."

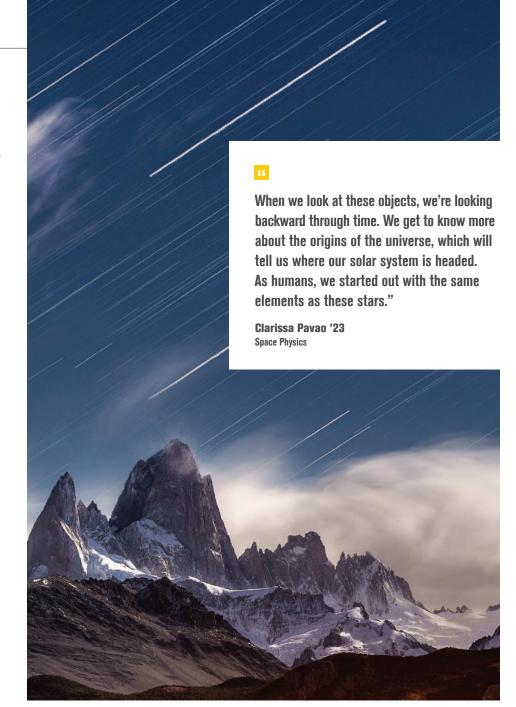
A native of Belleville, Illinois, Pavao grew up in a science-focused family. Her father is a computer scientist, and her mother is a geologist and amateur astronomer.

Embry-Riddle also gave Pavao the chance for an undergraduate research experience at the SETI (Search for Extraterrestrial Intelligence) Institute, where she met scientists, including Jill Tarter, who was played by actress Jodi Foster in the movie "Contact."

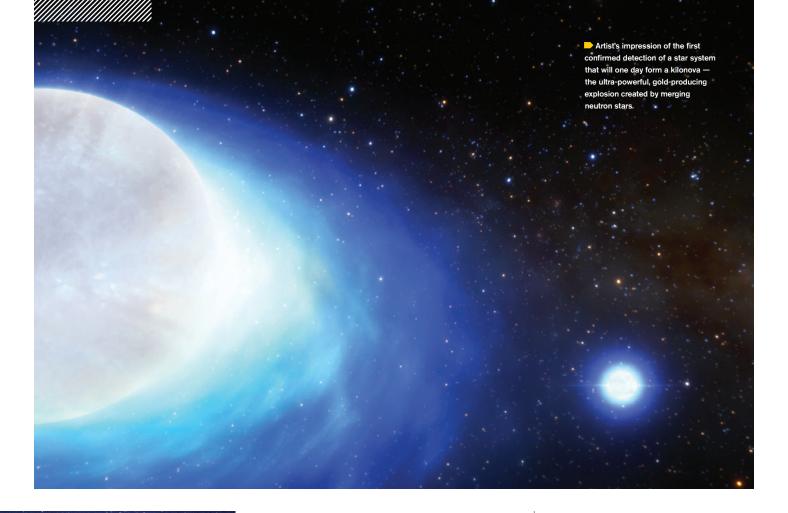
"It was a life-changing experience," Pavao said. "Later on in life, I'll be able to say I went to this observatory and looked for techno-signatures from outer space."

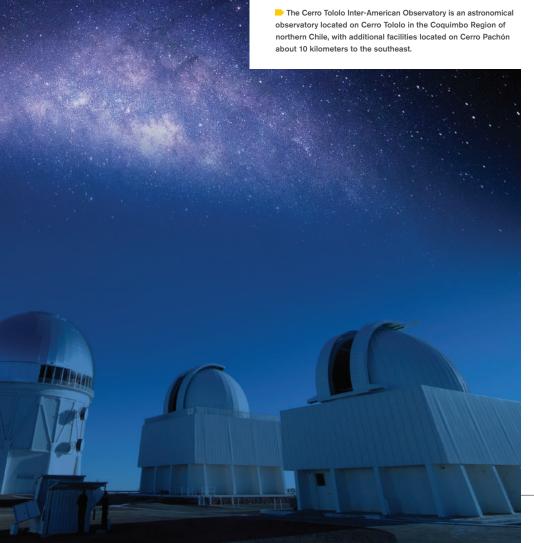
Pavao also credits Richardson with guiding her research and giving her the confidence to succeed.

"He pushes for his students to be on papers," she noted. "That made a big difference for me."









A STELLAR TEAM

In addition to Richardson, Pavao and Jan J. Eldridge of the University of Auckland, the Nature paper, "A high-mass X-ray binary descended from an ultra-stripped supernova," was co-authored by Herbert Pablo, American Association of Variable Star Observers; André-Nicolas Chené Gemini Observatory; Peter Wysocki and Douglas R. Gies, CHARA and Georgia State University; Georges Younes, The George Washington University; and Jeremy Hare, NASA Goddard Space Flight Center.

COMMUNITY SUPPORT

Pavao's research was supported by Embry-Riddle's Undergraduate Research Institute and the Arizona Space Grant program. The project also received support from the university's Faculty Innovative Research in Science and Technology program.

RECOGNIZING STARS

Richardson has been named Embry-Riddle Aeronautical University's first recipient of the \$100,000 Cottrell Scholar Award, which recognizes research and teaching excellence. He will use the award to develop additional student research opportunities and continue to study massive binary stars.

LEVERAGE YOUR EXPERIENCE

JaciLynn Poteet ('21) grew up in a small, rural Arizona town. Her love for math and science, combined with inspiration from the professors at an Embry-Riddle summer camp, led her to study Aerospace **Engineering at Embry-Riddle.**

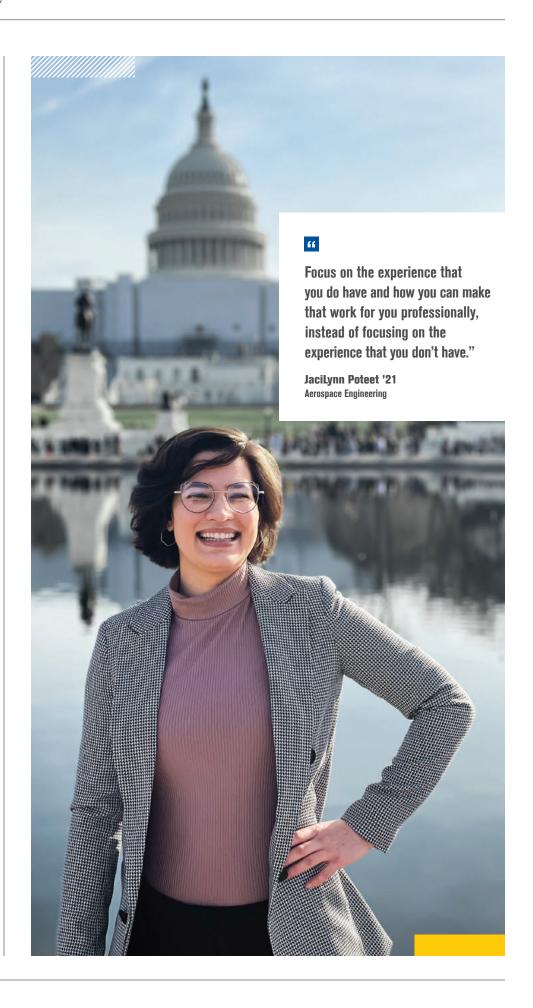
The Covid-19 pandemic interrupted the latter half of her college career, which made it difficult to obtain internships. She had an internship lined up in 2020 that was unfortunately canceled. As graduation approached, Poteet was nervous about her lack of hands-on industry experience.

"I felt really behind all my peers," she said. At the time of graduation, most of her work experience was at local grocery stores. Nonetheless, she wasn't afraid to apply for industry jobs.

Poteet's first industry job was as a Commercial Space Transportation Safety Inspector for the Federal Aviation Administration's (FAA) Office of Commercial Space Transportation (AST). She was pleasantly surprised that her customer service experience gave her an advantage over other applicants.

Now, she is transitioning into a new position in the Flight Safety Analysis Division within AST, specifically working in the Flight Safety System (FSS) Branch. She's excited to move into a more technical role where she will be ensuring regulatory compliance of the FSS implemented for launch.

"As an inspector, I saw day-to-day operations, but I didn't always spend time thinking about broader impacts of the industry," Poteet said. "The industry is ever-changing and innovating and includes so much more than just launch."





A group of Embry-Riddle students recently journeyed to study abroad in both Belgium and Germany, led by Dr. Debra Bourdeau, professor of Humanities, and Dr. Tanya Corbin, professor of Security and Emergency Services.

While there, students received firsthand learning experiences regarding international affairs and homeland security. They pursued two courses, Special Topics in Humanities and Emergent Topics in Homeland Security, while attending classes hosted in Brussels, Belgium, and Frankfurt, Germany.

"By taking part in briefings with the European Union, North Atlantic Treaty Organization and the United States Consulate in Frankfurt, I was able to gain an acute understanding of international protocol," said Aidan Rock-Arnarson, an Aviation Business Administration student minoring in International Relations at Embry-Riddle Worldwide.

He also shared that exposure to differing viewpoints and practices helped him gain real-world understanding of the topics he was learning and where they could be applied.

"The external viewpoints from being exposed to individuals from unfamiliar backgrounds allowed an education that, through debate and questioning the norm of the subject, mirrored that of a Socratic basis rather than the traditional method of scholarly debate," he said. "Furthermore, retention was much greater as our lessons became connected with unique cultural facets we were exposed to."

Equipped with new experiences, interests and insights into global cultures, Rock-Arnarson says his favorite aspect of attending Embry-Riddle is the ability to explore and expand upon an array of topics within his degree program.

"My experience studying abroad with Embry-Riddle offered me a new outlook on my educational career, instilling within me knowledge and experience that will help guide me in achieving future success regardless of the path I will take."



DAYTONA BEACH

FLORIDA CAMPUS

Our East Coast campus is only minutes from the beach and adjacent to an international airport and speedway.

CAMPUS PROFILE

- ► 7,200 Undergraduate Students
- ▶ 50 States / 91 Countries Represented
- ► 11% International Students

Student Clubs + Organizations

Our Florida campus houses hundreds of student clubs, including the Mars Society, Musicians Club, Muscle Car Association and Microgravity Club, as well as club, intramural and recreational sports.

Athletics

Women's

- Basketball
- Cross Country
- ► Golf
- Lacrosse
- Rowing
- Soccer
- Softball
- ► Tennis
- ► Track & Field
- Volleyball

Coed

Cheerleading

Men's

- Baseball
- Basketball
- Cross Country
- ► Golf
- Lacrosse
- Rowing
- Soccer
- ► Tennis
- Track & Field





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The day Isabella Novo ('23) applied to attend Embry-Riddle was also the day she first heard of it. But as someone who has dreamed of floating amongst the stars since childhood, she was immediately drawn to the curriculum, like-minded students and the campus' proximity to the Space Coast in Florida.

"It's not too big and it's not too small. I'm surrounded by the most brilliant student body," she shared, "I don't think I'd find this experience anywhere else... I don't think I've seen as advanced of a student body as the brains here."

On top of her dedication to university coursework, Novo became a member of the Society of Hispanic Professional Engineers (SHPE). Today, she is secretary of the on-campus organization. Her enthusiasm and drive to succeed are what got her there.

"Honestly, SHPE has been the greatest experience I have had on campus," she gushed. "I've met the greatest friends, and I've excelled professionally, academically and socially. Honestly, I owe all the internships, all the job offers and the current job I have now to SHPE."

Near the end of 2022, Novo attended the SHPE convention in Charlotte, North Carolina, which is an opportunity for members to meet and potentially interview with over 200 STEM-oriented companies. Of 41 Embry-Riddle attendees, 93% took part in at least one interview at the



conference. Novo left the convention with six job offers, all from top organizations. From NASA, she got something else: an opportunity to fly to Houston for a second interview.

After two more "grueling" interviews, NASA offered her the position. Thinking back, Novo said, "When they told me, I was able to sit back and look at all the hardships I went through and overcame and saw this was the fruits of my labor... I think that day I didn't even do anything crazy. I just... simmered and sat with my emotions. I was just like 'let me soak up this moment."

At NASA, Novo will be working on the life support system for the International Space Station. But her final goal is still the same: to become an astronaut. "That's my long-term goal," she shared.

Novo's advice to other college students pertains to confidence, open-mindedness and getting out of your comfort zone.

"Do not compare yourself to other people... I found that comparing myself to other people only brought my self-esteem down. I just needed to look inward and think, okay, what can I learn? Not what am I good at. How can I propel myself forward and just throw myself out there?" she said.

"Literally throw yourself out there. Join organizations, put yourself in uncomfortable situations, don't ever cut yourself short... It's going to look like you hit a rock wall, but there's always more room, there's always another corner somewhere else."



Community Through Shared Interests

Aerospace Engineering senior Elena Djudaric ('23) has been active in the Society of Women Engineers (SWE), First-Generation Students Association and the Embry-Riddle Pep Band since her freshman year.

Looking for a club that would help with professional development, she found SWE, where she holds the position of Professional Engagement Chair. Her favorite on-campus SWE event is the annual Introduce a Girl to Engineering Workshop.

Djudaric is President of the First-Generation Students Association. The close-knit group focuses on "creating a fun, inclusive community of other first-gen students while providing useful resources," including professional development workshops.

As a drummer with the Pep Band, she says that the group "has been an excellent source of stress relief." She loves the high energy of playing music at our Eagles' basketball games.



These clubs have made my college experience significantly better. I found like-minded people and felt a strong sense of community and passion toward shared interests. I cannot express how important it is to get involved on campus."

Elena Djudaric '23 Aerospace Engineering

Eagles Reporting for Duty

Reserve Officer Training Corps (ROTC) is a four-year college elective program that trains students to become Air Force, Army, Navy, Marine or Space Force officers. Each program offers its students a chance to develop skills for success needed in both the military and civilian worlds.

Students are often awarded ROTC scholarships that will cover all or part of tuition, fees and book costs. They are also eligible to take part in Project Global Office, or Project GO, an eight-week intensive language and cultural immersion program.

daytonabeach.erau.edu/rotc





FUELING THE FUTURE? WE ROCK IT!

Aerospace Engineering students Alex Clay and Samir Ahmed have spent the past four years at Embry-Riddle Aeronautical University manufacturing complex liquid-propellant rocket engines. Now, as they near graduation, there is one last thing they'd like to do: Prepare for ignition.

Along with fellow members of the university's Experimental Rocket Propulsion Laboratory (ERPL), the two have built a state-of-the-art fuel-feed system in hopes of accomplishing that very goal. If successful, the hardware will offer future generations of rocketry students a safe and consistent way to field test their designs — which, according to sophomore Aerospace Engineering student Taylor Koehn, is currently the "most significant bottleneck" in the process of engine building.

The team's liquid-propellant engine, or Daytona Beach Propellant Feed System, delivers two propellants at a rocket engine's desired pressure and flow rates. It can handle extremely cold cryogenic liquid oxygen and high pressures. The system is also capable of simultaneously processing one ambient propellant, like ethanol, and one cryogenic propellant, like liquid oxygen.

"After all our work, for us to see everything run as predicted — that is the most exciting part," said Ahmed, the team leader and a recent intern with United Launch Alliance's test propulsion engineering group.

The Daytona Beach Propellant Feed System, estimated to cost \$35,000, is comprised of multiple valves, regulators, pressure-relief devices, propellant tanks and plumbing, all of which are mounted onto a test stand. The first test fire is scheduled for spring 2024 from Cecil Spaceport in Jacksonville, Florida.



A New Space for Safety

The Boeing Company has provided Embry-Riddle Aeronautical University with a \$5.1 million donation for a research center that will drive safety improvements throughout the industry.

The newly named Boeing Center for Aviation and Aerospace Safety at Embry-Riddle, charged with advancing the safety of all who fly, will conduct independent research aimed at mitigating known and emerging operational safety risks.

The center, set to open in January 2024, will occupy a 13,000-squarefoot building on Embry-Riddle's Daytona Beach, Florida, campus that features offices and lab space as well as a dedicated classroom for safetyrelated professional education courses.

"

The Boeing Center for Aviation and Aerospace Safety at Embry-Riddle will provide an infrastructure for systematically investigating and reducing safety risks, from technological challenges to human factors. We are grateful to Boeing for supporting independent research in this field."

Dr. P. Barry Butler President, Embry-Riddle Aeronautical University



Conceptual Architectual Rendering

PRESCOTT

ARIZONA CAMPUS

Nestled in the beautiful Bradshaw Mountains between Phoenix and the Grand Canyon, our Western campus is renowned for its excellent seasonal weather and outdoor activities, such as skiing, hiking, mountain biking, kayaking and rock climbing, to name just a few.

CAMPUS PROFILE

- 3,100 Undergraduate Students
- > 50 States / 46 Countries Represented
- ▶ 9% International Students

Student Clubs + Organizations

Our Arizona campus is home to countless student clubs ranging from the Mountain Biking Club to the Society of Women **Engineers and from the Blue Eagles** Skydiving Team to the Brotherhood of Steel, as well as a variety of intramural and recreational sports.

Athletics

Women's

- Basketball
- Cross Country
- ► Golf
- Outdoor Track
- Soccer
- Softball
- Volleyball

Men's

- Baseball
- Basketball
- Cross Country
- ► Golf
- Outdoor Track
- Soccer
- Wrestling



@erauprescott



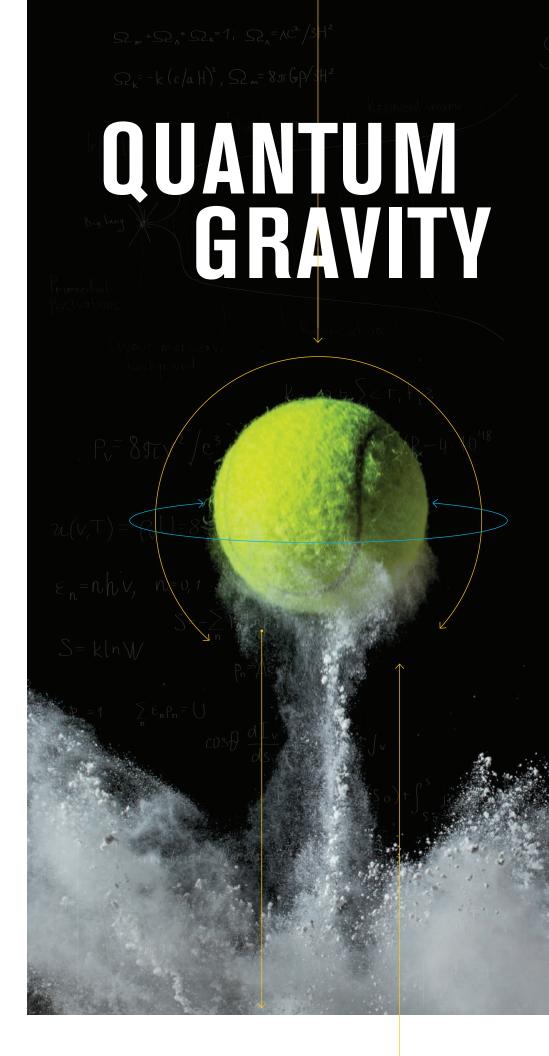
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Student Researchers Make Quantum Leaps

The new frontier of physics is infinitesimally small. But exciting discoveries are being made one micrometer at a time — even among some of the field's most time-tested concepts, as an Embry-Riddle Aeronautical University team has found.

"What we are doing is testing gravity," said Quentin Bailey, professor of Space Physics at Embry-Riddle's Prescott Campus. "We want to see if the laws of gravity according to Newton and Einstein still hold true at very small scales."

Isaac Newton's universal law of gravitation explains gravity as a force of attraction between all matter. But scientists in the centuries since Newton have begun to wonder if the physics that apply to apples and planets can change at the very smallest levels.

Over the past two years, Bailey led a team of undergraduate research students on a mission to discover what Newton never had a chance to test: How do the rules of gravity apply at the quantum level? Their findings have recently been published in the peer-reviewed journal Classical and Quantum Gravity.

Based on the team's experiments, gravitational forces appear to behave the same at micrometer distances as they do on a huge, universal scale. But many physicists like Bailey are interested to see if this holds at smaller, unexplored distances.

"We don't know much about gravity at very small distances," Bailey said. "We know it works on planetary scales and larger scales, like solar system and galaxy scales, and even larger scales comparable to the size of the universe."

Exploring these questions was exactly what student researcher Janessa Slone ('23) wanted to do, and she was thrilled to get the chance while still an undergraduate.

"I think our work will benefit the physics industry as a whole. We're working to learn and develop more science and physics, more than what we currently know. It's what we all strive for - to contribute something to knowledge, even if it feels little."

Janessa Slone '23 Space Physics

After getting hooked on physics in high school and learning about the research opportunities at Embry-Riddle, Slone said Bailey sparked her interest in theoretical physics with his enthusiasm for general relativity. For this project, much of Slone's responsibilities consisted of checking the team's work, which she said provided great satisfaction — especially when her work confirmed theirs.

Slone wants to continue studying theoretical physics and has applied to various graduate schools around the country with hopes of one day working for NASA or the National Laboratories.

The research team also included doctoral candidate Kellie O'Neal-Ault and Space Physics graduate Jennifer James ('22), who is now pursuing her Ph.D. in physics.

PUBLISHED

The paper authored by Bailey, Slone, James and O'Neal-Ault is called "Short-range forces due to Lorentz-symmetry violation" and was published in January 2023.

HANDS-ON DAY ONE

Embry-Riddle undergraduates are given unique opportunities to take part in high-level faculty-sponsored research projects thanks to grants from NASA and the National Science Foundation, among others, along with support from Embry-Riddle's Undergraduate



Building Skills With Clubs

Mia Hamlin ('23) is a senior studying Global Security and Intelligence Studies. She's a member of eight student organizations, including honor societies and social groups.

When she's not studying, she's busy as VP of Academic Affairs for Delta Phi Epsilon Sorority, President of YoungLife and member of ASL Club and honor societies for psychology, global security and more.

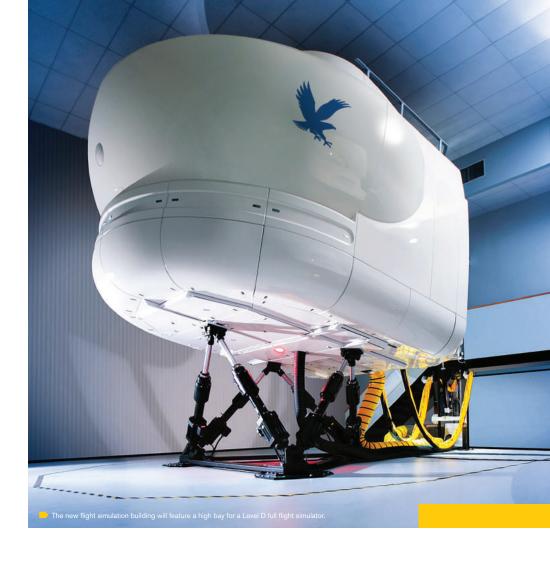
I have a meeting almost every night," Hamlin said, but she doesn't let it stress her out. "It keeps me busy and helps me organize my time better for when I'm out in the real world."

Mia Hamlin '23 **Global Security and Intelligence Studies**

Participating in clubs has strengthened her leadership, management, professionality and accountability skills, plus given her connections that will be useful after graduation.

"Joining these clubs has let me learn so many things that you don't learn in a classroom," Hamlin said. "I have been able to take the skills that I have learned in my organizations into my classwork, and it has made me a better student."

She also emphasizes the importance of taking time for herself amidst her busy schedule, whether that be getting extra sleep or hitting the gym.



FLIGHT TRAINING AT NEW ALTITUDES

The Robertson Flight Simulation Center is scheduled to open before the start of the fall 2024 semester. This 16,000-square-foot state-of-the-art facility will house simulators. as well as a full-motion simulator bay and an observatory deck to allow students to see flight patterns more easily.

Dean of the College of Aviation, Dr. Tim Holt, said the center "will increase efficiency and help ensure that students have ample opportunity for simulations training."

The project will begin with reimagining and expanding the existing simulation facility, followed by a new airport complex. Once completed, the center "will allow us to develop and grow our program in a virtual and augmented reality structure, which will allow for improved student learning and success," said Dr. Holt.

Growing numbers of aeronautical science students created an opportunity for the Prescott Campus to modernize and expand its facilities. The simulation center is essential to the continued success of our students, flight program and in keeping our stellar reputation as a world-class aviation institution.

Parker Northrup, chair of the Prescott Flight Department, said, "We're the largest and best collegiate flight training program in the mountain west, and these improvements will have a very positive impact on the student experience."

CONTRIBUTING TO AVIATION SAFETY TECH

Embry-Riddle Aeronautical University's reputation in the aviation and aerospace industry allows students the privilege of learning and working directly with innovative companies.

A group of Air Traffic Management and Aeronautical Science students had the unique opportunity to work with a team from Reliable Robotics, an automated aviation company, while utilizing the state-of-the-art simulators in our Air Traffic Control (ATC) Lab.

Reliable Robotics is in the process of getting its technology certified with the FAA, including automated landing, taxiing and takeoff features, in addition to remote piloting, with the goal of enhancing safety and preventing fatal accidents.

Extensive testing is required before the systems can be certified by the FAA, and Reliable Robotics turned to Embry-Riddle to test their remote voice communication system in the ATC Lab, with student volunteers replicating realistic air traffic scenarios.

"I was interested in how the skills we've learned could be used beyond the lab." said Carol Martin, an Aeronautical Science graduate who is now earning an Aircraft Dispatcher certificate. "It was exciting to support research and development that will shape the future of the aviation industry."

Kyle Wilkerson, chair of Embry-Riddle's ATC program, added: "Reliable knew they could come in and simulate environments and gain credible data as proof of concept as they progress through the certification process. This was a good opportunity for our students to experience technology that is changing the aerospace industry in a meaningful way."

STATE-OF-THE-ART AIR TRAFFIC CONTROL LABORATORY

Featuring simulation software that mimics real-life aircraft performance, this lab gives Air Traffic Management students the chance for one-on-one instruction using the software and technology employed in real ATC facilities.







Research From Day One

Embry-Riddle undergraduates have an advantage in research opportunities. Our Prescott Campus is home to the Undergraduate Research Institute (URI), whose mission is to promote student research across all disciplines.

The URI provides over \$100,000 in funding each year for student research and development, including grants and team funding for students attending competitions.

Our students have access to a wide range of research projects that can help them develop key skills and hands-on experience that employers are looking for.

As the Director of the URI, Dr. Anne Boettcher, assists students in strengthening their resumes and research skills by connecting them with grants, funding and interactions with industry experts.

"By enhancing critical thinking, problem-solving and communication skills, URI helps to prepare Embry-Riddle students to contribute as productive individuals, employees and citizens," she says of the institute.

Dr. Boettcher advises that high school students keep themselves open to opportunities and remember that no project is too small; "you would be surprised at how the diversity of what you experience can open new opportunities."

WORLDWIDE

ONLINE CAMPUS

Earn your degree on your terms, your schedule and from anywhere in the world through one of the nation's top online bachelor's programs.

CAMPUS PROFILE

- ► 15,300 Undergraduate Students
- ► 50 States / 82 Countries Represented
- ► 10 Start Terms Per Year for **Online Programs**

Online Classes

- Students complete assignments, join discussions, study and ask questions on their own schedule.
- ► Courses are divided into nine week-long modules.
- ► Classwork takes eight to 12 hours per week.
- Students manage their time and resources while earning their degrees.
- ► Faculty members use technology and gamification to enhance the learning experience.
- ► Completing a degree online can save money on tuition, fees, transportation and housing costs.



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TWO DEGREES OF DEDICATION

When Zach White ('20, '24) was a teenager, he had an experience that forever changed his life.

Driving home on a foggy night near Winston-Salem, North Carolina, he had just come out of a complicated set of curves when a car traveling in the other direction whipped past him at an extremely high speed.

White watched "as their taillights quickly disappeared and were replaced by headlights as the car spun out of control," he said, adding that he immediately turned his truck around and raced to where the car had crashed.

"At 17 years old, I had no idea how to stop the screams for help coming from that pitch-black car. I wanted to help, but I didn't have the tools or knowledge," he said, adding that the minutes he waited for first responders to arrive and rescue the people in the vehicle felt endless. "I lay in bed that night, trying to process what had happened. I vowed never to be so unprepared in a life-or-death situation again."

After taking a job with his local fire department, White joined the U.S. Air Force as a fire protection apprentice. Over the years, while serving in the Air Force in locations from Guam to Oman — "my training and time invested in the fire service have saved lives and rescued people from life-threatening situations" - he earned a bachelor's degree in Emergency Services at Embry-Riddle Aeronautical University's Worldwide Campus.

Now pursuing his master's degree in Emergency Services from Embry-Riddle while also working as assistant fire chief for the Vandenberg Space Force Base Fire Department, White joins 59 other leaders selected to receive a scholarship from the Pat Tillman Foundation. The scholarship provides educational funding as well as leadership development and networking.

Dr. John R. Watret, Worldwide Campus chancellor, commended White on his award:

"(Zach's) tenacity and commitment both in academics and in his profession make him an excellent choice as someone who will fully demonstrate the qualities and traits of a Tillman Scholar. We look forward to the positive impact he will have on the safety of space launch operations."

John R. Watret, Ph.D., FRAeS Chancellor, Worldwide Campus

White has maintained full-time student status since beginning his undergraduate degree at Embry-Riddle and has progressed in his career "without having to choose one over the other," he said. "There have been many sacrificed weekends over the past five years, but the experience has been 100% worth it."

His involvement in providing emergency services for space operations began last year, offering him an opportunity to develop new strategies as space operations expand.

"I have seen where the fire service needs to grow in order to prepare for the projected growth in space operations over the coming years," White said. "Working around rockets and understanding the impact of each successful launch is incredibly rewarding."



ASPIRING PILOT GETS A LIFT

As a first-generation college student, Marily Aguilar-Hernandez is pursuing some big dreams, not the least of which is becoming a commercial airline pilot.

Now, as she graduates with her B.S. in Aeronautics from Embry-Riddle Aeronautical University's Worldwide Campus, Aguilar-Hernandez is thrilled with the progress she has made thanks to the support of the entire Worldwide team.

After being raised by a single mother who came to the U.S. from Mexico, Aguilar-Hernandez began her aviation adventure in Germany, where her father was serving in the military. She took her first Embry-Riddle classes at the Ramstein Air Base campus and supported herself by working as a preschool teacher at the base.

She then relocated to Mobile, Alabama, where she is now continuing her degree program and learning to fly. Her desire to land a job on the flight deck has become a mission that includes her desire to set an example for others especially other Latinas - to follow.

Beyond the guidance she gets from the expert College of Aviation faculty, Aguilar-Hernandez is grateful for the support of the Center of Mentorship Programs and Student Success, better known as COMPASS. Offered through Worldwide's College of Arts & Sciences, COMPASS pairs students with faculty mentors to elevate skills that enhance personal growth and academic achievement.

One of the key things Aguilar-Hernandez has learned is how to avoid being overwhelmed by big projects.

"The COMPASS program taught me about 'eating the elephant,' which you have to do one bite at a time," she said. "And that's actually helped me so much, and it's become something that I am using now in my everyday life."

SAP Partnership Produces Supply Chain Standouts

Ten students from Embry-Riddle Aeronautical University's Worldwide Campus College of Business are among the first to benefit from the college's latest industry partnership by earning a Student Recognition Award from SAP, a global company that specializes in enterprise resource planning to create networks that provide transparency, resiliency and sustainability across supply chains.

The new connection to the SAP University Alliances Program allows students pursuing the Bachelor of Science in Logistics and Supply Chain Management to set themselves apart and stand out to potential employers in this vital and rapidly expanding field.



LEARN MORE HERE

Learn more about Embry-Riddle's partnership with SAP.



ON COURSE TO THE BOEING COMPANY

When Berlin Martinez-Rivera ('20, '22) graduated with a B.S. in Engineering from Embry-Riddle Aeronautical University's Worldwide Campus, she already had a full-time position lined up with The Boeing Company, where she is part of the wiring engineering team and doing challenging work that she loves.

Born in Guatemala, Martinez-Rivera came to the United States when she was 7. Her parents had not attended college and her family's financial situation was tight, but from the time she was in high school, she was determined to earn a college degree.

She enlisted in the military and was stationed in Japan when she started taking classes through Embry-Riddle Worldwide, earning her associate degree by the time she left active duty in 2017.

GREAT OPPORTUNITY

About 13,100 openings for aircraft and avionics equipment mechanics and technicians are projected each year through 2031, according to the Bureau of Labor Statistics.

EXPONENTIAL GROWTH

The Worldwide Campus Engineering program has grown from 100 students to more than 1,680 in the past eight years.

ABET ACCREDITATION

The B.S. in Engineering is accredited by the Engineering Accreditation Commission of ABET, abet.org.

She then continued her studies through Worldwide, happy for the path to an engineering degree that "had many different disciplines." Ultimately, she chose circuits and design as her focus, and while earning her bachelor's degree, she worked part-time while interning at Boeing, which was her entree to her full-time job at the corporation.

In December, Martinez-Rivera earned her master's degree in Airworthiness Engineering with a concentration in structures, again through Embry-Riddle's Worldwide Campus.

Martinez-Rivera is an example of how online engineering programs at the Worldwide Campus are empowering students by making higher education more accessible and affordable to a broader population of aspiring professionals.



Empowering Student Voices

Meet Serafina Vitale: Embry-Riddle Worldwide's SGA President.

After serving as Associate Justice on Embry-Riddle Daytona Beach's Student Court and being chosen as the Student Government Association's Member of the Year, Serafina Vitale wanted to stay involved with the SGA while pursuing her master's at Embry-Riddle Worldwide. Vitale served as Secretary for one year before being elected to serve as SGA President, a personal dream come true.

Vitale presented at Embry-Riddle's 2023 Board of Trustees Meeting, a first for any Worldwide student. The meeting is where many major decisions regarding all campuses are made and provides an opportunity for the Board to be presented with all prior and current SGA initiatives, functioning as a platform for student representation among key decision-makers.



I believe that because students are the heart of the university, they should be included in the conversations and voting of these decisions that directly affect them... Having the ability to give insight into aspects of student life at the university is not only fundamental but should always be valued with the utmost care."

Serafina Vitale '22, '24
Aeronautics, Business Administration in Aviation





Florida Campus Worldwide / Online Campus 1 Aerospace Boulevard | Daytona Beach, FL 32114

Arizona Campus 3700 Willow Creek Road | Prescott, AZ 86301

NEXT STEPS

HOW TO APPLY

Submit the following:

- Application: erau.edu/apply
- Official high school and/or college transcript or GED scores
- ACT and/or SAT scores (recommended)
- \$50 nonrefundable application fee
- Optional admission essay and/or resume.
- Transfers with more than 30 credits:
 - High school transcripts NOT required.
 - Transcripts from all colleges attended.
- Applications evaluated continuously.
 Once all documents have been received, we will notify you of your admission status.

Based on the quality of our programs and the exciting and growing industries we serve, Embry-Riddle degrees are in high demand. Some of our programs may have limited capacity and we encourage you to contact one of our admissions counselors for updates.



SCHOLARSHIPS

Every student applying for admission is automatically considered for scholarships.

Scholarships:

- Are based on student abilities both inside and outside the classroom.
- Do not have to be repaid.
- Are sometimes need-based and require a FAFSA to be submitted.

FINANCIAL AID

96% of Embry-Riddle freshmen receive some form of financial aid through scholarships, grants and loans.

To apply for need-based financial aid:

- Fill out the Free Application for Federal Student Aid (FAFSA) at studentaid.gov.
- Include Embry-Riddle's federal school code on the FAFSA: 001479.
- The FAFSA is the first step in receiving additional aid. Notification of your complete financial aid package will arrive after you submit your FAFSA form. Federal and state financial aid programs are available to U.S. citizens or permanent residents who qualify.

COME VISIT

A visit to our residential campuses in Daytona Beach, Florida, and Prescott, Arizona, lasts about three hours and includes:

- Walking tour of campus.
- Meeting with admissions staff and getting answers to your admissions questions.

Register online, where you can customize your visit experience and view a schedule of available tour times. You may also request to sit in on a class or to meet with a professor, a financial aid advisor or an ROTC representative.

CONTACT US

Schedule your visit and learn more about Embry-Riddle.

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Worldwide / Online Campus worldwide@erau.edu 800.522.6787