

Lift



On the Horizon

Alumni are leading the autonomous
systems industrial revolution

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FROM THE PRESIDENT

This issue focuses on autonomous systems. From a technology perspective, they can help us collect data without putting anyone in harm's way. We can restore independence to people by giving them new mobility options. We can move materials expeditiously. As impressive as the "how" of these systems is — now, more than ever, I want to acknowledge the "why." We don't pursue these projects to create gizmos and gadgets. We create them to put technology in service to society.

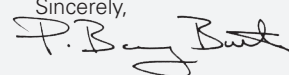


Applying science, technology, engineering and mathematics — STEM skills — to real-world problems goes back to our roots in early aviation. So does a sense of duty to our communities. At 17, John Paul Riddle volunteered to drive his town's doctor to house calls. The 1918 influenza pandemic hit his hometown of Pikeville, Kentucky, so hard that officials were too overwhelmed to report all the deaths to the board of health. Riddle got the flu but recovered to enjoy 82 more years. Today, Embry-Riddle Aeronautical University continues to live up to our founder's example of civic service and resilience.

In the present pandemic, our staff and faculty moved quickly to protect students and our communities, migrating programs online and instituting wellness checks for those who needed to remain on campus. We also extended our resources to help younger students keep learning during school closures. In March, we began offering free, online programs for young learners and seven college-credit courses to high school students in Arizona and Florida. Our Massive Open Online Course (MOOC) on aviation fundamentals reached more than 3,000 homebound students across the world.

Beyond our campus communities, our work as a global research and engineering institution has far-reaching impact and potential. This issue describes how an alumnus — through his employer — is using autonomous systems to deliver medical supplies to remote areas in Rwanda and Ghana. Our unmanned aerial systems (UAS) faculty and students have also surveyed cultural sites in Kosovo, monitored the aftermath of hurricanes and fires, helped farmers mitigate climate change with high-resolution imagery, and are developing robots that remove microplastics from beaches.

Our students will be qualified for the more than 100,000 "disruptive" jobs projected by 2025 in transportation, energy, telecommunications, the government, military and even entertainment. Embry-Riddle has always been synonymous with "all things aviation." Our tradition of excellence continues as we become synonymous with "all things autonomous," inspired by a spirit of service.

Sincerely,


P. Barry Butler, Ph.D.
President

Embry-Riddle Aeronautical University


WE ARE EAGLESTRONG
alumni.erau.edu/connect

An online resource to help you stay Eagle Strong during the coronavirus pandemic.



Volume 16, No. 1

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Autonomous technology is turning science fiction into reality



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lift.erau.edu

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ON THE COVER: A Zipline drone launches in rural Africa to deliver precious medical supplies. Alumnus Joseph Marshall ('10) is helping Zipline bring its delivery service to the United States (see Page 12). Photo courtesy of Zipline.

CHATTER

ALTIMETER: HIGH POINTS AT EMBRY-RIDDLE

U.S. News & World Report's 2020 Best Colleges' guidebook ranked the Prescott Campus No. 1 Best Undergraduate Aerospace/Aeronautical/Astronautical Engineering program for schools without a doctorate. The Daytona Beach Campus' Undergraduate Aerospace/Aeronautical/Astronautical Engineering program was ranked No. 4 (tie) for schools with a doctorate.

Men's Basketball Head Coach **Steve Ridder** celebrated his **700th career victory** in November 2019.

The Prescott Campus was designated a **National Center of Academic Excellence** in Cyber Defense Education through 2024.

U.S. News & World Report ranked Embry-Riddle No. 1 for online undergraduate degrees tailored to veterans; and No. 2 for its online bachelor degree programs, overall.

Eduardo Rojas, assistant professor of computer and electrical engineering, received a **National Science Foundation Faculty Early Career Development Program** award.

Terry Oswalt, chair and professor of engineering physics, was named an **inaugural American Astronomical Society Fellow**.

Susan Allen, associate dean of research and distinguished professor of mechanical engineering, was named a **National Academy of Inventors 2019 Fellow**.



Embry-Riddle student Shlok Misra, right, and his research partner, Tanish Jain, won top honors at the USAIRE Student Awards Program.

EAGLE ACCEPTS PRESTIGIOUS INTERNATIONAL AEROSPACE AWARD

Embry-Riddle student Shlok Misra was one of only five students worldwide awarded top honors in the 14th annual Association of United States and European Aerospace Industries Representatives (USAIRE) Student Awards Program.

Misra and his research partner, Tanish Jain, a student at the University of California San Diego, won scholarships and were flown to Paris in November to attend the USAIRE gala and present their paper to global industry and government leaders.

The two students spent six months researching and writing a comparative analysis of two emerging military powers — India and Israel — and their defense capabilities for the award program's prescribed topic:

"Protectionism in the Defense Aerospace Industry in a Multipolar World."

"Going to Paris was a great opportunity to interact with leading industry executives and represent Embry-Riddle at a global platform," Misra says.

"Going to Paris was a great opportunity to interact with leading industry executives and represent Embry-Riddle at a global platform." — SHLOK MISRA

USAIRE includes representatives from over 100 American and European companies in the aviation, aerospace and defense industries. Its student awards program aims to identify the next generation of administrators, disruptors and visionaries.

— James Roddey

USAIRE

Park Place

Embry-Riddle's Research Park fills in

The university's new Applied Aviation and Engineering Research Hangar is now at capacity. Home to the Eagle Flight Research Center, the hangar also provides more than 7,500 square feet of flexible lease space for corporate and research partners, with direct taxiway access to the Daytona Beach International Airport. The unique facility combines the attributes of a research complex with the capabilities of an aircraft hangar and engine test bed.

The Research Hangar is the latest addition to Embry-Riddle's John Mica Engineering and Aerospace Innovation Complex (MicaPlex) at the Research Park.



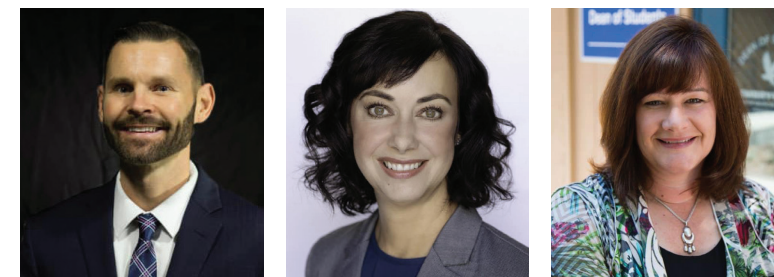
The new Applied Aviation and Engineering Research Hangar, which includes the Eagle Flight Research Center, combines a research complex with an aircraft hangar and engine test bed.

"Since the debut of the MicaPlex in spring 2017, entrepreneurs there have secured more than \$27 million in seed funding for their ideas," says Rodney Cruise, senior vice president for administration and planning. Additionally, the Research Park has created 115 internships and 71 high-paying jobs.

Supported by more than \$3 million in State of Florida grants, \$1 million from the U.S. Department of Commerce Economic Development Administration and a grant from Volusia County, the Research Hangar was established to spur innovation within the state's aeronautical cluster.

"We want to create a working lab where innovative companies advance aviation," says Embry-Riddle President P. Barry Butler. "We want to welcome entrepreneurship onto our campus so that students gain inspirational models and hands-on opportunities. And we want to help high-paying jobs take root here. The Research Park's facilities and tenants help us achieve all three goals."

DAVID MASSEY



From left: Jason M. Ruckert, Shanan Gwaltney Gibson and Rhondie Voorhees.

Staffing Up

New VP of enrollment, two deans named

Embry-Riddle recently named a new vice president for enrollment management and welcomed two new deans to its ranks.

Jason M. Ruckert started as vice president for enrollment management on April 1, managing enrollment across the university. Joining Embry-Riddle in 2005, he was the Worldwide Campus' vice chancellor and chief digital learning officer, as well as a College of Business faculty member.

"As a nationally recognized authority on technology-enhanced education, Dr. Ruckert has the leadership skills and expertise to help us advance our strategic goals related to student recruitment and retention," says University President P. Barry Butler.

Ruckert holds a Ph.D. in Leadership and Education from Barry University, with a specialization in higher education administration and is a Fellow of the Royal Aeronautical Society.

Shanan Gwaltney Gibson became dean of the David B. O'Maley College of Business at the Daytona Beach Campus, also in April. A scholar with expertise related to job analysis, entrepreneurship and small business development, Gibson most recently served as dean and professor of management within the College of Business at Texas A&M University-Commerce. She holds a master's degree and a Ph.D. in Industrial and Organizational Psychology from Virginia Tech.

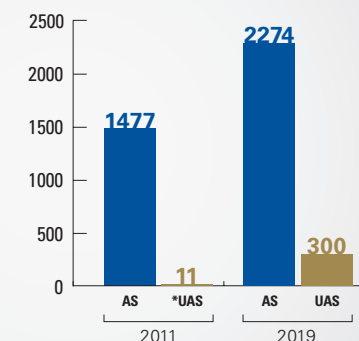
Rhondie Voorhees has nearly a year under her belt as dean of students at the Prescott Campus. Starting in July 2019, she joined Embry-Riddle from the University of Montana, where she served as the dean of students since 2012. Voorhees has more than 30 years of higher education experience, including a Ph.D. in Higher Education and Student Affairs from the University of Maryland.

BY THE NUMBERS

A Growing Field: Unmanned Aircraft Systems (UAS) & Aeronautical Science (AS) Enrollments

*2011: The UAS program started this year at the Daytona Beach Campus. It started in 2015 at the Prescott Campus.

SOURCE: Institutional Research; Residential Campuses, Fall Enrollment Trends



FEEDBACK

FROM THE EDITOR

Calling all writers! Embry-Riddle is establishing a volunteer Eagle Writing Corps to help us expand and enrich our content with stories and news that matter to you. Journalists, authors or bloggers who have a flair for authentic storytelling are encouraged to apply. Those selected for the Eagle Writing Corps will develop articles for *Lift* and write digital and website features for a variety of online platforms. This is an opportunity to support your alma mater through your talent and skills, build personal connections with your Eagle Network and expand your writing portfolio. Send writing samples to liftmag@erau.edu for consideration.

— SARA WITHROW, EDITOR

P.S. Inaugural Eagle Writer Chris Pezalla ('07, '12) developed a Web Exclusive for this issue. Check it out: lift.erau.edu/cooldrones.

Anyone Remember AHP?

I am trying to find some information about a chapter of AHP at Embry-Riddle at the Miami Campus in 1960 or 1961. I was a charter member of a new chapter there, along with about 15-20 other students. I still have my black mug with gold AHP on it. I don't have any other names or information, but I do know that we had an AHP chapter. Since there seems to be no record that I can find that it ever existed, I am assuming that for some reason it was dropped from the records.

W. Emory Chronister
Former student

EDITOR'S NOTE: No records regarding the AHP chapter have been located. Readers who have information about AHP, please email liftmag@erau.edu.



My view is that the industry needs to forget about upscale shopping and fine dining and refocus on the mission of an airport to link passengers from ground transportation to air transportation as efficiently and seamlessly as possible.

George F. Doughty

In the Footsteps of the Founders

In the spring edition [2019: *Wings of Legacy: The Riddle of T. Higbee Embry*], I read about the origins of the Embry-Riddle School of Aviation and its humble beginnings in Cincinnati, Ohio.

I am from Cincinnati, and as a teenager I used to patron a pool hall that was in the downtown area of Hyde Park as well as "Buskin Bakery." To read that I walked perhaps the same paths as T. Higbee Embry is quite astonishing given my career path. And while I was aware that Cincinnati had a significance in the early beginnings of what we know today to be Embry-Riddle, the Hyde Park [connection] was a new revelation for me.

To the casual reader, the article may have some historical relevance. [For me] I look forward to going back to Cincinnati to visit with family and to visit Lunken Airport, the place where I once played as a child, to see what it has become after some 45 years. And of course, my ultimate desire is to drive through Hyde Park, to see if there are any historical landmarks that mark the birthplace of T. Higbee Embry, one of the founders of our great aeronautical institutions.

Thomas J. Ridley ('05)
M.S. Aeronautical Science
Navy Retired, Mustang

TALK TO US

We invite your feedback on *Lift* content or topics related to the university. Letters may be edited for style, length and clarity. Submission does not guarantee publication.

EMAIL: liftmag@erau.edu

IN OTHER WORDS

What Makes an Engineer Tick?

BY KEN HURT ('97)

On the heels of Engineers Week (Feb. 16-22), I find myself reflecting on why I became an engineer. The answer is simple: There was never any other choice. The best way to describe it is to tell my story.

As a young boy picking strawberries in the field with my mom, I could not help but look up every time a Grumman F-14 Tomcat from the local training facility flew overhead. *Sorry, Mom, for not picking more berries, but the distraction was too much to overcome.*

In 1984, I had the privilege of meeting Maj. Chuck Sewell, the chief flight test pilot for Grumman at the time. Not only did he fly the Tomcat, but he was also the pilot of the X-29 experimental, forward-swept wing airplane. Over the next several years, Maj. Sewell invested in me and further sparked my interest in aerospace. I had the privilege of touring the Grumman facility and seeing the F-14s and X-29 up close.

As I grew up, many things changed, but my captivation with and love of air and space flight never did. My journey took me from the U.S. Naval Academy, to a small liberal arts college in Massachusetts, to Embry-Riddle, and finally to Honeywell.

Every engineering college student undergoes a rigorous training program that eliminates some, and ensures all who succeed are equipped for the challenge ahead. Graduating with a degree in aerospace engineering was the day I transitioned from a young boy who couldn't help but look up at the sky, to a man who had the training and capability to actually make flight possible. That is a privilege and a responsibility.

God granted us the ability to dream, the ability to fly and the ability to reach beyond what we think our limits are. What we do with that ability and that dream is what makes the difference in aerospace.

As engineers, we are wired to solve problems and to create new things, to challenge the status quo and push the limits. When we do, incredible things happen. The Wright Brothers proved that; Elmer and Lawrence Sperry proved that; Amelia Earhart proved that; Charles Lindbergh proved that; the Gemini program proved that; Apollo 11 proved that; the SR-71 program proved that; Honeywell's aviation and space technology prove that, and the list goes on.

I am honored and proud to be a part of the aerospace industry. Someday when I talk with my grandchildren and tell them what I spent my career doing, I will tell them that I used what God gave me: I impacted the aerospace industry, made new aircraft and



"As engineers, we are wired to solve problems and to create new things, to challenge the status quo and push the limits. When we do, incredible things happen."

spacecraft possible and contributed to aviation and space flight being safer and better.

As an engineer, the passion behind what we do makes us tick. It's what drives us.

Maj. Sewell's Korean War flight helmet still sits on my desk at home. I cannot help but pause every time I walk past it, to remember someone who invested in a young boy who had his head in the clouds – and encouraged him to never take it out of the clouds.

EDITOR'S NOTE: Hurt earned a B.S. in Aerospace Engineering from Embry-Riddle in 1997. He is an engineering director at Honeywell Aerospace in Phoenix and is Honeywell's executive focal liaison to Embry-Riddle.

SEND US YOUR STORY *In Other Words* gives you the opportunity to share your industry-related or personal perspective with *Lift* readers. Email submissions/proposals to liftmag@erau.edu.

The Betz brothers, from left, Calvin ('70), Allen ('65), Norman ('73) and Gerald ('60, '66), returned to the Daytona Beach Campus for Homecoming last fall to experience the metamorphic changes at their alma mater.



Front Row Seats

The Betz brothers participate in history-making decade at Embry-Riddle

BY SARA WITHROW

Gerald "Jerry" ('60, '66), Allen ('65), Calvin "Cal" ('70) and Norman ('73) Betz have more than their last name in common. Together, the brothers witnessed and contributed to over a decade of Embry-Riddle's history, including its move from Miami to Daytona Beach and its transformation from a flight training/technical school to a fully accredited nonprofit university.

The Trailblazer

The family's legacy at the university started in 1955 with the eldest brother, Jerry. "I was in an airplane (C-47) and I was reading a magazine, and in the corner was this little ad [for Embry-Riddle]," he recalls.

An airborne radio operator for the Air Force during the Korean War, Jerry started considering his postwar future. He filled out and mailed the enrollment form.

"I got the card back and it said, 'Yeah, come on.' They were looking for people; they were building the school," Jerry says.

Following the conclusion of World War II, Embry-Riddle's South Florida military flight and technical training operations — former income streams — dried up. The school turned its focus to commercial aviation and started actively soliciting veterans looking to retrain for civilian careers.

Jerry was one of the GIs who came. In 1958, he moved to Miami and started taking classes at Embry-Riddle's Aviation Building.

DAVID MASSEY

"It was like a big hotel; everything was in there, travel agencies and other businesses; they just all had rooms in it," Jerry says, describing the school's unique setting.

Finding His Footing

Allen started his college education at Michigan Tech, but admitted he floundered there. He quit school and went to work as an engineering aide at Pratt & Whitney in West Palm Beach.

"After a couple of years, I got a feel for what the engineering field was like and the people in it — how smart they were, how smart they weren't. And, I said, 'I can do that.'"

By now, Jerry had completed an associate degree in aeronautical engineering and was working at the Martin Company (now Lockheed Martin) in Cape Canaveral.

"Jerry had gotten a job immediately out of [Embry-Riddle], so I ended up going there as well," Allen says.

It was a time of transition. At the urging of Jack Hunt, then a consultant for Embry-Riddle, President Isabel McKay moved to reorganize the school as a nonprofit corporation. The new status would open doors for federal aid. A few years later, Hunt, now president, recommended the school consolidate its South Florida operations on one larger property that would allow for future growth. The board ultimately chose Daytona Beach as the school's new home.

Operation Bootstrap

Allen was a student at the time (1965) and helped with the move, which became known as "Operation Bootstrap," because of the human resolve and volunteer labor it took to accomplish.

"I disassembled some of the equipment down there and loaded up trucks. Then, I helped unload the trucks and reassemble some of the labs, wind tunnels and a lot of the lab equipment [in Daytona Beach]," says Allen, who shortly thereafter was elected president of the first Student Council.

Fly Boy

Enter Cal. "When I got out of high school [1964], I knew I wanted to fly," he says. "My whole purpose in life was to get in the U.S. Air Force."

After working and saving money for a year, Cal enrolled in the aeronautical engineering program at Embry-Riddle. "My dad thought all his sons were engineers," he says. In 1966, when the school started offering a B.S. in Aeronautical Science, he promptly changed his major.

Cal and Allen, who had one trimester together (before Allen graduated), helped create the first intercollegiate sports field at Embry-Riddle.

Dean of Students Herbert Mansfield had started a men's soccer team, Allen explains. "Cal and I were ordered by him to lay out a soccer field."

Building an athletics program was part of the school's greater goal of being accredited by the Southern Association of Colleges and Schools (SACS).

"[Mansfield's] goal was to have the best soccer team in the region, and he did it. The teams he put together beat the University of Florida, Stetson, Rollins and Florida State," Cal recalls.

'Special Purpose Institution'

Cal also helped the school develop its physical education (PE) course, another SACS requirement. "One day, I went into [Mansfield's] office and he said, 'I don't have time to teach this PE course anymore. I want you to teach it.'" Cal ended up getting paid for teaching and earning PE credit at the same time. "All we did was flag football," he says.

Under the leadership of President Jack Hunt, in 1968-69 Embry-Riddle was accredited by SACS as a "special purpose institution."

Last but Not Least

Norman arrived at Embry-Riddle in 1967. He brought with him two years of engineering education from Lawrence Technical College.

"I liked the small class environment [at Riddle]," he says. While he had a couple of stops and starts at Embry-Riddle, Norman says there was a strong incentive to finish. "I had three brothers who all had their bachelor's degrees; I wasn't going to be left out," he says.

Norman completed a B.S. in Aeronautical Engineering and went on to earn an M.S. in Engineering and Project Management from the University of South Florida.

Career Calling

The brothers all credit Embry-Riddle for their career success. Both Allen and Norman contributed to the development of high-energy laser systems. Norman retired in 2008 from The Boeing Company, and Allen retired in 2009 from Pratt & Whitney.

Jerry, who returned to Embry-Riddle in 1966 to earn a bachelor's degree, worked for Chrysler at Cape Canaveral and contributed to NASA's Apollo program. In 1969, he returned to Michigan to take over the family business, Imperial Plastics Inc. He sold the business in 1999 and retired in 2001.

A lieutenant colonel in the Air Force, Cal retired in 1994 after 24.5 years of service. His final assignment was Air Force representative to the Federal Aviation Administration's (FAA) Southern Region. He continued to work for several different companies on FAA telecommunications projects, retiring in 2014.

Coming 'Home'

The Betz brothers returned to Embry-Riddle for the 2019 Homecoming Weekend. Today's campus is nothing like the school they attended, but Allen says some things have not changed.

"This is the real deal. When you come to Riddle, you run into people who are trying to get someplace."



Did You Know?

➔ At one time, Embry-Riddle's Aviation Building in Miami, the former Fritz Hotel, housed up to 60,000 hens. Given the building's history, Embry-Riddle students would often refer to it as the "Chicken Coop." For more about Embry-Riddle's history, visit erau.edu/leadership/archives.

Space Eagles

Alumni team contributes to historic Boeing Starliner capsule landing



BY SARA WITHROW

t's almost 6 a.m. (MST) on Dec. 22, 2019. A bank of spotlights focuses on the pre-dawn sky above the desert at White Sands Space Harbor, New Mexico. Minutes later, a spacecraft recovery team — and the world via NASA TV live — witness a first-of-its-kind engineering feat. Suspended by three parachutes and surrounded by six specially designed airbags, the Boeing Crew Space Transportation-100 Starliner spacecraft descends gently to the Earth's surface.

Among those celebrating the landmark moment were more than a dozen Embry-Riddle alumni who work for the Starliner program.

"We're the first fully reusable (human-rated) capsule to land on land," said Louis Atchison ('02, '04), chief of launch and recovery operations for Starliner.

Proving the ground-landing capability of the spacecraft is a critical step to advancing Boeing's business model for Starliner, Atchison said in an early December phone interview. "The reusability of the vehicle helps us give the customer the best value on this particular capsule platform."

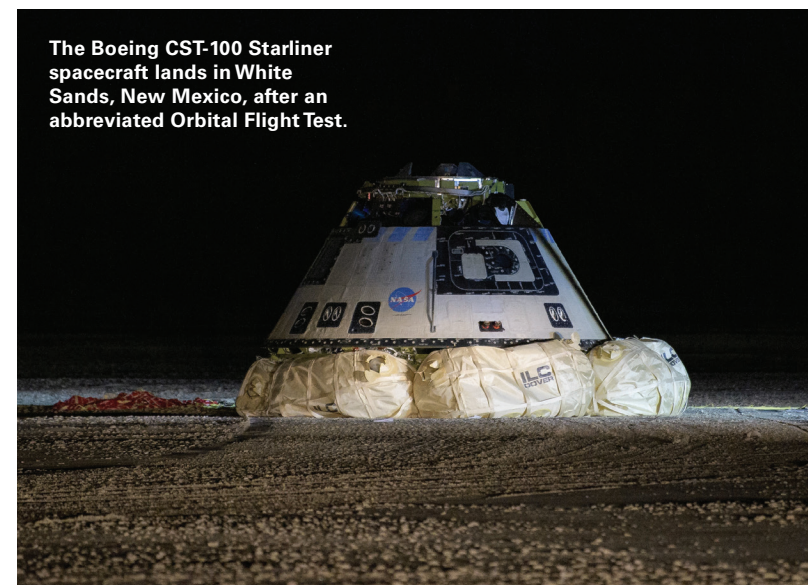
Starliner's nominal landing was the highlight of its inaugural Orbital Flight Test (OFT). "The hardest parts of this Orbital Flight Test were successful," said NASA Administrator Jim Bridenstine in a statement released after Starliner's successful touchdown. Bridenstine also acknowledged the need to investigate two software errors and an intermittent communications link issue that occurred during the test flight. An independent Boeing/NASA investigation took place, and Boeing is addressing the recommended fixes, according to a public statement on March 6.



Embry-Riddle alumni, from left, Evan Rollyson, David Currey, Lou Petcovic, Gary Wedekind, Kimberly C. Fuentes-Lehtonen and Louis Atchison stand in front of the CST-100 Starliner that launched Dec. 20 and landed on Dec. 22 for the Orbital Flight Test (OFT). At least 15 Eagles were involved in preparing for and executing the OFT.

THE BOEING COMPANY

NASABILL INGALLS



The Boeing CST-100 Starliner spacecraft lands in White Sands, New Mexico, after an abbreviated Orbital Flight Test.

Eagle Team

Together with Atchison, at least 14 Embry-Riddle alumni and one student have touched nearly every aspect of the historic spacecraft's development. This Eagle team includes electrical, materials, manufacturing and production engineers, a materials management lead, a systems test conductor, assembly and aerospace technicians, a welding shop lead/crane operator and a safety specialist.

Largely working behind the scenes, Kimberly C. Fuentes-Lehtonen ('17), an occupational health and safety specialist for the Starliner program, has helped ensure workplace safety for her Starliner teammates since January 2018.

The most common safety hazards — as at any construction site — relate to "slips, trips and falls," she said in an early December interview. "You'd be surprised how many areas have to be reached when working on [Starliner]."

Still, jobsite mishaps have been rare to none, she said. "Space is a very safe industry, because it has to be," Fuentes-Lehtonen explained. She helps keep it that way by listening to employees, mitigating safety hazards and conducting safety training. "I've trained technicians to NASA engineers to astronauts," she said. "To be a part of this program is so unique. We've never built a capsule like this before."

Orchestrating the Launch

The conductor of the launch-day countdown, Atchison earned a B.S. and an M.S. in Engineering Physics from Embry-Riddle. After eight years with Boeing's satellite division, he was originally brought on to the Commercial Crew Program as a flight test director. Five years ago Atchison was asked to create Starliner's launch architecture. The plan coordinates multiple teams and activities to operate in lockstep, so the heritage Atlas V rocket system marries up seamlessly with Starliner for a successful liftoff, he said. "It's been a very interesting journey integrating all of the pieces of this puzzle."

Maturing the concept of a ground landing for the reusable capsule was another of Atchison's challenges. "The [space]

shuttle landed on a runway. ... This is an off-road, expedition-type spacecraft recovery," he explained.

Starliner's landing isn't the only thing that makes it distinct from the Space Shuttle and NASA's previous capsule programs, Gemini and Apollo. "It's a lot like comparing a 1955 Corvette to a 2020 Vette or a 1975 Cessna to a 2019 Cessna. The avionics, the fit, the finish, the feel — everything is completely different [from Gemini and Apollo]," Atchison said. "The challenge with Starliner is that most of what we're doing is new."

Discovery Is Part of Development

"We have a custom, one-of-a-kind, hand-built spacecraft," affirmed Gary Wedekind ('81, '83, '91, '92).

With more than 37 years of experience, including multiple roles within the Boeing Starliner Program as an integration engineer, manufacturing engineer, test engineer, test conductor, test director and Boeing mission support room manager for test flights, Wedekind is intimately familiar with crew and service module designs and as-built configurations.

"The primary goal of the OFT is to perform on-orbit testing and performance checks for systems that cannot be tested on the ground, and to understand all the successes and any problems that occur," Wedekind said in a phone interview prior to Starliner's Dec. 20 launch.

"Sometimes stand-alone hardware will pass qualification and is integrated onto the vehicle; now that box has to respond correctly with other boxes and other systems, and you realize it doesn't play well with others. It's based on these unplanned discoveries that you now work to resolve them so they don't occur again," Wedekind said.

"The most important thing is we get it right for the people who will fly our spacecraft." 🦅

EDITOR'S NOTE: Boeing and SpaceX were selected by NASA in 2014 to develop capsules to transport astronauts to the ISS. Since the Space Shuttle program retired in 2011, American astronauts have traveled to space aboard Russian Soyuz rockets.

REACHING FOR THE STARS Eagles on the Starliner Team

Louis Atchison ('02, '04)	Carmen Moore ('06)
Catherine Ayotte ('18)	Lou Petcovic ('00)
David Currey ('98)	Evan Rollyson ('16)
Vincent D'Amore ('19)	Sean Rose ('16)
Deanna Dobson (Embry-Riddle student)	Gary Wedekind ('81, '83, '91, '92)
Kimberly C. Fuentes-Lehtonen ('17)	Michael L. Wilson ('16)
Yvens Joseph ('01, '03)*	Robin Zwick ('87, '99)
Jason McBride ('05)	

*Left Starliner Program in 2020

SOURCE: BOEING SPACE



Kyle Zier ('20), a senior majoring in interdisciplinary studies, uses a drone to collect data on the changing Indian River Lagoon ecosystem.

COASTAL COLLABORATION

Unmanned aircraft systems are helping researchers track the changing coastal environment

BY MELANIE STAWICKI AZAM

Rising sea levels, warmer temperatures and increased human activity are taking a toll on Florida's coastal ecosystems. Intent upon safeguarding this delicate habitat, Embry-Riddle students and professors are using unmanned aircraft systems (UAS) to collect critical data on the changing coastal environment. "It's important, because our climate is changing," says Dan Macchiarella, a professor of aeronautical science at Embry-Riddle.

In collaboration with the University of Central Florida's (UCF) National Center for Integrated Coastal Research, a group of students used UAS to survey oyster reefs in the Indian River Lagoon system on the east coast of Central Florida in 2019. The project is now expanding to investigate the potential for dead reefs to be used as nesting sites for threatened birds, including the American oystercatcher and least terns.

"Collaboration started organically — the best way," says Linda Walters, a biology professor at UCF. "Embry-Riddle and UCF coastal scientists met and realized we could help each other better understand and hopefully help improve the Indian River Lagoon and associated biodiversity."

UAS are flown over the oyster reefs at low tide, taking photos that are stitched together to make high-quality images that are about 25 times more detailed than Google Earth's, Macchiarella says. The UAS images create a baseline of data that can be used to measure the changes in an area. The next step is to use lidar — a remote sensing method that uses laser light to measure distance — to make digital 3D representations of the survey site.

"Lidar also gives us the ability to penetrate vegetation and mangroves, which grow a lot around oyster reefs," Macchiarella says. "They share the same habitat."

UAS: Tools for Conservation

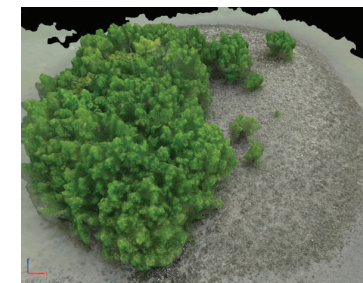
To further their research, the Embry-Riddle-UCF team is applying for a state grant to conduct a topographical analysis of wading bird nesting sites for habitat protection. As increased coastal development and human activity have reduced the beach areas where wading birds have traditionally nested, some birds are now nesting on dead oyster reefs.

"Their habitats have been disturbed by development," Macchiarella says. "Where they traditionally go is not as viable."

The research will look at elevation, among other metrics, in site selection for nesting. The findings could help guide future restoration and conservation efforts in the Indian River Lagoon.

The researchers agree that UAS, which can easily collect data in hard-to-reach areas, are ideal tools for environmental research projects.

"I'm interested in testing this technology for understanding many important human impacts — one being quantifying the number and level of damage by boat strikes to oyster reefs, shorelines and seagrass beds in the Indian River Lagoon, and to see if we could use drones to count oysters on a reef — to minimize field efforts in the future," Walters says. 🌿



Researchers used high-quality drone images to create 3D models of the oyster beds.

Beachcomber

Students design autonomous robot to harvest microplastics from sand

BY MICHAELA JARVIS



In January 2019, first-year student Grace Robertson was involved in a beach cleanup, when she noticed tiny pieces of plastic in the sand that were too small to pick up and tended to break into smaller pieces. She started doing research and found out that these plastic bits, called microplastics, are in the air we breathe, the fish we eat and the water we drink.

"I knew we had to do something about this," Robertson says.

She embarked on a project to build a robot to help cull the microplastics from beach sand. Now a sophomore studying aerospace engineering at Embry-Riddle, Robertson says her goal is to prevent these particles from "ending up back in the ocean and consumed by wildlife, in freshwater systems or in the atmosphere."

According to a February 2019 issue of the journal *TrAC Trends in Analytical Chemistry*, microplastics "tend to accumulate and move through living organisms, inducing a variety of biological effects," such as disturbances in metabolism, DNA, immunity and neurological function.

Supported by an Ignite Initiative grant from the Embry-Riddle Office of Undergraduate Research, Robertson is the general team lead on the project. She directs the electrical team and three other undergraduates, Emma Bucey, Jackson Schuler and Matt Liepke, who head up the logistics, design and software teams, respectively.

Using a GPS system, lidar obstacle avoidance and a technique called geofencing, the robot they're developing will comb through dry sand one to three inches deep in a prescribed area, utilizing an induced electrical charge to attract the microplastics and gather them.

A secondary part of the project research involves developing a technology to use the collected microplastics. As Robertson points out, "If we take the microplastics out of the sand but throw them into the landfill, they will wind up back in the water."

The research team is looking at technologies employed by such organizations as TechniSoil and UNICEF that use plastic bricks to build houses in developing countries. Another concept they're considering involves repurposing the harvested microplastics to produce filament for 3D printing.

"This project has impacted my life way more than I could have ever thought," Robertson says. "It's taught me about sustainability and about how people learn, and how to be on a team."

DARYL LABELLO

PILOTING THE WAVE OF THE FUTURE

BY MELANIE STAWICKI AZAM AND
ALAN MARCOS PINTO CESAR



Somewhere in rural Rwanda a small, autonomous, fixed-wing aircraft whizzes off a launcher into the sky. Its cargo is precious, and time is of the essence. Instead of traveling by car over bumpy, undeveloped roads and risking delays caused by weather or civil or political unrest, this insulated box of lifesaving blood will reach its patient in minutes, not hours.

The delivery is one of more than 31,000 packages of blood, medicine and vaccines that have been airdropped since 2016 by Zipline — the first drone delivery company to operate commercially — to hospitals and other medical facilities in Rwanda and Ghana.

Now, Embry-Riddle alumnus **Joseph Marshall** ('10) is working with the Federal Aviation Administration (FAA) and the North Carolina Department of Transportation (NCDOT) to expand Zipline's medical delivery service to the United States.

"Zipline is saving lives," says Marshall, who is the San Francisco-based company's director of UAS flight operations. "For me, it was an opportunity to do something bigger than myself, for really the first time in my career."

It may seem like the stuff of science fiction — delivery drones, self-driving semitrucks and flying taxis — but Embry-Riddle alumni and faculty who are autonomous systems experts say what once was futuristic is now just on the horizon.

Zipline's drones can deliver lifesaving medical supplies to rural Rwanda villages in minutes, instead of hours.

ZIPLINE

'SLOW AND STEADY WINS THE RACE'

"Package delivery is closer than most realize. The concept is proven," affirms **Josh Olds** ('11, '15), president and co-founder of the Unmanned Safety Institute Inc.

Darshan Divakaran ('11), an executive aviation consultant and a UAS program engineer with NCDOT's Division of Aviation, agrees, but says the technology advancements should not be rushed. "Companies and agencies are saying we can do beyond visual line-of-

sight (BVLOS) operations, but the FAA needs data to prove the safety case, before they are OK with that."

The FAA's Unmanned Aircraft Systems (UAS) Integration Pilot Program (IPP) is establishing the foundation for airspace management and other regulations related to the integration of UAS into the National Airspace System. As part of the program, nine regions, including Raleigh, North Carolina, are working with the FAA to test commercial UAS applications.

North Carolina's IPP status means the state's private partners, including Zipline, are able to test more advanced UAS operations, Divakaran says. Data collected from those operations will help with the eventual integration of UAS on a larger scale.

Marshall acknowledges safety comes first. In manned aircraft, pilots are responsible for seeing and avoiding other aircraft. With an autonomous UAS, that responsibility shifts, he says. "With drones, it is a detect-and-avoid system that the FAA has to approve, so they are the ones held

accountable if something happens. The rules slow us down, but the FAA has to do their due diligence."

Still, Marshall predicts BVLOS drone delivery will be operational, at least in some regions in the United States, within the next one to three years. "[Zipline has] proven the technology is scalable," he says. "Everyone wants to get there fast, but I think slow and steady wins the race."

SIZE MATTERS

Mike Wiggins ('76), chair and professor of aeronautical science, says a challenge for UAS airspace integration is the fact that drones are too small for air traffic control to pick up. "They can't detect these small things from the tower," Wiggins says.

A joint study by Embry-Riddle and Oklahoma State University found that drones can only be seen about 30% of the time by pilots during the final approach phase of their flights. "Dangerous close encounters between aircraft and drones are becoming an increasingly common problem," says **Ryan J. Wallace**, assistant professor of aeronautical science at Embry-Riddle and an author of the study.

Wiggins says some airports are using drone detection devices, but they are not flawless. In December 2019, the FAA proposed a new UAS regulation that may help with this problem. [See sidebar: *Managing the Highway in the Sky*.]

Jiyoung Hwang ('19) is an R&D integration and flight test engineer at Volansi, a Silicon Valley-based startup that builds and operates long-distance, high-payload UAS. The company would like to see larger aircraft, but the FAA's current weight restriction mandates a maximum of 55 pounds under its Part 107 regulation.

"No matter the size of the UAV, a reliable, smart 'brain' is needed when autonomous flight is being considered," Hwang says.

Hwang sees the industry's future in fixed-wing UAS with vertical take-off and landing (VTOL) capabilities. Featuring electric rotors for takeoff and landing, and a gas pusher motor for horizontal flight, the Volansi autonomous delivery aircraft she's developing will be able to transport a payload of up to 20 pounds over 360 miles.

"Fixed-wing configurations allow longer flight time because they're much more efficient. The beauty of having both systems is that you have the flexibility to take off and land anywhere, and fly longer with the same size power source," Hwang says.

DRIVERLESS CARS AND TRUCKS

Aerial drone delivery isn't the only autonomous transportation system on the cusp of a commercial explosion. Self-driving freight trucks are already transporting cargo on some long-haul routes, albeit with a safety driver in the cab. As the technology advances and public acceptance increases, big rigs could soon be delivering goods with no human occupants.

Brent Terwilliger ('00, '05), program chair of the M.S. in Unmanned Systems and associate dean of research for the College of Aeronautics, projects fully autonomous long-haul trucking may be common by 2031. Terwilliger says it won't happen right away, or all at once. "[But] when the market can sustain it, when the efficiency is realizable, it's going to happen."

The trucking industry isn't the only one that will be transformed by advancements in autonomy. Several ride-sharing companies are investing in the technology, too.

Managing the Highway in the Sky

Experts agree safety is the top priority

The sensors on this DJI S1000 are measuring air data in the urban boundary layer (UBL) — research conducted in 2019 by faculty and students in Kosovo. Understanding UBL will be key to safe UAS operations in urban areas.

Before the skies can open for business to drone delivery companies and on-demand, taxi-like aircraft, the technology must be proven safe for public use — and laws, policies and regulations must be enacted to ensure their safe operation.

David Hansell ('04), global head of aviation regulation and policy at Loon — an Alphabet subsidiary — and a former air traffic controller, believes commercial drones are being built with safety as a top priority. "I don't know a single manufacturer or operator out there who is not supremely concerned about the risk to the general public. Never mind the business considerations: In the minds of people I talk to on a daily basis, it's about doing the morally right thing when it comes to safety."

Testing is important to mainstreaming the technology, says **Will Shaler** ('14), a systems engineer at Anduril Industries. Just like full-scale aircraft, drones must undergo hardware and software validation, bench testing, hardware-in-the-loop simulation and testing in safe environments, he says. Redundant systems and appropriate recovery modes are keys to mitigating failure, Shaler adds.

Joseph Marshall ('10), director of UAS flight operations at Zipline, agrees. "I look at the aircraft — even though they are smaller — and the crews monitoring them, no differently than I would a Boeing aircraft or Delta Air Lines flight crew. That is the mental model I use, because if we fail to maintain that mindset, safety will naturally be degraded."

Policy Advancements

In the past five years, there have been a host of regulatory and policy changes at the national, regional and international levels in support of unmanned aircraft systems (UAS) integration, Hansell says.

Josh Olds ('11, '15), president and co-founder of the Unmanned Safety Institute, says one such policy relates to

operator certification. "Now it's a matter of proving [each UAS type] is safe, through data compilation, building the safety ecosystem to ensure compliance under certification and existing regulation — or obtaining waivers from those that can't be met — and implementing the plan."

The Federal Aviation Administration took a step forward in December 2019 when it issued proposed rules for the remote identification of drones, says **Sarah Nilsson** ('03, '06), an aviation and drone law attorney licensed in Arizona and an Embry-Riddle professor. The drone ID will be like a UAS license plate or digital signature, she explains.

"You would be made aware of traffic in your area and who is around you," she says. "It is the foundation of air traffic control down the road."

"The biggest hurdles to industry growth are public adoption, public perception and reliability."

— **JOSH OLDS** ('11, '15), PRESIDENT AND CO-FOUNDER OF THE UNMANNED SAFETY INSTITUTE

Going Public

Hansell says full-scale adoption and integration of UAS — and later urban air mobility (UAM) vehicles — into the national airspace will take time. "I think this will be a gradual change over years of gaining social acceptability, building consistent safety cases, partnering with forward-leaning regulators who are willing to take different risks in controlled environments, proving every day that it's safe," he says.

Olds agrees. Large-scale UAS and UAM integration will probably take a crawl, walk, run approach, he says. "The biggest hurdles to industry growth are public adoption, public perception and reliability."

At Volansi, **Jiyoung Hwang** ('19) is developing an autonomous delivery aircraft that will be able to transport a payload of up to 20 pounds over 360 miles.

CONTINUED ON PAGE 17

“I look at the aircraft – even though they are smaller – and the crews monitoring them, no differently than I would a Boeing aircraft or Delta Air Lines flight crew. ... If we fail to maintain that mindset, safety will naturally be degraded.” — JOSEPH MARSHALL ('10)



Joseph Marshall ('10) started working for Zipline in Seattle (shown here). He recently relocated to North Carolina as director of flight operations.

ZIPLINE

Self-driving technology company Waymo, formerly the Google self-driving car project, has logged more than 20 million miles on public roads, says **Tracy Murrell**, director of safety operations for the company and a current Embry-Riddle graduate student. Waymo One is the company's fully autonomous ride-hailing service serving more than 1,500 riders in the Phoenix-metro area, but none are currently available for sale.

“Our vehicles recognize construction zones, school zones and other unique situations and take appropriate action in those areas,” Murrell says. “Meanwhile, we are heavily investing in weather testing from foggy San Francisco to snowy Michigan and rainy Washington State, to ensure that our vehicles learn to drive in a variety of challenging weather conditions.”

Murrell says Waymo's investment in custom-designing its hardware sensor suite, and over a decade of experience developing the complex machine learning behind its self-driving technology, positively impacts its deployment of Level 4 autonomous capable vehicles.

A COMPLICATED SYSTEM

From an environment perspective, fully automated vehicles have more obstacles than UAS, when it comes to integration.

Will Shaler ('14), a systems engineer at Anduril Industries who participated in

robotics and automation competitions as a student at Embry-Riddle, says, “It's much more difficult to deal with an autonomous [ground] vehicle. Just to get from one place to another, you need a GPS and an INS (inertial navigation system), and it needs to be much more accurate. You're moving much slower and more precisely than an aircraft ... you have obstacle avoidance, complications with wheel slip, with localization. It requires a whole different approach.”

However, **Eric Coyle**, associate professor of mechanical engineering, says autonomous cars do have an advantage over UAS. “It's much harder to deal [with UAS] when something goes wrong. You can't just cut the motors off and be safe. With a car, you can usually coast or brake to a stop and move to a safe area.”

TRAINING THE NEURAL NETWORK

Autonomous systems have come a long way in a relatively short time, thanks to developments in how they “learn.”

“One of the big advances that's come recently is the learning-based approaches,” says **Patrick Currier**, associate chair and associate professor of mechanical engineering. In the “old-school method,” you would try to basically program a vehicle to reduce an image down to certain objects, so the computer could understand how to react to those objects — be it a car, a person or a trash bin.



Top: Tracy Murrell of Waymo says the company's self-driving car project has logged more than 20 million miles. Bottom: Will Shaler ('14) is a systems engineer at Anduril Industries.

Studying the Urban Boundary Layer



Student Ronald White uses an anemometer to measure wind near Pristina, Kosovo.

To aid in the integration of unmanned aircraft systems (UAS) and urban air mobility (UAM), faculty and students are studying and modeling the atmospheric-urban boundary layer — the space in the sky where UAM will ultimately operate. Professor **Dan Macchiarella** and 23 students conducted a pilot study last summer in the city of Pristina, Kosovo. The country's supportive regulatory environment is an “untapped gold mine” for UAS activities, he says.

The student-faculty team collected data on humidity, wind and barometric pressure, to study how these are impacted by an urban environment.

“There are a lot of variations in wind around buildings — you may be outside an urban canyon, and the wind is blowing 12 knots and bending around buildings. We have sensors that we developed with Dr. Kevin Adkins (College of Aviation) to collect atmospheric data and model wind in urban environments,” Macchiarella says.

This data will be important to realizing safe and reliable operations of remotely piloted and autonomous systems in urban areas, he says. Additional studies in Kosovo and the United States are planned. Embry-Riddle's work in Kosovo is sponsored in part by the U.S. Embassy in Kosovo.

Autonomy BY THE NUMBERS



LEVEL 0

No automation:

Includes cars with ordinary cruise control



LEVEL 1

Driver assistance:

Includes adaptive cruise control and lane keep assist



LEVEL 2

Partial automation:

Helps control speed and steering and maintains distance between the controlled vehicle and the one in front of it, e.g., Tesla's Autopilot



LEVEL 3

Conditional automation:

Includes hands-off-the-wheel operation, but a driver is still required



LEVEL 4*

High automation:

No human interaction is required (other than entering a destination)



LEVEL 5*

Full automation:

Capable of monitoring and maneuvering in all conditions without human intervention

*Awaiting regulation/approval for integration

SOURCE: TRUECAR.COM



WEB EXCLUSIVE

→ From a niche hobby to a mainstream activity, the latest unmanned aircraft systems are user friendly, high tech and affordable. Alumnus **Chris Pezalla ('07, '12)** reveals his top picks: lift.erau.edu/cooldrones

"The new way of classifying objects is using neural network technology and basically teaching the network what a human is, or what a car is, and then letting that network process images as they come in and classify them and detect them [in realtime]," Currier says.

That method gives much better results, but Currier cautions that it can also fail unpredictably. "No one has a neural network analysis tool that can tell you why it did what it did. The best method right now is to throw enough data at the model so it fails less often."

A SAFER EQUATION

Murrell, who also spent several years working at the National Transportation Safety Board, says the calculus is simple, and it favors autonomous cars. "The statistics are staggering: Every year, 1.35 million people die around the world in traffic crashes, and 94% of crashes in the U.S. involve human error.

"From what we've seen, riding is believing. As with most new technologies, it's hard to trust what you're not familiar with. As the technology develops and more people connect with our *World's Most Experienced Driver*, consumer acceptance will follow."

“This is my generation’s moonshot. This is our way to contribute to positively changing the world.” — BRENT TERWILLIGER ('00, '05)

In addition to safer roads, autonomous systems promise greater efficiency, says **Ken Witcher ('02)**, dean of the College of Aeronautics. Cities with large populations stand to benefit the most. With an autonomous urban mobility system, vehicles could be driven inches apart at a high speed, with a low risk of human error — allowing for quicker, safer and less stressful travel, he says.

"We can't continue to build new freeways, so we have to find a way to use our current infrastructure in a more efficient way," Witcher explains.

BEYOND FREEWAYS

If fully autonomous cars are possible in the medium term, urban air mobility (UAM) — low-altitude, on-demand passenger and cargo transportation services, commonly referred to as air taxis — is just over the horizon. Investment in this sector has grown substantially; most recently, Toyota invested \$394 million in Joby Aviation, a company that boasts a four-passenger UAM aircraft capable of VTOL.

Paul Andreoli ('18), an unmanned aircraft pilot for ULC Robotics and a New York City resident, envisions a day when UAM aircraft will shuttle Manhattan residents to weekend vacation homes in the Hamptons, avoiding traffic-snarled highways. "I think this is the next hurdle in aviation and the future of modern-day urban transportation," he says.

Pat Anderson, professor of aerospace engineering, agrees. "Models show a very favorable chunk of a very large market of intercity travel can be absorbed in a UAM network," he says, but it comes with two significant and interlinked challenges.

The first is noise, not just from the engines, but from the propellers. Anderson is researching solutions to

this problem at Embry-Riddle's Eagle Flight Research Center in Daytona Beach, Florida, where he serves as director. "The ability of a propulsive electric motor to turn a rotor at low RPM with the required high torque makes the rotor very quiet, car-like quiet," he says.

The second challenge is battery power. Though battery technology improves every day, Anderson says it won't beat fossil fuels in this decade.

"Batteries are not scalable to light-weight, high-energy operations," he says. "The good news is that battery electric

systems can be replaced by hybrid systems that will work today, and fixed-pitch rotors can be replaced by rotor systems. With the deployment of both of these technologies, the UAM vehicle is scalable."

Also working to scale the technology, **Borja Martos ('04, '06)**, president of engineering at Flight Level Engineering, is developing simplified vehicle operations for future UAM aircraft that will allow nontraditional pilots to fly them. "There are not enough pilots available to operate all the Uber flying vehicles in the world," he says. "The idea is that [UAM] wouldn't require a pilot, but more of a manager or operator." His company is engineering one basic control scheme that is "agnostic of the aircraft configuration" for this purpose.



There are definite steppingstones to mature the public confidence in automation, Martos says. "The desire to progress to a pure passenger model is there. This work is in direct support of that, to make it easier for pilot licensing and operations of these vehicles."

In the short term, Martos says UAM will likely launch with a traditional pilot. "That'll have to change for the UAM model to be profitable," he adds.

'MOONSHOT'

With several FAA approvals still pending for UAS operations, UAM-for-hire is likely much further from reality at this point. But alumni and faculty experts, alike, say it will happen ... someday.

"The next decade is really going to be the decade of unlocking the potential and economic viability of UAS," Marshall says. "And I think UAM won't be far behind. It's the wave of the future."

"This is my generation's moonshot," Terwilliger adds. "This is our way to contribute to positively changing the world." 🌟

DARYL LABELLO



Pat Anderson, director of the Eagle Flight Research Center, stands with an urban air mobility prototype currently being built at the facility.

Embry-Riddle Researchers Help Pave the Way to UAM Development

BY KELLY PRATT AND JON O'NEILL

Urban air mobility (UAM) innovation and the development of new aircraft propulsion systems are more possible today, thanks to revised Federal Aviation Administration (FAA) standards that went through much of their formative stages at meetings hosted by Embry-Riddle over the past decade.

Driven by Congress' Small Airplane Revitalization Act of 2013, updating the FAA's Code of Federal Regulations required overhauling its Part 23 airworthiness standards for general aviation airplanes weighing less than 19,000 pounds with 19 or fewer seats, with an eye toward getting safety-enhancing technologies to the marketplace more quickly. The revised rules — effective August 2017 — give manufacturers leeway to employ what are known as consensus standards to meet airworthiness requirements.

"Embry-Riddle really was one of the cornerstone locations for all of this to begin," says **Greg Bowles ('98)**, an aerospace engineering graduate now working at Joby Aviation, a UAM startup. Bowles helped organize stakeholders during his time as vice president for global innovation and policy for the General Aviation Manufacturers Association (GAMA).

Professor of Aerospace Engineering **Pat Anderson**, whom Bowles studied under when he was a student, played a vital role in getting the revision effort off the ground. Working with GAMA, Anderson organized meetings and conferences that helped create the consensus the FAA was looking for to drive the revision of Part 23.

"The rules had been outdated for 30 years," says Anderson, chair of GAMA's Electric Propulsion Committee. "It was very prescriptive with means of compliance written directly into federal law. It was essentially a guide on how to build an aluminum airplane."

Building something as unique as a flying taxi or a personal air vehicle and bringing it to market wouldn't have been possible until the regulation overhaul. Thanks to private industry's efforts to work hand-in-hand with the FAA, Part 23 went from 277 pages down to 74 pages of rules, and established new means of compliance contained in consensus standards that groups like GAMA helped create.

With Embry-Riddle on the leading edge of UAM and new technologies such as hybrid electric propulsion, helping change outdated standards is key to pioneering future aircraft, Anderson says. "This allows significantly more innovation because you don't have to change the rules to do something novel."

Powering Investment in Clean Energy



David Rogers ('89) never imagined his career path would lead to blockchain technology

BY SAM MITTELSTEADT

David Rogers' degree in aeronautical engineering didn't lead him to a career in aviation; instead, the chief technology officer at Ziyen Energy is using his structural software expertise to develop a startup project designed to help a new era of renewable energy take flight.

"Originally I was going to become a pilot, but I discovered that I was more intrigued with the engineering program, so I transferred over and found a lot that kept my interest on the structural side of things as well as the aerodynamic," Rogers explains. "It was an era of great change — as students we started out on drafting tables, but by the time we graduated we were using CAD."

Adapting to change became a theme in Rogers' career: What started as a steady, traditional climb toward a management position eventually morphed into a quick-fire series of career choices that has placed him at the leading edge of developing cryptocurrency for renewable energy projects.

Starting Again, at a Startup

Around 2016, the software company where Rogers served as director of software quality assurance moved into a different business sector, leaving Rogers, then 50, to hustle contract gigs, mostly in the med-tech industry. "One day, I met this gregarious Scotsman on a driving range who was looking for someone to manage the software side of his startup business," he recalls. At that point, Ziyen's focus was industry-specific government and private contracts for bid. For example, the owners of a cement company could sign up to receive push-notification alerts when new construction contracts had been posted that they could potentially bid on.

From there, Ziyen founder and CEO Alastair Caithness noticed that many contracts crossing his desk involved oil wells in Texas and the Illinois Basin, which had been abandoned during the most recent industry bust. "These unused wells were sitting around like Solo cups after a barbecue," Rogers says, "and while larger companies wouldn't bother with them, for a smaller company, a \$30 million oil field looks good on the bottom line."

Originally, Caithness suggested acquiring the wells in terms of interest — taking advantage of existing wells, rather than drilling in pristine resources — and, in an ironic turn, using wind turbines to power the oil production.

"Because of this boutique idea, Ziyen began to be invited to join conferences with some big energy players," Rogers says. "We were on the dais with people from Shell, BP and Exxon, and as part of those interactions we heard that many companies had begun looking toward blockchain for their secure contracts. We thought, 'How can Ziyen apply blockchain?'"

That's when Caithness' original concept began to evolve. Instead of a small-scale, well-by-well approach, Ziyen could use blockchain as the catalyst to transform the global energy sector from fossil-based to zero-carbon before the second half of this century.

Diving Into Blockchain Technology

With blockchain — a shared, decentralized information record that can pass information from one entity to another in an automated, secure manner — one party initiates a transaction by creating a *block*, which must be verified by a *chain* of network computers before the next step begins. The best-known users of blockchain, such as Bitcoin, use it for monetary transactions because blockchain requires no transaction or currency conversion charges from banks or credit card companies.

Unlike the unregulated cryptocurrency Bitcoin, however, Ziyen was proposing a new digital currency, called ZiyenCoin, backed by energy assets, that would report to the U.S. Securities and Exchange Commission and follow the agency's guidelines. Information about each new project, including geological and financial statements and

"Everyone says we need to move from traditional to renewable energy, but that's not a matter of just flipping a switch. We need to plan that transition."

— DAVID ROGERS ('89)

David Rogers ('89) is working on a new digital currency that will make it possible for users to invest in renewable energy projects alongside oil and gas projects.

tax distributions, would be available on a newly developed ZYEN platform, giving the public the opportunity to invest in its equity through "tokens," or digital shares. Blockchain tokens representing the asset would be tradable on secondary markets, just like traditional securities. By the end of 2020, the ZYEN platform will make it possible for users to invest in oil and gas projects alongside renewable energy projects for the first time in history.

"Today, if someone wants to support renewable energy and the reduction of carbon emissions, they're fairly limited in their options. They can drive an electric car, put solar panels on their roof, perhaps buy stock in Tesla," Rogers says. "The tokenization of assets of renewable projects will allow much broader, democratic opportunity for people on the street to invest in these projects."

Refinancing Renewable Energy

In four years, Rogers has helped Ziyen pivot from providing bidding-contract software to purchasing oil leases, to producing blockchain technology that supports renewable energy projects. "This whole thing grew up around us," he says. "You don't want to end up in a 9-to-5 job you're bored with. Here, I'm exposed to new, cutting-edge ideas every day, and I think that's terribly exciting. Having the opportunity to get into something that's going to be new to the market and enable companies to 'bootstrap' projects that much faster is so worthwhile."

"Everyone says we need to move from traditional to renewable energy, but that's not a matter of just flipping a switch," Rogers says. "We need to plan that transition. Any way we can help leverage our technology to do this is hugely exciting." 🌱

Aviation Maintenance Science students Roxanne Rosado, left, and Sarah Fairchild work on the Learjet at the Daytona Beach Campus.



Expanding Horizons

FedEx, Spirit Airlines' scholarships encourage diversity in aviation

BY MELANIE STAWICKI AZAM

Amaya Newport left her home in New Hampshire knowing exactly what she wanted to study and where she needed to go. "As someone who has always enjoyed airplanes and hands-on projects, this university is perfect for me. I came to Embry-Riddle specifically for my major of aviation maintenance science," Newport says. Newport is a minority in the aviation industry. According to the Federal Aviation Administration, approximately 7% of certified pilots and 2.4% of aircraft mechanics in the United States are women (2017). With the industry facing a shortage of skilled workers, women represent a relatively untouched labor market. That's one reason why FedEx and the Spirit Airlines Charitable Foundation have created scholarships at Embry-Riddle that are aimed at supporting and encouraging more women to pursue aviation-related careers. "It's predicted that we could face a shortage of AMTs [aviation maintenance technicians] in the next five to 10 years due to an aging workforce. Should that time come, we want to be in good position to pick and choose from a qualified, skilled and talented pool of applicants," says Scott Ogden, vice president of aircraft maintenance with FedEx Express.

DAVID MASSEY

Scholarships for Women

The FedEx Purple Runway Aviation Scholarship is awarded to aviation maintenance science students at Embry-Riddle, with a goal to expose women and other underserved populations to aviation careers, while the Spirit Airlines Charitable Foundation has funded two scholarships, with a preference for female students.

"This scholarship allows me to be one step closer to meeting my goals and to concentrate more on my studies," says Newport, who received a FedEx Purple Runway Aviation Scholarship.

The FedEx Purple Runway Aviation Scholarship aligns with the company's apprenticeship and recruitment programs. "Scholarship winners have access to FedEx team members during their time training here. Those students are exposed to a variety of careers in aviation," Ogden adds.

Building a Diverse Workforce

Aeronautical science student Hailey Auterson was thrilled to become the first Spirit Airlines scholarship recipient.

"This scholarship is very important," Auterson says. "Going through college and becoming an airline pilot is very costly, but I am determined to find a way to earn my degree no matter what life throws my way."

President of the Spirit Airlines Charitable Foundation Laurie Villa says students, like Auterson, represent the future of aviation.

"We believe that change starts by giving back in the communities where we live and work, and part of our mission is to inspire women to go into the field of aviation, aeronautics and STEM. This will ensure that our industry continues to be diverse, inclusive and equitable for everyone."

Female Initiatives

Attracting and retaining more talented female students is a university initiative, as well. Women comprise roughly 23% of Embry-Riddle's collective undergraduate student body (residential campuses). "Given the pilot shortage that we're facing, it's critical that we tap into the entire potential talent pool and do a better job of recruiting more women into the pilot pipeline," says Michele Halleran ('04), a professor of aeronautical science and the director of diversity initiatives for the College of Aviation at the Daytona Beach Campus.

Halleran leads the university's Women's Initiative Committee. Composed of female faculty and staff, the group's mission is to recruit, retain and support female students.

A mentoring program for aspiring female pilots was launched in 2019. Other initiatives include a university-wide Women's Giving Circle, which will raise funds for scholarships for female students, and a Women's Alumnae Network.

To get involved, contact **Stephanie. Kenyon@erau.edu**.



DOUBLING THE IMPACT

Board of trustees launches Scholarship Endowment Matching Challenge

BY MELANIE STAWICKI AZAM



At the direction of Chairman Mori Hosseini (HonDoc '13; '78, '79, '82), the Embry-Riddle Board of Trustees has launched a Scholarship Endowment Matching Challenge to provide more

students with tuition assistance, in perpetuity.

The challenge will match, dollar for dollar, cash gifts or pledges of up to five years that total \$100,000 or more and are directed to scholarship endowment funds at the university. Leading the charge to build the scholarship endowment, Vice Chair of the Board of Trustees Jim Henderson (HonDoc '13) was the first to take the challenge.

"I can't identify a better use of money than to help a student get through college," Henderson says. "And there is such a visible benefit of that gift."

A trustee since 2003, Henderson has been connected to Embry-Riddle since 1969, when he served as the school's external auditor.

"I started a scholarship several years ago, and this contribution honors and builds upon that commitment," says Henderson, who designated his gift to support business students with financial need.

Henderson, who is chairman and CEO of AssuredPartners, a private insurance brokerage firm, says the board's matching incentive was attractive, but he also made his gift to encourage other trustees, community members, alumni and friends of the university to support scholarships, as they are financially able.

In addition to Henderson, board of trustees members Joe Martin (HonDoc '18; '74), Neal Keating and Glenn Ritchey, and University President P. Barry Butler and his wife, Audrey Butler, have also made scholarship commitments to take advantage of the challenge.

"This pool of matching funds is limited," explains Senior Vice President of Philanthropy and Alumni Engagement Marc Archambault, "so those wishing to seize the opportunity to double the impact of their own contribution are encouraged to reach out promptly." 🐦



MAKE A GIFT

To contribute, visit givingto.erau.edu/100kchallenge or contact Marc.Archambault@erau.edu or 386-226-7770.

Rowing the Distance

Former Air Force aviator sets world record for completing the longest solo, nonstop, unsupported ocean row across the Pacific from North America

BY JENNY QUILL

It's 3 a.m. and Jacob Adoram Hendrickson ('02, '13) has been rowing nearly nonstop for 16 hours. He has spent the last 335 days paddling across the Pacific, and he's within 5 miles of his destination: Cairns, Queensland, Australia. Strong winds and ocean currents have made the final hours especially challenging, but Hendrickson's blog post from that final day reveals his unsinkable nature:

As the skies give way to darkness, I attempt a quick rest break. The second I stop rowing I immediately start losing angles to the north. I can't afford breaks. I eat as quickly as possible then get back to it. Quitting isn't an option. It's the last major push towards shore on day 335 at sea; I'll row until something breaks.

Hendrickson crash-landed on Trinity Beach the following day, June 8, 2019, with a lot to celebrate.

Jacob Hendrickson ('02, '13) waves to family, friends and onlookers after landing on Trinity Beach in Australia following 335 days at sea.



Looking for a Challenge

The seed for Hendrickson's 7,145-mile journey was planted eight years earlier when the U.S. Air Force fighter pilot was assigned to an air liaison role — a desk job — in Fort Irwin, California. He had dreamed of being a fighter pilot since high school and had attended Embry-Riddle's Daytona Beach Campus because it boasted the largest Air Force ROTC detachment. Having flown 170 combat sessions in his dream job, this new assignment was a gut check. "I wasn't feeling good about the direction of my career," Hendrickson says. "I wanted to find out how I could become more fulfilled and find more meaning in life. I wanted to do something physically challenging."

Hendrickson zeroed in on a challenge: completing the longest solo, nonstop, unsupported row across the Pacific Ocean from North America. At the time, the only person in history to come close was British rower Peter Bird, who rowed from San Francisco to Australia in 1982 but had to be rescued a quarter mile off the Great Barrier Reef. In 2015, John Beeden completed the challenge by successfully making landfall. But unlike Bird and Beeden, Hendrickson had zero rowing or ocean-going experience, and he was planning to row a greater distance without any resupplies or stops along the way.

Building the Perfect Boat

To accomplish his goal, Hendrickson needed a boat. A Google search led him to naval architect Eric Sponberg. They discussed the project for nearly two years while Hendrickson was still in the Air Force. When Hendrickson's Air Force career ended in 2014, Sponberg began designing in earnest. The result was a 28-foot-long, 2,400-pound ocean rowboat capable of storing a year's worth of food, equipment and electronics; a forward cabin dedicated to Hendrickson's living area; and a hardtop-covered rowing station situated in the center.

The task of building the boat fell to Schooner Creek Boat Works of Portland, Oregon. Construction came in fits and starts as Hendrickson worked to finance the project. But in 2018, the boat — christened *Emerson* after Hendrickson's favorite English bulldog — was complete.

To train for the journey, Hendrickson spent three years getting in shape, even going so far as to bike across the United States in 2015. He studied maritime weather and navigation. Once *Emerson* was complete, he spent 12 weeks with her, training, testing and organizing. The final two weeks prior to departure were spent rowing in Neah Bay, Washington, including his first and only open-ocean trial run.

Moxie vs. Mother Nature

Hendrickson departed Neah Bay on July 7, 2018. His first day at sea proved a hard slog as strong currents hindered his progress. During the trial run, it had taken two hours to paddle out into the open ocean; on this day, it took eight. "I felt like I was rowing through mud," Hendrickson says. "I was tired, sore, anxious and having all kinds of doubts."



ROWING FOR A CAUSE

Jacob Hendrickson ('02, '13) chose Water Mission as his charity partner for his record-breaking ocean row across the Pacific. The engineering nonprofit organization works to solve the global water crisis by bringing safe water, sanitation and hygiene solutions to developing countries and disaster areas.

For Hendrickson, Water Mission was a natural fit. "It tied in nicely with what I was doing," he says. "Being at sea, you become acutely aware of your water and where it comes from."

Eventually, the tides turned in his favor, and he settled into a rhythm. Each day, he rowed an average of 10 to 12 hours, listening to podcasts, music and audio books to pass the time. The sheer vastness of his surroundings intimidated and inspired. From his blog, day 255:

The silence is almost painful. There can't be anything else like it. Maybe there is, but I've never been fortunate enough to stumble upon such intense serenity.

Hendrickson's most challenging day at sea came at the hands of Tropical Cyclone Ann. "All of a sudden it went quiet," Hendrickson says. "And then a wave hit broadside. Water rushed in, and I hit my head on the ceiling. When the boat finally came back upright, I started hearing this crazy loud creaking sound I had never heard before." In the pitch black, rain pouring down, Hendrickson fumbled for the source of the sound, discovering that his spare oars had ripped off the side of the boat and were dangling by a lashing. He pulled them back in, cutting his hands badly in the process. Undeterred, Hendrickson rode out the storm, grateful for *Emerson's* self-righting capabilities.

Now, Hendrickson is gearing up for his next great adventure: finding a job, a home and, possibly, settling down. "I realize I want to pay attention to what I do and do it mindfully," he says. "I'm realizing that maybe getting married and having kids is more important than I thought it would be."

As for *Emerson*, she was recently on display at the Portland Boat Show, and Hendrickson is in talks with a maritime museum regarding her possible acquisition. 🌿

Embry-Riddle alumnus Phil Rosnik ('86) and Sofiya Diurba, a University of Colorado medical student, transported medical supplies to a rural Colorado hospital for Angel Flight West.

Eagle Impact

Around the globe, alumni step up to combat and contain pandemic

Months before the novel coronavirus started circumnavigating our planet, we planned to launch a new *Lift* department that would highlight the university's global impact and its internationally connected alumni. We didn't expect to inaugurate this new *Global* section during an unprecedented pandemic, but given the timing, we'd be remiss not to address it. Eagles who work for airlines, airports and the Federal Aviation Administration and in medical settings became front-line workers, as they continued to report for duty, despite the virus threat. Other alumni stepped up to help their communities.

For example, **Phil Rosnik ('86)**, a volunteer command pilot and chief mentor pilot for Angel Flight West (AFW) Colorado Wing, used his Cessna TR182 to fly lifesaving medical supplies — including hand sanitizer and surgical masks and gowns — to a rural Colorado hospital. Rosnik says the CEO of Wray Community District Hospital was so anxious to get the supplies that he met Rosnik at the airport with his personal pickup truck to retrieve the 85 pounds of cargo.

"It's just a fantastic way to be useful in a crisis, while using your skills and your aircraft to do something you love to do," Rosnik says.

Others, like **Gabriel Bentz ('15)**, a partner at Slant 3D, used their engineering and manufacturing skills to create protective face masks for front-line medical workers. "We have redirected our 3D printing farms to help medical personnel and have been manufacturing 1,000 3D-printed face shields per day, in order to address the protective equipment supply shortages felt during the COVID-19 epidemic," Bentz says.

At Embry-Riddle, 22 staff people have been mobilized to serve as digital engagement officers. "With many states adopting a stay-at-home ordinance during the pandemic, we are engaging alumni and friends through video and telephone visits to share words of support and encouragement during these difficult times," says Donald Hale, executive director and digital engagement officer.

As many Eagles moved to their home offices to telework during the pandemic, several shared their experiences with us. Following are a few of their stories.



Spanish Lockdown

"Sushi restaurant chain owner, to shipbroker, to now Realtor in southern Spain. My company is called We Sell Homes In Paradise, and currently it's ironic, as what's going on in Spain is not paradise at all. Right now, we have been locked in for more than a week

and this has been extended to the middle of April. I am based in Sotogrande, southern Spain, with my wife and four kids trying to work from home. It's very hard, and I think this photo sums it up." — **Stewart Craig ('98)**

Sewing for a Purpose

"I'm making face masks with all my spare fabric for the #millionmaskchallenge! [A global sew-a-thon supporting healthcare workers and those in need]"

— **Embry-Riddle Associate Professor Kelly George ('15)**



Mobile Hospital View

"I just took this picture off my deck. These are crazy times we are in." — **Douglas Muir ('84)**

Read more alumni coronavirus coping stories: alumni.erau.edu/athome.

Virtual Space

Embry-Riddle establishes joint space research lab with the University of Luxembourg

BY CYNTHIA PUCKETT

Students discuss attitude determination and control sub-system testing protocols, which monitor and control satellite systems, at the Luxembourg space research lab.

Researchers at Embry-Riddle and the University of Luxembourg are collaborating in network-connected labs to develop technology for future space missions. The Joint Space Research Lab is a partnership between Embry-Riddle's Engineering Physics Propulsion Lab (EPPL) at the Daytona Beach Campus, the Worldwide Campus and the University of Luxembourg's Research Unit in Engineering Science.

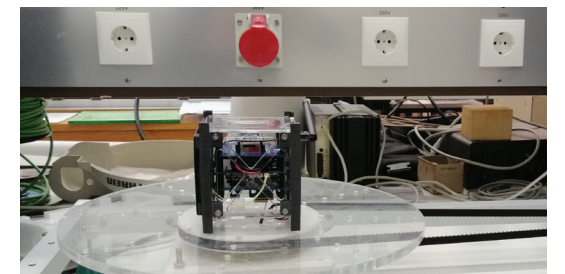
"The new lab explores steam propulsion technology for deep space exploration and prospecting missions," says Edder Jose Rabadan Santana, a University of Luxembourg postdoctoral researcher helping to build the lab.

As humans go into deep space, it will become more critical for them to generate their own products with local materials, a practice called in-situ resource utilization (ISRU). The new lab will use virtual tools that simulate spacecraft control on the surface of the moon, Mars and asteroids to develop environment technologies for ISRU.

"The lab will provide Embry-Riddle with a partner in Europe to work with on joint research and access European grants," says Bob Walton, associate professor at Embry-Riddle's Worldwide Campus College of Business and EPPL representative in Europe.

Vision

Walton and Sergey Drakunov, professor of engineering physics and director of EPPL, saw the potential to extend projects into Europe, and the University of Luxembourg was similar to Embry-Riddle, in terms of space interest, which made it an ideal partner.



The Joint Space Research Lab will explore steam propulsion technology and in-situ resource utilization for deep space exploration.

"This kind of collaboration is very exciting because it presents unique student exchange opportunities. The ability for students to conduct simultaneous research in labs either in the United States or Luxembourg, without physical parameters, not only enhances the environment for learning, it also enhances the potential for new ideas and solutions," says John Watret, chancellor of Embry-Riddle's Worldwide Campus. "This cooperation strongly supports strategic global initiatives that are in Embry-Riddle's Strategic Plan to provide students with robust international learning opportunities."

The partnership with the University of Luxembourg is possible because Embry-Riddle is fully licensed in Berlin, Germany, with a campus that opened there in 2007.

"Not every university can do this. We have experienced tremendous success with expansions in Brazil and Singapore, and we are very excited to have this unique partnership in Europe as it allows us to provide global opportunities for student and faculty interaction," Watret says.

FULL STEAM AHEAD

Marie-Jeanne Steady Ndiaye ('13) is using hands-on learning techniques to inspire and educate young people in West Africa

BY CYNTHIA PUCKETT

When she's not working fulltime as a human interface devices (HID) human factors engineer, Marie-Jeanne Steady Ndiaye ('13) is demystifying science and igniting a passion for flight in the hearts of young people in Senegal, Africa.

In 2019, she helped organize the Saly Airshow in Dakar, Senegal. It was the first international aeronautic event of its kind in West Africa and drew a crowd of nearly 3,000. As the co-founder and technical director of the Senegalese Alternative Learning Association (SALA), she's also working to integrate hands-on science, technology, engineering, art and mathematics (STEAM) projects into Senegalese classrooms.

"On the day of the airshow, a 6-year-old boy came up to me while they were doing aerial performances, and he said, 'I could never put myself in that airplane. My heart is not meant for that. But I can be the one to build that plane and make it do all of those things.' That's the whole point of SALA and the Saly Airshow," Ndiaye says.

Classroom Change Agent

Ndiaye co-founded SALA in 2017 with her husband, Frederic Ndiaye ('04, '12), executive director of enrollment, student success and retention at Embry-Riddle, and her best friend Codou Mbaw. A STEAM advocacy group devoted to promoting

all things science, Ndiaye conducts most of her work for SALA from her home office in the United States, but makes frequent trips to Senegal.

"SALA is a stark departure from Franco-Senegalese methodology, which is very heavy on theoretical teachings," Ndiaye says. "Ours is a totally different approach to teaching. We're introducing science at an early age, in fun ways, through hands-on workshops. Our motto is science always, in all ways."

"We're introducing science at an early age, in fun ways, through hands-on workshops. Our motto is science always, in all ways."

As SALA's technical director, Ndiaye creates curriculum and tailors it so it's relevant to the environment and makes sense to young students. She also networks to find and pair mentors with students and promote workshops.

"Private schools pay us for our workshops, and we use the money to buy materials to do free workshops in underserved and underprivileged communities. We also do workshops in underfunded public schools and in the remote areas where the government almost forgets that there are people," she says.



Jean Olivier Mbog ('13), a United Airlines pilot and programs co-chair for the Organization of Black Aerospace Professionals, partners with SALA to inspire students to pursue aviation careers.



SALA workshops are a departure from Franco-Senegalese teaching methodology, which focuses on theoretical teachings, as opposed to hands-on instruction.



Marie-Jeanne Steady Ndiaye ('13)



MIDDLE, RIGHT: THE BOEING COMPANY



The Senegalese Alternative Learning Association, co-founded by Marie-Jeanne Steady Ndiaye, organizes science, technology, engineering, art and mathematics workshops in underfunded public schools and in remote areas of Senegal.

Personal Motivation

Ndiaye can relate to the students her program benefits. She says she struggled in school in Senegal, because European teaching methods weren't conducive to her learning style. After attending a physics and math camp in the United States that involved solving real-world problems, everything changed and she excelled.

Ndiaye earned both bachelor's and master's degrees in human factors from Embry-Riddle, and has worked for United Space Alliance, NASA (Kennedy Space Center), Embry-Riddle, The Boeing Company and now Apple. She credits her career success in part to Embry-Riddle, for teaching her how to network — a skill she uses broadly today in her role at SALA.

Traveling home to Senegal between semesters in college with kits donated by NASA, Ndiaye led science workshops in community centers, churches and schools. In 2011, the U.S. Embassy asked her to speak with parents of prospective international students about her experiences studying in the United States as a representative for the newly launched EducationUSA program.

Education Game-Changer

Ndiaye believes science can be used to catapult individuals and their families into higher economic and social levels and set them on a path toward financial freedom.

"The reality is, a brilliant young girl living in a remote area is not necessarily prioritizing school, because at about 12 to 13 years old, her father sees her as a financial liability and wants to marry her off to someone who is financially secure. This young girl is not thinking about science and math, she's thinking about not getting married," Ndiaye says. "If I can teach her technical skills and turn her from a financial liability to a financial asset, she's going to be left alone." 🐦

ALUMNI NEWS

MESSAGE FROM THE EXECUTIVE DIRECTOR

Have an aeronautical day

Earlier this year, I had lunch with some visiting alumni at Embry-Riddle's new dining experience at the Daytona Beach Campus: Boundless. Branded as an all-you-care-to-eat restaurant, this mini-mall of elevated food stations offers a smorgasbord of tasty offerings — and limitless servings — all for one price. After ordering a salad from one of the dining stations, I was handed a carefully crafted custom bowl of leafy greens, fruit, nuts and cheese, and greeted with a friendly, "Thank you, have an aeronautical day!"

While our vocabulary doesn't define us, it can certainly add flavor and meaning to our encounters with others. The salad artist at Boundless must recognize this truth. Like the cherry on top of an ice cream sundae (which I avoided this time), or the sprig of mint afloat in an iced beverage, she joyfully seasons each transaction with a unique-to-Embry-Riddle garnish.

She's not alone. As I cross the country and travel abroad meeting with alumni — now close to 140,000 strong — I find a similar aviation-minded and purely Embry-Riddle spirit.

Our alumni share a collective drive to achieve, to lead, to innovate, to design-test-build, to rise to great heights — 30,000 feet ... and beyond. And, to make a difference for others — especially their fellow Embry-Riddle Eagles.

Everywhere I go (physically and virtually), I see Eagles helping Eagles. From offering résumé advice and mentoring, to sharing business leads, doing beach and park cleanups, running 5 and 10Ks for charity, helping build homes for the needy, leading club sports for our students, and volunteering for university and community boards and committees.

It's the Embry-Riddle way. It's not only our passion for aviation and aerospace that we share. It's the way we treat our co-workers, family, friends and neighbors. We see the difference we can make in the world with the skills and aptitudes we've developed through our lifelong love of learning and in our professions, and we choose to apply these skills to help others. We give of our talent, time and treasure. It's just who we are. It's part of our vocabulary.


I'm proud to be an Embry-Riddle Eagle, and I'm proud of all of you. In the words of my friend at Boundless, "Thank you, and have an aeronautical day."


Forever an Eagle,

Bill Thompson ('87)
Executive Director

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The 3rd annual True to the Blue 5K raised funds for the Ashley Guindon ('10) Memorial Scholarship.



A United Express Embraer 175, operated by ExpressJet, was the highlight of the fly-in/static display.



Students showcased their projects.

A variety of aircraft flew in for Pancakes and Planes.



A block party on Connolly Quad entertained students and alumni, alike.



Wings Out West celebrated the 75th anniversary of the D-Day invasion with warbird performances.



New connections were formed at the Alumni Women's Breakfast.

OctoberWest & Wings Out West PRESCOTT, ARIZONA OCT. 3-5, 2019

PRESCOTT PHOTOS: CONNOR MCSHANE



EagleNIGHT brought the campus community together.



The Industry/Career Expo offered networking opportunities.



Every other year, former players of the Daytona Beach Campus baseball program are invited back to campus for a game against current players. In 2019, about 30 former players participated.

Grand Fam

Eagle baseball players share a lifelong bond

BY MICHAELA JARVIS

It may never have occurred to members of the Embry-Riddle baseball team at the tail end of the 20th century that they were establishing lifelong friendships that would affect their lives for decades. But they were.

“We were all so young,” says Luke Martin (’02), a left-handed pitcher and now global logistics manager for Lockheed Martin. “For most of us, it was our first time out of the house. So, we kind of grew up together through all the ups and downs of being 18 or 19 years old, playing collegiate-level athletics, and having to go to classes and keep your grades up.”

Martin and a tight-knit group of his teammates have stayed in touch ever since. Eagle baseball alumni — regardless of when they played on the team — share a similar connection.



A tight-knit group of Eagle baseball alumni get together in a different city every year for Guys Weekend. The first Guys Weekend took place in 2009 (top photo). At a more recent Guys Weekend (above), the guys participated in Embry-Riddle’s Golf Tournament. Pictured, from left, Kevin Hawkins, Johnny Yuzzolin, Mike Magee and Luke Martin.

TOP: DARYL LABELLO

That’s why every other year the athletics department invites former players from all eras of the Daytona Beach Campus baseball program back to Sliwa Stadium, to challenge the current players in an alumni baseball game. “It’s about bridging the gap between old and new players,” says Assistant Coach Chuck Stegall. “And, it gives them a chance to see each other.”

Chuck and his brother, Head Coach Randy Stegall, established the biennial tradition in 2010. This past year, about 30 former players from as far back as the 1990s came for the game.

One of those who returned to campus, Phillip Reamy (’10, ’13), an Eagle pitcher and now an air traffic controller in Syracuse, New York, says, “You put so much time and effort into it when you’re playing here, you cannot help but want to stay invested.”

Richard “Richie” Cormier, who played on the team from 2003-2005 and now owns his own insurance company in Sebring, Florida, agrees. “We may have never played together, but we have a bond. It’s a brotherhood.”

Guys Weekend

Martin and a smaller group of alumni have taken the biennial game to another level, getting together every year in a different city to maintain the friendships they began in the late 1990s — an era when the team brought home its first conference championships, won its first regional title and achieved the baseball team’s first No. 1 ranking in the National Association of Intercollegiate Athletics.

Fast-forward through graduation, bachelor parties, weddings and random get-togethers, and Martin and his former teammates decided to make time together an annual priority. Guys Weekend was born.

The first Guys Weekend took place in 2009. Since that time, the group — about 10 guys — has met in cities all over the country.

“The trips have gone from all-night liver killers to golf and catching up with best friends,” says Mike Magee (’99), a pitcher and the founder of a Maryland aerospace engineering company called MTech.

Martin adds, “We laugh about the evolution of this and what it will look like 15 years from now. Someone will have a walker, and we won’t ever leave the house we rent.”

An old adage says one of the reasons to go to college is to broaden your perspective and your circle of connections, and these former Embry-Riddle baseball players can certainly attest to that.

“My experience at Embry-Riddle shaped who I am today,” says Kevin Hawkins (’01), pitcher and now an engineering director at Qualcomm in San Diego. “I still remember moments in classrooms ... just like I remember moments on the field. Maybe most importantly, I have this bond with the guys in this group.”

Magee agrees. “As I get older I realize how few ‘lifetime’ friends I’ll make and most of those friendships were developed at Embry-Riddle. Getting together with best friends and catching up on life, family, business — what could be better?” 🍷

CAREER CORNER

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CLASS NOTES

Share your Class Notes with *Lift* and your fellow alumni. Email announcements to eralumni@erau.edu; or go to: lift.erau.edu/submit-class-note.

Career News

1970s

Rick Pollak ('76) received the Federal Aviation Administration's (FAA) Wright Brothers Master Pilot Award, which recognizes individuals who have exhibited professionalism, skill and aviation expertise for at least 50 years while piloting aircraft.

Beverley Drake ('77, '02, '05) was honored with the Pioneer Women of the Year Award by the Guyanese Girls Rock Foundation. The first female pilot to fly for the Guyana Airways Corporation and the Guyana Army, Drake is a program manager for the National Transportation Safety Board.

Capt. Mike Lundeen ('79) retired from United Airlines on Dec. 9, 2019. He previously worked for Eastern, Pan Am and Continental Airlines.

1980s

Capt. Mark Davies ('80) retired after 32 years of piloting, flying first for Continental Airlines and then for United Airlines. He flew the B-757 and B-767 on international and Hawaii routes. He was based at George Bush Intercontinental/Houston Airport.

Roy Gioconda ('82) is now vice president of customer success at TRAXXALL, a business-aviation maintenance management partner.

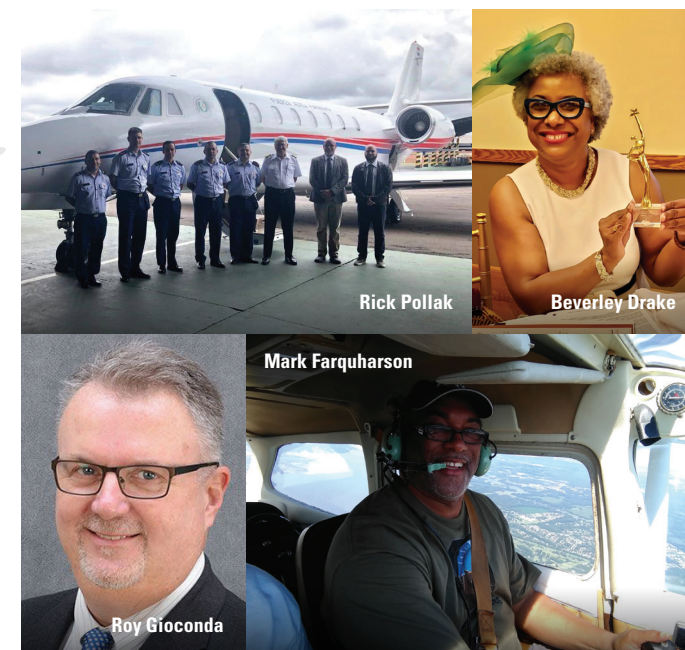
David W. Hannum ('82) earned a doctorate degree in business administration from Baker College. A retired U.S. Air Force senior non-commissioned officer, Hannum is president of his own consulting company, WxWar Consulting.

Dennis R. Haber ('84) received the FAA Wright Brothers Master Pilot Award. Haber completed his first flight in 1966 at Embry-Riddle's Daytona Beach Campus, then served with the U.S. Navy in aviation during the Vietnam era. He continues to fly his own Cirrus SR22 around the country as an aviation business attorney.

Juan Fuentes ('86, '91) is the general manager for air traffic operations at the FAA in Miami, Florida.

Steven Hirshorn ('86) is celebrating his fourth anniversary as chief engineer for aeronautics at NASA Headquarters.

Retired U.S. Air Force Chief Master Sgt. Richard E. Russell ('86) was appointed to the Okaloosa County Aviation Board. Russell is a recipient of the FAA Master Pilot Award and member of the Tampa Shriners Hospital Board.



Mark Farquharson ('87) is a systems administrator at Phantom Eagle in Virginia. He shared: "At 59 and after 40-plus years, I'm finally pursuing the rest of my dream all the way to ATP. About to start on my instrument rating after BFR, then commercial, complex aircraft, multi-engine and on to ATP."

George King ('87) is senior vice president and chief financial officer of McKinley Children's Center. He has lived in California since 1987. He and his wife, who have two children, volunteer for the California State Guard.

Capt. Michael Weymer ('87) was recently promoted to Boeing 767 Line Check Airman at Atlas Air.

Roland Buskirk ('89) supports the U.S. Custom and Border Protection Aeronautical and Marine Spectrum Efficient National Surveillance Radar Program in Washington, D.C., for the Department of Homeland Security.

Frank A. McFall II ('89) is employed with SkyWest Airlines as a first officer on the Embraer 175 and is based out of Denver, Colorado. After 27 years of service, he retired from the U.S. Department of Justice in 2018.

1990s

Brian Mahoney ('90) is owner of Airkeen Aviation Safety Consulting (ASC) in Riles Acres, North Dakota. He served in the U.S. Air Force as an air traffic controller, then a pilot. He retired from the military after 29 years and started his own business as an aviation safety and operations consultant.

Col. Carl Misner ('93) recently retired from the U.S. Air Force. He now works as a senior technical advisor for General Dynamics. He and his wife, Liza, live in Woodbridge, Virginia.

Michael Stellwag ('93) is founder and CEO of Silverfox Digital, a full-service digital marketing consultancy serving clients throughout the Middle East. He also serves as co-founder and CEO at Yallajet.com, a new online travel agency, with founding partners from Emirates.

Rob Akins ('94) was promoted to director of training at FlightSafety's Learning Center in Tucson, Arizona.

Joe Gartrell ('94) earned a Ph.D. in General Psychology from Grand Canyon University on July 30, 2019. Gartrell has worked at USAA in San Antonio, Texas, for the past nine years.

Scott Souva ('94) was promoted to vice president, advanced research account manager at Assured Information Security in Rome, New York.

Diana Roe ('95) retired as a financial analyst at Pratt & Whitney in San Jose, California. She previously worked at Northrop Grumman in Los Angeles, California, as an earned value management (EVM) specialist, performing audits on the B2 and F35 aircraft.

Retired Lt. Col. Charles "Sammy" Samuel ('96) is a demonstration pilot for Bombardier Aerospace Company. Samuel has flown the Bombardier Challenger and Global aircraft and, in April 2019, he was a graduate of the first Global 7500 initial school.

Kevin Wisneski ('97, '98) celebrated his 21st anniversary at Wencor Group.

Joe Gibney ('98) is vice president and chief operating officer for TAC Air, an aviation ground services company. He also oversees the business management of Keystone Aviation.

Rob Baran ('99, '08) retired from the U.S. Air Force as an EOD officer and civil engineer. He is now a research and development systems engineer at Los Alamos National Laboratory.

Jay Erskin ('99) is president of Louisiana-based Daybrook Fisheries.

Rhonda Y. Smith Gullette ('99) earned a doctorate degree in business administration with an emphasis in healthcare management and leadership from California InterContinental University.

2000s

Capt. Robert Scott Laedlein ('00) retired in August 2019, following 30 years of active duty service in the U.S. Navy. His retirement ceremony was held at the National Naval Aviation Museum in Pensacola, Florida.

Kat Hakola ('01, '14) is CEO of Challenger Point Engineering, Strategy & Consult.

Cmdr. Ramiro Flores ('02) is program manager of the U.S. Navy's Specialized and Proven Aircraft program office. In 2015, he was assigned to Naval Air Systems Command (NAVAIR) as the executive officer, deputy program manager for Automated Test Equipment and integrated product team lead. Flores was selected as the U.S. Navy's first F-35 Joint Strike Fighter Maintenance Officer assigned to VFA-101 "Grim Reapers."

David Neely ('02) is owner of Jet America, a fixed wing and rotor wing maintenance facility in Lewisburg, West Virginia.



Chancellor's Salute

Capt. Kurtis Ludwig ('94) recognized for service to students and industry

Combining his passions for aviation and supporting the pilots of tomorrow, Kurtis Ludwig ('94) has helped countless Embry-Riddle students navigate their way to offices in the sky. The airline captain was named to the Prescott Campus Chancellor's Alumni Hall of Fame in October 2019, in recognition of his service to students and the aviation industry.

"Since 2011, Kurtis has connected with close to 6,000 students about piloting careers," says Bill Thompson ('87), executive director of alumni engagement. These connections were largely fostered through his involvement with the education committee for the Prescott Air Line Pilots Association ACE Club.

Ludwig started volunteering as the ALPA liaison for the club eight years ago. The club exposes students to the aviation industry through presentations, tours and workshops, and often leads to internships and employment opportunities.

Several Embry-Riddle graduates credit Ludwig for helping them achieve career success. Capt. Scott Singleton ('14) is one. "I wouldn't be where I am without Kurtis. His guidance and insight into this industry allowed me to grow into the airline pilot I am today," Singleton says.

An Airbus A220 captain for Delta Air Lines, based in New York City, Ludwig graduated with a bachelor's degree in aeronautical science from the Prescott Campus. He worked as a flight instructor at the Daytona Beach Campus, before starting his career as a commercial pilot for cargo, corporate and passenger operators.

Ludwig met his wife, Alicia, as a student at Embry-Riddle. The couple have two daughters, Shelby and Kailey. ✨

EDITOR'S NOTE: *The Chancellor's Alumni Hall of Fame was established in 2012 to honor the significant contributions of alumni to their profession, the community, the campus and the university. Since that time, 23 awardees have been recognized.*

CONNOR MCSHANE

Phanel Petit ('03) is the information technology (IT) portfolio manager for the Nebraska Department of Transportation Business Technology and Support division. Previously, he worked for the Nebraska Department of Health and Human Services as the healthcare informatics supervisor and IT systems analyst/project lead.

John Chiumento ('04) is a regional manager of pilot scheduling operations for Delta Air Lines.

Jacqueline Yaft ('04) is executive director of aviation for the Austin Bergstrom International Airport in Austin, Texas.

Michael Brewer ('05) is the right wing pilot for the Thunderbirds, the U.S. Air Force Air Demonstration Squadron, flying the No. 3 jet.

Katie Bigelow ('06) is president of Mettle Ops, which was recognized as one of the 2019 "Michigan 50 Companies to Watch." Mettle Ops was also recognized as one of the 2019 "Best Small Businesses."

Rick Funkhouser ('06), a retired commercial pilot, flight instructor and air traffic controller, recently received the FAA Wright Brothers Master Pilot Award.

Michael Ferullo ('07, '18) is a flight controller and crew instructor for Robotics Operations at Johnson Space Center. Ferullo shared, "After leading the ISS Robotics team during increment 59, my flight director granted me the honor of hanging the mission plaque in the control center. Our robotics team worked tirelessly through multiple failures and management requests this entire mission." Fellow Eagles **Troy McCracken ('94)** and **Leslie Hammond ('95)** are on the robotics team as well.

Brian Gambino ('07) is president of the National Gay Pilots Association, the largest organization of lesbian, gay, bisexual and transgender aviation professionals and enthusiasts from around the world. Gambino serves as a first officer on the Airbus A320/321 for JetBlue Airways.

Maj. Brandon Alford ('08) was commander of the 346th Expeditionary Air Base Squadron and deputy commander of the 346th Air Expeditionary Group, in support of New Horizons Guyana. Alford is a meteorologist and will redeploy to Davis-Monthan Air Force Base in Arizona, where he is the division chief of weather operations and partner nation airshows. Exercise New Horizons is a yearly American military training exercise in South America.

2010s

Caitlin Dillman ('11), who is program manager for flight operations at Envoy Air, is a second-generation Eagle. Her father, **Capt. Charles Dillman ('76)**, recently retired from United Continental, after more than 34 years. Caitlin flew as a passenger with her dad on his last flight on Feb. 26, 2019, in the Boeing 767-300 he flew from Berlin, Germany, to Newark, New Jersey.

Bradley A. Gilson ('11) helped his company win a 2019 Campbell Award from the National Safety Council for having an excellent electrical and construction safety program. They audited Gilson's site, which is the NASA Goddard Space Flight Center in Greenbelt, Maryland, where he is a safety specialist for Parsons Corporation.

Arthur Hoven ('12) is the vice president of Quality for Lufthansa Technik Middle East. He is a Embry-Riddle Alumni Network Leader in Abu Dhabi, United Arab Emirates.

Michael Turner ('12) recently celebrated his three-year anniversary with Delta Air Lines. He shared, "Along with flying the line as a 737 First Officer in Atlanta, I have been working with the Delta Propel Pilot Career Path Program for the past year as a college liaison with Embry-Riddle Daytona Beach Campus. It has been a lot of fun working with my alma mater and current students during this exciting time in aviation."

Elise Lagerstrom ('13) and **Madeleine Edbom ('11)** both competed in the 2019 IronMan 70.3 Victoria in Victoria, British Columbia, Canada. Both were student-athletes at the Daytona Beach Campus — Lagerstrom was on the women's tennis team and Edbom played on the women's soccer team.

Daniel Mondragon ('13, '15) is head men's basketball coach at Davis & Elkins College in Elkins, West Virginia. Mondragon worked as an assistant coach at Embry-Riddle from 2013 to 2016 and played collegiate basketball for the Eagles from 2009-13.

Mark Newpower ('13) completed his Ph.D. in Medical Physics from the University of Texas MD Anderson

Cancer Center, University of Texas Health Graduate School of Biomedical Sciences in Houston, Texas.

Capt. Synkero L. Missick ('14) is chairman of the Turks and Caicos Islands Civil Aviation Authority Board. In 2015, Missick was hired as a pilot by Caicos Express Airways. He also serves as CEO of Missick's Vending, a small retail and marketing company.

Hannah Morris ('14), who is an aircraft structural design engineer at Spirit AeroSystems, was recognized as a Leader In Diversity. Morris leads the Embry-Riddle Alumni Network in Wichita, Kansas.

Jessica Naor ('15) is chief operating officer of GrandView Aviation, a light jet charter operator.

Capt. Keith Novatnak Jr. ('15) and **First Officer Alice Novatnak ('19)** are pilots for Piedmont Airlines. Originally from Pennsylvania, the siblings both began flying at age 15, and Keith was Alice's first flight instructor. Alice represented Embry-Riddle in the 2018 Women's Air Race Classic and was a flight instructor at Embry-Riddle.

Albert Apaloo ('16, '18) is a quality assurance analyst for the NAVAIR in Patuxent River, Maryland.

John Challyl Bautista ('17) is a U.S. Army aviation sergeant at Fort Campbell, Kentucky.

Raquelli Bianco ('17) and student Mariana Pereira competed with the Brazilian national team this past fall in the World Baseball Softball Confederation (WBSC) Americas Softball Qualifiers for a chance to qualify for the 2020 Olympics. Both women have played on the Embry-Riddle Women's Softball Team at the Daytona Beach Campus.

Christian Esoy ('17) is a maintenance planning engineer at Thales Avionics in California.

Sebastian Jacome ('17) is an aviation maintenance technician for Delta Air Lines in Atlanta, Georgia.

Daniel Dias Landroni ('17) is revenue management manager at Latam Airlines in Santiago, Chile.

Aaron Collins ('18) is a production supervisor at Weasler Engineering in West Bend, Wisconsin. He was a staff sergeant in the U.S. Air Force.

Diali E. Coll-Mercado ('18) was promoted to global security manager for the Southeast Region of the United States, including Puerto Rico, in the Global Security Organization at ADP, a Fortune 500 Company.

Rafael Colon-Alma ('18) is the system support center manager at the FAA in Fremont, California.

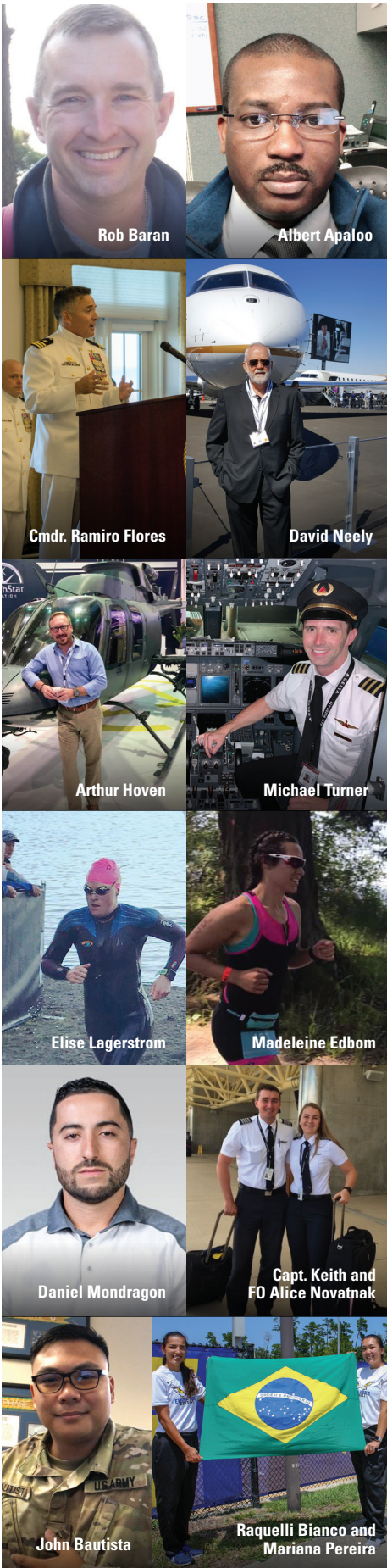
Erick Gomez ('18) is a UAS operator for Huntington-Ingalls industry in Texas.

Jordan Pfile ('18) is a flight test engineer for COLSA Corporation, currently testing the new HH-60W combat rescue helicopter.

Cherenfant Pierrelouis ('18) is a maintenance technician for the U.S. Army.

Hunter Weaver ('18) is an airfield operations officer with the U.S Air Force, stationed at Columbus Air Force Base in Mississippi.

Tyler Christenson ('19) recently earned a master's degree in aeronautics, while working full time as a flight line operations manager at The Boeing Company.



A GIFT to Embry-Riddle Can Give You Income for Life

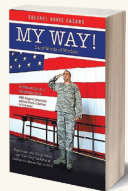
A charitable gift annuity provides fixed payments for life and tax benefits, in exchange for a gift of cash or securities to Embry-Riddle. Rates of return on investments are greater than traditional saving options (e.g., certificates of deposit/savings accounts) and benefit Embry-Riddle and its students at the same time.

SAMPLE RETURN ON \$10,000 INVESTMENT:		
Age	Rate of Return	Annual Earnings for Life
65	4.7%	\$470
70	5.1%	\$510
75	5.8%	\$580
80	6.9%	\$690
85	8.0%	\$800

For a customized quote, contact **Travis Grantham** at 386-226-7568 or email Travis.Grantham@erau.edu.



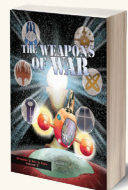
EAGLE AUTHORS ON THE BOOKSHELF



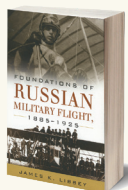
Col. Augusto "Augie" Casado ('92) published the book *My Way!*, a compilation of 365 daily emails Casado sent his sons, Ben and Alex. Casado is manager of the Federal Aviation Administration's Flight Standards Strategic Planning and Financial Services Division. Serving in the Air Force Reserve, he is also the 10th Air Force director of logistics, engineering and force protection.



Capt. Scott Costin ('90, '93) authored *The Doctor Won't See You Now: Be the Savvy, Successful Biopharma Representative in a Rapidly Changing Industry*, published in 2017. A U.S. Air Force veteran, Costin has worked as a manufacturer's representative in the biopharmaceutical and pharmaceuticals industry for the past 20 years.



Fr. Patrick Kokorian ('98), M.M.A., authored and illustrated a graphic novel titled *The Weapons of War: Brendan and Eric in Exile*. Published in 2019 under Kokorian's pen name, Amadeus, it is the third volume in a series that seeks to inform and enlighten Catholics and non-Catholics about God and the church. Kokorian was named abbot (head monk) of the Most Holy Trinity Monastery in Petersham, Massachusetts, on Sept. 24, 2019. He is the second abbot of his order, Maronite Monks of Adoration.



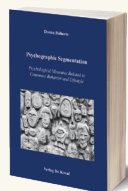
Embry-Riddle Professor Emeritus James K. Libbey authored *Foundations of Russian Military Flight 1885-1925*, published in 2019. The book focuses on the early use of balloons and aircraft by the Russian military. At Embry-Riddle, Libbey taught aviation history and Russian-American relations.



David J. McGowan ('74) authored and published in 2015 a memoir: *Delta Shotgun*. The book details his experiences as a reconnaissance pilot, flying for the U.S. Army in Vietnam.



Retired CW3 Kenneth Peck ('11) authored *American Airborne Ads of the 20s Thru the 50s*, published in 2019. The book features 200 pages of period print ads, cartoons and magazine covers, all with paratroopers. Peck served with the U.S. Army Warrant Officer Signal Corps from 1988 to 2014, and is the owner/operator of Round Canopy LLC.



Donna Roberts ('10), associate professor and chair of the social sciences and economics department and chair of undergraduate research at the Worldwide Campus in Germany, authored *Psychographic Segmentation: Psychological Measures Related to Consumer Behavior and Lifestyle*, published in 2019 by Verlag Dr. Kovac.



Houbing Song, an assistant professor of electrical engineering and computer science at Embry-Riddle, is the co-editor of four books. The latest, *Big Data Analytics for Cyber-Physical Systems: Machine Learning for the Internet of Things*, was published in 2019 by Elsevier.



Capt. Walter F. Sorenson Jr. ('84) authored *Do You Live in a Barn? A Children's Story*, published in 2019. His three children, Emma, James and Mary Grace Sorenson, helped illustrate the book, which was inspired by stories Sorenson would tell his children when they were younger. For every 10 books sold, the author donates one to a library kid zone. Sorenson is a pilot for American Airlines and owns/operates Sorenson Electric, where he works as a master electrician. Emma is a current Embry-Riddle student studying homeland security.

ARE YOU AN AUTHOR?

Eagle Authors features traditionally and self-published books authored by Embry-Riddle alumni and faculty. To have your book considered, email liftmag@erau.edu.

Anurada Hindle ('19) is an A320 First Officer for Airbus in Ho Chi Minh, Vietnam.

Jorge Morante ('19) is now a Boeing 777 First Officer.

Felipe Orozco ('19) is an engineer at Raytheon in McKinney, Texas.

Chad Stearns ('19), who is a former president of the Student Government Association at Embry-Riddle's Daytona Beach Campus, received the Florida Association of Colleges and Employers Student of the Year Award.

Marriages/Engagements

1990s

Jeff Forste ('95) and **Catrina Riediger Forste ('96)** celebrated 24 years of marriage in November 2019. They are also the parents of a senior and a freshman in college, both of whom are attending Embry-Riddle's Daytona Beach Campus.

Helmuth Eggeling ('98) married Loida Gutiérrez on Jan. 26, 2019, at the Brophy Chapel, in Phoenix, Arizona. They honeymooned in Playa del Carmen, Mexico.

2010s

Brittany Novy-Mackey ('13) and **Andrew Zack ('14)** got engaged Oct. 5, 2019, while celebrating their seven-year anniversary in Iceland. Novy-Mackey writes: "On that night, in our rented cabin under the Northern Lights and Milky Way, with not a soul for miles, we danced to our song, 'We'll Meet Again,' by Vera Lynn, and he asked me to be his forever."

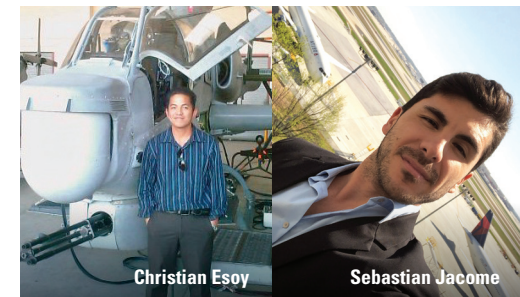
Jenna Ludwick Slater ('14, '17) and **Jesse Slater ('14)** were married in February 2019. This past year, they moved to Tampa, Florida, where she works for the ICON Aircraft company's flight center, and he is a data analyst and professor at Embry-Riddle's Worldwide Campus.

Elijah Gravenhorst ('19) proposed to his girlfriend, Emily Ashey, while being serenaded by the Embry-Riddle AcaFellas singing group after the Dec. 16, 2019, commencement ceremony at the Ocean Center in Daytona Beach, Florida.

Other

1980s

Capt. Ron Barnard ('80) piloted an American Airlines B-777-200 on Oct. 19, 2019, from Miami to Barcelona, Spain, with two other Eagles: **First Officer Kent Thorpe III ('81)** and **Craig Feinberg ('92)**. Barnard was Thorpe's first primary flight instructor.



Christian Esoy

Sebastian Jacome



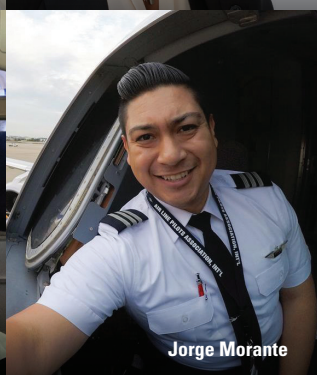
Diali E. Coll-Mercado



Jordan Phile



Anurada Hindle



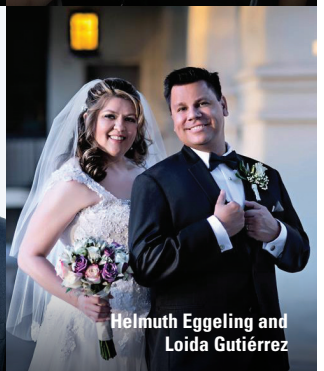
Jorge Morante



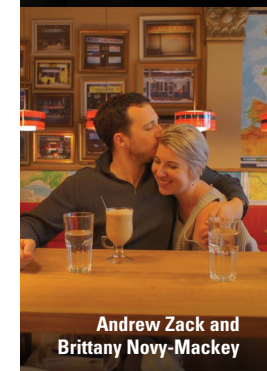
Felipe Orozco



Chad Stearns



Helmuth Eggeling and Loida Gutiérrez



Andrew Zack and Brittany Novy-Mackey



Jesse Slater and Jenna Ludwick Slater



Capt. Ron Barnard, FO Kent Thorpe and Craig Feinberg



Emily Ashey and Elijah Gravenhorst



ACES Gather at the Prescott Campus

Readers identified the alumni pictured in this photo (published in the fall 2019 edition of Lift) as volunteers for the Alumni Council for Enrollment Support (ACES). The group visited the Prescott Campus in 1989 for a training session. ACES volunteers helped leverage the efforts of Embry-Riddle's office of admissions by attending and meeting with prospective students at college fairs near their homes. The program was later dissolved.

'They'd Never Get Me to Wear [That]'

"The photo taken in Prescott is of the ACES Group, which stands for Alumni Council for Enrollment Support. It was an organization of alumni who went to schools and events to recruit students. The girl in the back row with the purple scarf is my wife Teresa Anderson ('88) and she's holding a glass of chardonnay right in front of my face. It was a very useful conference, and the folks at Prescott were great to us. Sorry I do not recall the date. I didn't even recall being in the picture. I looked at it and said, 'They'd never get me to wear one of those dumb scarfs ...' Then I looked close and saw Teresa ... and there I was wearing one of those dumb scarfs!"

Wes Oleszewski ('87)
B.S. Aeronautical Science

The Western Theme

"The photo is likely an Alumni Council for Enrollment Support (ACES) meeting at the Prescott Campus in 1988 or 1989. The neckerchiefs were part of the western theme for events that week."

Joseph Hillmon ('87)
B.S. Aeronautical Engineering

'Goofy Bandanna'

"I am on the extreme right (red shirt, goofy bandanna). I supported ERAU for years as an alumni rep to various high school college nights. I remember visiting the Prescott Campus and looking over the (new) electrical engineering program, the first program that did not specifically reference an aviation tie-in."

Douglas K. Manuel ('80, '93)
B.S. Professional Aeronautics;
M.S. Technical Management

Training Alumni to Engage Potential Students

"Yes, I am in this picture. This event in 1989 was an alumni training retreat at the Prescott Campus for a program called ACES. It was hosted by admissions and trained alumni to participate and engage potential students at college fairs across the country. Some of the participants in the photo — those I can recall — are John Wrightington ('79), Greg Patscheck ('81), Wes Oleszewski ('87), Teresa Oleszewski ('88), Marcus Burke ('85, '87), and Doug Auld ('78)."

Garrett Ison ('87)
B.S. Aeronautical Studies



U.S. Air Force Capt. Ryan S. Phaneuf ('12)

• Jan. 27, 2020

Capt. Ryan S. Phaneuf ('12) of Hudson, New Hampshire, died serving his country. Assigned to the 37th Bomb Squadron at Ellsworth Air Force Base in South Dakota, Phaneuf was copiloting a Bombardier E-11A communications aircraft when it crashed in Afghanistan. A graduate of Embry-Riddle's applied meteorology program and Air Force ROTC Det. 157, Phaneuf, 30, joined the Air Force in 2012.

Meteorology Professor Tom Guinn remembers him well. "What I always admired most about Ryan was that he never backed down from life challenges," Guinn says.

In honor of his sacrifice, Embry-Riddle's Air Force ROTC Det. 157 assembled for a moment of silence, remembrance and prayer at the detachment's opening formation Feb. 7, and dedicated its morning physical training and campus run to Phaneuf. He is survived by his wife, Megan.

Jack H. Thompson ('05) • Oct. 14, 2019

Jack H. Thompson ('05), who was the director of Embry-Riddle Worldwide's Ft. Eustis Campus in Virginia, passed away at his home in Yorktown, Virginia, at the age of 91. Thompson served for 28 years in the U.S. Army and was a master aviator. After retiring from the Army, he started working at Embry-Riddle's Worldwide Campus at Ft. Eustis. He earned his second master's degree from Embry-Riddle at the age of 76 and continued to work at the campus office until he died. He is survived by his wife, Mary Louise, and two daughters.

"I will always remember Jack's kind smile and caring spirit. He was an encourager and used that gift to help countless students over the years. Jack will be missed, but his legacy will live on in the profound impact he made throughout the university," says Lyndsay Beaulieu, former associate executive director of U.S. Campus Operations at Embry-Riddle Worldwide.

Professor Shahrddad Sajjadi • Jan. 6, 2020

Professor, mentor and colleague in the mathematics department, Shahrddad "Shar" Sajjadi, 58, worked at Embry-Riddle's Daytona Beach Campus since 2005 in a variety of academic roles. He was known for his research on theoretical fluid mechanics and for helping start the university's degree in computational mathematics. Born in Tehran, Iran, Sajjadi graduated from Coventry University in England with a B.S. and a Doctorate in Philosophy. Later, he earned another Doctorate in Science from Cambridge University. He is survived by his wife, LuAnn.

In Memoriam

1950s

Retired Maj. Brooks W. "Buster" Lovelace Jr. ('50)
Nov. 3, 2019

Robert H. Campbell ('57)
Oct. 24, 2019

Dale G. Heckman ('57)
Oct. 19, 2019

James H. Connell ('59)
Sept. 19, 2019

Richard E. DeMars ('59)
Oct. 1, 2019

1960s

Capt. Chesley Wells Berry ('64)
Sept. 18, 2019

Theodore R. McLean ('64)
May 21, 2019

Ronald Chivers ('65)
July 19, 2019

Michael W. Dolphin ('68)
Sept. 30, 2019

David A. Forney ('68)
June 3, 2019

Joseph A. "Joe" Henebry III ('69)
Dec. 27, 2019

Robert J. Szydlo ('69)
Oct. 31, 2019

1970s

James Creighton Welch ('71)
May 25, 2019

Joseph Michael "Mike" Kruszynski ('72)
Oct. 27, 2019

Joseph "Joe" George Hajcak ('73)
June 6, 2019

Richard Alan Warner ('76)
Oct. 17, 2019

Leo Joseph Haigley ('78)
Nov. 9, 2019

1980s

David Rowand ('81)
Sept. 14, 2019

Laura Lynn (Stephens) Ward ('86)
Jan. 1, 2020

John Nathan Hutchison Jr. ('87)
May 30, 2019

Mary Frances Sobzack ('88)
Sept. 5, 2019

Chief Master Sgt. Donald L. Yeager Jr. ('88)
May 25, 2019

1990s

Scott Socquet ('91)
Oct. 23, 2019

Sgt. Varanda Lucarious Jones Huffman ('93)
Aug. 31, 2019

Douglas K. Davis ('94, '95)
Dec. 25, 2019

Roger A. Rennick ('94)
Sept. 21, 2019

Dennis Riddle ('95)
June 4, 2019

Orion Evans McMahon ('97)
Oct. 18, 2019

Glenn B. Wilder ('97, '02)
Nov. 28, 2019

Lt. Col. Mathew "Pyro" McCarty ('99)
Dec. 25, 2019

2000s

Samuel Ward Fritz ('04)
Nov. 4, 2019

Daniel Marcus Tidgwell ('07)
July 22, 2019

Charles Z. Walker ('08)
July 31, 2019

Steven M. Turley ('14)
May 26, 2019

OTHER

Retired U.S. Navy Capt. Richard E. Carlson, M.D.
Former Faculty Member
June 15, 2019

Caleb Cole Driggers
Daytona Beach
Campus Student
July 2, 2019

George R. Mendonca
Longtime Supporter and Friend
June 25, 2019

Cmdr. Irving E. Morrill
Former Faculty Member
May 5, 2019

David Rummel, M.D.
Former Board of
Trustees Member
June 19, 2019

Thomas "Tommy" Townsend
Former Faculty Member
June 24, 2019

TAILWINDS

Vroom!

Are you in this picture? Do you know someone who is? Help us fill the gaps in Embry-Riddle's institutional knowledge. Tell us about the event, the people and the year this photo was taken. We'll share the details in the next edition of *Lift*.

Email: liftmag@erau.edu

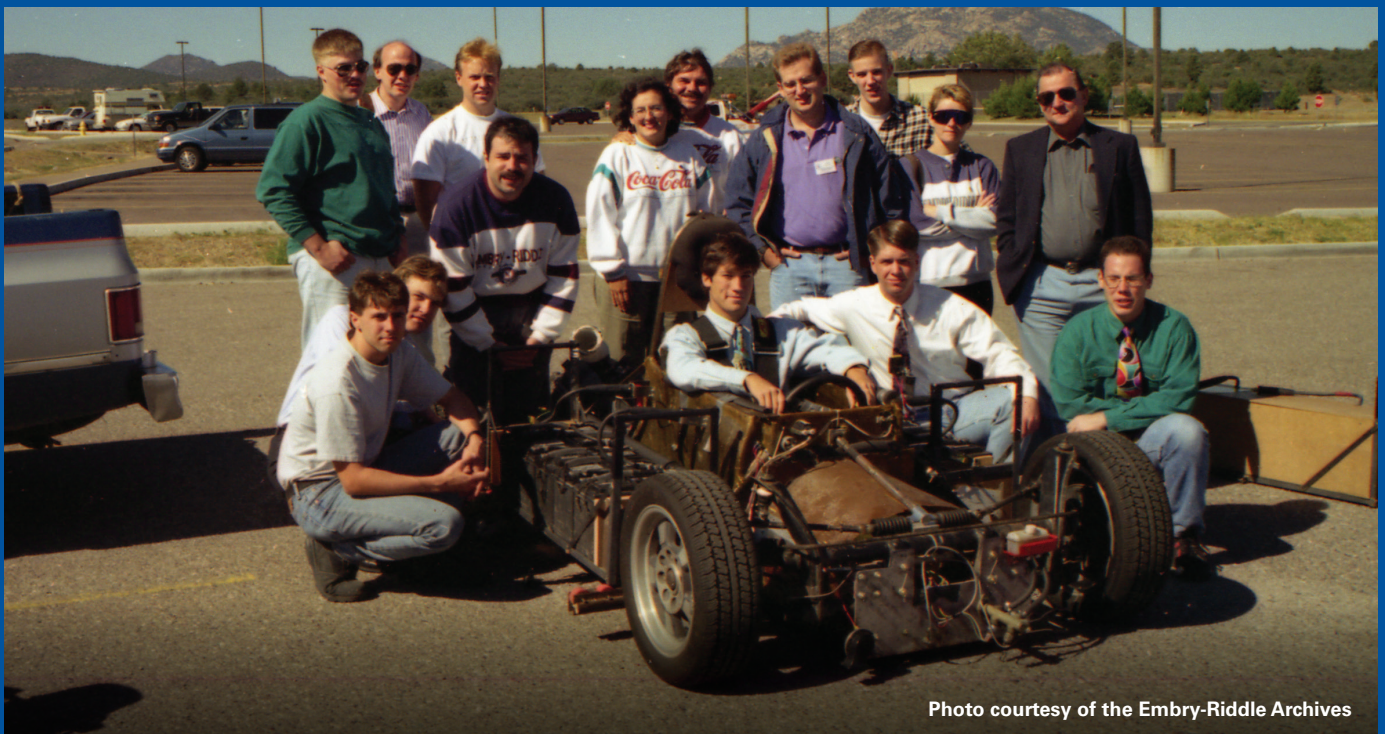


Photo courtesy of the Embry-Riddle Archives