

FLORIDA TECH

M A G A Z I N E

WINTER 2023

Breaking into Biomed

Biomedicine is shaping health care, society and the future—
at Florida Tech and beyond.



In This Issue

Winter 2023 • Volume 31, Issue 3

Global Kitchen

The campus community is taking a culinary trip across the world via Global Kitchen: An International Dining Series. Hosted by Panther Dining Hall, the series features monthly buffet-style dinners offering authentic foods from different regions and countries. To ensure authenticity, each food is tasted, tested and approved by Florida Tech students and staff from the featured region. The international cuisine is also accompanied by related educational materials posted in the dining hall, together with sights and sounds from the featured area.



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CONNECT WITH US

Scan the QR code to visit our university and Alumni Association social media pages.

A MESSAGE FROM THE INTERIM PRESIDENT

I've only been on campus a few months, but a key reality has been clear to me since my first day: This is a university with a bright future. That's thanks to the many faculty, staff and students, as well as legions of alumni, who help make Florida Tech a strategically important educational asset to our community and our nation.

Florida Tech has served the Space Coast and, indeed, the world for nearly 65 years and is known across the globe for its STEM education curriculum. Our people allow us to deliver that world-class experience. Outstanding people paired with remarkable resources make all the difference for our students' educations and our research contributions.

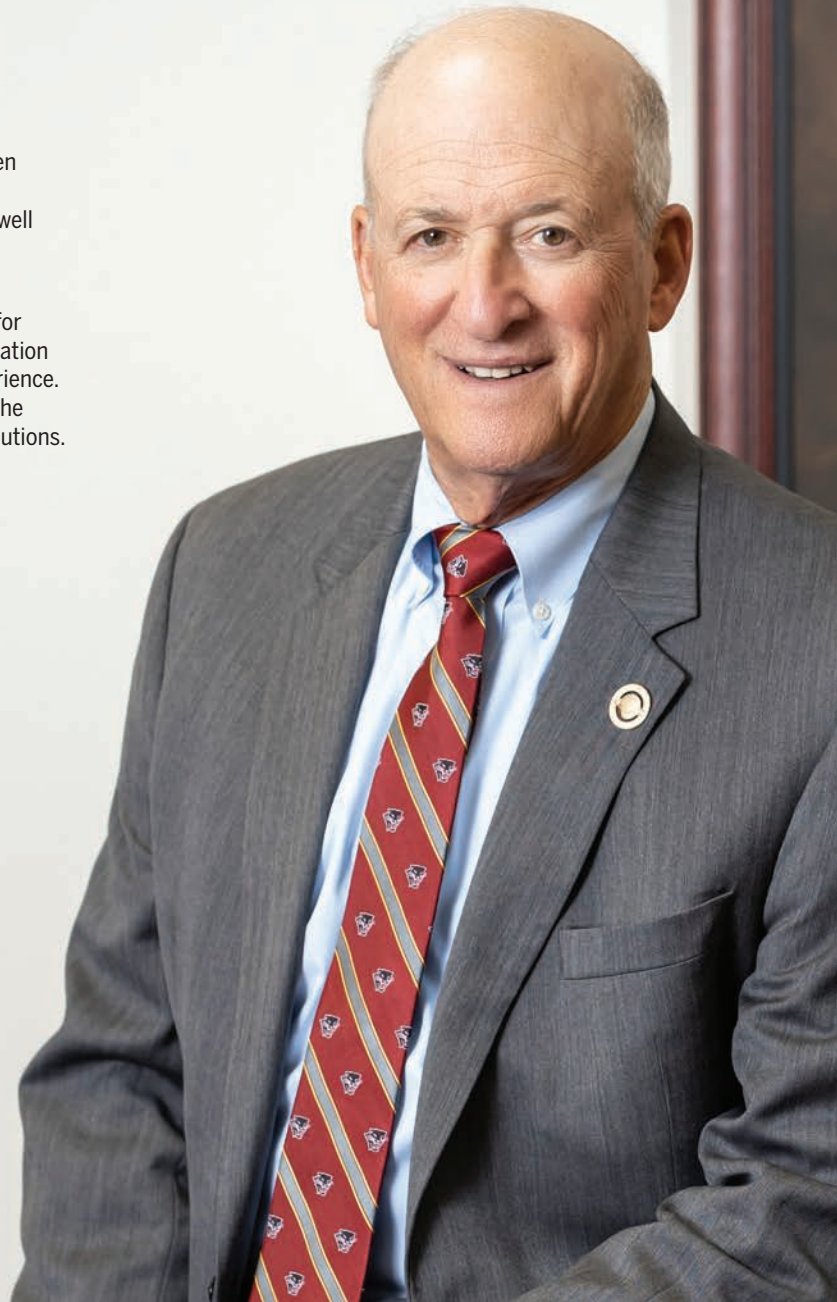
I'd like to highlight a recent accolade, and I hope you'll share it with friends and family who might consider Florida Tech.

Your university has surged in the latest edition of the influential Global Employability University Ranking and Survey, where 1,000 universities and higher education institutions worldwide were examined before the top 250 were determined. More than 100,000 employers, human resources professionals and corporate recruiters were surveyed. Just two Florida schools made the list—no surprise, the University of Florida ranked 34th in the U.S.—and Florida Tech ranked 17th! We were lauded in the same breath as Arizona State University, Carnegie Mellon University, the University of California, Berkeley, and Georgia Tech. Truly, an outstanding accomplishment!

Amazing things are on the horizon for this university and its people. I think we're poised for what's next. Let's all be ready!

Sincerely,

Robert L. King, J.D.
Interim President



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Hurricane Ian Offers Powerful Opportunities for Data Gathering

Hurricanes are frightening events, to be sure. But amid the gales and rain, these powerful storms can provide valuable data to those who seek it.

Hurricane Ian brought out multiple seekers from Florida Tech.

With support from a National Institute of Standards and Technology (NIST) grant, engineering and meteorology teams deployed dozens of pressure and temperature sensors and multiple pieces of equipment at a Satellite Beach neighborhood as Ian approached.

The engineering team consisted of faculty members Jean-Paul Pinelli and Chelakara Subramanian and students Celton Alexandre, Tuquet Corentin, **ALI LEBBAR** '21, **SOUNDARYA SRIDHAR** '19 M.S. and **JIAN ZHANG** '18, '20 M.S.

The meteorology team featured faculty member Steven Lazarus and students Hadley Besing, Marcus Cote and Connor Welch.

The teams deployed 17 sensors on the roof of a home, six on the garage door and two each on windows and the porch. They used three anemometers—devices that record wind speed—with one reaching nearly 20 feet up.

They also utilized a Light Detection and Ranging (lidar) device, which measures wind profiles as high as 1,000 feet using a laser beam. The lidar research is essential to developing a better understanding of how the wind interacts with the built environment.



Graduate student Hadley Besing works on an R.M. Young anemometer in Satellite Beach, Florida. The device, which also included a HOBO temperature/humidity sensor package and additional pressure sensor, would later collect wind speed data from Hurricane Ian.

Some of the learning experiences students gained from the fieldwork included experimental planning and preparation, remote sensing and data monitoring, effect of surface roughness and wind direction on near-surface wind profiles and the correlation between hurricane wind aloft and local wind on the structures, Subramanian said.

The teams are just starting to process much of the data, but they reported that a 64 mph gust was recorded at a height of 36 feet just before midnight Sept. 29.

This work with Ian is part of a three-year, NIST-funded effort to develop and use a unique wireless sensor

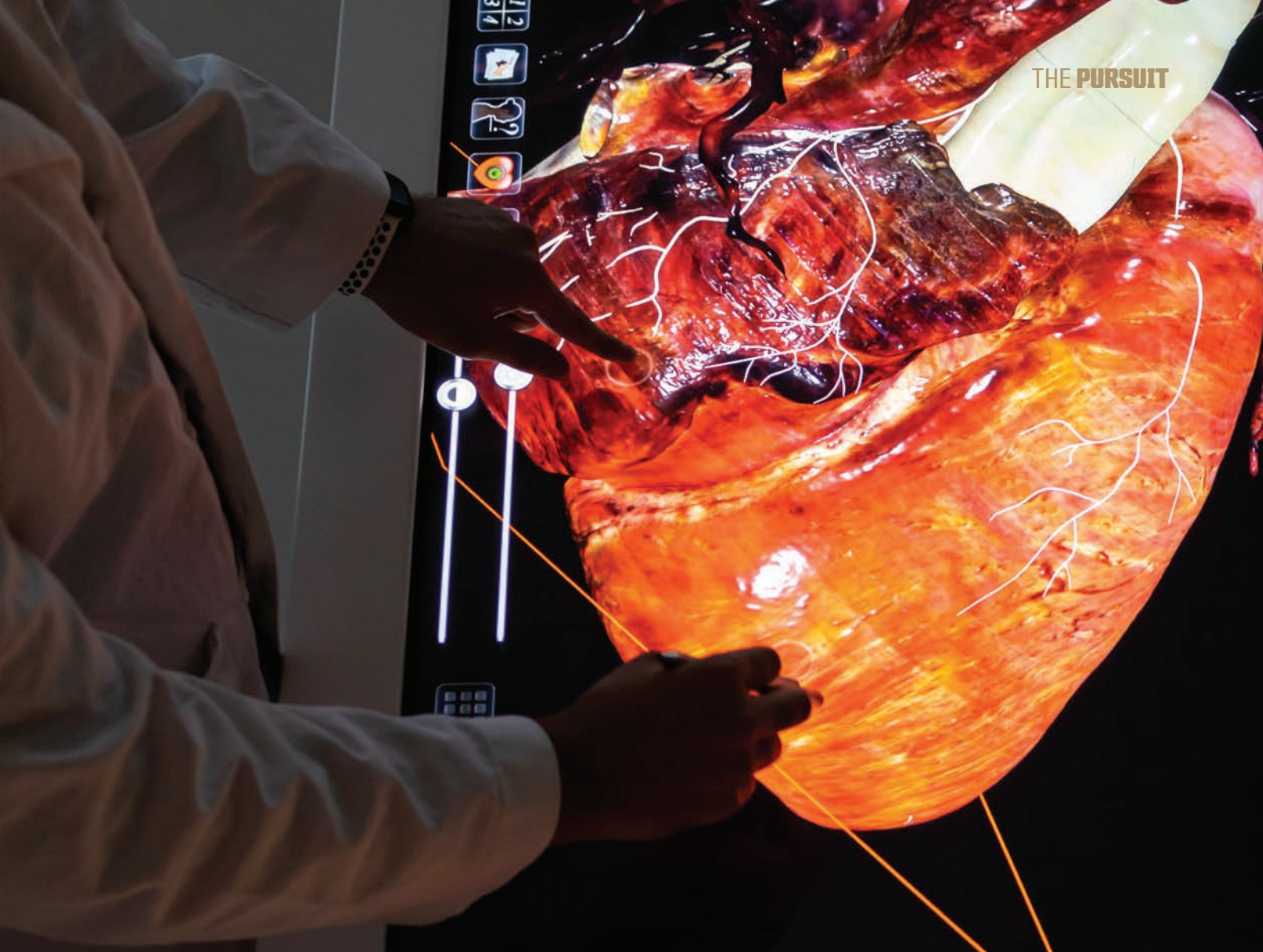
network system together with state-of-the-art anemometry, including lidar, to characterize the impact of the surrounding terrain on the wind profile near the ground and subsequent wind loads on buildings' nonstructural components, such as roods, soffits, windows and doors.

"It is critical to understand the interaction between the building, its environment and the incoming wind to come up with better, more resistant designs," Pinelli said. "The architectural details can be the weak link in the load chain. Their failure can trigger cascading effects that lead to the demise of the building."

Meteorology Mention

Inside the Magic, a popular Disney blog launched years ago in Central Florida, featured a post that referred to Florida Tech's prominence in meteorology education. The story, "Disney World's EPCOT 'Tornado' last week was part of an Elaborate Hoax," discussed a photo, taken by a guest at the park, of a scattered cumulus under deck (SCUD) cloud behind Spaceship Earth that looked like a tornado:

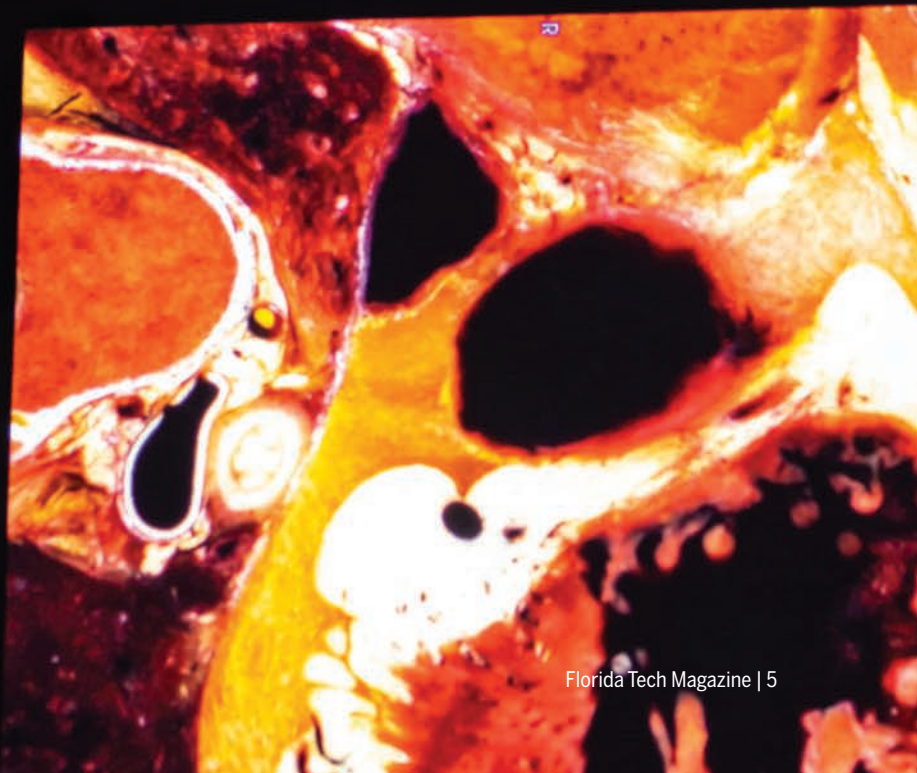
"If you're ever at a Disney Park and notice clouds that resemble funnels or a full-blown tornado (and you didn't graduate from the Florida Institute of Technology with your degree in meteorology), it's best to play it safe," Texas-based writer Becky Burkett wrote.



High-Tech Anatomy Education

Florida Tech's Nelson Health Sciences building is home to two Anatomage virtual dissection tables. These state-of-the-art, 3D anatomy visualization systems support anatomy and physiology education, allowing users to explore human anatomy in an operating table-style environment.

Students can study a variety of systems, from macro- to microstructures, as well as interact with a complete human body or an individual organ.





FAMILIAR FACES:

James Baucom

A SERIES CATCHING UP WITH THE CAMPUS FIGURES WHO MADE YOUR TIME AT FLORIDA TECH MEMORABLE

“For most of my adult life, I’ve had the good fortune of traveling and living in many places around the globe. Now that I’m traveling less, I don’t need to; working at Florida Tech, the world comes to me without leaving Melbourne.”

—James Baucom

James Baucom, user experience specialist at Evans Library, has been part of the Florida Tech community for 36 years, creating a positive and uplifting experience for everyone with whom he interacts. We spoke with James about his time at Florida Tech, his impact and more.

How long have you worked at Florida Tech?

My first experience on the Florida Tech campus began in 1986, when I attended classes while cross-enrolled at the University of Central Florida (UCF). I took an AROTC commission from the Panther Battalion, graduating from UCF in 1988. After a three-year tour of active duty, I returned to live in Melbourne and took a position with Campus Security. In 2007, I took a lateral transfer to Evans Library, where I’ve been ever since.

What’s the secret to that kind of longevity?

Florida Tech is a true gem of this community. Working and living close to the Florida Tech campus has been a pleasure. Being associated with bright people from around the world is a rewarding experience. For me, it is a real treat to interact with such a multicultural environment. I’ve been lucky enough to have lived in five different countries for up to a year or more. I love the diversity Florida Tech brings to this part of the world.

What role does interacting with the campus community play in keeping your job fresh and exciting?

Interacting with such a diverse community is rewarding for me. For most of my adult life, I’ve had the good fortune of traveling and living in many places around the globe. Now that I’m traveling less, I don’t need to; working at Florida

Tech, the world comes to me without leaving Melbourne.

What do you love about your job?

I enjoy meeting folks from far-flung places. I work at the information desk, a.k.a. the iDesk, the heart of the campus. It brings me into contact with many of our students/faculty/staff. When I find out where a patron comes from, I study that place (language/geography/history/culture). I make it a point to learn something about the world that they come from. I try to greet them in their language, find out how to ask them, “How can I help you?”

What do you see in the future for Florida Tech?

With the growth I’ve seen over the past 30-some years and surviving what we just went through with the COVID pandemic, I am encouraged and truly believe that Florida Tech will forever be a stellar university.

What do you see in the future for you (personally or professionally)?

I have reached retirement age. I am a retired military veteran of 33 years, and I don’t see myself working too much longer. I can honestly say that my years at Florida Tech have been more than anyone could ask for. I will dearly miss the excitement of working with so many brilliant people and having seen this campus develop and grow into a top-rated university.



Student Project, Oral Abstract Win Awards at ASAIO Conference

Biomedical engineering undergraduate students won a top prize for their pediatric heart assist device monitor senior design project, and a master’s student was recognized for her oral abstract on using fluid dynamics to optimize blood flow for heart failure patients implanted with mechanical pumps at the 67th International Conference of the American Society of Artificial Internal Organs (ASAIO) in summer 2022 in Chicago.

From left: Rachel Hillner, Andre Farina, Luke Perry, Venkat Keshav Chivukula, Jasmine Martinez.

Panthers Among World's Most Employable

Florida Tech surged in the latest edition of the influential Global Employability University Ranking and Survey (GEURS), rising to 17th among U.S. schools on the list and 76th overall among all 250 ranked universities.

Florida Tech's overall ranking represents an advancement of 85 spots since the 2021 GEURS report, making it the biggest mover in the 2022–23 edition.

"We are proud of this ranking, which reflects Florida Tech's focus on empowering learners to excel in their

careers," said Marco Carvalho, the university's executive vice president, provost and chief operating officer. "This approach, now anchored by our STEM philosophy and enhanced by Florida Tech's hands-on pedagogy, means our students are flying planes, building rocket engines, fighting simulated cyberattacks and doing so much more—starting year one."

Florida Tech was one of just two Sunshine State institutions in the GEURS, with the University of Florida coming in at No. 167.



Building an equitable, diverse and inclusive culture is essential to create and maintain a healthy and productive academic environment for our students, faculty and staff.

—Marco Carvalho, executive vice president, provost and chief operating officer who established and chairs Florida Tech's newly formed University Diversity Council



The council, which includes representatives from the university's four academic colleges, Evans Library, student body and administrative units, was established to champion Florida Tech's diversity, equity and inclusion efforts while embracing the challenge, as all institutions must, of examining the university climate, culture, practices and policies to ensure they are equitable and inclusive.

Student Chosen for Frontier Development Lab Challenge



Space sciences Ph.D. student **MEGAN MARK** '19 M.S., pictured above left, participated in the prestigious Frontier Development Lab (FDL) 2022 Challenge.

The eight-week summer event at the SETI Institute in Mountain Valley, California, brings together top graduate students from around the world to tackle challenges using artificial intelligence (AI). FDL is a public-private partnership between NASA, the U.S. Department of Energy, the SETI Institute, Trillium Technologies and leaders in commercial AI, space exploration and earth science.

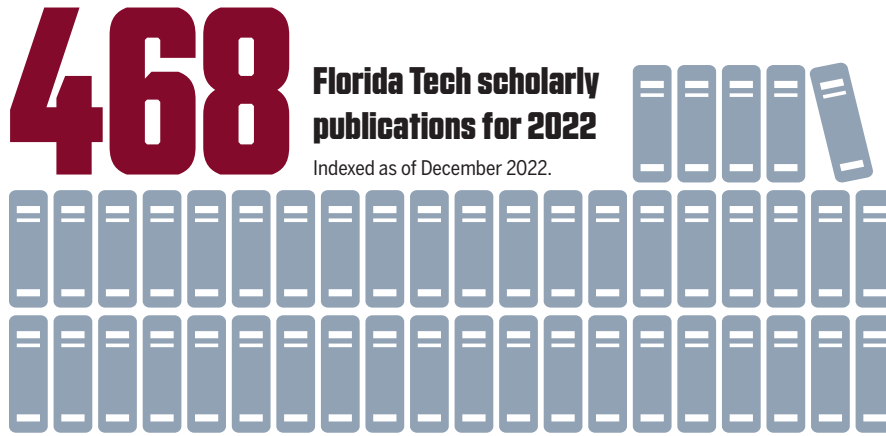
Mark was on the Science Mission Directorate Knowledge Graph Discovery team charged with exploring the question, "Can we use natural language processing to develop more effective discoveries by embedding modern language models with 'scientific expertise' to suggest potentially useful connections for researchers?"

The team developed a baseline for a multidomain knowledge graph that can be used to connect datasets using word co-occurrence, semantic similarity, cosine similarity and topic modeling. The baseline can be integrated across a variety of sciences to allow for better data discovery, Mark said, and it can provide researchers opportunities for new information and a more efficient search for related datasets.

"Experiencing FDL was awe-inspiring," said Mark. "I was welcomed by the program and my team with kindness and the understanding that we were all there to learn and build something that hasn't been done before."

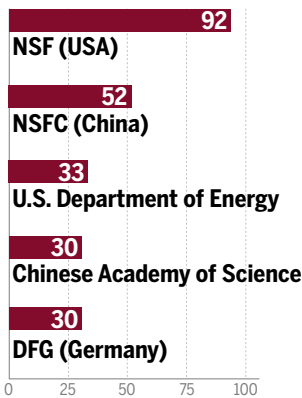
Scholarly Publications: 2022 Year in Review

“To The Stars Through Science”—it’s both our motto and our mantra, and it means we strive for greatness through scientific research, scholarly inquiry, in-depth study and relentless determination. This pursuit was quantified through the following Scopus data:



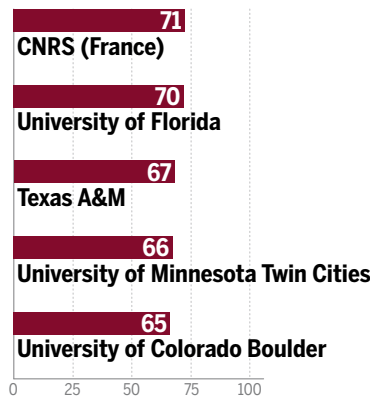
Top funding sponsors

The two largest U.S. funding sponsors were the National Science Foundation and the U.S. Department of Energy, but the international nature of our faculty’s collaboration meant they also worked with agencies in China, Germany, Brazil and more.



Top co-author institutions

Co-authors came from many institutions around the world. The French National Centre for Scientific Research (CNRS) overtook the University of Florida as the institution we co-authored with the most.



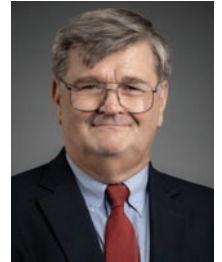
Subject areas

Subject areas spanned industries, from “physics & astronomy” to “veterinary,” and included the following:

- » Physics & Astronomy
- » Engineering
- » Computer Science
- » Mathematics
- » Earth & Planetary Sciences
- » Environmental Science
- » Materials Science
- » Psychology
- » Social Sciences
- » Agricultural & Biological Sciences
- » Chemistry
- » Energy
- » Biochemistry, Genetics & Molecular Biology
- » Business, Management, Economics, Finance & Accounting
- » Medicine & Health Professions
- » Arts & Humanities
- » Decision Sciences
- » Pharmacology, Toxicology & Pharmaceutics
- » Multidisciplinary
- » Neuroscience
- » Immunology & Microbiology
- » Veterinary

Robert Taylor Receives DePuy Award for ROTC Support

As dean of Florida Tech’s College of Psychology and Liberal Arts and its leading military historian,



Robert Taylor was well aware of Gen. William DePuy’s writings and illustrious career, which included oversight of the ROTC program as the first commander of the Army’s Training and Doctrine Command in 1973.

What Taylor did not know—but now, will never forget—is that Gen. DePuy is also the namesake for one of the Army’s top awards associated with its ROTC program. Established in 2005, the national William E. DePuy Award is presented annually to an individual who exerted a significant influence on the success of the Army ROTC program throughout the previous calendar year.

For 2022, that individual was Taylor.

Presented the award in a surprise announcement at the end of his orientation chat with incoming ROTC cadets in mid-August 2022, the normally loquacious Taylor was momentarily stunned into silence.

“For once, I am speechless,” he said as the gathered cadets and ROTC leadership applauded.

“I’ve gotten to do a lot of cool stuff in my career, but one of the coolest things I’ve ever done in my career is being with you and your colleagues,” he said, pausing to collect himself. “Thank you. This means a lot.”

High School Outreach Through the Power of STEM

High school students, parents and teachers participated in a host of memorable hands-on learning experiences Nov. 8, 2022, at Florida Tech's Center for Advanced Manufacturing and Innovative Design (CAMID) during its STEMPower Day. A taste of the college life, the event celebrated science, technology, engineering and mathematics during 20 varied interactive sessions, such as:

STEMPOWER Day

FLORIDA TECH



"From Cockroaches to Monkeys: Inside the Minds of Animals"



"The James Webb Space Telescope: A Tour de Force of Space Science"



"King of the Packet: Cyber-attacking Remote-controlled Cars"



"SHARKS! Research, Conservation, and Why You Should Care"



"Digital Design: Jet Dragster Edition"



High school students participate in hands-on learning experiences at CAMID during Florida Tech's inaugural STEMPower Day, an event celebrating science, technology, engineering and mathematics.



Panther Battalion Commissioning Ceremony

Five cadets from Florida Tech's Army ROTC Panther Battalion were commissioned into the U.S. Army as second lieutenants Dec. 16, 2022. The ceremony featured guest speaker Brig. Gen. John M. Dreska, who commands the 311th Sustainment Command (Expeditionary) in Los Angeles, a position he has held since April 2021.

Pictured here:
JARED G. BLANCO '22



Giving Back to the Game

Men's soccer great Robin Chan talks leadership, legacy and leaps of faith

By Jerry Durney and Christina Hardman

If you were to ask someone, “Who is among the most important people in Florida Tech men’s soccer history?” the name **ROBIN CHAN** ’91, ’93 MBA, would come up almost immediately.

Between his time first, as a player and now, as head coach, Chan has been an active part of the Panther soccer program for 21 years.

Over 30 years after helping put Florida Tech on the map as a national soccer power through his play on the field, Chan has helped bring the Panthers back to contention once again, this time, from the sidelines.

That fact and the résumé he has continued to craft in this time frame, however, cannot do justice to the path that Chan took to get where he is now.

Today, people can do a simple internet search to find what they need to know about a school. Chan did not have that luxury while living in his childhood home of Walton-on-Thames, England, in summer 1987.

“It was a particularly late process—like, a really late process—in terms of my getting here for that first season,” Chan says. “It was in the summertime that I was being recruited; **CHRIS PAYNE** [’91], as well. I think it was maybe three, four weeks that we were deciding that we’re going to go and get on the plane.”

After arriving in Melbourne on what he describes as “a leap of faith,” Chan immediately fit in as a Panther. He finished his collegiate career as a three-time First Team All-Sunshine State

Conference (SSC) selection and earned a Second Team All-American nod in his senior season in 1990.

He helped the crimson and gray earn back-to-back SSC Regular Season Championships in 1988 and 1989. To this day, he remains in the program’s career top 10 for goals, assists and points. He was inducted into the Florida Tech Sports Hall of Fame in 2003 and the SSC Hall of Fame in 2008.

His crowning achievement in a Panther uniform came during his sophomore season in 1988, as he scored in Florida Tech’s 3-2 victory at California State University, Northridge, to secure the university’s first national championship.

After concluding his professional playing career, the game brought him back to Babcock Street, as he became

head coach at Melbourne Central Catholic High School, where he led the Hustlers to two state championships and five final four appearances between 1998 and 2005.

That’s when his alma mater came calling, hoping that one of the men who had helped elevate the program to such heights nearly two decades before could bring the Panthers back to that place after some down years following the retirement of legendary coach Rick Stottler.

Starting his first season in fall 2005, Chan realized that it was essential to build something that could be sustainable for the program’s long-term success as opposed to an immediate winner.

“It wasn’t all about winning right away. It was about trying to build, and it starts with building little blocks,” he says. “I think we first had that in the first couple



Robin Chan helped the crimson and gray earn back-to-back SSC Regular Season Championships in 1988 and 1989. To this day, he remains in the program’s career top 10 for goals, assists and points. He was inducted into the Florida Tech Sports Hall of Fame in 2003 and the SSC Hall of Fame in 2008.



Florida Tech men's soccer coaches celebrate the team's 2022 SSC Tournament championship victory over Barry University Nov. 6, 2022. Left to right: Martin Peat '98, Robin Chan '91, '93 MBA, Nick Robinson '12, '13 MBA, Chris Callaghan

of bigger classes that came with players like **DEAN FAITHFULL** ['11], **RYAN MOON** ['11, '14 MBA,] and **NICK ROBINSON** ['12, '13 MBA]. When those guys stuck in the program, they recognized that they had a responsibility at that point. We were investing in them to come in and help us build the program back, and I think that they really bought into that."

Since the start of the 2010 season, the Panthers have finished inside the top four of the SSC six times, have received three NCAA Tournament berths and have been ranked inside the nation's top 25 at some point in six of the past seven seasons, reaching the top 10 in three of those seasons. Thirty players have been named to the All-SSC team, including 12 on the First Team. Chan has been named Coach of The Year twice, and in the 2022 season, he and assistants Robinson, Chris Callaghan and **MARTIN PEAT** '98 were named Coaching Staff of The Year.

The 2022 season saw, what is to this point, the high-water mark of Chan's tenure, with the team going unbeaten during the regular season, ranking inside the nation's top 10 for seven weeks and, on Nov. 6, 2022, earning the program's first SSC Tournament championship title, with a resounding 4-1 victory at Barry University in the final. The team earned the No. 1 seed for Super Region 2 in the NCAA Tournament and, ultimately, reached the Sweet 16. Four players were named to the All-SSC team, and goalkeeper Luis Tovar Romero was

named the conference's Defensive Player of The Year.

If you ask those who have played for and coached alongside Chan, his biggest strengths are his man-management skills and his genuine care for his players that goes well beyond the pitch.

"As a player, you may think that it was a quick decision in the game or for a starting lineup. But the reality is, it's a talk. It goes on a lot, back and forth and thinking about how it's going to affect everyone's mentality," says Panther women's soccer head coach Moon, who played for Chan and later served alongside as an assistant coach. "I learned that from Robin when I moved into the coaching role. I think seeing his management of players and his availability to talk and listen mostly to players gave them that feeling of trust that I had for him when I was a player. I saw how he cultivated those relationships with players from the other side."

"It was more than what I could ask for," says **SAM SAWYER** '17, who also went on to serve as an assistant for Chan after becoming the first Panther to win SSC Defensive Player of The Year in 2016. "He was always there for me if I needed something to talk about. Or if it was, 'Sam, we need to talk,' he would always take the time to come and have a chat. The door was always open, and if there were any issues that you had, you were always able to move on from there. He would always look after you."

Moon and Sawyer aren't the only Panthers who were inspired by Chan

to get into the coaching side after their careers at Florida Tech. **JOE BARBER** '14 was recently named Appalachian Athletic Conference Coach of the Year in his first season at Milligan University. **GARY OGILVIE** '13 serves as assistant coach at the University of Charleston, which also made the NCAA Tournament this season. Robinson has served as the top assistant at Florida Tech for each of the past two seasons.

This isn't just a sign of the influence that Chan had on his players, but it's something he had hoped for, as well—a way of paying forward the game that helped give him the life he lives today.

"I think it's really rewarding. I think it's important for players to feel like they should give back to the game. Whether it's youth coaching or whatever," he says. "I think college is another step that shows your dedication to wanting to be a coach after that. I think that motivation was there for me when I finished playing and was feeling like I had responsibility to give back to the game."

The bonds and the culture that Chan helped build both on and off the pitch have manifested themselves in truly poetic ways.

As the Panthers hosted Lander University in a thrilling second-round NCAA Tournament matchup that Florida Tech ultimately won on penalty kicks, several of Chan's former players were among the crowd at Rick Stottler Field and eager to celebrate with their former gaffer afterward. When you talk with them about their coach, it becomes very evident as to why.

"I think that was the main thing that Channy installed in you: It was, 'You're a family at the end of the day—whoever played before you, whoever played after you,'" Sawyer says. "At the end of the day, Channy has so much time for anyone. No one has a bad word to say about him, and everyone wants to see him do well. And that's why people stay around and support the team as much as they do. It's mainly because of Channy."

Now married with two sons, Chan talks with contentment and relief about the decision he made to choose Florida Tech that summer, despite having received offers from Division I schools.

Sometimes, a leap of faith can benefit many.

MARC BAARMAND

On Quantum Mechanics: From Epistemology to Technology

What I find most fascinating about quantum mechanics is how it stretches our imagination to its limits.

Over the last hundred years, physicists have developed quantum mechanics as the best description of natural phenomena at a subatomic level, with far-reaching ramifications even at a macro level, like better understanding of the solid state of bulk matter.

One of the founding principles of quantum mechanics is Niels Bohr's complementarity principle that states that certain entities could be separately described in terms of contradictory properties.

A prime example is light, which, depending on the phenomenon, may be best described as a wave or as a particle. Early in the 21st century, this idea of wave-particle duality was extended to all matter, e.g., an electron has both particle and wave properties. Louis de Broglie formulated its wave property in terms of a wavelength determined by the electron momentum.

The wave-particle duality is regarded as the first quantum revolution. The vast amount of knowledge acquired using this concept led to new physics, such as superconductivity and superfluidity, and to the invention of new technologies, such as transistors and lasers. It is captivating to see how such a remote concept ends up making such a significant impact in our everyday life—imagine a world without computers and cellphones, which have transistors as their building blocks.

We are now at the cusp of a second quantum revolution. The concept, which has no parallel in classical physics, is called quantum entanglement. It involves a bipartite system: When a property of

“

Looking beyond epistemology, quantum entanglement lays the foundation for several revolutionary, newly realized applications, such as quantum computing, quantum teleportation, quantum simulation and quantum cryptography. This is truly the dawn of a new quantum information era!

”

one part is determined by a measurement, that property of the second part is also determined instantly, no matter how far apart the two parts are. This is very intriguing, as no superluminal information can travel from one part to the other.

Several well-designed optical experiments with entangled photons have shown the effect to be a fact of nature. This year's Nobel Prize in physics went to three physicists, Alain Aspect, John Clauser and Anton Zeilinger, who conducted some of these experiments.

Looking beyond epistemology, quantum entanglement lays the foundation for several revolutionary, newly realized applications, such as quantum computing, quantum teleportation, quantum simulation and quantum cryptography. This is truly the dawn of a new quantum information era!

Here, at Florida Tech, I am working with my students to devise a new measurement of quantum entanglement with a nonoptical quantum system, namely, a bipartite system made of a pair of top quarks. These are elementary particles that are copiously produced in collisions of protons in the Large Hadron Collider accelerator in Geneva, Switzerland.

I am a charter member of the Compact Muon Solenoid (CMS) experiment, which is one of the two large general-purpose experiments collecting data from proton collisions. Measurement of quantum entanglement with entangled top-quark pairs in a completely different environment should bring us better insight of this quintessential feature of quantum mechanics, which could pave the road to new applications and technologies that will advance our civilization in more ways than we can conjecture now.



Flight Potential to Planet 9

Planet Nine is an oft-discussed hypothetical planet in the outer region of the solar system. A new study involving Florida Tech astrophysicist Manasvi Lingam helps illustrate how we could get there.

The study, “Can We Fly to Planet 9?” is from Lingam and researchers Adam Hibberd and Andreas Hein. The team discovered that using current, unmanned transportation methods, it would take 45 to 75 years to get to Planet Nine, which is about 42 billion miles from Earth. By comparison, Pluto, which is the ninth object from the sun, is roughly 3 billion miles from Earth.

The team also studied near-future transportation methods nuclear thermal propulsion and laser sails. Using nuclear thermal propulsion, it would take approximately 40 years to reach Planet Nine. It would take merely six to seven years to reach Planet Nine using laser sail propulsion, which involves using light from lasers to propel the vehicle.

Normally, when seeking more information on a planet, researchers use telescopes or send spacecraft to the planet. Planet Nine is too far for current telescopes to garner much data, so transportation methods

were also examined in this work with an eye toward taking the steps necessary to learn more about the planet, such as its atmosphere (if one exists).

It could be a rocky planet, like Earth, or a miniaturized version of Neptune, Lingam said. Its origin is also the subject of discussion, whether it formed initially in the solar system or was captured from elsewhere by the sun’s gravitational pull.

In their research, team members used the principles of orbital mechanics, sometimes called spaceflight mechanics. They entered the complex and nonlinear mathematical equations into a computer and then solved those equations with some optimization constraints.

“Ideally, you want to maximize or minimize some quantity as much as possible,” Lingam said. “You might say, ‘Well, I want to minimize the flight time of the spacecraft as much as possible.’ So, what we did is that we put in an optimization constraint. In this case, it happens to be minimizing the time of journey. You solve the mathematical equations for a spacecraft with this condition, and then you end up with the results.”

Biochar May Help Fight Against Harmful Algal Blooms

Florida Tech researchers are examining a novel sustainable approach to address harmful algal blooms in Florida's lagoons.

Toufiq Reza, biomedical and chemical engineering and sciences assistant professor, and Spencer Fire, ocean engineering and marine sciences assistant professor, have collaborated in researching mitigation and control of harmful algal blooms. Their goal is to use locally produced, low-cost sustainable biochar to control harmful algal blooms in St. Lucie Estuary, Indian River Lagoon, Tampa Bay Estuary and Sarasota Bay.

The biochar, a porous carbon material, is created using waste biomass, such as agricultural wastes or sargassum, a floating seaweed algae that has been in the news recently for overtaking beaches in South Florida and Mexico. Using a high-temperature retort—like a furnace—the waste is turned into biochar, which would be then spread across the lagoon water. As with the activated carbon in a Brita or PUR water filter, the biochar

would absorb the toxins in the water and, ultimately, fall to the bottom, trapping the toxins in the process.

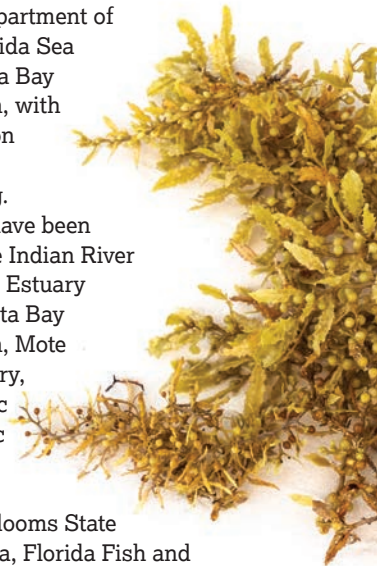
“Our goal is to use that biochar to remove toxins from different harmful algal blooms, like red tide, Pyrodinium and blue-green algae” Reza said. “So far, the result has been amazing.”

It has been an eye-opening experience for students, Reza added.

“Students have been highly motivated. For example, originally from Jamaica, **CADIANNE CHAMBERS** [’21], a chemical engineering Ph.D. student, has seen firsthand the harmful algal bloom and sargassum in her country. She’s been excited about how effective biochar could be to mitigate harmful algal blooms. Other undergraduate students, like Russell Smith from Ohio and Savannah Grimes from Illinois, are also aware of the harmful algal bloom devastations on the Great Lakes, and they are excited to find an engineering solution using their engineering knowledge.”

The research is funded by the U.S. Environmental Protection Agency, U.S. Department of Agriculture, Florida Sea Grant and Tampa Bay Estuary Program, with about \$1.2 million in combined research funding.

The projects have been supported by the Indian River Lagoon National Estuary Program, Sarasota Bay Estuary Program, Mote Marine Laboratory, National Oceanic and Atmospheric Administration (NOAA), NOAA Harmful Algal Blooms State Liaison of Florida, Florida Fish and Wildlife Conservation Commission, Florida Sea Grant Extension Offices of Brevard, Martin and St. Lucie counties, and local industries.



Researchers Find Tiger Sharks Return to Nurseries

As conservationists learn better ways to preserve and protect marine life, new Florida Tech research investigating the movement patterns of tiger sharks may help safeguard the near-threatened species.

“Age-Dependent Dispersal and Relatedness in Tiger Sharks (*Galeocerdo cuvier*)” is a new publication featuring Florida Tech shark biologist Toby Daly-Engel, Margaret (Maggie) McClain, a student of Daly-Engel’s when she taught at University of West Florida, and researchers from the University of Miami, Florida State University, Mississippi State University, South Carolina Department of Natural Resources, Saving the Blue, Bimini Biological Field Station, Beneath the Waves and the Mississippi-Alabama Sea Grant Consortium. The paper was published in the July edition of *Frontiers in Marine Science*, and the research looked at the northeastern Gulf of Mexico, Bahamas, Florida and South Carolina coasts to study the dispersal patterns of tiger sharks.

Researchers discovered that not only do female sharks return to nurseries for reproduction, but so do male sharks, with the goal of finding mates. They also discovered 8.9% of the tiger sharks studied were closely related to one another, showing not only that sharks returned repeatedly to the areas studied, but also that the species is declining in numbers, likely due to overfishing and environmental changes.

Sharks are what Daly-Engel and other researchers call “roving predators,” meaning that they don’t have a specific territory, making the discovery of their consistent return to specific areas even more noteworthy. The mother sharks use shallow areas, such as river lagoons, as nurseries. This includes the Indian River Lagoon, a common nursery for bull sharks. Past research showed that a lot of female sharks use the same habitats where they were born to give birth to their own pups, but researchers assumed that since male sharks didn’t have to

give birth, they didn’t return to the nursery habitats.

Because of the diverse shark population that Daly-Engel compared to “taking a bunch of watercolors and mixing them together,” McClain dug deeper into the data, taking out the largest sharks from the sample and reanalyzing it. When McClain got down to sharks that were under 8.5 feet, the team saw there were three unique genetic populations of sharks just in this small part of the world.

“It’s this repeated behavior that males are apparently doing as well,” Daly-Engel said. “What we were able to see in our data, the signal that they were looking at, we found it while looking at nuclear DNA, the DNA that an animal inherits from both its mom and its dad. Because that signal showed up nice and strong, we know that it must result from both male and female sharks going back to the same areas year after year to reproduce over hundreds of thousands of years.”

F. ALAN SMITH DISTINGUISHED LECTURE

Mike Moses on the Transformational Power of Space Tourism

With a career at NASA and in the commercial space industry that has spanned nearly 30 years, **MIKE MOSES** '91 M.S. has met plenty of astronauts. No matter the nature of their mission, their country of origin or how long they were in space, all of them, he said, returned with a new perspective on Earth made possible by what so few of us have seen: our planet from more than 50 miles above it.

Moses is making it his mission to broaden that group.

He discussed this and more in his presentation, "The Expanding Influence of Private Commercial Human Spaceflight," at the F. Alan Smith Distinguished Lecture in September 2022.

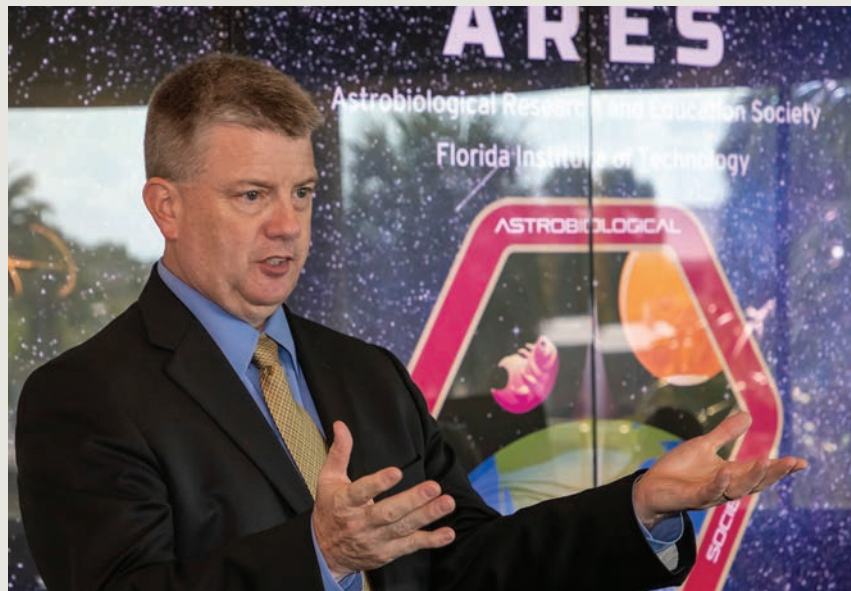
At space launch company Virgin Galactic since 2011, where he is president of space missions and safety, Moses is witnessing and helping to shape the nascent space tourism industry.

Leading the company's human spaceflight efforts, he is bullish on the eventual democratization of space tourism, where a \$450,000 ticket on his company's SpaceShipTwo Unity is among the most affordable suborbital experiences currently offered.

"It's an exciting job," he said. "It's a lot of responsibilities, but it hits exactly what I'm passionate about: the operations side of human spaceflight, the management and the safety that you have to do to be good at that, as well as just the personal delivery of something that can be transformative and life-changing."

Moses said his educational experience at Florida Tech was critical for his professional success.

"It really prepared me. Everything was targeted very practically. It wasn't just academics for the sake of academics," he said of his space sciences master's degree program. "The other big thing was just the comprehensiveness of the degree. When I came here, all of the years of undergraduate work kind of



Mike Moses '91 M.S. speaks to students at the Digital Scholarship Lab ahead of his keynote address at the F. Alan Smith Distinguished Lecture.

“The more people who get to make space part of their life, ... the more we start to transform society and the way people think about space access and what space does for ... the earth-based societies.”

—Mike Moses

clicked for me, and it started to make sense. That's really served me well in my career.”

Guided by a mission of “space for all” at Virgin Galactic, Moses is passionate about expanding access. But he realizes we are not there yet, and not everyone can afford the journey.

The most seismic force to push prices lower will be the sustained success and rising frequency of space tourism, he said. This is why Virgin Galactic is developing a fleet of reusable spaceships. With that fleet, it can offer more flights. That allows the cost of the ships to be covered, and then the earnings become profit, resulting in lower ticket prices.

Moses noted that the power of the journey can affect those not on the trip, too.

“The more people that get to make space part of their life, ... the more we start to transform society and the way people think about space access and what space does for the local economy, the earth-based societies,” he said.

Moses also discussed what he calls “space for Earth.”

“You can go to space to do science and research and exploration and operations to continue to explore space. That's space for space. Or you can use it as a platform to develop things that apply back here, on Earth. Suborbital technologies are an example of that,” he said.

Prime is a quantity.

Unique, a product unachievable by any two other numbers. 1, 2, 7 ...

Prime is a quality.

Excellent, of the highest caliber. Outstanding, Choice, Top-Notch...

In both quantity and quality, this column features Prime Examples of what makes us Florida Tech.

PRIME EXAMPLES *of* GENEROSITY

There are three T's of generosity: time, talent and treasure. And while all of the hours we spend, efforts we exert and items we share are valuable gifts, true generosity goes beyond a readiness to give. It is giving more than is necessary or even expected—the voluntary, the gratuitous, the extra mile. At Florida Tech, we give it all. A hoot. Our best. The time of day.

Here are a few prime examples.

Day of **GIVING**

1

The generosity of Panthers across the globe did not disappoint during Florida Tech's eighth annual Day of Giving event Nov. 17, 2022.

2,514
donors from **53 U.S. states and territories** and **22 countries** raised

\$609,313

Thank you, Panthers!

★ ★ ★ ★ ★

2

ALTRUISTIC FACULTY

KELLI HUNSUCKER '07 M.S., '13 Ph.D.

Assistant Professor,
Ocean Engineering
and Marine Sciences

In October 2022, Hunsucker led Florida Tech's participation in the Ocean Research and Conservation Association's fifth annual A Day in the Life of the Indian River Lagoon event, examining oyster mats at Ryckman Park as part of the university's Living Docks program.



“Anytime that you can do something that’s hands-on, it’s more meaningful; it’s more memorable; it makes a greater impact.”

—Kelli Hunsucker '07 M.S., '13 Ph.D.

ABRAM WALTON

Professor, Nathan M. Bisk
College of Business

Since 2013, Walton, director of Florida Tech's Center for Innovation Management and Business Analytics, has volunteered his time and expertise as founding chairman of the Innovation Council for the Economic Development Commission of Florida's Space Coast (EDC).



“The EDC formed the Innovation Council to support a culture where innovation and collaboration can happen.”

—Abram Walton (*Space Coast Daily*)

7

STUDENT-RUN CHARITY EVENTS



Big Day of Service

Benefiting: Second Harvest Food Bank of Central Florida (in 2022)

SGA Giving Tree

Benefiting: Toys for Tots

Relay for Life

Benefiting: American Cancer Society

Swab-a-Cheek with TKE (Tau Kappa Epsilon)

Benefiting: Gift of Life Marrow Registry

It's on Us Donation Drive

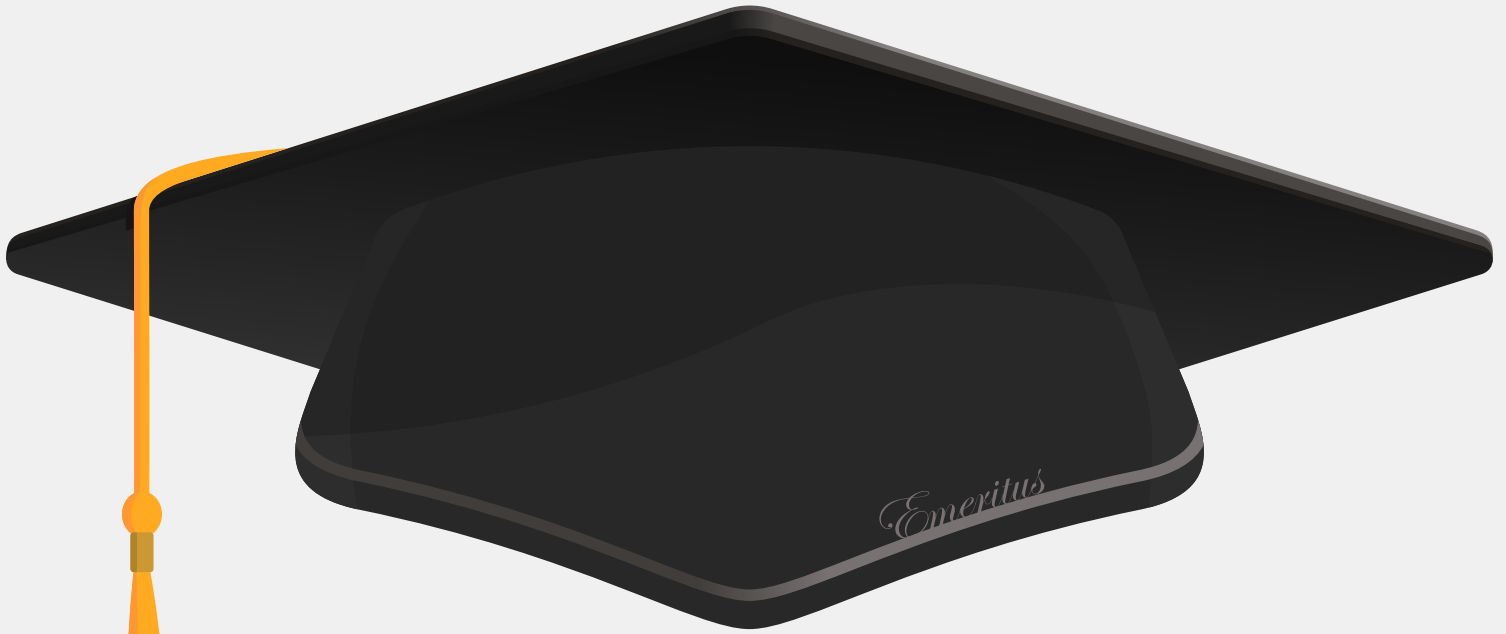
Benefiting: Women's Center of Brevard

November

Benefiting: November Foundation for men's mental health and suicide prevention

Greek Life Karaoke for a Cause

Benefiting: Joy and Gordon Patterson Botanical Garden



Faculty Emeriti: A Different Kind of 'Alumni'

**Panthers through and through,
retired faculty members maintain
strong ties with Florida Tech while
pursuing new adventures.**

By Ryan Randall

What does it mean to be faculty emeritus for a university? The answers vary.

For some, it's a means to stay academically active, doing things that benefit the world, as they have done their whole careers, but also doing things that, of course, benefit the university.

Florida Tech's emeritus faculty stay connected to the university through the Emeriti Officers organization. Among others, benefits include library privileges for personal and professional use, retaining a Florida Tech email address and admission to regular faculty events.

As much as they did, and continue to, enrich the university, Florida Tech's faculty emeriti also enrich the communities around them.

Carrying the Message

Michael Grace joined Florida Tech as an assistant professor in the biological sciences department in fall 1999. Rising through the ranks and, eventually, becoming a full professor, he built and ran the university's behavioral neuroscience research lab and taught several classes. Studying the neurobiology of vertebrate animals as it underlies complex behavior, Grace's focus was sensory biology related to vision.

Some of Grace's studies involved snakes, including pit vipers and pythons. They garnered international attention through numerous appearances on National Geographic television, the Discovery Channel and other outlets. His research team studied the mechanisms in a snake's infrared imaging system with the goal of building better artificial infrared detectors. He also studied tarpon and whales, aiming to understand how they perceive their environments and trying to help their conservation.

"We discovered that when tarpon begin life with only one kind of light detector, they are colorblind," Grace says. "But our research showed that by the time they're adults, they have five distinct color detectors—completely unheard of in the animal world. We believe

that this gives them extraordinary color vision with about 10,000 times greater color discrimination capability than we have."

In 2010, Grace also began to work in the administration, ultimately becoming a senior associate dean of engineering and science. Grace would remain in the administration until he retired in 2019.

"Ultimately, my retirement was about a new chapter in life—getting back to some other things that I really enjoyed," he says. "My son had graduated high school, and he had moved up to MIT. So, it was just time. My wife and I talked a lot about it. Deciding to step back from Florida Tech was one of the hardest things I've ever done. People often use this phrase loosely, but it truly was with a heavy heart. I had so many great friends and colleagues, and I had

Scouting honor society, as well as other outdoor programs.

Grace also collects and restores antique small boats, a passion grown out of Scouting. President of the international Wooden Canoe Heritage Association, Grace has nearly 100 very historic boats from around 1870 through the 1930s.

"I've always enjoyed the outdoors, and canoes are a great means of transportation in the natural world, quiet," he says. "Plus, you can get into very remote places and see aspects of nature that powerboats prevent."

While providing a legitimate academic affiliation that is important for staying active in the field is a valuable part of his faculty emeritus status, he says, Grace believes the title comes with a more important responsibility: serving as an ambassador for Florida Tech.



Michael Grace

"Good, happy, committed emeriti are great for Florida Tech because we do many things that reflect upon our university. We serve on boards; we are active in the community; and we remain active in scholarship."

watched the university change in so many ways—in so many great ways over the course of the time that I was a full-time faculty member."

Grace still maintains a presence in academia. In July 2022, the journal *Behavioral Brain Research* published his work on the snake infrared imaging system. He also has been teaching an online introductory biology class for about two years.

However, it's his work outside of the classroom that has taken him back to his outdoor roots. A very active Boy Scout growing up, Grace is on the board of directors of the regional Scouting organization and does a lot of work with Order of the Arrow, the

"We carry the Florida Tech message everywhere we go," he says. "Of course, there's a lot of history. Many of our emeriti were at Florida Tech for decades before retiring—20 years, 30 years or more—and there's a lot of institutional knowledge; there's a lot of history built into that. Good, happy, committed emeriti are great for Florida Tech because we do many things that reflect upon our university. We serve on boards; we are active in the community; and we remain active in scholarship. In all these things, we represent Florida Tech and, hopefully, we all represent Florida Tech very well."

"The opportunity to stay connected with the university and other retired faculty, those connections help ensure lifelong learning for me—something I've always believed in and promoted."



Mary Bonhomme

continued on page 20

Power of Community

Mary Bonhomme has a history of leadership during her time at Florida Tech.

As associate provost, online learning, and university professor and dean, she was responsible for the administration and launch of Florida Tech's partnership with Bisk Education Inc. to provide both undergraduate and graduate degree programs. She also shepherded the programs through the respective curriculum committees to obtain faculty approval of the degrees. Bonhomme is also a past Emeriti Officers president.

As an emeritus faculty member, Bonhomme still works with the university's chapter of Phi Kappa Phi honor society. She works with LEAD Brevard, an organization founded to enhance participation from community leadership in the county. Bonhomme worked with the Eau Gallie Rotary Club to install a peace pole as part of the international Peace Pole Project. Along with Friends of the Eau Gallie Library, she was part of the installation of a literary landmark honoring Zora Neale Hurston, a legendary author who lived in Eatonville, Florida. Bonhomme also teaches online graduate courses for the learning design and technology program at Purdue University.

For Bonhomme, being an emeritus faculty member is a way to stay linked to the university.

"The opportunity to stay connected with the university and other retired faculty, those connections help ensure lifelong learning for me—something I've always believed in and promoted," she says.

Bonhomme tries to promote the university.

"On our current European river cruise, there was a passenger on the ship wearing a Florida Tech Panther T-shirt, so I inquired and found out her son goes to Florida Tech and is a freshman in mechanical engineering," Bonhomme says. "I made sure he was doing OK."

When thinking back on memories she made at the university, Bonhomme remembers a Phi Kappa Phi initiation ceremony, during which a service member stationed overseas asked if his wife and daughters could attend on his behalf. Bonhomme said "yes,"

and the service member's wife traveled to Melbourne from Georgia. When it came time to accept his certificate, she and her daughters walked across the stage.

Bonhomme also fondly remembers the bonds formed among the students.

"Seeing all the online students who come to the graduation reception meet each other in person for the first time and the closeness they had developed through their studies showed the real power of community in online learning," she says.

Lasting Memories

As a professor in the College of Aeronautics, Donna Wilt served as



"It means still being family, like an alumnus. It's recognition for an important part of my life, a body of work and accomplishments over a career well lived."

chair of the flight education program, associate dean, faculty senate president, flight team advisor and Women in Aviation advisor.

Wilt is still involved in general aviation and various organizations.

A few years ago, she set up a nonprofit, Pelican Flying Club Inc., to provide safe, fun, affordable flying. She serves as club treasurer and maintenance officer and generally runs the club, a labor of love to pay it forward, like those who helped her when she was younger, she says.

"I especially like being able to provide pilots, those working toward being a professional pilot, a way to get their experience while enjoying the benefits of general aviation in a well-maintained aircraft at an affordable price," she says.

She also works with Experimental Aircraft Association Chapter 1288 in Valkaria, Florida, as well as The Ninety-Nines, an international organization of licensed female pilots.

Being an emeritus faculty member means remaining connected to the university for Wilt.

"It means still being family, like an alumnus," she says. "It's recognition for an important part of my life, a body of work and accomplishments over a career well lived."

Florida Tech continues to be a presence in Wilt's life, in part through her research with current Florida Tech faculty.

Wilt is collaborating with College of Aeronautics professor Meredith Carroll on a book chapter about human-computer interface in general aviation, and she is serving periodically as a subject matter expert and research collaborator with Carroll's ATLAS (Advancing Technology-Interaction and Learning in Aviation Systems) Lab. Wilt also attends lectures and social activities on campus and in the College of Aeronautics.

She volunteers for the National Intercollegiate Flying Association (NIFA), recently serving as a judge at

NIFA's Safety and Flight Evaluation Conference (SAFECON) Region IX competition, where Florida Tech's flight team competed. Attending the conference as a judge was different from going as a faculty advisor, Wilt says, but she recognizes that these events depend on volunteer judges.

Past trips to the conference have allowed for some lasting memories.

One year, the team flew to Selina, Kansas, for the National SAFECON competition with three Florida Tech planes plus Wilt's personal Cessna. The first transcontinental flight as pilot for the students included a layover in Memphis, Tennessee, where they visited the famous Beale Street and indulged in its signature Memphis barbecue. Departing the next day, one aircraft had an instrument failure and returned to the airport. Waiting in Memphis for parts and repair would have caused those in the aircraft to miss a large part of the competition.

"The instrument repair facility turned out to be at Fort Smith airport on the way to Selina, so the pilot crew replanned their flight to fly to Fort Smith and waited while the instrument was repaired," Wilt says. "After another layover in Fort Smith, the flight was on its way and arrived at Selina just in time to make the opening ceremony."

A Meaningful Experience

For 17 years as dean and professor at Florida Tech's College of Psychology and Liberal Arts, Mary Beth Kenkel enjoyed a career enhancing individual lives and the broader community through educational programs, research and services.

"My fondest memories are of graduation days," Kenkel says. "I was always so thrilled by seeing the pride and joy on graduates' faces as they came on stage to get their degrees. To know that I played some small part in preparing them for future filled with promise gave me great satisfaction and joy."

As an emeritus faculty member, she continues to live an enriched life.

Kenkel remains involved professionally through her work with the International Council of Psychologists, which is committed to promoting human rights, justice and world peace. Kenkel also continues to work as a reviewer for several psychology journals, keeping her up to date on the latest research and thinking about how psychology can be applied to address societal problems.

Kenkel has gotten very involved politically, doing voter registration and canvassing in the county in support of candidates and issues she supports.

"In doing so, I feel like I am doing something to address the pressing problems our country has been experiencing, rather than just complaining or being discouraged," she says.

Travel is also important to Kenkel, who has explored the U.S. through several long road trips and has had great fun and adventures doing so. She and her husband, Larry, are planning a visit to Croatia and Slovenia in March.

Florida Tech continues to be a part of Kenkel's life, as she keeps tabs on the university and its new programs

"I will always consider Florida Tech as an important and meaningful part of my life and professional identity."



Mary Beth Kenkel

and research through contact with past colleagues and students.

Being an emeritus faculty member is part of who she is, Kenkel says.

"It means that I will always consider Florida Tech as an important and meaningful part of my life and professional identity," she says. "Like cities you have lived in for a long time and then moved away from, they leave an important imprint in your life, and you know they had a significant role in making who you are."

Like an Alma Mater

Muzaffar Shaikh's teaching philosophy has four key dimensions: It is a lifelong phenomenon; it should be participative; it should entail an effective utilization of class time; and there should be proper feedback from both the teacher and the student.

In his time as a faculty member for Florida Tech, where he worked in the Nathan M. Bisk College of Business and later, the College of Engineering and Science from 1985 to 2018, Shaikh applied similar principles, serving, participating, utilizing his time and showing clear communication.

Throughout his career, he served as head of the engineering systems department, associate provost for industry partnerships and associate vice president for international partnerships, while teaching students.

Shaikh has seen the university change, not only from its physical appearance, but within the organization itself.

"Florida Tech has evolved tremendously over the years in terms of ranking and infrastructure change, academic area change," he says. "That also brought more faculty members, more staff members and so on."

Shaikh remembers being in the classroom and watching the faces of his students learning. Considering himself a teacher at heart, Shaikh felt most comfortable in the classroom. His passion for teaching was also rewarded, winning four teaching excellence awards: two from the College of Business, one from the College of Engineering and Science and one university honor.

Shaikh works in the industry as a consultant, something he had done throughout his Florida Tech career, as well. Working with international companies, he develops digital twin technology courses for employees.

Shaikh also works with the Patrick Space Force Base Defense Equal Opportunity Management Institute (DEOMI) to train new employees or cadets in diversity. As one of the panelists on Islam, he speaks with various community organizations about his faith.

Being an emeritus faculty member means a lot to Shaikh, and he is taking that passion to the next level as president-elect for the Emeriti Officers. He appreciates both the continued attachment to the university, as well as the recognition he and other senior faculty receive for their service throughout the years.

"Because it is a sense of belonging.

It's a sense of continued connection to, I should say, my alma mater," he says.



"Florida Tech is not my alma mater, but I consider it that way since I served so many years. So, the continuing information that Florida Tech is doing well, excelling in areas, gives me a sense of satisfaction."



Muzaffar Shaikh

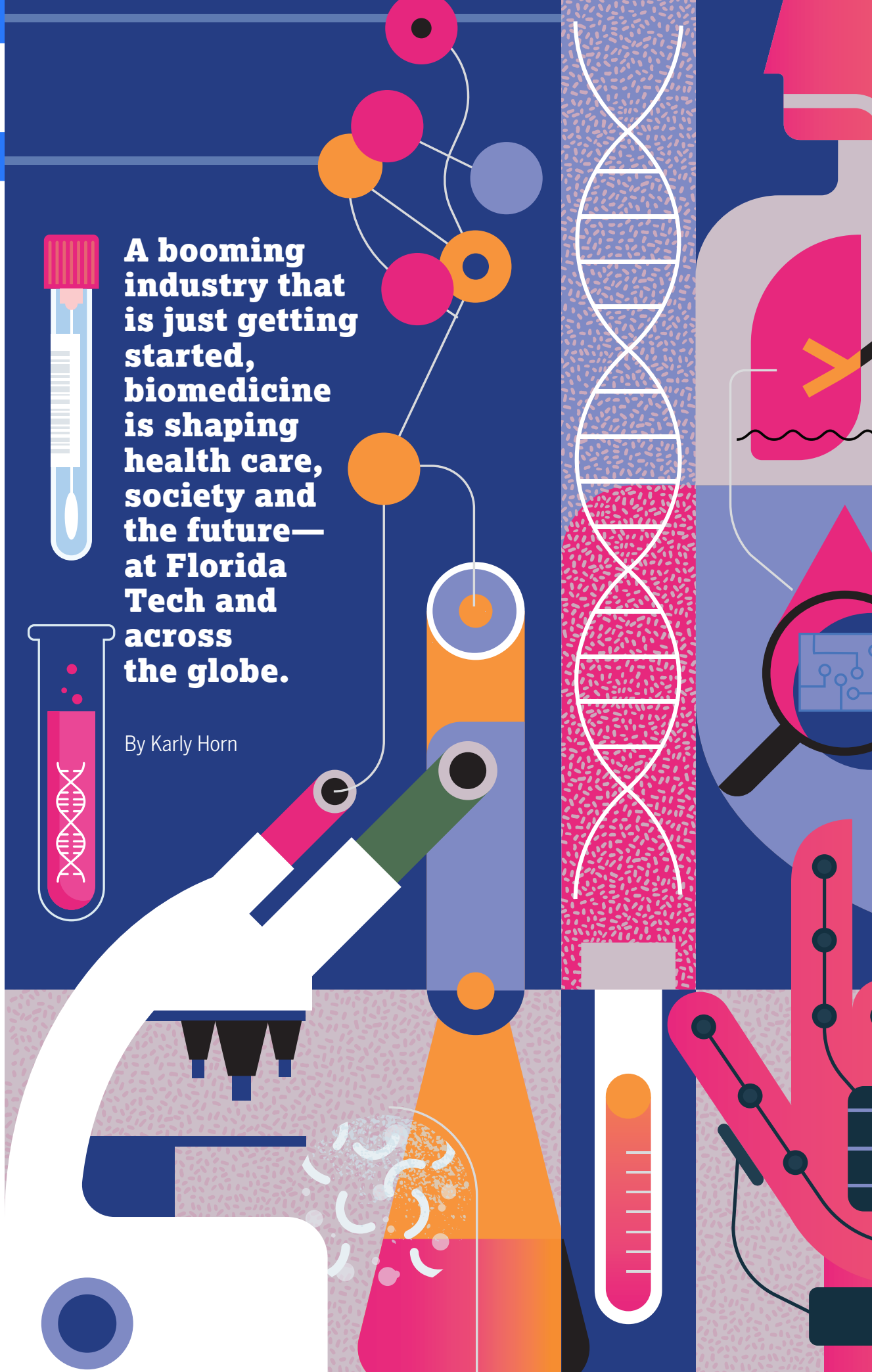
"It is a sense of belonging ... a sense of continued connection ... Florida Tech is not my alma mater, but I consider it that way since I served so many years."

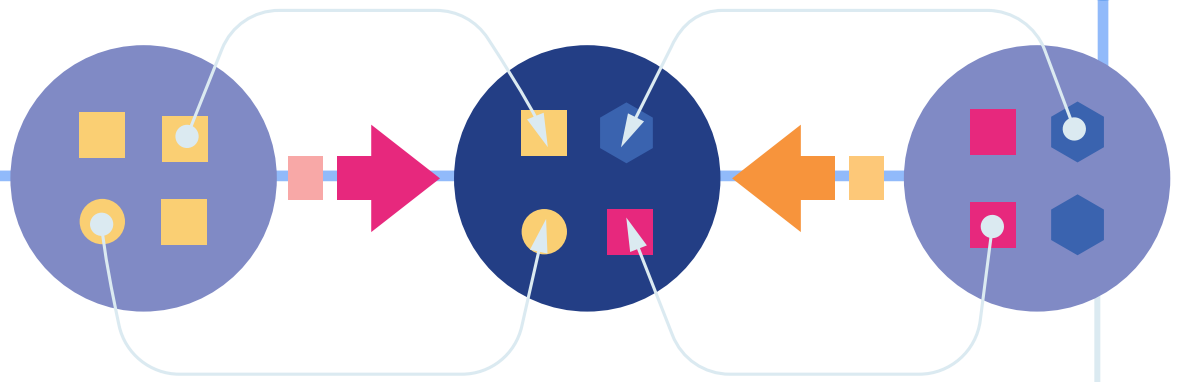
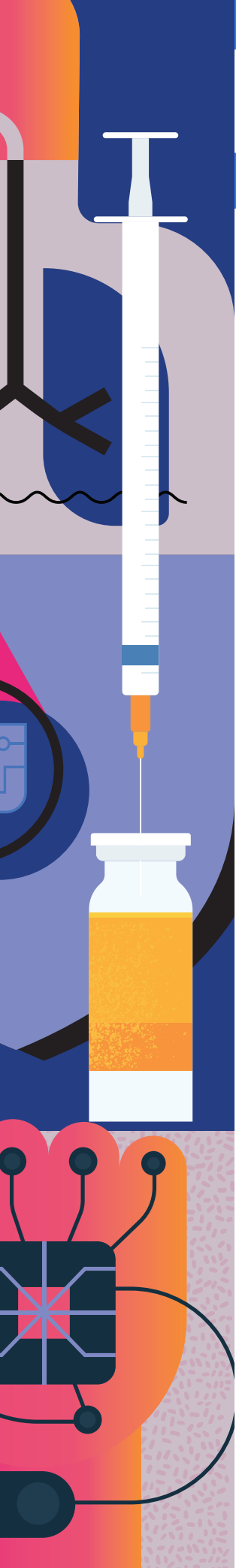
Breaking into Biomed



A booming industry that is just getting started, biomedicine is shaping health care, society and the future— at Florida Tech and across the globe.

By Karly Horn





Scientists can sequence a person's entire genome for \$1,000.

Doctors can laser a kidney stone to extinction, navigating a patient's body with live footage from microscopic cameras without a single incision.

Researchers can take a cell from a patient's body, grow it in a dish, reprogram it to attack a tumor and transplant it back into the patient.

No, this isn't science fiction. It's biomedicine. And it is changing the world.

A relatively new field, biomedicine—a term first introduced in the 1930s, preceded by “biomedical” a decade earlier—incorporates the aspects of medicine derived from the natural sciences, particularly biology, biochemistry and biophysics.

Florida Tech offers undergraduate degrees in both biomedical science and biomedical engineering, as well as a master's degree in biotechnology.

What's the difference?

Where biomedical scientists are more interested in basic research discoveries and developing therapeutics—understanding, diagnosing and treating disease—biomedical engineers typically focus on practical solutions—creating new technologies with medical applications.

Essentially, biomedical science evaluates “What?” “How?” and “Why?” while biomedical engineering and biotechnology aim to answer, “How can we fix it?”

While becoming a doctor is a popular career path for biomed students, it is one of many intertwining options within the greater scope of health care.

Researchers make initial discoveries. Biotech companies translate those discoveries into therapies. Pharmaceutical companies formulate the next groundbreaking medications. Engineers design and create tangible medical tools and prosthetics. And physicians apply it all to benefit their patients.

Aside from science and engineering careers, a biomedical mindset has benefits in fields such as patent law (Who made the most critical discovery first?), business (What are the most promising advances to invest in?) and education and outreach (How do we close the

disconnect between the basic sciences and the public's appreciation of science?).

“Career paths in biomed really span the gamut,” says Eric Guisbert, an associate professor in Florida Tech's biomedical and chemical engineering and sciences department, “and our alumni do it all.”

Nationwide, biomed is rapidly growing, with employment of biomedical engineers and scientists expected to grow by 10% and 17%, respectively, from 2021 to 2031—significantly faster than the average for all occupations, according to the U.S. Bureau of Labor Statistics.

Why?

Some attribute the increase to a demand for physicians—as the population ages, more people need more doctors.

Some recognize that as technology advances, so must its applications in all fields, including health care.

If you ask Guisbert, a biomedical scientist, it's the desire to change people's lives for the better that draws people to biomed.

“This is such an impactful part of everyone's lives,” he says. “We want to do everything possible to help patients—those with Alzheimer's, cancer and other diseases. It's very rewarding because we're doing something important. We're trying to help humanity.”

The biomed boom is just beginning, and with proper nurture and collaboration, the Space Coast is poised to become a hub of biomedical innovation and advancement.

Florida Tech is leading the charge.

On campus, we have students conducting advanced biomedical research in areas such as regenerative medicine, tissue engineering, nanotechnology and more.

continued on page 24

continued from page 23

Administration is investing in cutting-edge resources and facilities, like the new Gordon L. Nelson Health Sciences building, which features 20,000 square feet of classrooms and labs, augmented and virtual reality teaching tools and more, and is expected to double the size of the biomedical engineering program and drastically increase the size of the undergraduate premedical program.

As Florida's STEM university and home to the world-class Nathan M. Bisk College of Business, we are cultivating the next generation of both STEM-minded businesspeople and business-minded scientists and engineers to develop and market the next "big thing" in biomed.

With the know-how to attract investors to fund said "big thing," are university-affiliated entrepreneurial organizations, such as weVENTURE Women's Business Center. And with the resources to build and cultivate it, is the Center for Advanced Manufacturing and Innovative Design (CAMID), Florida Tech's innovation accelerator that connects businesses of any size with advanced manufacturing resources and faculty expertise.

Factors such as these, paired with the university's location in the heart of Florida's high-tech corridor, have laid the groundwork for Florida Tech's most recent step toward biomedical

renown: an affiliation agreement with Burrell College of Osteopathic Medicine (details on page 26).

In its first year, the affiliation, announced in January, will bring 100 first-class medical students to campus, where they'll receive a top-notch education from an established, reputable medical school fortified by access to Florida Tech's state-of-the-art tools and facilities.

In a rapidly evolving industry with so many diverse yet connected facets, collaborations such as these present the opportunity to share not just equipment, but ultimately, ideas, vision, perspective.

Seeking some of this perspective, we spoke to a few Florida Tech alumni—now and forever, our most valuable contribution to the biomed industry—about the most impactful ways biomed is shaping health care, society and the future. »



Theodore Schuck

DEGREE: '16 MBA, Health Care Management

OCCUPATION: Family Medicine Doctor and Chief Medical Officer, Brevard Health Alliance

Putting medicine in the patient's hands.

Wearable EKG and continuous glucose monitors, biosensors, smartwatches and fitness trackers enable you to check real-time health stats like heart rate, blood pressure, blood sugar and oxygen levels, sleep health and more with a quick glance at your cellphone—quite literally, putting your health in your own hands.

"Thanks to these new technologies, we're seeing individuals' health care being placed more so on the patients themselves, and physicians being the guide, but not necessarily the treater," says **THEODORE SCHUCK** '16 MBA, a family medicine doctor and chief medical officer at Brevard Health Alliance. "You're going to be your own best advocate for health care."

Since he graduated from medical school over 10 years ago, Schuck, who earned his MBA in health care management from Florida Tech, has seen patient-guided treatment make its way to the forefront of health care. This, he says, is in response to both technological advancements and a general shift from acute care to more chronic disease management.

"People are living longer. So, they have to be able to manage some of these disease states that, unfortunately, we can't cure, such as diabetes or heart disease," he says. "So, it's a matter of them being able to determine what they can do for their own health to feel better—whether it's taking their medicines, exercising or just knowing their status, and then reporting those results to their primary care doctor."

"It's important that we continue to grow from a technology standpoint. Like any other field, if we're not making innovations and changes, then we're not progressing."

Improving patient outcomes.

“How can we use our current resources to improve people’s lives?”

That is the question **PAMELA FORERO** '17 continually strives to answer in her work as a process development engineer at Humacyte, a regenerative medicine company in Research Triangle Park in Durham, North Carolina.

Humacyte creates artificial blood vessels using human cells that scientists develop into tissue and implant into the body to restore blood flow.

Other options exist: an artificial blood vessel made from a synthetic graft or blood vessels extracted from a cadaver or another part of your body. But these either require additional surgery—posing additional risk—or have high infection rates—because the body rejects the unrecognized materials.

“We’ve worked with so many doctors who have told us, ‘Your product is going to change everything. It is saving lives,’” Forero says. “That is why I chose this career.”

Her work, Forero says, is never done. She and her team are continuously experimenting with ways to improve the process, working with scientists and engineers in several biomedical subfields with varying expertise.

“Take all the physics, all the chemistries, all the biologies, all the engineerings and apply those to the body—that’s what we do,” she says. “That’s the really cool thing about biomedical engineering. Everything is connected, and through collaboration, you can achieve something really, really mind-blowing.”



Pamela Forero

DEGREE: '17 B.S., Biomedical Engineering

OCCUPATION: Process Development Engineer, Humacyte

“Biomedical engineering, despite its many years, is still a new field, and I don’t think we even know all of the things we are capable of because it just keeps growing and growing.”

Personalizing medicine.

Before ever administering a therapeutic, scientists can know almost exactly how the treatment will affect your body—not a similar body. Not most bodies. Your body.

ISIAH MOSSIAH '20, '21 M.S., is a research associate at Hesperos Inc., an Orlando company that uses human-on-a-chip® technology to conduct disease modeling and drug testing. According to Hesperos, human-on-a-chip is an “interconnected, reconfigurable, multi-organ in vitro platform reproducing the functional aspects of human physiology, providing unprecedented visibility into how the human body will respond to chemicals and novel therapeutics.”

One application of the human-on-a-chip system involves differentiating a patient’s cells that are affected by disease and placing them in a microfluidic chip in conjunction with other relevant organ types. Then, researchers, like Mossiah, test whether different treatments can restore function when compared to healthy cells, ultimately, allowing the patient and his or her doctor to administer the most safe and effective medications.

“Personalized medicine is essential to improving the quality of care people get, especially those with rare diseases,” Mossiah says. “Instead of giving patients something that could potentially help them, we can give them something that we know could help them because we tested it prior.”

While other labs conduct similar research, Hesperos is one of few that have commercialized the technology, transitioning it from academia to industry.

“Ever since we decoded the human genome—and that was a huge, huge discovery—now it’s just trying to figure out what genes do what in the body and using that information to develop therapies that can actually help people,” Mossiah says.

Isiah Mossiah

DEGREE: '20 B.S., Genomics and Molecular Genetics B.S.; '21 M.S., Biotechnology

OCCUPATION: Research Associate, Hesperos Inc.

“The future of biotech is having people and companies that are multidisciplinary, allowing them to maximize the biological applications they’re trying to study.”



continued on page 27

Biomed Boost: Florida Tech and Burrell College of Osteopathic Medicine Announce Plans for Medical School

Affiliation Agreement Paves Way for Proposed 2024 Opening on Melbourne Campus



The Burrell College of Osteopathic Medicine (BCOM) and Florida Institute of Technology have entered into an affiliation agreement to establish a four-year osteopathic medical school on Florida Tech's Melbourne campus.

"We are excited about our proposed new campus in affiliation with Florida Tech. Over the past three years, we have operated a regional academic center in Brevard County for our medical students' clinical clerkship rotations; 34 of our third- and fourth-year students are currently conducting these rotations," says John L. Hummer, co-founder and president of BCOM. "Based upon the success of this regional academic center and the positive relationships established with key stakeholders, the natural next step was to develop an additional four-year medical school location in Florida."

The need for physicians is growing rapidly in the Sunshine State.

Florida will be short approximately 18,000 physicians by 2035, according to a 2021 study from The Safety Net Hospital Alliance of Florida and the Florida Hospital Association. The Association of American Medical Colleges (AAMC) reported that only 32% of Florida's population has adequate primary care and that nearly half of primary care physicians are expected to retire in the next 15 to 20 years.

Additionally, in 2021 research into the medical workforce, AAMC found that 47.4% of Florida-based medical school graduates practiced medicine in Florida, and 78.8% of physicians



who completed both medical school and residency in Florida remained in the state to practice.

"We desperately need the next generation of highly trained physicians around Florida and across our nation," says Florida Tech Interim President Robert King. "This affiliation with the Burrell College of Osteopathic Medicine allows Florida Tech and its students to be part of the solution to one of the biggest challenges facing our society today: ensuring adequate access to high-quality medical professionals. We are excited about the prospects."

BCOM executed the affiliation documents to open the additional location with Florida Tech in November 2022 contingent upon final approval from the college's accrediting body. The inaugural class will include 100 students and is expected to matriculate in July 2024 and to graduate in May 2028.

"We are grateful for Florida Tech's invitation to establish a mutually beneficial affiliation

agreement, which is based upon a shared mission of addressing the significant physician shortage, especially in underserved areas," says Dr. Bill Pieratt, dean of BCOM.

The medical school will be in Florida Tech's L3Harris Commons via a sublease agreement. Burrell students will be able to use Florida Tech's libraries, fitness facilities, student health services and housing. The agreement also allows for collaborative research and teaching opportunities between both institutions. A vital component of the affiliation agreement is the Medical School Pathway program, whereby Florida Tech premed students will be guaranteed admission into Burrell if they meet the established criteria for academic performance.

Marco Carvalho, Florida Tech's executive vice president, provost and chief operating officer, says that with their success in shaping the brightest young minds with hands-on instruction and

cutting-edge technology, BCOM and Florida Tech are a logical and powerful fit.

"We are pleased to welcome Burrell to our campus and look forward to the academic and research connections we will most certainly forge," Carvalho says.

To date, Burrell's campus in New Mexico has graduated 430 osteopathic physicians. Of its graduates, 99.5% have been successfully placed into medical and surgical residency training programs. Currently, Florida ranks third in the country among the states where Burrell's applicants reside.

Osteopathic medicine is one of the fastest-growing health care professions. According to the Osteopathic Medical Profession Report, the number of osteopathic physicians in the U.S. climbed to nearly 135,000 in 2021. Today, one in four medical students in the U.S. is training to be osteopathic physicians.

continued from page 25

Enhancing the learning experience.

In her first year of medical school, **AMANDA KAHN** '18 was able to “run a code”: administer immediate resuscitative measures, like performing CPR and applying an AED, on a patient in sudden cardiopulmonary arrest.

Thankfully, she says, the patient was a simulation mannequin.

“It can be very overwhelming,” Kahn says. “So, to have the experience with a simulator in a safe educational space, where no one’s going to get hurt, and you can practice and mess up and it’s no big deal, is amazing.”

A fourth-year medical student at Florida International University in Miami, Kahn still remembers the lessons she learned on the simulator—a life-like human body with a heartbeat, a pulse and the ability to move its eyes, blink and have a seizure—and applies them in the hospital today.

In addition to simulators, advances in camera and robotic technology have really made it easier for students to study anatomy, she says.

The da Vinci surgical system, for example, is a robot that docks on

top of a patient lying on an operating table. Its high-definition camera allows physicians-in-training to see everything the surgeon does from the surgeon’s viewpoint.

“As a med student, you’re the last person in line to have the best view in an open surgery,” Kahn says. “But now, I can sit in the corner of the operating room, not have to be scrubbed in or touching the patient, and I can see everything very clearly. It has really changed things for learners.”

Kahn is applying to the field of urology, a surgical field, and is interested in urologic oncology, minimally invasive surgery with robotics and endoscopic urology. She has seen firsthand how biomedical advances, like laser technology in noninvasive surgery, have improved the patient experience, as well.

“In urology, you really get to mix biotechnology, patient care and medicine, so I think it’s part of why I’m super interested in the field,” she says. “There’s always new technology coming out, always trying to get better, trying to improve.”

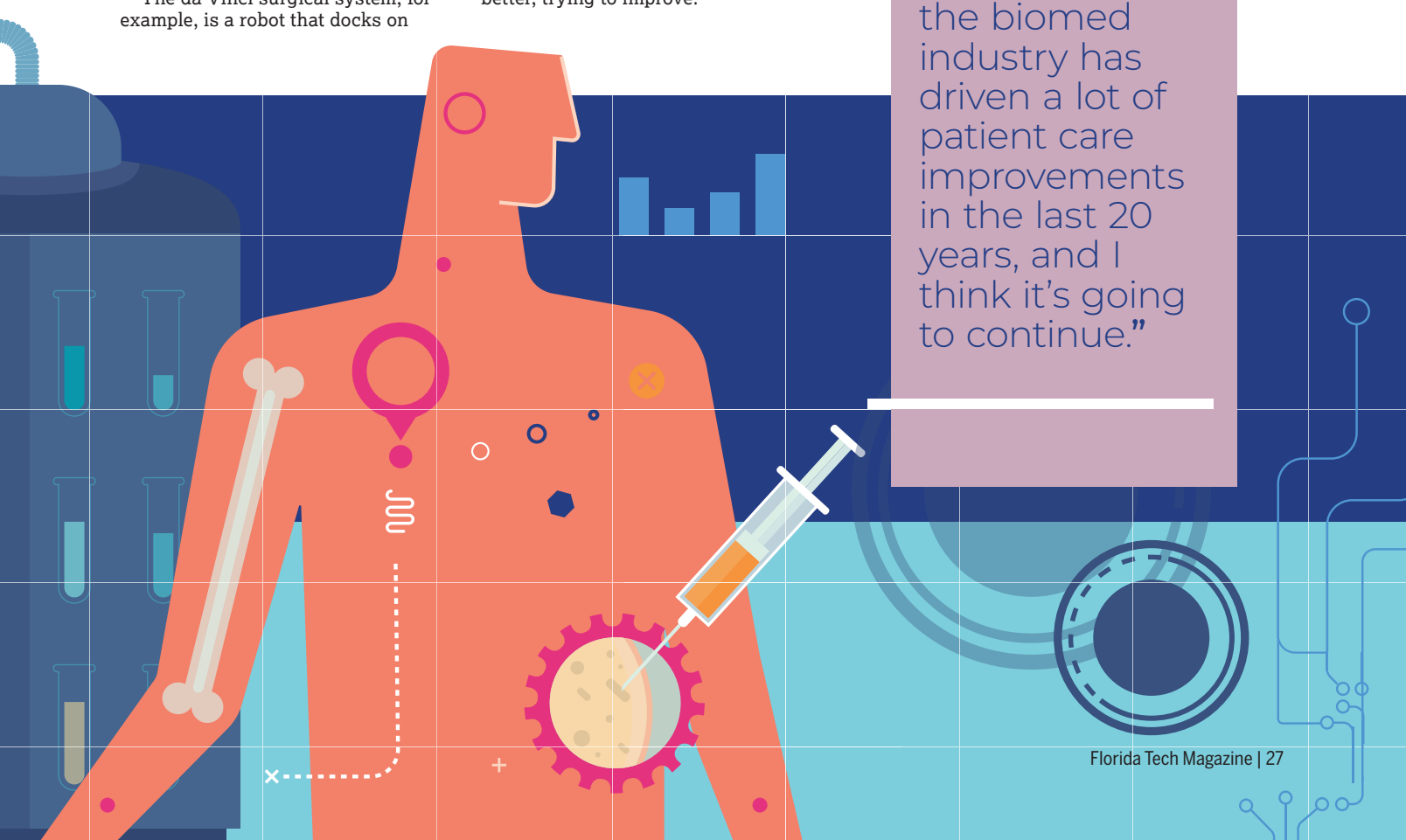


Amanda Kahn

DEGREE: '18 B.S., Biological Sciences, Premed

OCCUPATION: Medical Student, Florida International University

“When I think of my community, I think of our patients—the people we’re here doing all of this for. I think the biomed industry has driven a lot of patient care improvements in the last 20 years, and I think it’s going to continue.”





Sense and Sustainability

In a world fraught with environmental and economic challenges, graduates with sustainability skills are in high demand.

By Adam Lowenstein

When Christian Foster arrived at Florida Tech in 2018, the Rochester, New York, native planned to major in aerospace engineering. That remained his thinking until midway through his sophomore year, when his career aspirations changed.

He opted to major in sustainability.

“I felt like I had a lot more to contribute to this field,” Foster says, “and I found out how uniquely awesome the program was here.”

With an unprecedented surge in sustainability-related jobs in the U.S. and beyond, Foster, who graduates in December 2023, and future students of Florida Tech’s unique, STEM-based sustainability program will have no shortage of opportunities.

LinkedIn featured 133,000 sustainability jobs in early December 2022, with opportunities ranging from corporate social responsibility and environmental, social and governance (ESG) executives to interns, technicians and specialists.

While there are certainly fields that have more openings—at the time, there were nearly 920,000 nursing jobs on LinkedIn, for example—the rising demand for sustainability professionals is a relatively new trend that has gathered momentum following the COVID-19 pandemic. It will put successful sustainability programs like Florida Tech’s in the spotlight, and in greater demand.

“What’s happening in the last five to 10 years is that the larger corporations, and increasingly the mid-scale corporations, are leaning in to sustainability and resilience,” says Ken Lindeman, an ocean engineering and marine sciences professor who built Florida Tech’s sustainability program.

Why are more businesses leaning in to sustainability? What is the view from those within the field? And what is motivating students to seek this vocation?

‘The Great Expansion’

“Business leaders are facing an intense landscape, as climate-related disasters occur with startlingly high frequency and intensity. The pressure to act on sustainability from all stakeholders is greater than it has ever been,” according to “Climate Leadership in the 11th Hour,” the 2021 edition of the decennial United Nations Global Compact – Accenture CEO Study on Sustainability.

Another report, the State of the Profession 2022 from GreenBiz, put it this way: “This is indeed an unprecedented moment for the profession, one that may come to be referred to as ‘The Great Expansion.’”

But the rise in sustainability opportunities is about more, and runs deeper, than jittery companies protecting their bottom lines with new recycling programs or a newly hired resilience coordinator. The rise in sustainability-related jobs is societal and even generational, as well as economic.

For starters, it is increasingly difficult for people to ignore climate change. Yes, there are still doubters, but more people in the U.S. and beyond are realizing how inaction could condemn future generations to many avoidable challenges in a vastly changed climate.

“Nothing gathers the attention of people like an impending crisis,” says economist and Nathan M. Bisk College of Business professor Michael Slotkin. “People procrastinate, but this has permeated a wider share of people who believe, ‘This is real. We have to do something.’”

The COVID-19 pandemic played a role in this, too, according to the Accenture report, which is based on insights from more than 1,200 CEOs across 21 industries and 113 countries. Nearly four

Zachary Eichholz '16, '19 M.S., deputy community and economic development director and sustainability manager for the City of Cape Canaveral, with the city’s first solar array, atop the community center.

Composed of 72 panels, the 48-kilowatt array is estimated to save the city over \$242,500 in energy costs and abate 1.325 tons of carbon dioxide emissions over its 25-year lifespan.

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in five CEOs (79%) say that the pandemic has highlighted the need to transition to more sustainable business models.

George Oliver, chairman and CEO of Johnson Controls, the global conglomerate that produces electronics and HVAC equipment, told Accenture, “I would have predicted that a crisis like COVID would have slammed the brakes on anything other than conventional bottom-line thinking—and the fact that it did the exact opposite is extraordinary. It has accelerated the trajectory of sustainability.”

Another factor is the workforce itself and its influence, Slotkin says. Younger workers have not been forged by economic depressions and are not necessarily motivated only by financial gain and the security that could bring.

“They want to have a purpose,” Slotkin says. “If it becomes more about a purpose than a paycheck, young workers are going to check out unless they view their companies as trying to do something in a particular area. They want to believe in what they are doing and want the company to take a stand.”

Count **NICOLE BARNETT** ’21, who earned a bachelor’s degree in sustainability studies, in that group. She recalls sitting in a sustainability class with her roommate and being reminded of how pressing these issues—and the need to do something about them—are.

“Outside of class, we were still talking about it,” she says. “It definitely clicked with me that that is what I needed to be doing.”

And as awareness of companies’ benefitting from climate-related decisions grows, others on the fence may be opting in.

“Companies now understand that if they do this a little bit or try, they can obtain competitive advantages, improve community relations and improve risk management,” Lindeman says. “And there’s data that show they recruit and retain better employees.”

The third element of the surge is growing awareness in the business world and beyond that the government, despite recent high-profile actions such as the Inflation Reduction Act, will need help.

“If you feel like you are getting stasis from your public authorities, you will see the nation’s attention moves toward businesses and people that work there,” Slotkin says.

On the Job

If **ZACHARY EICHHOLZ** ’16, ’19 M.S., is getting the nation’s attention, he’s too busy to see it.

The 29-year-old deputy community and economic development director and sustainability manager for the City of Cape Canaveral has known only the sustainability profession since he graduated from Florida Tech in 2019 toting a bachelor’s degree in sustainability studies and a master’s degree in interdisciplinary sciences. It wasn’t hard to find motivation.

“I don’t think it’s naïve to say that this is our generation’s moonshot. Younger individuals, I believe, are a little more adaptable than our predecessors just because of the sheer number of things that have happened across the world in the 21st century,” he says, naming two once-in-a-generation economic crises, the global COVID-19 pandemic and the horrors of 9/11 that started the century.

“Climate change has been creeping up in the back that entire time,” he says. “We are the generation that sees the challenges head on, and this has galvanized us, on the flip side, to react and be proactive to remediate these issues. We want to have a livable world, too, that we’ve inherited.”

As with Foster and Barnett, Eichholz came to Florida Tech with a different path in mind. Though he was aware of environmental issues and started with plans to minor in sustainability, the Florida native was fascinated by hurri-

“I could kind of see early on that cities, counties, private companies would probably start to embrace this stuff as more and more issues came about that needed to be addressed,” he says. “You could tell there would be a lot of opportunities, and it would be quite expansive.”

Barnett entered Florida Tech as an environmental science major but was open to other opportunities. She hadn’t heard of sustainability studies, but when she learned more about it and its mix of STEM and business courses, the fit was there and she switched majors.

“This is kind of exactly what I am interested in,” she remembers thinking. So, she changed her major. “I jumped on this train, and I love it.”

Starting in the second semester of her junior year, she interned for the City of Palm Bay, a period she called “the biggest catapult in my educational career.”

At Brevard County’s largest city, she was instrumental in the development of the city’s first sustainability action plan, working closely with city staff and the Sustainability Advisory Board.

That process allowed her to work in public policy and understand how sustainability and related practices function in a municipal setting, both critical skills for her future employment. And the

“I don’t think it’s naïve to say that [sustainability action] is our generation’s moonshot.”

—Zachary Eichholz

canes and fully planned to study them and earn a degree in meteorology.

Amid all of this, Eichholz couldn’t help but see that what he called “the green path toward sustainability” would offer a more fulfilling career while still allowing him to explore some facets of meteorology. When Florida Tech launched its sustainability major program in fall 2013, he was all in.

With a sustainability internship for the City of Satellite Beach that Lindeman helped arrange—as he would continue to do at multiple cities across Brevard County for students, including Barnett—Eichholz saw the potential of this profession.

report itself, which was also her senior capstone project, played a big role in that first job, too.

After wading into the job market with limited responses, Barnett posted her Palm Bay project on LinkedIn. Almost immediately, she got a message from EXP, a multinational firm providing engineering and design services. A short time later, she started an internship there, and by August 2021, she was a full-time municipal sustainability planner. She has now also earned the credential EN SVP: Envision Sustainability Professional.

At EXP, she provides sustainability input on projects along with input from engineering, design and other areas,

“Every project has some sort of resiliency or sustainability component.”

—Nicole Barnett

including a Miami project to develop building materials that will repel airborne salt from ocean mist and not heat up in that famous Florida sun. She also works on credentialing buildings to become LEED certified.

“Every project has some sort of resiliency or sustainability component,” she says. “Net-zero [energy], like our alumni center on campus—all of these things Florida Tech has that I’ve been exposed to help me be familiar with terms of industry.”

In his role, Eichholz has helped take Cape Canaveral forward in substantial ways. A leading example is the city’s community center. Opened in September 2022, the nearly 25,000-square-foot facility was designed with a modern, window-heavy sensibility.

One of its most exciting features, spearheaded by Eichholz, may not be noticed by most visitors: a rooftop solar array, the city’s first. Composed of 72 panels, the 48-kilowatt array is estimated to save the city over \$242,500 in energy costs and abate 1,325 tons of carbon dioxide emissions over its 25-year lifespan.

Beyond that, Eichholz and the city are planning to make the building a reliance hub. It will be a community center most times, with its gym, multipurpose room and so forth. But when an emergency strikes, because of the power that will be produced by the array—which is designed to withstand winds of up to 160 mph—it can function as a hub for the distribution of food, water and other resources.

Eichholz has also led efforts to install a network of remote sensor sites across the city to measure weather data and tide levels.

“There is a lot of data on climate change, but when you get down to hyper-local level, it’s difficult to pinpoint exact issues. So, we are planning for and mitigating potential threats like urban flooding,” he says, “and building our understanding of its influence on stormwater below ground. For example, ‘Why did one street flood but not another?’”

The network has allowed city officials to see events as they happen and, equally important, respond in real time in a way

they haven’t been able to before, Eichholz says. It also provides useful data to use when designing and engineering new buildings.

This has resonated with many residents, who have expressed themselves during the city’s ongoing development of its sustainability and resiliency plan, the Cape Canaveral 2063 Program, which informs the city’s broader sustainability and resilience program.

“It is very enlightening, empowering and validating to see residents say, ‘I think we need some changes. I want to live here, have a city that is livable, viable and safe—what are you going to do?’” he says.

The city has also recently formed a Resilience Division within the Community and Economic Development Department. To help run the department, the city hired **ALEXIS MILLER** ’15, ’19 M.S., as resilience engineering services manager.

Challenges Ahead

With about 20% of Florida coastal municipalities now featuring sustainability and/or resilience staff, and likely similar or smaller percentages across the country, Lindeman says local government should be a landing spot for many new workers in the field.

“In urban areas in Florida, the city planners and city managers have to deal with the reality on the ground, the impacts of now sunny-day high tides that are flooding streets in multiple areas and many other issues further below the surface,” he says. “These positions are needed.”

Barnett agrees.

“At the local government level, I don’t think those positions will be removed from now on. Resiliency officers, sustainability planners will be embedded, hopefully, in every municipality.”

Foster is encouraged by what he sees in the job market.

“We are on the precipice. We have to do something, and companies want to be the ones that did something,” he says.

He is interested in institutional sustainability, and his capstone project

is to carry out portions of Florida Tech’s STARS certification efforts. STARS is a comprehensive sustainability rating system for colleges and universities that addresses the environmental, social and economic dimensions of sustainability.

“Everyone here seems to be very forward-thinking. I think everyone here is aligned very well,” Foster says. “It’s a great experience for me because I would like to work in the private or public sector, making legislation, working as a sustainability officer for a company—instead of making innovations, implementing them.”

He added about the university’s sustainability program, “I can confidently say I haven’t met anyone in this program who isn’t doing something related to what they want to do in the workforce.”

One way to boost sustainability traction is to monetize the process, which Barnett describes as, “making it attractive to get things done but turning the change into a profitable and attractive investment for industry.”

That approach, such as giving builders credits for making their structures energy efficient, can help normalize sustainability practices, Lindeman says.

“The way you do that is by monetizing the good and creating jobs that have an implicit, if not explicit, role in monetizing the good,” he says.

Are there downsides to being sustainability professionals and being knee-deep in forecasts of rising seas, rampant high temperatures, violent storms and the like?

The phenomenon of climate anxiety is real, Eichholz says.

“It can be a lot,” he says. “You fight that with a map of how many new solar arrays you can put up across the city, how much emissions and energy does it save?”

And they draw encouragement from, what all involved hope is, growing public support.

“By basically catalyzing your efforts into action, doing projects and initiatives on the ground no matter how small or what scale of government or private company you’re in, making a difference day in and day out—that is a way to make an actual difference and keep your own mindset positive and strong,” Eichholz says.

“You are kind of, we don’t say, ‘killing two birds with one stone.’ We say, ‘releasing two birds with one stone.’ That’s the way you fight the existential dread.”

A MESSAGE FROM THE FLORIDA TECH ALUMNI ASSOCIATION

Greetings, fellow Panthers! With the 2023 Homecoming festivities on the horizon (March 21–26), I thought it would be fun to reminisce about my good old days at Florida Tech as a young international student from Aruba coming to live in the United States for the first time.

Homecoming always brings back nostalgia. It reminds us why it is important to return to campus, reconnect and continue to make lasting memories.

My favorite memories from when I first came to campus consist of meeting other people with the same interest I had in aviation. It felt wonderful that I was not the only person in the world with the ambition to fly airplanes. I could finally talk about aviation with fellow enthusiasts.

There was an immediate solidarity, and everyone was excited to be here in a community that prized itself on small class sizes and more intimate learning environments. I felt at home immediately. There was a common feeling of pride about why we were at the university.

In addition, I chose Florida Tech because of the opportunity to fly in great weather and be near the beach, as I was—and still am—a surfer. It did not take long before I made lifelong surfing friends who were attending the university, as well.

At the time, the Florida Tech surfing community consisted of aviation students, ocean engineering students, marine biologists and many crew team members. So, here I was with a great mix of friends in aviation and a great diversity of other disciplines. The ability to make friends easily is still something I see when I walk around campus and conduct lectures from time to time.

Florida Tech is unique in this way, and I am so glad to know that it is still happening. You can still feel it, and it is also still an international hodgepodge of a community!

My other fond memories are of watching space shuttle launches, attending hurricane parties, flying solo around our beautiful Melbourne airspace (and exploring Florida in general), fraternity parties and other wonderful things that still pale in comparison to the friendships I made.

Many of those friendships resulted in professional networking, and I am successful today in life and business because of these bonds formed at Florida Tech.

I am sure many, if not all, of you can relate. See you in March, friends.

Fin Bonset '96, '99 MSA
President, Florida Tech Alumni Association



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FLORIDA TECH HOMECOMING NEON JUNGLE 2023

Florida Tech Homecoming is back—and you're invited!

This year's theme: Neon Jungle.

Think bright, beachy and better than ever. How so?

- ▶ Moved to Spring, which means prime Florida weather.



- ▶ Homecoming 5K will be on campus, so you can check out the changes and reminisce on old times with your running buddies.



**AT NANCE PARK IN INDIALANTIC
FEATURING**

SAINT MOTEL

- ▶ Homecoming Fest is hitting the beach! Catch us—and Saint Motel!—at Nance Park in Indialantic.
- ▶ More events than ever before open to students, alumni, faculty, staff and registered/paid family members attending Family Weekend
 - ◆ HOCO Casino Night
 - ◆ Tropic Like it's Hot: HOCO Carnival
 - ◆ Lecture with an astronaut: Capt. Winston Scott
 - ◆ And more!

MARTHA GUYAS '09 M.S. has always had a connection with the water.

Born and raised in Maryland on the Chesapeake Bay, she was surrounded by it. It was there that she truly discovered her love of marine biology from her father, a fishing charter captain and avid angler. Watching and learning through his career and embracing her natural surroundings, Guyas formed a unique passion for commercial fishing.

After she received her bachelor's degree in biology from Wake Forest University, Guyas was researching where to continue her education when her college advisor suggested Florida Tech, where one of his past students was a professor. After learning more about the university's outstanding marine biology program and its ideal location near several bodies of water, Guyas was hooked. Since graduating with her master's degree in marine biology, Guyas has spent her career advocating to improve fisheries for commercial fishermen.

She began working with the Florida Fish and Wildlife Conservation Commission (FWC) as a regional biologist, where her main focus was tackling the issues facing fisheries in South Florida. She later became section leader for the Federal Fisheries Section of the FWC's Division of Marine Fisheries Management. Within this role, she managed a team that formulated recommendations for the state and then presented them to the commissioners from a scientific and industry-focused point of view.

She also served on the Gulf of Mexico Fishery Management Council, where she represented Florida and continued on to serve as council vice chair.

Guyas was recently appointed as the southeast fisheries policy director for the American Sportfishing Association (ASA), where she represents sport fishermen within government affairs for the State of Florida and the country's southeast region.

"What I enjoy most about the role is using my scientific background to analyze data and being able to work with the recreational fishing industry to propose fisheries policy solutions," Guyas says.

In the future, Guyas wants to continue her career in the sport fishing industry and to keep fighting for sustainable fisheries and recreational fishing access. She is also passionate about clean water and hopes to educate others on why it is important, not only for sport fishing, but also for the environment.

"The mentors and hands-on experiences I gained while studying at Florida Tech taught me so much about the field I love and have played a big role in my career success."

—Erin Alvarado



SPOTLIGHT ON

Martha Guyas

FLORIDA TECH CONNECTION: '09 M.S. marine biology

DAY JOB: Southeast Fisheries Policy Director for the American Sportfishing Association (ASA)

PASSIONATE ABOUT: Sustainable fisheries, recreational fishing access and clean water

SPIRIT ANIMAL: Crab

FAVORITE FLORIDA TECH MEMORY: I really enjoyed my fellowship program and getting to bond with the other students in my professional development sessions.

1980s

1 MICHAEL DONOVAN

'84 was promoted in January 2022 to the Senior Executive Service for a new position in the Pentagon with the Joint Intelligence Directorate of the National Guard Bureau after spending over 18 years with the Defense Intelligence Agency.

KEITH HARRIS '88 M.S. started a new position as maintenance manager at International Service Solutions (ISS) supporting the Takeda Pharmaceuticals Thousand Oaks, California, manufacturing site.

2000s

DAVID MAGIDSON '03 M.S., '04 MBA, was promoted to chief systems engineer of the Joint Program Executive Office Armaments and Ammunition team (JPEO A&A) with the United States Army.

2 MISHAAL ASHEMIMRY

'06, '07 M.S., has become the first Saudi woman to hold the position of vice president of the International Astronautical Federation (IAF).

3 MITCH EHMKA '07

was promoted to chief trading officer at Kingsview Partners, where he oversees all trading operations within the Chicago firm and runs the day-to-day operations.

4 DAVID MORÓN

'07 M.S. joined Blizzard Entertainment in July 2022 as a game producer on the World of Warcraft team.

5 DANIELA IACOBELLI

'09 claimed victory at the Wildhorse Ladies Golf Classic, her fourth Epson Tour win.

6 APRYL ALEXANDER

'09 M.S., '12 Psy.D., was named the Metrolina Medical Foundation Distinguished Scholar in Health and Public Policy in the Department of Public Health Sciences at the University of North Carolina at Charlotte.



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2010s

7 SHAWN M. BENNETT '10, '18 M.S., and his wife welcomed a new Panther cub, Ella, in May 2022.

8 JONATHAN HANNA '10, '12 M.S., was appointed vice president of operations for the Nassau Airport Development Co. (NAD) At age 34, he is the youngest person appointed to NAD's executive management team. He and his wife, Tia-Toni Williams, recently welcomed a new Panther cub, Marleigh Gwen Hanna, to the family.

WILLIAM HARWOOD '10 recently became software development manager at Foster + Freeman, a forensic science company based in Evesham,

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England, helping to fight crime from the field to the courtroom across the world.

BRYAN HUDSON '10 MBA started work at a nonprofit association that services Virginia's hospital and health care system members with cost-effective resources, which keeps them in operation and may offer lower costs to the patients.

JAKE KOCH '10 accepted a new position with FinancialForce after 12 years with PTC Inc., where he took on a variety of roles, such as software implementation

consultant, instructor, IoT architect, consultant manager, customer success analyst and director of customer success.

9 ASHUTOSH DAS '11 M.S. was promoted to manager II with Anthem Inc. (now Elevance Health) and has been with the company for over nine years.

10 KIM FATICA '11 MBA passed his certification exam to become a Certified Broadcast Television Engineer (CBTE) through the Society of Broadcast Engineers.

11 ERIK MACKAY '11 and his wife recently welcomed a new Panther cub, Audrey Kaweesi Mackay, into the world.

12 KATREENA MULLICAN '11 M.S. was promoted to principal solutions architect at Amazon Web Services (AWS) and celebrated her third anniversary at AWS.

13 MARIE ZAHN '11 was chosen as a 2022 Cape & Plymouth Business Media 40 Under 40 honoree, an award that spotlights top young business leaders who excel in their industry and show dynamic leadership.

14 LUIS MARISTANY '12 started a new position as senior coastal engineer with

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In August 2022, **ANUAR AKCHURIN** '22 won two gold medals and one silver medal in the USA Canoe Sprint Nationals. He went on to compete in the FISU World Championships, where he represented Florida Tech and placed seventh in the finals.

Originally from Kazakhstan, Akchurin discovered his love for canoeing 11 years ago after watching a competition in person with his father. Afterward, he enrolled in a free club that taught children about the sport. Not only did he love the challenge canoeing presented, but he also enjoyed spending more time in nature.

He dreams of one day competing in the Olympic Games, but already, Akchurin can thank canoeing for more than just medals.

In fact, canoeing is responsible, in part, for leading Akchurin to Florida Tech. He had noticed that his favorite professional canoeers would post about traveling to Melbourne, Florida, for training in the Indian River Lagoon and was intrigued to learn more about the area.

"I had always dreamed of attending college in the United States," Akchurin says. "So, when I realized I could continue training and receive a high-quality education at the same time, I was sold."

While attending Florida Tech, Akchurin pursued his bachelor's degree in mechanical engineering and continued competing independently in sprint canoeing.

One day, while on the water training, Akchurin crossed paths with professor Paul Cosentino and Florida Tech's concrete canoe team. After striking up a conversation, Akchurin was brought on to assist the team as an expert in paddle sports.

While coaching the team, he taught the students proper paddling techniques and team-building exercises to improve overall communication.

"Cosentino has continued to be a close professional and personal mentor and friend of mine since I graduated from Florida Tech," he says.

Currently, Akchurin is an engineer with Bansbach Easylift of North America Inc., which has manufactured gas springs for more than 50 years. He received this position after meeting the company's CEO, Robert T. Rose, on the Indian River Lagoon while he was training.

The two connected over their love of watersports, and Akchurin is very grateful for Bansbach Easylift's support of his canoeing career and for sponsoring him in competitions.

"In the future, I would love to start a canoeing team at Florida Tech and to give back to the university that helped prepare me for the future and the faculty who always stopped to help, no matter the circumstance."

—Erin Alvarado



SPOTLIGHT ON

Anuar Akchurin

FLORIDA TECH CONNECTION: '22 B.S. mechanical engineering

DAY JOB: Engineer with Bansbach Easylift of North America Inc.

RECENT HONOR: Won two gold medals and one silver medal in the USA Canoe Sprint Nationals, then placed seventh in the finals of the FISU World Championships.

ALTERNATE CAREER: Astronaut

FAVORITE FLORIDA TECH MEMORY: Traveling to the ASCE Regional Conference to support the Florida Tech concrete canoeing team on my birthday!

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Stantec, working on coastal restoration and protection projects. He also welcomed his firstborn son, Adrián Luis Maristany, in October 2021.

15 TINA TUCKER

'12 M.S. was recently appointed president and CEO of Pinnacle Solutions Inc.

TIA HASLETT '14 M.S. started a new position as senior acquisition consultant at DC Capital Group.

16 MARC SALVADORI

'14 became a member of the technical staff with HyPerComp Inc.

17 NICHOLAS SCHWARTZ

'14 M.S., Ph.D., P.E., joined Obantarla as the principal scale-up engineer, working on a modular, transportable natural gas-to-methanol process to address flaring and climate change.

MISSY DRURY '15 joined Nike as change management and engagement lead for the data and analytics team.

18 SEAN KOHN

'16 recently started a new position as a senior field engineer at The Lane Construction Corp., working on large highway infrastructure projects.

19 CHAITYA BIRENBHAI

SHAH '16 M.S. joined FracTEL LLC as a software engineer in 2017 and recently got promoted to communication platform as a service (CPaaS) product manager. FracTEL provides telecommunication services to carriers, service providers and businesses, including Florida Tech.

AKHIL SUNDAR '16 M.S. recently joined the team at VillageMD, which focuses on providing better value-based health care after the pandemic.

OBINNA O. UYANNA

'16 M.S., '21 Ph.D., was selected as senior hardware engineer with Dell Technologies.

ALEXANDER DAVILA

'17 M.S. joined Schellman &



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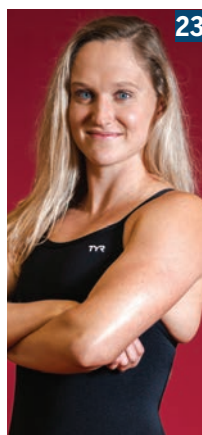
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Co. as a penetration tester with a specialty in web application security testing. He previously worked at Gleim Publications Inc. for over 10 years, moving up the ranks before leaving as the digital marketing manager.

MATTHEW MERCADO '17 started a new role as industrial controls engineering consultant in the Baltimore area.

AASRITHA OBBILISSETTY '17 M.S. started a new position as business data analyst with Intuit.

20 SAMANTHA PAITSEL '17 and **COLEMAN OLSON** '19 were married in New Orleans in October 2022. Over two dozen College Players alumni attended their wedding.

ROSS GARTMAN '18, '22 M.S., was promoted at AAR Corp. and now serves as senior logistics analyst for the Worldwide Aviation Support System program.

BRANDON CURRIE '19 M.S. started a new position as manager of training and development at Brevard Health Alliance Inc.

21 KEITH HARRIS '19 M.A. started a new position as chief people officer with Operation HOPE. Before Operation HOPE, Harris spent over two years with the Boys & Girls Clubs of Tampa Bay.

CAPT. DARIAN SOTOMI '19 was promoted to captain in the ERJ 170 at Republic Airways. He credits his influential flight instructors at FIT Aviation for preparing him for this next step.

22 LEANNI TIBBETTS '19 is the fourth woman to become a pilot with Cayman Airways, having completed the local airline's recruitment and training program.

2020s

23 SAVANNAH BRENNAN '21, '22 M.S., was named a top 30 honoree for the 2022 NCAA Woman of the Year Award. Brennan, a First Team All-American swimmer, is the first Florida Tech scholar-athlete to be honored as a top 30 selection.

VICTORIA NEWMAN '21 M.S. was selected as part of the inaugural cohort of the U.S. Digital Corps. There, she will spend the next two years working at the Cybersecurity and Infrastructure Security

Agency (CISA), supporting government entities with technical expertise and assistance in implementing the president's cybersecurity executive order.

JOCELYN PITTS '21 M.S. was promoted to advanced support technician with KnowBe4.

24 ASHLEA DANIELS '22 moved to Huntersville, North Carolina, after graduation and accepted a position with Covia Corp. as a process engineer.

2ND LT. REGINA GAGLIONE '22 was commissioned second lieutenant in the United States Army with the Florida Tech ROTC Panther Battalion.



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For details: alumni@fit.edu

IN MEMORIAM

KEVIN SCOTT '82, who earned a degree in oceanographic technology from Florida Tech, passed away in September 2022.

JESSICA KOELSCH BIBZA '91, who earned a marine biology degree from Florida Tech, passed away Sept. 24, 2022, at age 53.

ALFA EKELE, an applied aviation safety MSA student at Florida Tech, passed away in an aviation incident at Orlando Executive Airport Sept. 1, 2022. The incident was unrelated to his Florida Tech program.

JAMES L. FISHER, a trustee emeritus who served on Florida Tech's board of trustees for 15 years, passed away Sept. 7, 2022.

MARK HANLIN, who attended Florida Tech's Jensen Beach campus, passed away Oct. 23, 2022, at age 70.

JOANN PARLA PALUMBO, professor emeritus and 15-year School of Arts and Communication faculty member, passed away Sept. 17, 2022, at age 73.

VICTOR VARGAS, a retired staff sergeant who had served in Florida Tech's security office for nearly 15 years, passed away Aug. 23, 2022, at age 58. He had previously served in the U.S. Air Force and the New York Police Department.

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Panther Basketball Alumnus Wins On and Off the Court Overseas

In addition to his athletic success, Chris Carter has learned a new language and published a children's book.

By Christina Hardman

It was a big year for **CHRIS CARTER** '15.

In 2022, the business administration and men's basketball alumnus learned German, passed a citizenship test, got engaged, wrote a book in two languages and won a championship as captain of the Rostock Seawolves, a team in the German ProA basketball league.

After Carter graduated from Florida Tech, where he played three seasons, making the Sunshine State Conference tournament every year he was a Panther, he signed his first professional contract with BIPA Odessa of the Ukrainian Basketball SuperLeague, the top level of basketball in Ukraine.

He joined Sports Club Rasta Vechta, also of the ProA league, for two seasons in 2017–18 and 2018–19. He helped the club win the ProA championship and move up to the Basketball Bundesliga (BBL), the top division of German professional basketball.

In 2019–20, Carter was a member of the Niners Chemnitz team, which he helped lead to a league-best 25-2 record before the season was cut short due to COVID-19. From there, he joined the Seawolves.

"I have to credit much of my success to Florida Tech," Carter says. "Playing

under coach [Billy] Mims gave me the opportunity to not only learn from a former pro coach and understand that coaching style, but to also learn from a leader. The leadership skills he taught me have stayed with me during my pro career."

On May 21, 2022, Carter led the Seawolves to victory over the Tigers Tübingen in the ProA championship, advancing the team to the BBL.

"I have been through a lot during my career, but even at 30 years old, I still feel like I'm going into my prime," Carter says. "There is definitely still a lot of basketball left for me."

Basketball, among other things.

Having spent virtually all of his adult life living abroad, surrounded by different languages, Carter sees athletics as a bridge between cultures. This, paired with his lifelong ability to connect with young people, led Carter to writing *Ivy*.



A children's chapter book available in English and German, *Ivy* is about a young woman who, through hard work, perseverance and dedication, overcomes numerous obstacles to become a professional basketball success—not unlike Carter's own story.

"I am so proud of Chris and all that he has achieved in his professional career since leaving Florida Tech," Mims says. "What an amazing year it has been for him!"

"He is one of our all-time greatest players and one of the finest young men I've ever had the pleasure to coach. Chris Carter is an outstanding ambassador for Florida Tech and truly is the epitome of being a Panther for life."



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BACK IN THE DAY

- 1980s ●
- 1990s ●
- 2000s ●
- 2010s ●

In April 1994, Shaquille O'Neal and his Orlando Magic basketball team (pictured here) visited Florida Tech to practice in the Percy Hedgecock gymnasium ahead of their first NBA Eastern Conference playoffs matchup against the Indiana Pacers. The Magic practiced at Florida Tech to avoid the media hype in Orlando, according to an article that month in *The Crimson*. New rims, polished backboards and temporary lines taped to meet NBA specifications were among the preparations Florida Tech completed to accommodate the team.

Photo courtesy of the Harry P. Weber University Archives

