FLORIDA TECH

MAGAZINE

WINTER 2019

HACKATHON HEROES

How a culture of creativity has spurred a team to be reckoned with.

In This Issue

WINTER 2019 • Volume 27, Issue 3

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GO GREEN, GET ONLINE!

floridatech.edu/magazine

Florida Tech's 60th Anniversary Founders Day brought approximately 2,000 students, faculty, alumni, staff and friends together in celebration Sept. 22, 2018. Attendees enjoyed each other's company, admiring the beauty of a dramatically lit campus until it was dark. Then the fireworks began, painting the sky with color and filling hearts with Panther Pride.

Alumni News

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ON THE COVER: As part of a mashup at the GRIT Popup III event that featured Florida Tech hackathon team member and comic book lover Muntaser Syed, local illustrator Nikoby created a poster depicting Team Zero members with their would-be superpowers. The comic-book-style illustration was adapted for the cover of this issue of *Florida Tech Magazine*.

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FLORIDA TECH MAGAZINE
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Dwayne McCay, Ph.D.
VICE PRESIDENT FOR MARKETING AND COMMUNICATIONS
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PRESIDENT'S MESSAGE

Dear Alumni and Friends,

As we have celebrated Florida Tech's 60th anniversary throughout the academic year, I've been struck by the difference this university has made in so many people's lives. The stories of the 60,000 alumni spread across the globe are not only inspiring, they speak to the value that a college degree holds in 21st century society—especially the type of STEM-related education that you can earn here.

However, higher education is sometimes criticized these days as costly and unnecessary. Consider the facts as highlighted by the National Association of College and University Business Officers (NACUBO). These data points may seem like common sense, but they are worth repeating and sharing with skeptics:

- Workers with bachelor's degrees earn an average of $1 million more in their lifetimes than those with only high school diplomas.
- College graduates are much more likely to be employed than high school graduates who do not go to college.
- College graduates are more likely to vote in elections and give back to their communities.
- College graduates are more likely to lead healthy lifestyles, exercise more and enjoy longer life spans, on average, than their counterparts who earned only a high school diploma.

Perhaps most importantly, college grads like those from Florida Tech are the engineers, scientists, business executives and community leaders who are working to change our world for the better. Every issue, some of their stories are chronicled in the pages of this publication—so many more stories are yet to be told.

Thank you for the difference you continue to make in our world. Florida Tech alumni like you are leaders whose efforts and energies are making our communities better places to live in ways both large and small.

Sincerely,

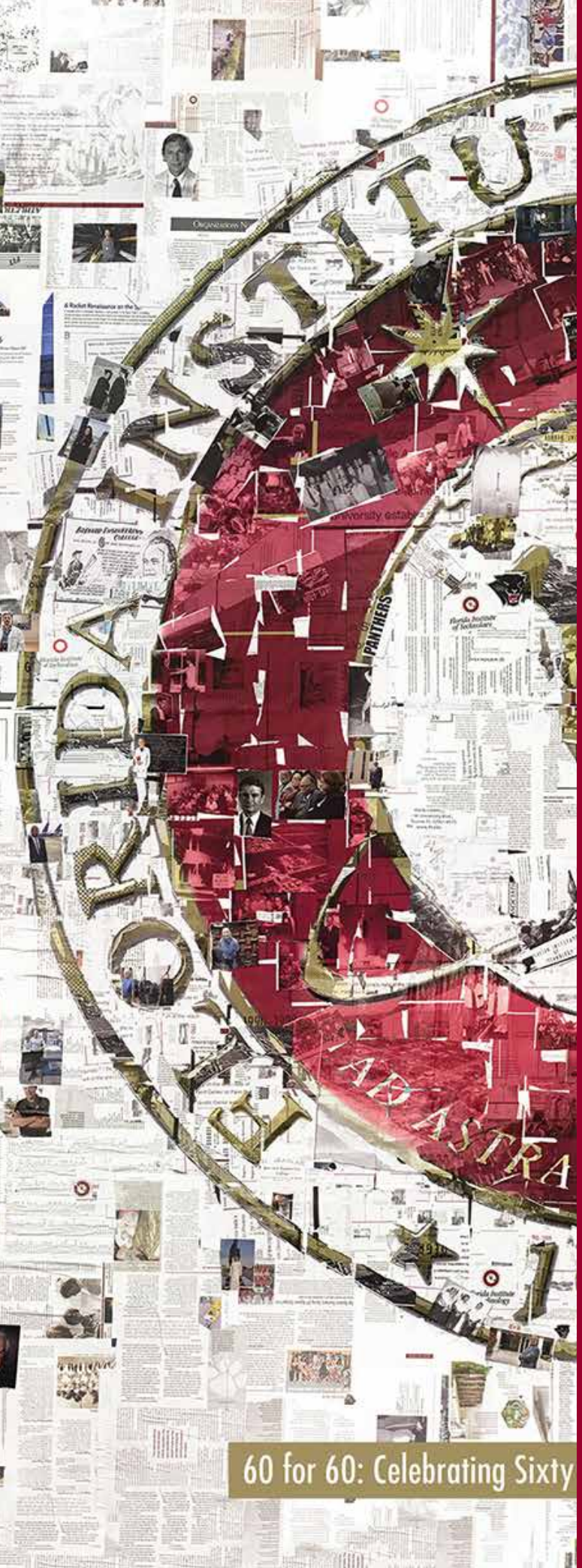
Dwayne McCay

Dwayne McCay, Ph.D.
President

Andy Kirbach, Bino Campanini, Fr. Doug Bailey and Dwayne McCay at Father Bailey's retirement celebration during Homecoming.

Mary Helen and Dwayne McCay at the Tastes of the Season event.

Past presidents Anthony J. Catanese and Lynn Weaver with current president Dwayne McCay at the 60th Anniversary Gala.



60 for 60:

Celebrating Sixty Years of Alumni at Florida Institute of Technology

Nothing better defines the Florida Tech story than our alumni.

The successes of the more than 60,000 engineers, scientists, astronauts, technology leaders, captains of industry, clinical researchers, athletes and educators who once cultivated their skills at our university have fueled us for 60 years.

60 for 60: Celebrating 60 Years of Alumni at Florida Institute of Technology commemorates this milestone anniversary by compiling these snippets of success into one story: the Florida Tech story.

Every book has a beginning, and who better to detail Florida Tech's origins than our own Gordon Patterson, professor, history specialist and university historian. In the book's foreword, Patterson takes us on the wild ride from our humble beginnings to our accomplished present. Following university president Dwayne McCay's introduction, the book transitions to a collection of distinguished alumni profiles.

Organized by decade, each section begins with a snapshot of the time period, profiling the era's active university president, major challenges faced, accomplishments achieved and an accompanying timeline that depicts Florida Tech's growth through those years.

Selecting a mere 60 representatives from a pool of 60,000 alumni as illustrious as Florida Tech's was a major undertaking. We searched the globe for alumni representing each of the university's colleges and in varying stages of their careers. Enriched by current, vibrant photographs, the 60 stories within these pages represent the rich diversity of our alumni, both in origin and in their professional pursuits, and truly showcase the limitless possibility of a Florida Tech education.

A book does not jump off the shelf without a dynamic cover. Celebrated artist Derek Gores created the stunning collage depicted on the front of the book. Torn *Florida Tech Magazine* pages, brochures, photos, posters, yearbooks, advertisements and images of all featured alumni converge to illustrate the Florida Tech university seal. An 8-foot insignia hanging in the Foosaner Art Museum, the actual collage's future home will be in the new Alumni Center—so pack your selfie stick for your next campus visit to add your face to the collage, too!

While all books must come to an end, at Florida Tech, our story continues to unfold. Thank you for being a part of it.

ORDER YOUR COPY TODAY!

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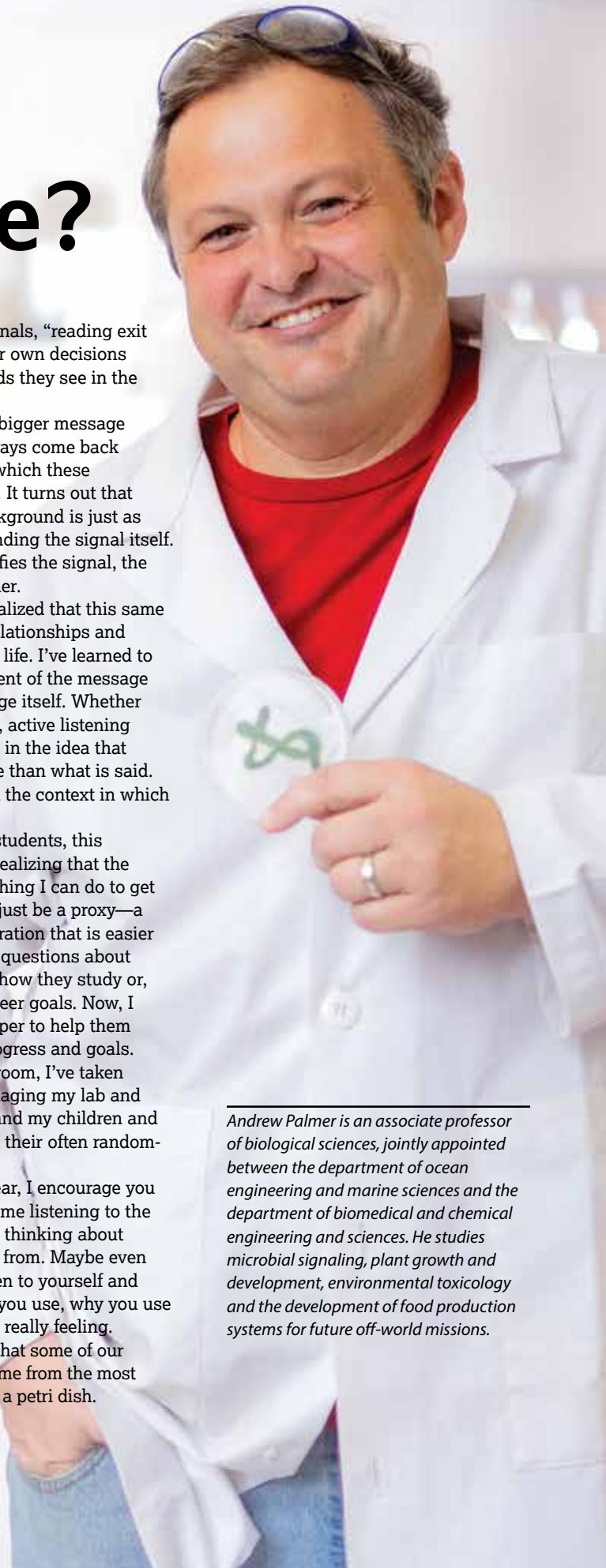
Can Bacteria Communicate?



There are at least as many bacterial cells living on/in your body as your own cells. The same is true for other animals and plants. These bacterial populations are diverse, always changing and crucial to the health and well-being of their hosts: us.

You've probably heard of this population referred to as the "microbiome" and haven't given it much thought. On the other hand, there are scientists, like me, who can't stop thinking about the microbiome: how it changes, how it can keep us healthy, how it can make us sick—or how it can teach us to be better listeners.

One of the biggest lessons from the study of this microbial world is that bacteria are far more social than we thought 30 years ago. For example, in my lab, we study a phenomenon known as "quorum sensing," through which bacteria release little chemical signals into the environment. Each of these signals is like a vote to change the status quo, and when enough of these bacteria "show up to the polls," that's exactly what they do.

These changes can be dramatic, beautiful, beneficial or even lethal. In the case of some marine animals, the bacteria that colonize them reach these quorums around dusk and become bioluminescent, causing their hosts to glow. To potential predators, these glowing organisms look like reflected moonlight rather than food, giving the bacteria a safe home for the night, which equates to several generations in bacterial terms.

In a less pleasant example, some of the bacteria that frequently colonize our lungs can suddenly turn virulent, producing enzymes that dissolve connective tissue and can be fatal to those with compromised immune systems.

Determining the conditions that drive bacteria to change their behaviors and how we can control them are of critical importance to human health, agriculture and several other aspects of society. In my lab, we focus on understanding how hosts eavesdrop on these signals, "reading exit polls" and making their own decisions in response to the trends they see in the bacteria.

Yet to me, there is a bigger message here. In my lab, we always come back to the environment in which these signaling events occur. It turns out that understanding the background is just as important as understanding the signal itself. The environment modifies the signal, the producer and the listener.

A few years ago, I realized that this same idea was true for the relationships and interactions of my own life. I've learned to try to figure out the intent of the message and not just the message itself. Whether you call it mindfulness, active listening or empathy, it is rooted in the idea that communication is more than what is said. It is also the intent and the context in which it is said.

When dealing with students, this could be as simple as realizing that the question "Is there anything I can do to get a better grade?" could just be a proxy—a manifestation of desperation that is easier to express than harder questions about their academic ability, how they study or, perhaps, even their career goals. Now, I know to dig a little deeper to help them reflect on their own progress and goals.

Outside of the classroom, I've taken these lessons into managing my lab and even trying to understand my children and the motivations behind their often random-seeming questions.

As we start a new year, I encourage you to spend a little more time listening to the people around you and thinking about where they are coming from. Maybe even take a little time to listen to yourself and think about the words you use, why you use them and what you are really feeling.

Finally, never forget that some of our best life lessons can come from the most unexpected places, like a petri dish.

Andrew Palmer is an associate professor of biological sciences, jointly appointed between the department of ocean engineering and marine sciences and the department of biomedical and chemical engineering and sciences. He studies microbial signaling, plant growth and development, environmental toxicology and the development of food production systems for future off-world missions.

Global Grub

FLORIDA TECH BRINGS INTERNATIONAL CUISINE TO PANTHER DINING HALL—AND YOUR KITCHEN

"Just try it."

It's a mantra for parents of picky eaters, foodie friends of less-than-adventurous dinner dates and Florida Tech chef de cuisine Jon Skoviera, the mastermind behind the university's annual International Dinner Series.

Together with food service director Tom Stewart, Skoviera established the International Dinner Series five years ago to broaden native-born students' and Brevard County residents' culinary horizons and provide international students a sense of "home."

"I think it actually allows the students—especially if they're thousands of miles away from home—to show off something they know as comfort," Skoviera said.

Each month, the dinner series showcases a different culture, from Caribbean to Indian to Chinese, featuring music, entertainment, traditional dress, informational booths and a menu of regional fare painstakingly developed with the help of international students, faculty and staff who taste test for maximum authenticity.

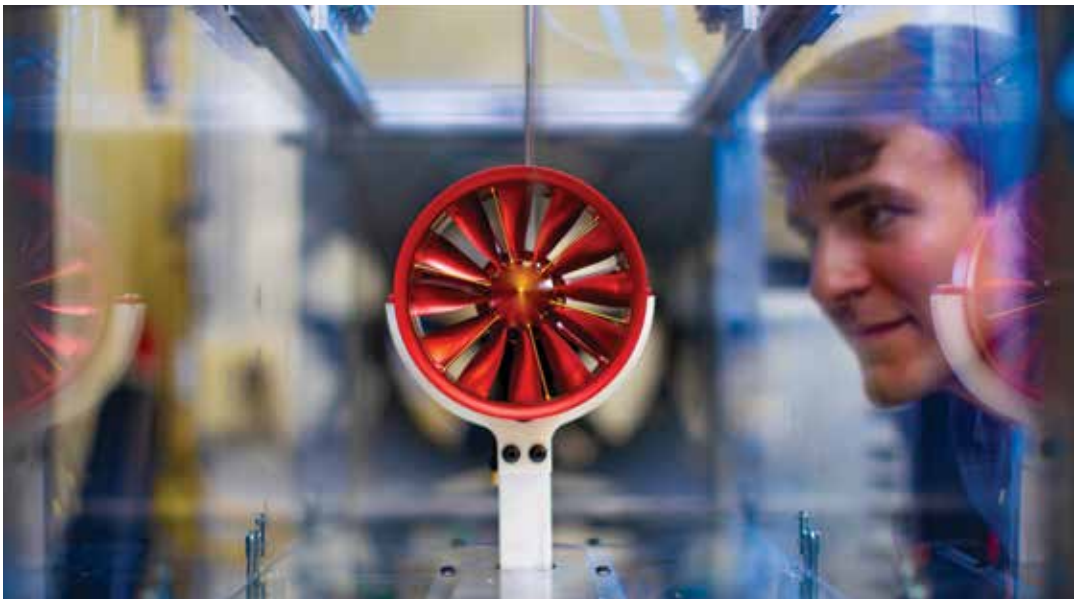
While you may not have the same cooking experience, kitchen tools or expert advisors as the team at Panther Dining Hall, you can bring the International Dinner Series experience to your own home with a few of Skoviera's top international home-cooking tips.

Place chopped herbs and spices, like cinnamon sticks, coriander, cardamom and cloves, in a cheese cloth and boil like a tea bag with the rice as it cooks for an authentic Indian taste without the pieces and sporadic bites of overwhelming flavor.

Bring butter to a boil, carefully skim off the whey that floats to the top and remove any remaining milk solids by straining through a cheesecloth to create ghee: a clarified butter used in traditional Asian cooking.

Transform your store-bought broth into Vietnamese pho by simmering with star anise, cinnamon, cloves and ginger for 15–20 minutes and adding rice noodles, thin slices of beef or chicken and chopped onion.

Fresh herbs add a full-bodied flavor to any dish, but it can be painful to throw away a whole bundle of cilantro minus the tablespoon your Caribbean recipe called for because you won't use it before it spoils. Instead, microwave the leftovers for 1–2 minutes to dehydrate them and save for months.



PANTHAIR 1000

The PanthAir 1000, found in the Aerospace Experimental Lab, is so named by the lab's students, faculty and staff who built the wind tunnel themselves. Using a load cell along with a set of pitot-static probes connected to pressure transducers, the device measures the aerodynamic properties of objects placed in its test section. The PanthAir 1000 is capable of containing test objects up to 1 foot and producing air speeds of 30 meters per second.

COLLEGIATE COLLAGE

Last November, *Derek Gores: Local Edition*, a mid-career retrospective of the Melbourne-based artist known for his innovative work in the art of collage, opened a four-month run at Florida Tech's Foosaner Art Museum in the Eau Gallie Arts District. Designed by guest curator Serene McGroarty, the exhibition built beyond Gores' repertoire of two-dimensional work and highlighted his devotion to the local arts community while exploring the foundations of the funky, Neo-Dada style that has brought him international acclaim. The exhibition also featured interactive tableaux, a new 3D work and an interactive "work room," where visitors tried their hands at Gores' game, offering a unique opportunity to interrogate and explore the artist's process.

Students Set Sights on Mars

Surrounded by miles of red sand and craggy outcrops, crew members inside the Mars Society's Mars Desert Research Station in Utah can easily envision what life could be like living on Mars.

For two weeks, MDRS crew members work together on simulated Mars missions inside a contained habitat. Past Florida Tech crew members have included computer engineering and sciences professor Ondrej Doule and aeronautics professor John Deaton.

Last year, aviation human factors student Tatsunari Tomiyama served as the health and safety officer for Crew 188, focusing his research on potential human activities to improve quality of life on Mars.

Now, Tomiyama is passing the baton.

A team of students from the Astrobiological Research and Education Society (ARES) will be the first group of Florida Tech students to participate in a mission together. Crew 205 will include students David Masaitis, Nathan Hadland and Hannah Blackburn. Together with crew members from Kuwait, Spain, Germany and England, they will be the pilot crew for the Mars Society's International Emerging Space Leader program.

"While some think our diversity will be a point of contention, I view it as our grandest strength," Masaitis said. "We have such a widely combined array of experiences between us that it creates a nearly limitless reservoir of problem-solving potential."

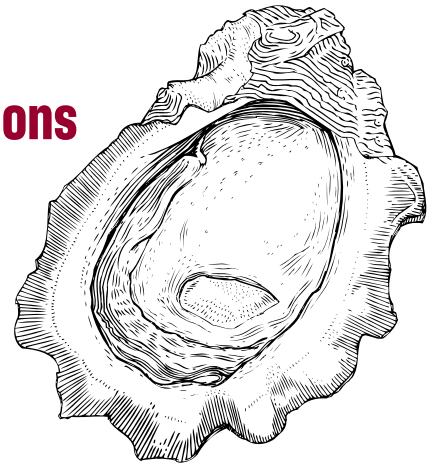
The team plans to take its project, Research to Advance the Development of Interstellar Horticulture, with them to the MDRS. The project is an experimental program through which students and faculty are testing different types of simulated soils, known as regolith.

"We have spent the past two years looking at how plants struggle in regolith and have been developing assays to qualify why they are poor substrates for plant growth," Masaitis said.

ARES recently created the ARES Future Astronaut Corps to ensure that students are able to experience the MDRS every year and to develop a long-term habitability and sustainability program for space exploration at Florida Tech.

"We are taking freshmen and sophomores with no experience and molding them into ideal candidates for future missions, so that we can build annual crews not just for the Mars Desert Research Station but for other habitability studies."

From Science to Solutions



Where do we go from here?

That is the question about 70 scientists, engineers, conservationists and researchers from across Florida and the United States asked themselves at the fourth annual Technical Conference on Coastal Water Quality, TechCon, Sept. 28.

The daylong conference, hosted by Florida Tech's Indian River Lagoon Research Institute and organized by professors Robert Weaver and Kelli Hunsucker, explored a potential fix for the ailing lagoon centered on five themes: combating coastal degradation; muck removal and control; novel approaches to water quality improvements; policy, permitting and planning, governance; and nutrient removal.

Keynote speaker Lew Linker from the Chesapeake Bay Program discussed similar restoration efforts in the Chesapeake Bay watershed, covering commonalities between what is the largest estuary in the United States and the Indian River Lagoon and how researchers can learn from the multigenerational challenges faced in both watersheds.

> "We know that there are a lot of groups out there doing remarkable research to understand the Indian River Lagoon. It's important to keep studying the system, but our goal with TechCon is to combine technology with that research to develop solutions to the issues that our coastal waterways are facing."

"We know that there are a lot of groups out there doing remarkable research to understand the Indian River Lagoon," Hunsucker said. "It's important to keep studying the system, but our goal with TechCon is to combine technology with that research to develop solutions to the issues that our coastal waterways are facing."

While researchers at TechCons past have discussed potential solutions to the lagoon's problems, this year, they've implemented some. In 2016, Brevard County voters approved a half-percent sales tax that in 2017 brought in about $44 million. This year's TechCon included brief "Tech Teaser" presentations about some of the projects implemented with the tax money.

"I know a lot of people were really excited to see what was being done with the money and how we're moving forward," Hunsucker said.

Other TechCon presentations included innovative techniques to remove muck, methods to replace plastic utilized in oyster reef restoration, enhanced septic tank technologies, defining indicators for the health of the Indian River Lagoon, comparing hydrodynamic characteristics of oyster reefs of different ages, climate-based vulnerability assessments and Indian River Lagoon septic policies.

"A lot of times, people hear about what's happening in the lagoon, and it seems very daunting and overwhelming," Hunsucker said. "To me, the presentations from TechCon seem very hopeful. So many people are pushing solutions from different angles. We all have different approaches, but they're all to help improve coastal water quality."

Lagoon-Friendly Lawns

While you might not be on the brink of inventing a revolutionary muck-removal device or developing a groundbreaking waterway restoration technique, you can do your part to clean up the Indian River Lagoon, too! Follow these simple tips from Keep Brevard Beautiful's Lagoon Friendly Lawn program to reduce your nutrient pollution at home.

FRUGAL ON FERTILIZER: Follow local fertilizer ordinances and apply phosphorous only if a soil test shows it is needed. When you do fertilize, use at least 50 percent slow-release nitrogen fertilizer, and don't apply more than 1 pound of nitrogen per 1,000 square feet.

PASS ON GRASS: Reduce the amount of turf on your property. The less grass in your yard, the lower your nutrient inputs will be. Instead, install a garden or mulched flower beds.

ABSORB IT: Replace impervious surfaces (like poured concrete) with surfaces that allow water to flow through: pavers, crushed concrete, mulch beds. This can reduce the stormwater runoff that flows into the lagoon, carrying nutrients with it.

GO NATIVE: Replace exotic, invasive plants in your yard with native landscaping that is perfectly adapted to our area, requiring less, if any, watering or fertilizer.

The Aftermath: Post-Disaster Reconaissance and Research

Jean-Paul Pinelli went to Southeast Asia after Super Typhoon Yolanda in 2013. He traveled to China after the violent tornado ravaged Jiangsu province in 2016. He surveyed the Florida Keys post-Hurricane Irma.

But he has never seen anything like this.

For the most part, the two-story house had weathered the storm fairly well. The glass French doors were intact. The vinyl siding was still attached. The satellite dish sat on the unfazed front porch, and the house clung firmly to the foundation on which it was built.

The structure, however, had one major problem: It lay entirely on its side, foundation and all.

If you tilted your head, you might not have known this house had weathered Category 4 Hurricane Michael just days before.

"It was really surreal—I've never seen that before."

Pinelli, a Florida Tech civil engineering professor, discovered the sideways home, which had been lifted by the hurricane's immense storm surge and floated like a boat until it hit a tree and capsized, during a trip to the Florida Panhandle as part of the Structural Extreme Event Reconnaissance Network (StEER).

Funded by a two-year National Science Foundation grant, StEER is part of a large-scale research project that aims to protect buildings and infrastructure from natural disasters like hurricanes, floods, tornadoes and typhoons.

As soon as a hazardous event has ceased, usually within a couple days, StEER deploys a preliminary reconnaissance team of about 10 members to the region to assess the damage, determine which areas were most affected and collect as much information—photos, drone footage, street-view camera images, community interviews, etc.—as possible before cleanup begins.

"The ultimate goal is to learn from the disasters and to understand what works and what doesn't," Pinelli said. "It is to increase our knowledge of the consequences of the hazards, so we can mitigate and prevent that from happening again—or at least minimize it."

While their ultimate goal is the same, StEER members approach reconnaissance from different angles depending on their specialties. As a structural and wind engineer, Pinelli evaluates structural damage, specifically, wind damage. Other StEER members evaluate the natural hazard's scientific, meteorological, social and economic effects.

Regardless of their angle, all StEER members upload the data they have curated to a centralized cyber infrastructure called DesignSafe-CI, a multimillion-dollar project funded by the National Science Foundation, on which Pinelli serves as co-principal investigator.

DesignSafe's reconnaissance portal provides an interactive map with markers indicating past natural disasters across the globe. The portal, which is aimed at the natural hazard engineering community but is open to the general public, allows users to click on a marker and view all available data sets related to the associated event.

Jean-Paul Pinelli evaluating an overturned house in Mexico Beach, Florida, after Hurricane Michael

"The idea is that in the future, any data that has to do with natural hazard engineering—not just in the U.S., but worldwide—will be accessible from that website," Pinelli said.

Pinelli's StEER involvement also benefits his students and professional research at Florida Tech. Students assist in curating data collected during field research, writing reports and inputting them into DesignSafe. They then utilize the data to validate and recalibrate the risk models they might have previously developed.

While the urgent nature, copious data and valuable research applications of Pinelli's work with StEER can be overwhelming and even exciting, some cases, like Hurricane Michael, hit particularly close to home.

"It's not only physical damage. There is a life story behind each of these houses that are destroyed," Pinelli said. "It could be my house, my family, my community. So, if anything, it makes you more adamant that we need to do something. We need to prepare, and we need to mitigate—it's critical."

"You're just like a drop in the bucket. There's so many people that need help, especially in Panama City and Mexico Beach. I feel like I could do more—I wish I could do more—but it's better than nothing."

Flying with Purpose The day after Hurricane Michael ravaged the Florida Panhandle, 24-year-old Christa Robison '18 drove $200 worth of supplies from Melbourne to her hometown community in Grand Ridge, Florida. When that didn't feel like enough, the Florida Tech aeronautics alumna and current FIT Aviation flight instructor raised more than $3,000 and enlisted the help of the university. On Oct. 20, she loaded a 1,300-pound payload of goods, like charcoal, food, air mattresses and other necessities, in a Florida Tech Piper Chieftain and flew to Marianna, Florida, stopping on her trip home to pick up a wounded warrior.

Treats Only

RESIDENCE LIFE'S ANNUAL TREAT-OR-TREAT EVENT BY THE NUMBERS:

5 HAUNTED HOUSE THEMES

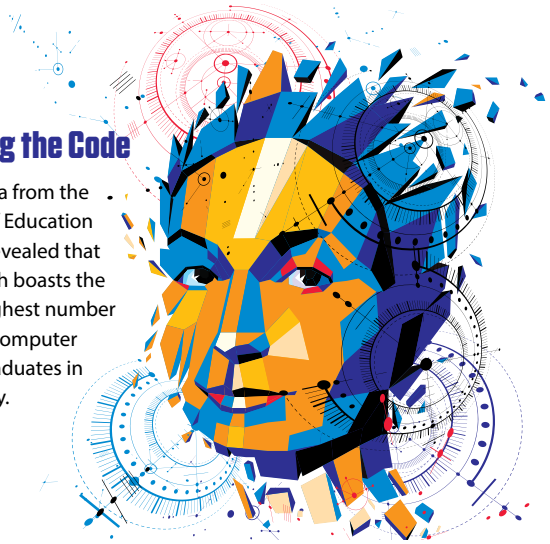
2,000 COSTUME-CLAD VISITORS

'Remarkable' Alumna On Screen

Mishaal Ashemimry '06, '07 M.S., an aerospace engineering and applied mathematics alumna who founded her own rocket company at age 26 and became the first female aerospace engineer in the Gulf Cooperation Council, was one of six "remarkable" women appearing in Macy's "Find the Remarkable You" ad campaign. Highlighting Macy's fall 2018 collection, the commercial features strong women paving the way in positions ranging from fourth-grade teacher to orchestra conductor to, of course, aerospace engineer.

Cracking the Code

Recent data from the Institute of Education Sciences revealed that Florida Tech boasts the second-highest number of female computer science graduates in the country.



The Real Winner

The Green Bay Packers may have defeated the New York Jets in overtime Dec. 23, but Florida Tech's Scott Center for Autism Treatment was the real winner. Thanks to Florida Tech's official education and STEM partnership with the football franchise, the Scott Center received a donation of more than $16,000 from the Jets 50/50 Raffle that day.

etc.

New Shark Species Honors Female Pioneer

Eugenie Clark was a pioneer in shark biology known around the world for her illuminating research on shark behavior. She was a pioneer in another critical way as one of the first women of prominence in the male-dominated marine biology field.

Fondly labeled "The Shark Lady," Clark, who founded Mote Marine Laboratory and continued studying fishes until she passed away in 2015 at age 92, will now be recognized with another distinction: namesake of a discovered species of dogfish shark.

The species, named Squalus clarkae, also known as Genie's Dogfish, was identified from the Gulf of Mexico and western Atlantic Ocean. The confirmation of this new species was reported in the July edition of the journal *Zootaxa*.

Florida Tech assistant professor and shark biologist Toby Daly-Engel was among the paper's four authors, along with marine scientists Mariah Pfleger of Oceana and Florida State University's Dean Grubbs and Chip Cotton.

Before their findings, researchers labeled this species of dogfish shark Squalus mitsukurii. However, using new genetic testing and morphology, the study of an organism through physical appearance, they discovered and classified Genie's Dogfish as a new species.

"Deep-sea sharks are all shaped by similar evolutionary pressure, so they end up looking a lot alike," Daly-Engel said. "So, we rely on DNA to tell us how long a species has been on its own, evolutionarily, and how different it is."

The multitude of threats sharks face, from overfishing and bycatch to the global shark fin trade, make this type of research essential to shark conservation and management, said Pfleger, marine scientist for the responsible fishing and sharks campaigns at Oceana.

"Many fisheries around the world are starting to fish in deeper and deeper waters, and unfortunately, much less is known about many of the creatures that live in the deep," Pfleger said. "The first step to successfully conserving these species that live in deeper waters, like Genie's Dogfish, is finding out what is down there in the first place."

CLIMATE THREATENS MPAS

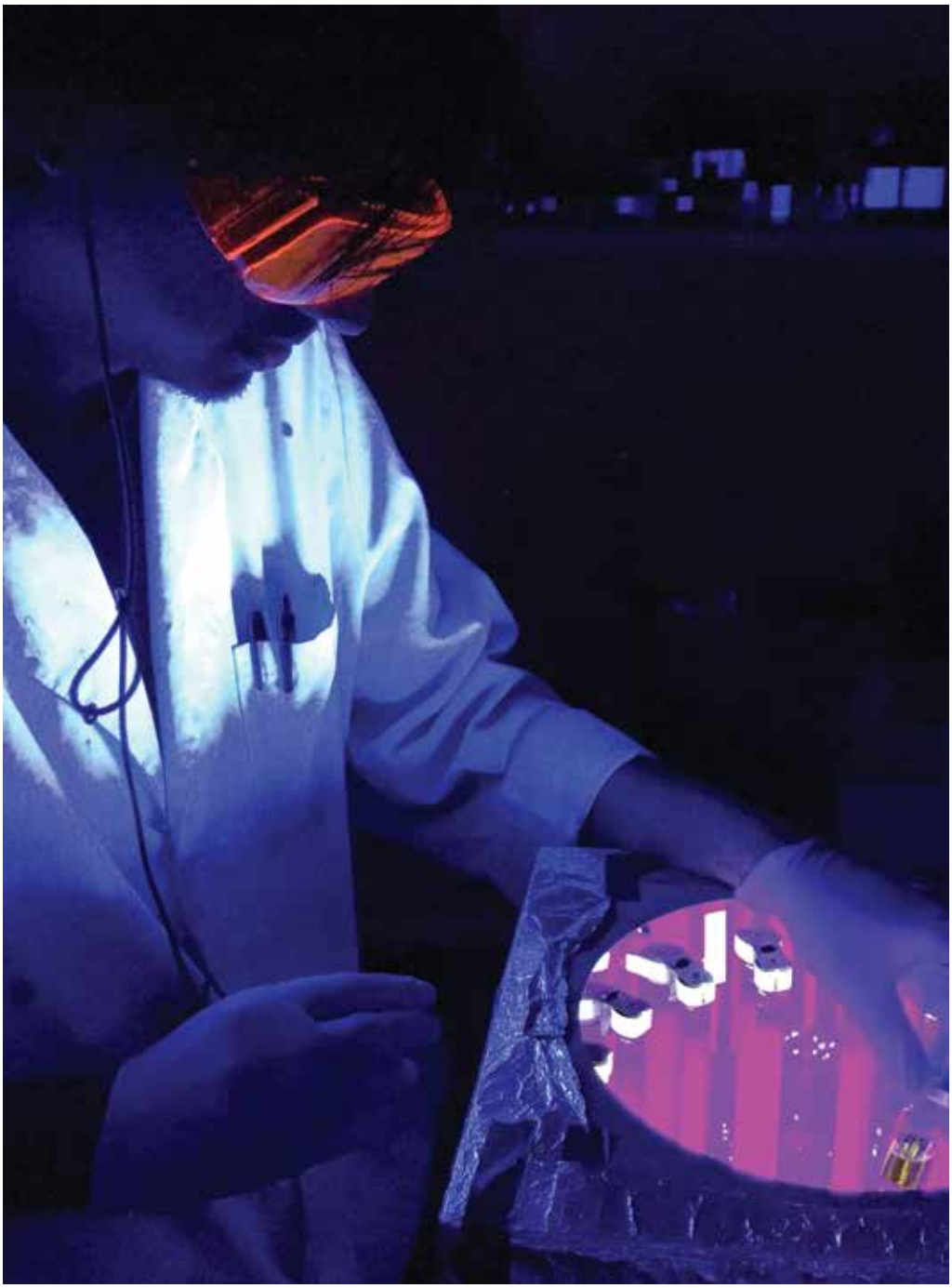
Research from Florida Tech and the University of North Carolina, "Climate change threatens the world's marine protected areas," was published in May's *Nature Climate Change* journal.

It reports that most marine life in marine protected areas (MPAs) will not be able to tolerate warming ocean temperatures caused by greenhouse gas emissions. The greatest risk is to MPAs in the Antarctic and Arctic, the northwest Atlantic and newly designated reserves in the Galápagos Islands.

SPACE SIMULATION INNOVATION

Florida Tech, working with Sanford-based Servos & Simulation Inc., has developed a 500-pound simulator that allows human subjects to experience the entire suborbital spaceflight profile—from takeoff through landing—using 360-degree motion and the hyperbaric environment of a spacesuit.

Their findings could lead to changes in the way cockpits, flight decks and even rescue pods are designed and used. They may also provide data to help develop Federal Aviation Administration guidelines for commercial spaceflight.



NEW TOOLS FOR MAPPING THE BRAIN

Researchers at Florida Tech have developed the fastest method to date for creating a key molecule used by neuroscientists at Columbia University to map brain activity. They also discovered ways to create two new versions of that molecule—a neurotransmitter called glutamate, or glu—that can further advance this critical field of study.

This work, funded by the National Institutes of Health, was published in the American Chemical Society journal, *ACS Chemical Neuroscience*.

Glu is the most common neurotransmitter. To aid neuroscientists in mapping the enormously complex brain circuitry, researchers have used light to activate inactive, or "caged," neurotransmitters, including glu, in live brain tissue.

The work reported on in *ACS Chemical Neuroscience* will make the process of making caged glu more effective by cutting the number of steps in half and the overall time by 80 percent while doubling the yields of previous methods, said Florida Tech chemistry professor Nasri Nesnas, who is the principal investigator and corresponding author of the paper.

CARVALHO LANDS $1.6M FEDERAL RESEARCH AWARD

Marco Carvalho, dean of Florida Tech's College of Engineering and Science, is leading a cutting-edge cybersecurity research effort that could revolutionize how multiple organizations collectively defend themselves from cyberattacks.

Carvalho is the principal investigator on a project at the Harris Institute for Assured Information that recently received a $1.6 million, three-year award from the Department of Homeland Security Science and Technology Directorate.

The federated command and control infrastructure Carvalho has developed under prior DHS funding enables coordinated detection and response to cyber events across different organizations, and the new DHS contract will have Florida Tech developing a federated defense ecosystem to further test and refine this powerful and important capability.

"It is an honor and a vote of confidence in our work to receive new funding from the Department of Homeland Security," Carvalho said. "I am proud of our groundbreaking research into this critical area of cyber defense, which I owe to the outstanding team of faculty and researchers we have at the Harris Institute for Assured Information."

Sasha Bush and the women's lacrosse team

Will Bush and the men's lacrosse team

Making an IMPACT

On Feb. 4, 2015, Florida Tech men's and women's lacrosse teams hosted a small "draft day" ceremony for local siblings Will and Sasha Bush, initiating them as official team members.

Will was 11 years old, and Sasha was 9. Previously, doctors had diagnosed Will with primary immunodeficiency disease, mitochondrial disease and a Chiari malformation. Sasha was also born with PIDD and mitochondrial disease in addition to episodic ataxia type 2 with familial hemiplegic migraine and a seizure disorder.

None of this mattered to Will and Sasha that February afternoon because when pen hit paper, they became part of the Panther family.

The Bush siblings' signing put into motion a movement within the Florida Tech athletics department that has since enriched the lives of several children and their families. In the three years since that initial draft day celebration, seven Florida Tech teams have hosted similar events to sign nine children through Team IMPACT.

Team IMPACT is a national nonprofit organization based in Massachusetts that enhances the lives of children facing life-threatening diseases by drafting them to local college athletics teams, including the Florida Tech Panthers. Children who are part of the program become official teammates for the duration of their treatments and beyond.

Will and Sasha's mother, Stefani Bush, considers their relationship with the student-athletes more like a family than just a team.

"For our family, being a part of Team IMPACT has given us a slice of normalcy," Bush said. "We can just be a family and not worry about medical stuff. It is not just a team; it is a lifestyle for my kids."

Children participating in Team IMPACT bond with their teammates by attending practices, getting help with their homework, rooting for them at games and sometimes going on small group outings. Unfortunately, not everything is as fun as cheering on the sidelines. Much like a real family, though, teammates are there for the children during the hard times, too.

When Will and Sasha are in the hospital, their teammates message them to see if they need anything. When Sasha's feeding tube needs to be changed, her teammates are there to help her get through the painful process, even changing the tube themselves to make the difficult experience a little easier on her.

"All but one of her tube changings has been done with the girls on the team," Bush said. "They would sit by her and calm her down while it was being changed. It's a symbiotic relationship for sure."

Florida Tech's most recent Team IMPACT addition is Anderson "AJ the Tank" Demarest, a 5-year-old with a multi-minicore congenital myopathy who became the swimming team's first Team IMPACT "draft" in November.

Olivia McKelvey, a junior on the swimming team, looks forward to building a relationship with AJ and his family, including his sister, Braylee, who also loves to visit and cheer on the Panthers.

"As an athlete, I think working with younger kids is really important," McKelvey said. "I think that, when it comes to AJ, we act as a role model for both him and even his younger sister. AJ and Braylee have only been with us for a short time, yet they already refer to us as their older brothers and sisters, which is heartwarming."

According to McKelvey, during their mid-season Panther Invitational, AJ cheered on his team and even handed out candy at the snack booth. The team is continually inspired by not only AJ's actions but also his attitude and ability to always stay positive.

"I think it's amazing to be able to show younger kids the value of teamwork and support," McKelvey said. "But when it comes to Team IMPACT, we're also giving back by being a support system for AJ and his family. That means a lot to us. We look forward to being a part of their lives now and in the future."

Although every child is different, most children graduate from Team IMPACT after two or three years with their team. A ceremony similar in celebration to draft day, graduation focuses on the children's accomplishments and the impact they've had on their teammates. AJ plans to graduate from Team IMPACT in 2020, at which point he is encouraged to maintain the relationships built through the program as an alumnus.

"Team IMPACT is a great way for the kids to gain social skills and be a part of a sports team," said Vanessa Rubio, Florida Tech softball player and Team IMPACT on-campus ambassador. "The majority of the Team IMPACT kids drafted at Florida Tech are home-schooled, so they have limited opportunities to make friends in class or on the playground."

Director of Athletics Bill Jurgens, who has been a fixture in the department for almost 50 years, believes a partnership with Team IMPACT is an incredible opportunity for the teams and student-athletes.

"Student-athletes have busy lives. They go to school, have practice, prepare for games and sometimes work, and they can get overwhelmed with it all," Jurgens said. "Then you meet these kids and—you have no idea—they are so inspirational. They go through so much every day; it just puts everything in perspective."

— Daniel Supraner
Ashley Letendre and Lexi Bettermann also contributed to this story.

ACADEMIC ALL-DISTRICT ATHLETES

The College Sports Information Directors of America recognized three Florida Tech fall sports team athletes for their academic and athletic success this year.

Trent Chmelik, Macey Hedelund and Paris Junior Roserie earned spots on the Google Cloud Academic All-District First Team, which recognizes the nation's top student-athletes for their combined performances on the field and in the classroom. The three will also be placed on the Google Cloud Academic All-America ballot.

To qualify, a student-athlete must be either a starter or important reserve, maintain a minimum 3.30 cumulative GPA, have been at his or her current institution for at least one calendar year and be of sophomore athletic eligibility.

Chmelik, an astronomy and astrophysics student, is the starting quarterback for the football team and has a 3.56 GPA. Hedelund started all 18 games for the women's soccer team this season and boasts a 4.0 GPA in biomedical sciences. Roserie appeared in 13 men's soccer team games this season and maintains a 3.83 GPA as a neuropsychology student.

PLAYER OF THE YEAR

Senior linebacker J.T. Hassell has had a record-breaking year that culminated with recognition as the Gulf South Conference Defensive Player of the Year.

He finished atop the GSC and ranked fifth nationally, with 124 total tackles and 76 solo tackles. He led the conference in tackles per game (10.3) and forced fumbles (3) while ranking in the league's top seven in tackles for loss and sacks. Furthermore, Hassell set school single-game records for most tackles in a game (20) and sacks in a game (4).

Hassell is the second Panther in program history to win the award, joining J.J. Sanders, who received it following the 2015 season.

WEBBE HONORED

Psychology professor and faculty athletics representative (FAR) Frank Webbe received the 2018 David Knight Award presented by the NCAA and the Faculty Athletics Representative Association (FARA).

During his 36 years as Florida Tech's only ever FAR, Webbe has served as the FARA Division II representative and Division II vice president, on the organizing committee for the Division II FAR Fellows Institute and the Division II Advanced Leadership Institute and on the Postgraduate Scholarship Regional Selection Committee.

The award is named after the longtime UNC Greensboro FAR lauded for his dedication to student-athletes and collegiate sports.

ABECEDARY OF

PARTICLE PHYSICS

Florida Tech's high-energy particle physics (HEP) team is partnering with CERN in Geneva, Switzerland, to build new equipment for the Compact Muon Solinoid experiment (CMS) at the Large Hadron Collider (LHC), the world's largest and most powerful particle accelerator. A little rusty on your particle physics? That's OK; we'll get you up to speed from A to Z.

ACCELERATOR

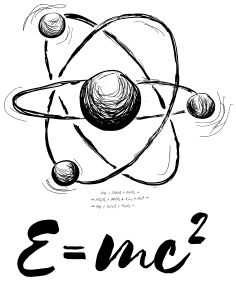
A particle accelerator collides charged subatomic particles, such as protons, electrons and positrons. The particles are accelerated using the electric force.

D DETECTOR

The CMS detector sits at one of four collision points in the LHC and takes 3D "photographs" of the particles up to 40 million times per second.

B BIG BANG THEORY

In its 12th and final season, the seven-time Emmy-winning CBS sitcom "The Big Bang Theory" follows two Caltech particle physicist roommates, their neighbor—an aspiring actress—and their group of nerdy, video game-playing, comic book-loving friends.



E $E=mc^2$

In particle colliders like the LHC, physicists use Einstein's famous equation, $E=mc^2$, to detect new particles.

GEM Built and tested by Florida Tech students in a clean room within the Olin Physical Sciences Center, Gas Electron Multiplier detectors were delivered to CERN and will be installed in summer 2019 to form large rings inside the LHC's CMS experiment.

H HIGGS BOSON

First observed by the CMS and ATLAS experiments at the LHC, the Higgs boson is thought to be the visible manifestation of the Higgs field that, theoretically, gives particles interacting with the field their mass.

C COCKCROFT

John Douglas Cockcroft and Ernest T.S. Walton won the 1951 Nobel Prize in physics for pioneering the use of particle accelerators in studying the atomic nucleus.

F FELICIA

Employed by the Fermi National Accelerator Laboratory in the 1970s, Felicia the Ferret's job was to burrow through hundreds of feet of vacuum piping while pulling a cloth dipped in cleaning solution to ensure the piping was clear of debris before turning on the particle beam.

I INTERNATIONAL

Our Florida Tech team is only a small part of the huge community that it takes to sustain the CMS experiment. With 4,300 particle physicists, engineers, technicians, students and support staff from 182 institutes in 42 countries, CMS is truly an international collaboration.

J JOYCE

From James Joyce's poem, "Finnegans Wake," Murray Gell-Mann adopted the term "quark." While his line "Three quarks for Muster Mark," likely referred to the German word for a cottage cheese-like dairy product, the line struck Gell-Mann as appropriate, since the hypothetical particles came in threes.

K KLYSTRON GALLERY

Built to house the 284 klystrons that pump accelerating energy into the largest linear accelerator in the world, SLAC National Accelerator Laboratory's Klystron Gallery is one of the world's longest modern buildings, measuring just shorter than 2 miles long.

L LHC

The Large Hadron Collider is the largest and most energetic particle accelerator in the world and is located at CERN in Geneva, Switzerland.

M MUON SCATTERING TOMOGRAPHY

The muon scattering tomography technique, which forms 3D images of volumes using cosmic ray muons, has several security applications, such as MST scanners to detect nuclear contraband hidden in cargo.

N NOONAN

Florida Tech's Daniel Noonan, a postdoctoral researcher working at the LHC, was named a 2019 Distinguished Researcher, a prestigious recognition given by the LHC Physics Center to provide resources that strengthen and expand their research programs.

O OPEN SCIENCE GRID

The Open Science Grid is a high-throughput distributed computing infrastructure designed to facilitate large-scale scientific research on which Florida Tech operates a state-of-the-art Linux Cluster.

P PADUA

Padua, Italy, is home to the INFN National Laboratory of Legnaro, where a group is heading the Cosmic Muon Tomography project using spare CMS parts.

Q QUARK-GLUON PLASMA

A state of matter thought to have dominated the universe's earliest moments, quark-gluon plasma is so hot that it causes quarks to break apart from one another.

S STANDARD MODEL

The Standard Model of particle physics classifies all known elementary particles and describes three of the four known fundamental forces (electromagnetic, weak and strong, not including gravitational). It is a successful theory but still cannot explain the most fundamental questions about the universe.

R RAPPER

Consensus, a British songwriter, rapper, producer and poet with an undergraduate degree in aerospace engineering and a recent hip-hop album about particle physics, rocked Florida Tech's Pantheum for a free concert in November. Consensus travels the world performing at universities as well as CERN and FERMI lab.

T TACHYON

Entirely theoretical, tachyons are particles that move faster than light. Although their existence in the real world has yet to be proven, Star Trek's fictional 24th-century characters have used tachyons to attack Q, detect cloaked ships and open transwarp conduits and temporal rifts.

U UNCERTAINTY PRINCIPLE

The Uncertainty Principle is the idea that position and momentum, or likewise energy and time, cannot both be known with absolute precision. The observation of a particle will act upon the particle, rendering the observation imprecise.

V VACUUM

Achieving a vacuum within the CMS beam pipe is essential. This allows particles to collide only with each other, not gas molecules. The lower the vacuum, the cleaner the data.

W WERNER HEISENBERG

A German physicist and philosopher, Werner Heisenberg developed the Uncertainty Principle.

X X-RAY

Linear particle accelerators generate X-rays or high-energy electrons for medicinal purposes in radiation therapy to destroy cancer cells while sparing surrounding normal tissue.

Y YUMICEVA

Francisco Yumiceva is one of the three physicists who lead high-energy particle physics research groups at Florida Tech. The others are professors Marc Baarmand and Marcus Hohlmann. Hohlmann is the CMS project lead and contributed to this abecedary.

Z ZWEIG

Around the same time but independently from Murray Gell-Mann, German-American physicist George Zweig introduced the quark model. "Aces," his term for quarks, however, didn't stick.

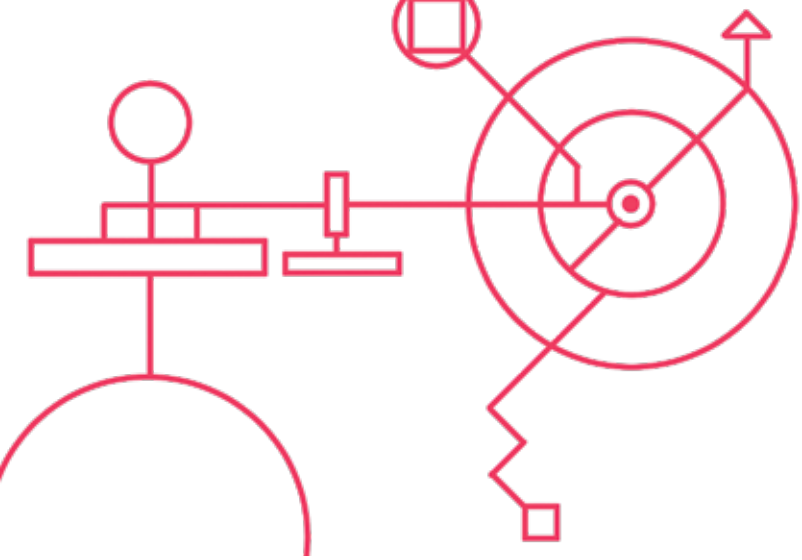

OUR H
THE Z

EROES, ZEROS

SWEPT UP BY THE WORLD OF COMPETITIVE INVENTING, FLORIDA TECH FOURSOME TEAM ZERO IS HAVING ONE HACK OF A RIDE.

Story by Stephanie Herndon

Illustrations by Nikoby



The term "hacking" used to conjure visions of nefarious nerds breaking into computer systems with fiendish intentions. Today, "hacking" has a new meaning. "Life hacks" are innocent shortcuts that save people time and money. And "hackathons" are problem-solving events that ask participants to invent programs and products designed to help, not harm.

First popping up in the late '90s as early dot-coms and tech startups sought answers to their toughest challenges, hackathons have gained popularity among commercial businesses, nonprofit organizations and universities, many of which host collegiate competitions and sponsor their own student teams.

How it works: A host college establishes a hackathon's date, time, duration, theme and challenges. Challenges typically center around a particular need of a sponsoring company or the novel application of a specific piece of hardware or software. Think "Use *blank* to do something that has never been done before," for example.

Teams get a set amount of time—around 24 to 36 hours—to come up with an idea and develop a prototype. From there, it's a fast-and-furious, caffeine-fueled race to the finish. Teams present their ideas, hoping their cleverness, ingenuity and execution earn the attention and praise of hackathon judges.

ROOTS OF ZERO

Florida Tech's all-student hackathon team, Team Zero, got its start in 2016, when the university sent students, including Muntaser Syed '17 M.S. and Chris Woodle '18, to the Institute of Electrical and Electronics Engineers (IEEE) Southeast Conference. Woodle led Florida Tech's robotics team, which took first place in the competition—a first for the university.

The following year, the Florida Tech contingent nabbed the second-place title in the IEEE conference's software competition.

Team Zero's present-day foursome formed in April 2017, when Syed and Woodle linked up with fellow IEEE members Chris Wille and Peter Tarsoly to compete in the NASA Space Apps Challenge. They built Cassandra, a real-time, interactive disaster-prediction engine. Team Zero won second place overall, as well as best use of hardware and the people's choice award. That earned them entry into the global finals.

"With Cassandra, we got a lot of popularity, not only among the hackathon attendees, but also among the Orlando tech community, which gave us a lot of positive feedback," Syed says. "This opened our eyes to the potential we had to accomplish very cool engineering projects given a very short timespan."

Propelled by the momentum of their successes and armed with new skills gained in the process, Team Zero cemented its reputation as an up-and-coming force to be reckoned with at the University of Central Florida's Knight Hacks competition in October 2017. The challenge? Create something new. The criteria? Creativity, originality and completeness.

Team Zero answered the Knight Hacks challenge with Tweetmaps, a machine learning app that analyzes tweets about hurricane damage and visualizes the data on a map.

They later revised Tweetmaps so it could help people locate clean public bathrooms. Why?

"For fun," Syed says. "Because we could."

PRODUCTS OF ZERO

Since Knight Hacks 2017, Team Zero has attended more than 27 hackathons and has taken home so many different awards, it's been hard for the team to keep track of them all.

"We've won so many prizes, I don't even know what we've won at this point," Syed says. He estimates the total at 71—between two and four per competition.

"We've won so many prizes, I don't even know what we've won at this point."

–Muntaser Syed '17

Team Zero won first place overall at University of Miami's UHack 2017. There, they created Vamped, a "virtual amp" system that regulates sound, volume and ambient noise based on its user's mood.

"I think the judges were impressed by how we used an electroencephalogram to correlate brainwave patterns to music," Woodle says.

At MakeHarvard in 2018, Team Zero members created Pillzy, a medication-tracking system to help users avoid under- or overdosing.

"We built it with the elderly, Alzheimer's patients and drug addicts in mind," Woodle explains. "It is activated by Amazon Echo voice commands and uses facial recognition authentication and touch verification to dispense medications only on schedule."

Pillzy earned Team Zero awards for best use of RightHand Labs TakkStrips (tactile array sensors), best use of Amazon Web Services and most likely to become a unicorn. (A "unicorn" is a startup company valued at more than $1 billion.)

At the 2018 UC Health Hack in San Diego, Team Zero built ClearPathAR, a wayfinding app to help patients and volunteers navigate hospitals. Team Zero says the event's sponsors were most impressed with the product's potential for commercial use, which earned them second place overall as well as the award for best use of machine learning.

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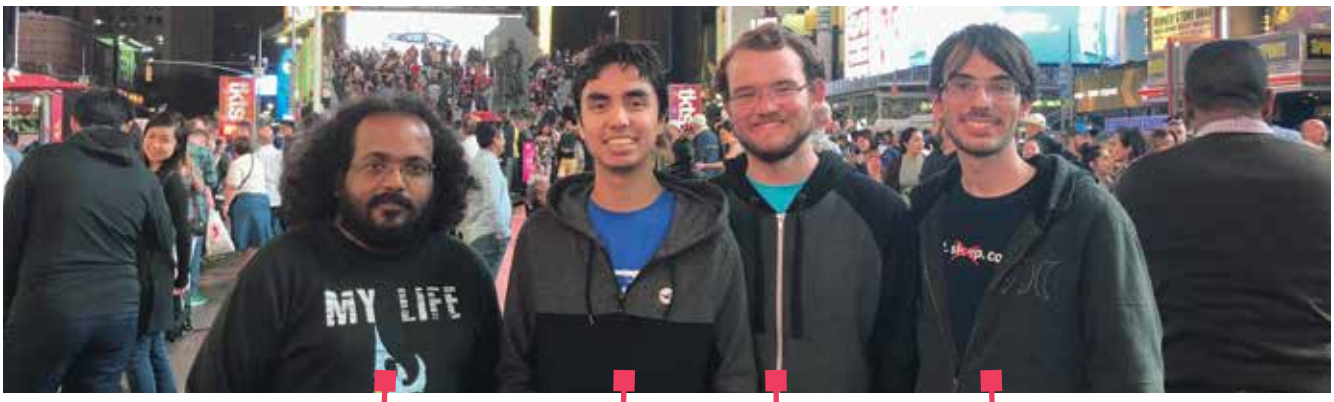
MEET TEAM ZERO



Name: Muntaser Syed '17 M.S.

Studying: Ph.D. student in computer engineering

From: United Arab Emirates

Hacks: devpost.com/msyed2011 or devpost.com/jemsbhai

Name: Chris Woodle '18

Studying: Master's student in computer engineering

From: St. Petersburg, Florida

Hacks: devpost.com/chriswoodle

Name: Peter Tarsoly

Studying: Junior in computer engineering

From: Long Island, New York

Hacks: devpost.com/ptarsoly

Name: Chris Wille

Studying: Senior in electrical engineering

From: Tampa, Florida

Hacks: devpost.com/cwille2012

Team advisor: Marco Carvalho, dean of the College of Engineering and Science

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Back in Cambridge for HackHarvard 2018, Florida Tech's hacker crew had an idea to revolutionize the insurance industry by adjusting premiums in the moment based on user data such as unsafe driving behavior (for auto insurance) or strenuous physical activity (for health insurance). This brainchild, called Insura-ledger, won Team Zero best financial hack, best use of Kensho Knowledge Graph API and best use of blockchain.

THE POWER OF ZERO

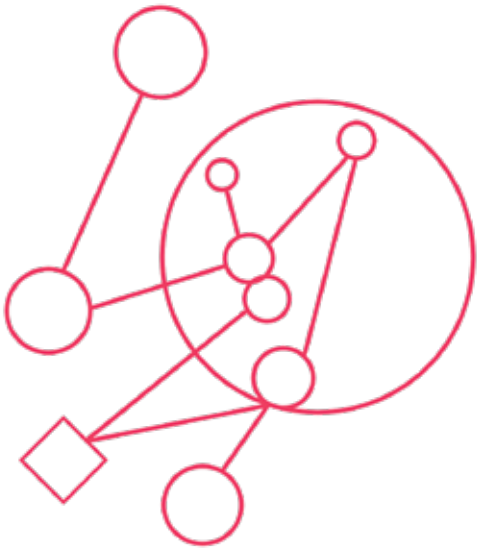
Despite their successes, the members of Team Zero remain firmly grounded. For them, hacking is more about friendship and growth than it is fortune and glory.

"I think the idea of collaboration has moved society forward in every age. Even with cavemen—if you hunt alone, you could hunt a rat to eat; if you hunt together, you can hunt a mammoth," Syed says. "With working together, the ultimate outcome will always be better."

Woodle values the career experience he gains at each event, particularly when corporate leaders get involved in the challenges.

"You're working one-on-one with professionals in your field, learning how to present yourself, getting a feel for what it's like to work for different companies," he says.

> "The main point is not to win. It's for like-minded people to collaborate and learn."
>
> –Muntaser Syed



"At these events, you interact with companies and the engineers who actually build the products you're using," Syed adds. "You talk to them, ask them questions—it's a unique experience you'd normally get only if you're in the company."

Hackathon networking and collaboration have led to more than a dozen pre-graduation job offers for the members of Team Zero. But Syed, Woodle, Wille and Tarsoly have no immediate plans to accept any offers of employment. Nor are they currently pursuing commercialization for any of their winning ideas.

"We're not looking to make an immediate financial gain," Syed says. "The main point is to collaborate with like-minded people and to learn."

For now, the heroes of Team Zero plan to complete their degrees while competing in as many hackathons as their schedules will allow. Oh, and possibly starting a software development and rapid prototyping company together. They wouldn't be Team Zero—or Panthers, for that matter—if they weren't already hacking a bright future.

THE ORIGINAL HACKER

Before Syed, Woodle, Wille and Tarsoly, there was Edwin Robin.

If "hacking" is creating something from nothing to solve an industry-specific problem, Robin is one of Florida Tech's—and computer science's—original hackers.

Robin was working as IBM's manager of launch site programming at Cape Canaveral in the early 1960s, a time of high demand and low availability of computer programmers nationwide.

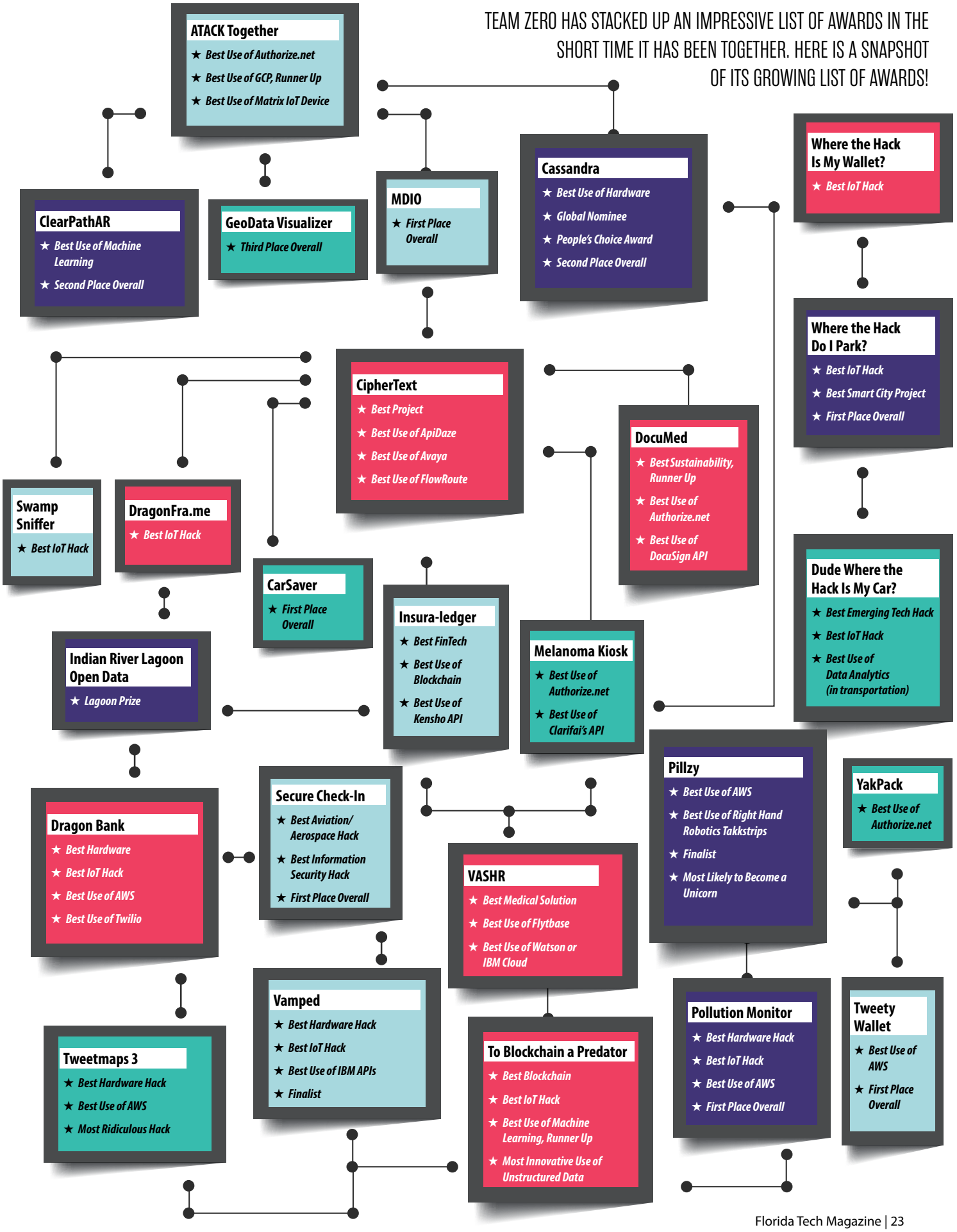
With what was then the newly established Brevard Engineering College just a few miles south, Robin recognized an opportunity to fill the gap for his employer. Making use of the university's pre-existing departments and with the support of founder Jerry Keuper, Robin developed the original curriculum for what became Florida Tech's undergraduate computer science program.

As the department's first chairman, Robin selected textbooks from the minimal number available at the time, secured donation of an IBM 1130 computer for the university's computer lab, hired program instructors—many of whom were fellow IBM employees working at the Cape on a contract with NASA—and officially launched the Bachelor of Science Degree in Computer Science in 1966.

Robin didn't realize until many years later that his successful application of the program for accreditation with various academic boards made it the first accredited undergraduate program in not only the United States, but the world.

—Karly Horn

TEAM ZERO HAS STACKED UP AN IMPRESSIVE LIST OF AWARDS IN THE SHORT TIME IT HAS BEEN TOGETHER. HERE IS A SNAPSHOT OF ITS GROWING LIST OF AWARDS!



PANTHER PIONEERS

Florida Tech graduates turned business owners reflect on what it takes to be a successful founder.

By Jessica Taylor

> When you have a job, you know what you have to do every day. With entrepreneurship, there are no set guidelines.

We've all had it at some point: that million-dollar idea, the fantasy of walking out on a job we hate or the hobby we wish we could turn into a career. Some of us shove these crazy dreams behind a wall of excuses or rational thinking. After all, so many things could go wrong. So many new businesses fail. Who in their right mind would give up a secure job or carefully planned future for—gasp!—the unknown?

But people are taking that leap more and more. As of 2018, there were 30.2 million small businesses in the United States, according to the U.S. Small Business Administration. That number continues to grow. Whether through a business with employees, a sole proprietorship or as a freelancer, more Americans see the value of going rogue.

So what sets an entrepreneur apart? What kind of person does it take to go it alone and found a company? We talked to a few Florida Tech graduates who went on to become successful founders. Interestingly, Florida Tech has a long list of alumni who also happen to be successful business owners. Coincidence? We don't think so. At Florida Tech, the spirit of independence and innovation is strong, and it shows in our graduates. After all, the school itself was founded 60 years ago on just 37 cents.

EMBRACE UNCERTAINTY

Scott Benjamin, assistant professor at the Bisk College of Business, sees firsthand the characteristics that set a successful future founder apart.

"A lot of students have great ideas, but very few of them can do things with uncertainty, where you don't know the next step," Benjamin said. "When you have a job, you know what you have to do every day. With entrepreneurship, there are no set guidelines."

Benjamin accepts the unknown on a daily basis in a variety of businesses outside his full-time teaching career. One of those ventures is Gamer Goo, a company he co-founded with former student Justin Clark '16.

Clark graduated with a degree in business administration and launched Gamer Goo in February 2018. Gamer Goo is a product designed to improve handgrip. Though it's targeted toward gamers, it's also helpful to anyone who needs a better grip in sports and other activities.

Gamer Goo isn't Clark's first business. He grew up with family-owned restaurants and even put himself through school with the sale of his direct-mail business. He and Benjamin hit it off in class, and that relationship grew into business partnership.

Clark agrees that it takes a certain mindset from the start to make a business successful.

"You can't be afraid to fail," Clark said. "You can't let the fear of not being good enough stop you from starting. Take those leaps, and figure the risks out as you go."

That formula has worked well for the partners so far. Since Gamer Goo's launch, they have continually hit their business goals, and they plan to reach $1 million in sales within the next 12 months. They intend to continue to build the company and sell it in three years to start their next venture.

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> "You don't have to be a TED Talk storyteller, but you have to be able to say, 'This is what I'm passionate about. And this is why you should care.'"

DAMION BAILEY '12

continued from page 25

BE REALISTIC

Don't let the idea of embracing uncertainty lead you to believe a person can blindly leap into a new business without being realistic. Many of these founders run their businesses full time, but it didn't start that way. Some were students. Others had full-time jobs and still do. Successful business owners go into their ventures knowing that it will consume their lives, while understanding that any financial reward may be in the very distant future.

"Have realistic timelines. Businesses take 18 to 24 months before they draw any salary," Benjamin said. "Too many people bail."

If you're like Clark, you don't have another job to fall back on. So, he faces a sink-or-swim situation with every new company. Having a clear idea of expenses is key.

"You have to have the mental ability to know and be willing to put yourself through the financial and mental struggle to balance everything out," Clark said. "Understand costs down to a cent. You can be surprised that your estimates for what you thought you would need don't go as far as you expected."

JUSTIN OLIVEIRA '06, '07 M.S. (left)

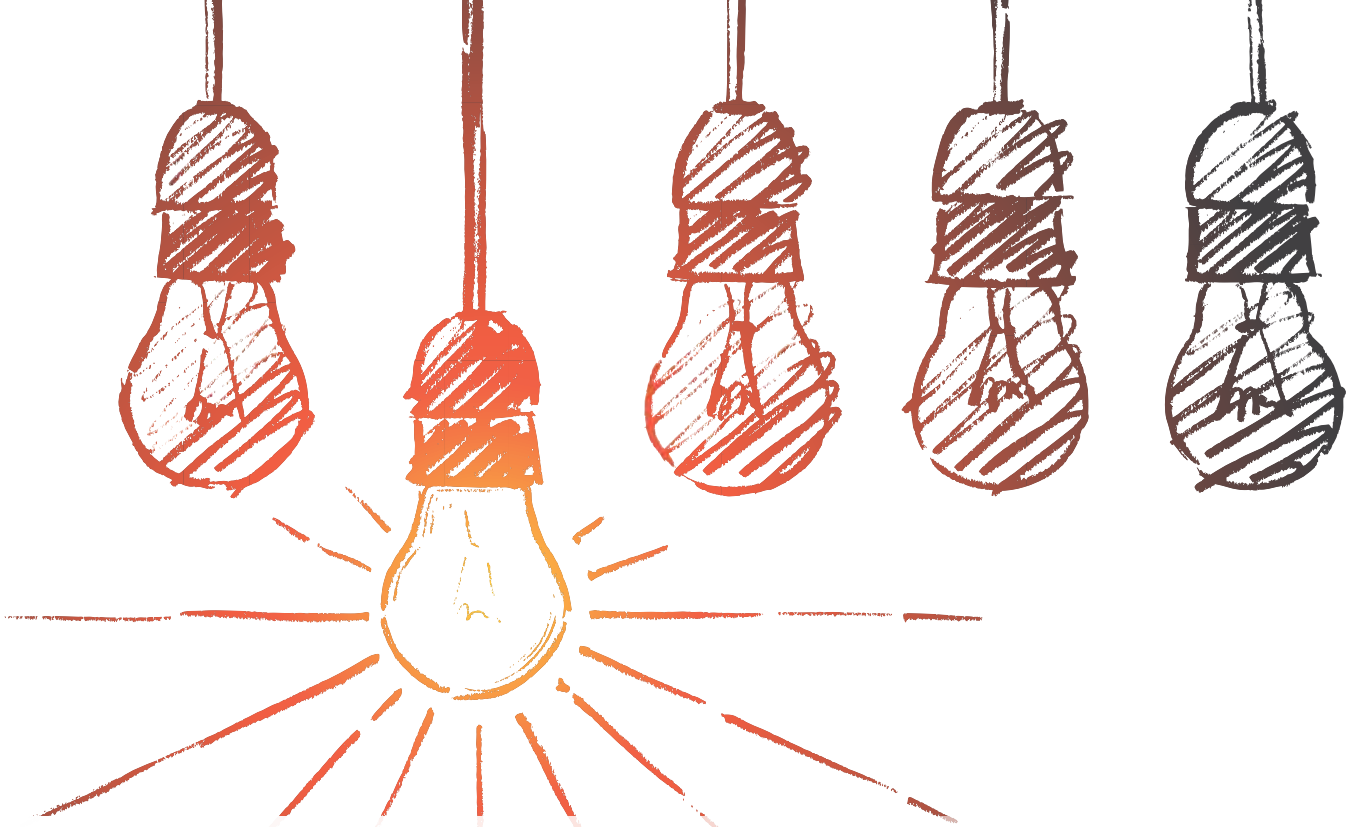
BUILD RELATIONSHIPS

Though it's a given that you'll face uncertainty, that doesn't mean you have to do it alone. Aerospace engineering alumnus Justin Oliveira '06, '07 M.S., lists a good partner as the key to success.

"The best thing you can do the moment you decide you want to start a company is to find someone equally as passionate and have them be your co-founder," Oliveira said, "because it's impossible to do it alone. Determine what your strengths and weaknesses are, and find a partner who can fill in those gaps."

Oliveira met his business partner while earning his MBA at Harvard University. They found they had a shared love for space. Oliveira's experience working for NASA on the technical

JUSTIN CLARK '16 (right)



side fit well with his partner's experience with commercial business. Together, they founded Analytical Space, a telecommunications infrastructure for lower Earth orbit. In just a year and nine months, they launched their first satellite and have the second launch planned for the coming months.

Clark credits Florida Tech for giving him the ability to find a good partner in Benjamin. Because professors and students work together in small classes, they have the opportunity to really get to know each other.

"You have to surround yourself with people who know more than you," Clark said. "The connection you can make with your professors, relationshipwise, can pay off."

It's not just co-founders who are important to a successful company. Employees, investors and customers are the glue that ties the whole thing together. The best way to attract a good team is to effectively communicate your goals.

"You have to have a dream and a vision, and you have to have the ability to articulate that to people," Oliveira said. "You're going to be selling to investors and customers. You have to sell them on the dream, too, because if they're not excited about what you're doing and the thing you're focused on, they're not going to give you money or sign contracts. You don't have to be perfect. You don't have to be a TED Talk storyteller, but you have to be able to say, 'This is what I'm passionate about. This is what I'm focused on. And this is why you should care.'"

TAKE INITIATIVE

Once you have surrounded yourself with people who share this common vision, it doesn't mean you can kick back and reap the rewards. There is a lot of learning and elbow grease that goes into running a company.

Damion Bailey '12, founder of Endeavor Group International, knows this firsthand. It took several years to build his educational staffing company based in China. In addition to mastering the language and learning the customs, he splits his time between the U.S. and China, serves in the Army Reserves and manages a full staff.

"You have to have a drive to commit to something and do it," Bailey, a military science and Army ROTC program graduate, said. "You can't say, 'I would like to start my business, but' and have an excuse why you haven't yet. So, I think the difference between those who are successful and those who aren't is they actually have that drive and the mindset that they're going to try."

That initiative continues as you face new challenges, learning as you go.

"Are you the type of person who can be self-taught? Can you go off and learn the stuff you need to learn?" Oliveira said. "You need to be someone who's fascinated by learning new things and self-aware enough to realize when you don't know something, and go find the information. Those are the people who will succeed."

MAINTAIN THE PASSION

Beyond taking initiative, facing uncertainty and surrounding yourself with people who can help, the foundation of it all is passion. All of these founders started their companies because they loved what they were doing.

Bailey discovered his passion when he spent a month in China through a cross-cultural program at Florida Tech. Oliveira developed his passion for space when studying engineering and working for NASA. Clark found a common passion for business with his professor. The challenge comes in keeping that passion alive through the work, uncertainty and financial unknowns.

"It's terrifying. It can be stressful, and that's why a lot of people don't do it. You can't let that fear of something going wrong stop you," Bailey said.

Florida Tech founder Jerome P. Keuper surely didn't let anything stop him, and he only had 37 cents.

Of Raft Racing, John Wayne Movies and Ska:

Homecoming
Through the Years

By Craig Lloyd-Smith

Homecoming is an important tradition at Florida Tech, not only for alumni returning "home" to see the old familiar places and learn what's new and exciting, but also for current students to get a feel for how rich their futures can be. As part of Florida Tech's 60th anniversary celebration, we thought you might enjoy a look at homecomings past.

THE EARLY DAYS

The first homecoming was in 1972—14 years after Florida Tech's founding in 1958. However, before the university had a football team, Homecoming wasn't in October, as it is today. It was usually scheduled in January or February to coincide with National Science and Engineering Week and featured basketball as the big-ticket sports attraction.

That first homecoming featured a powderpuff football game (seriously!), a cocktail party for alumni, a film festival, a bonfire and no fewer than three dances: a get-acquainted dance, a casual dance that featured the coronation of the homecoming queen (no mention of a king—that would come a few years later) and a formal ball.

WET AND EXTREMELY WILD

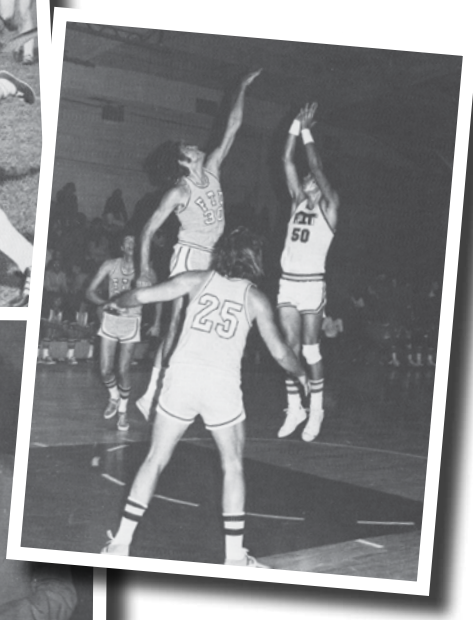
One of the most enjoyable homecoming events during the late 1970s and early '80s was the annual raft race down a 1.8-mile stretch of Crane Creek. Students would build their own vessels—using anything from barrels tied together with rope to empty milk cartons and fiberboard—and float from campus to Melbourne Harbor, passing behind private homes on Melbourne Avenue. Depending on the quality of the rafters' engineering, it was either a pleasant float downstream or a very damp and very long struggle.

In 1980, the raft race took on a more martial tone. The theme was the river battle between vaunted Civil War ironclad battleships the Monitor and the Merrimack. It was part of that year's homecoming theme: "Gone With the Wind." There was a "Burning of Atlanta" bonfire and a "Wounded Soldier" blood drive, not to mention a surfing contest, and yes, another powderpuff football game. There was also an 8-mile walkathon for muscular dystrophy, in which north campus residents competed against south campus students in "Sherman's March to the Sea."

Perhaps it was the era, but there was a wacky theme to 1979's homecoming as well: "Western Week at Gold Run Gulch." Cowboy hats were standard attire, and instead of a homecoming queen and king, students elected the "town's" mayor and sheriff. There were also three nights of John Wayne movies, a square dance, a saloon night, a hayride—and a bean-eating contest. Yes, you read that correctly. A bean-eating contest: like a pie-eating contest, but decidedly sloppier and more disgusting.

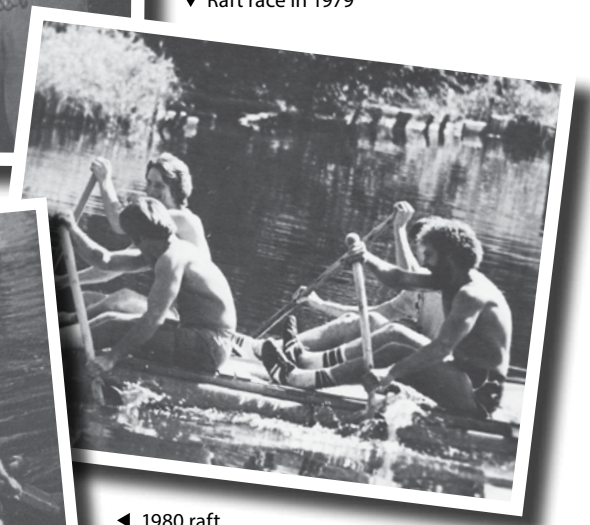
◀ Powderpuff game in 1975

▼ Basketball game in 1974



◀ 1978 Homecoming King and Queen

▼ Raft race in 1979



◀ 1980 raft

▼ 1979 saloon night

MORE RECENT TRADITIONS

In 2005, organizers began to host the annual homecoming dance at the Clemente Center. In 2014, however, it was bumped for the Homecoming Awards Gala and moved to the old County Line Saloon in Melbourne. Alas, that was the last year for the Homecoming Dance—and nearing the end for the County Line Saloon, which closed in 2016.

The awards gala has only grown in popularity since it was introduced in 2010. The Jerome P. Keuper Distinguished Alumni Award, named for Florida Tech's founder and first president, was first presented in 2011 to local attorney and Florida Tech alumnus Dale Dettmer. Other distinguished alumni to receive the award include MLB pitcher Tim Wakefield; astronaut Sunita Williams; Ann Dunwoody, the Army's first female four-star general; and this year, tech visionary Vik Verma.

QUIZ TIME

Another tradition introduced in 2010 is the annual Homecoming 5K Run/Walk in Downtown Melbourne. It's usually the homecoming weekend kickoff event and, of course, features a post-race party at Meg O'Malleys. But did you know that the 5K started as a benefit for the ASME Yarosh-Wiles Scholarship, a Florida Tech endowment that helps mechanical engineering undergraduate students with their financial needs?

One of the most enjoyable events each

October is Homecoming Fest, the annual street party in Downtown Melbourne with food and drinks, street vendors and a free concert from truly superb bands like this year's indie blues-rock band Cold War Kids. But do you recall the first band to play at Homecoming Fest? The year was 2012, and it was legendary ska band The Mighty Mighty BossToneS. Homecoming Fests that followed featured such musical innovators as SOJA and Wyclef Jean.

Homecoming at Florida Tech has a rich history, but it has also changed with the times. Here's to seeing what the next 60 years of homecoming will bring!

5K

Gala

HECOMING 2018

Aeronautics: Miguel Estremera '98

Business: James Wong '07 M.S.

Science: Trent Smith '01, '05 M.S.

Engineering: Mojy Chian '80, '82 M.S., '84 M.S., '86 Ph.D.

Psychology: Deborah O. Day '81 M.S., '85 Psy.D.

Alumni Awards

News from the desk of

Kim Bozik '87

Florida Tech
Alumni Association President

DEAR ALUMNI, STUDENTS, PARENTS AND FRIENDS,

Hello, all! I am so very glad that you're checking in on all the happenings at Florida Tech. These are very exciting times for the university, and I am so pleased and honored to have been selected the next Florida Tech Alumni Association president. As your new president, I welcome you to email me or the alumni office with suggestions that would encourage alumni to stay in touch and engaged with the university—any and all ideas are welcome. All Florida Tech graduates are automatically Alumni Association members, so I encourage you to get involved!

The 60th anniversary festivities were awesome. Florida Tech celebrated the big milestone in a big way, and the Alumni Association had a prominent presence. From sponsoring the Downtown Melbourne homecoming 5K and free concert to honoring some of our very special alumni with awards at the gala, FTAA continues to develop momentum.

I hope you took some time to learn about and participate in Florida Tech's "Fuel us to the Future" Day of Giving fundraiser in November. I've been on the event's board since its inception, and I can tell you first hand: It is not about the money. Day of Giving aims to retain connection with as many alumni as possible. Each year, our goal is to increase not our dollars raised, but the number of alumni who participated, as alumni involvement boosts the university in multiple ways.

If you were unable to participate this year, be sure to update your email address with the alumni office, alumni@fit.edu, so you can stay in touch with our 60,000+ alumni network.

Thanks to the dedication of our past and present board members, some clever partnerships across the university and some political savvy, FTAA is realizing another incredible goal: a new and improved Alumni House. Replacing the current house with a modern, environmentally cutting-edge building that emits a striking presence as you enter the university property has been a journey worth taking. Whether they attended Florida Tech on Melbourne's campus, a remote site or online, this new structure will be a shining example of our graduates' pedigree. We'll be sure to keep you updated on the progress throughout construction, so stay tuned!

Go Panthers!

Legacy Reception

New Jersey

Jensen Beach

Huntsville

Los Angeles

San Jose

More reception photos: **alumni.fit.edu**

SUBMIT YOUR NEWS TO **alumni@fit.edu**

1960s

WILLIAM BELL '69 shares a particularly indelible memory from his time working on the the "atomic toilet" in response to the recent *Florida Tech Magazine* piece about the project: "I used to be one of the students who helped receive the 300 gallons of sewage from the 'honey wagon.' During one delivery, the diaphragm on the pump ruptured and sprayed my co-worker with raw sewage."

1970s

1 **WENDY GABRIEL** '71 is a retired surgical nurse living in Wyoming. After she earned her nursing degree from San Antonio College, she accepted traveling positions. She then worked at a camp for mentally and physically handicapped clients in upstate New York before becoming nursing supervisor for the AHRC in New York City.

2 **ERIC SIMON** UT '79 and **ROB SALONEN**, director of global business development, met up at the Jensen Beach alumni reception in the fall at the old Jensen Beach campus.

1980s

DAVID L. ANDERSON '80 published his sixth book, *Black Angel Killer.* His seventh book is tentatively titled *Black Angel Back from the Dead.*

3 Captains **BRUCE SCHWAB** '83 and **SEAN SMITH** '93 completed basic check airman training for Southwest Airlines in Dallas. They were paired as academic and simulator teammates during the two-week course and are now part of a 200-member check airman team responsible for standardizing the 9,000-member pilot group. Schwab lives between Florida and Utah and is based in Denver, and Smith lives in Florida and is based in Houston.

LORI KLIGFIELD LABELL '85 joined the Metropolitan Washington Airports Authority at Reagan National Airport in August. As a manager in the Administration Department, she is responsible for leasing and airside contracts.

4 **RICHARD ENSTICE** '86 and wife Stephanie welcome their newest Panther cub, Makenna Enstice!

5 **STEVE PENTON** '87, '89 M.S., '90 M.S., and **AL HAGOPIAN** '89, '94 MBA, relax with associate director of athletics **PETE MAZZONE** after the annual Homecoming 5K at Meg O'Malleys.

6 **VIKRAM VERMA** '87, Florida Tech trustee and 2018 Jerome P. Keuper Distinguished Alumni Award recipient, met up on campus with former FTAA president **ANDY KIRBACH** '90.

7 **BALDUR BRAGASON** '88 competed in and finished the 2018 IRONMAN Kalmar in Sweden.

8 **KRISHNAN IYER** '88 was named vice president of information technology at Infinite Electronics Inc., where he will lead the IT initiatives of the growing company, which provides management and back-office support to globally recognized electronic component brands.

9 **TOM FOLLIARD** '89, **MARY FOLLIARD** '92 and **GUS ANDERSON** '91 stopped by the annual Homecoming 5K afterparty at Meg O'Malleys.

1990s

10 The members of this year's featured Homecoming Fest band, the Cold War Kids, stopped by the Florida Tech Alumni House for lunch with vice president for alumni affairs **BINO CAMPANINI** '90, '92 MBA, on the day of their performance.

11 **KATHY MCGUINESS** '90 was elected State of Delaware auditor, becoming the first female to hold the position. A certified fraud examiner, pharmacist, nonprofit volunteer leader and 17-year Rehoboth Beach city commissioner, McGuiness brings decades of private- and public-sector experience to the post.

12 Lt. Gen. **AUNDRE PIGGEE** '90 was inducted into the Arkansas Black Hall of Fame. Piggee is the Army deputy chief of staff for logistics at the Pentagon and oversees logistics policies, programs and plans for the Army.

13 **MICHAEL A. LADD** '92 was promoted to colonel and assigned as the director of military support for the Florida National Guard.

14 Retired Lt. Col. **NICHOLAS LAIACONA** '92 was named Veteran of the Year by the Association of the United States Army Capital District of New York chapter. U.S. Rep. Elise Stefanik presented the award and gave Laiacona a special congressional proclamation. Laiacona joined the army in 1966, graduated from Infantry Officer Candidate School in 1967 and served in Vietnam as a platoon leader and company commander in the Mobile Riverine Force 9th Infantry Division in the Mekong Delta region.

15 **TERRY SMITH** '92 stopped by the Alumni House for his first campus visit since he graduated. A Liquid Robotics engineer overseeing an installation at Cape Canaveral, Florida, Smith remembers managing FITV from 1990 to 1992 and enjoyed his visit to the station during his campus tour.

16 **MONIQUE PICOU** '93 shared her more than 20 years of consumer packaging goods and supply chain experience at companies like Walmart and Procter & Gamble Co. with students at an on-campus meet-and-greet.

RIZWAN PIRANI '93 joined DataCore Software as chief product officer and has led the transformation of Citrix's virtualization portfolio to the cloud, where he operationalized the delivery of a strategic roadmap for the cloud management and orchestration product line.

17 **PAULETTE KING-MORIN** '94 represented Florida Tech and her 10 award-winning films at the Melbourne Independent Filmmakers Festival.

18 **SEAN MCGEOUGH** '95 was appointed executive vice president of sales, specifically head of corporate sales, for Wheels Up, a turnkey private aviation solutions provider.

SUNITA WILLIAMS '95 M.S. has been selected for the first long-duration space mission aboard Boeing's Starliner capsule to the International Space Station along with astronaut Josh Cassada. Williams joined NASA in 1998 and has since flown a total of 322 days in space on two shuttle missions.

19 **MOHAMED AL HAMMADI** '99, Emirates Nuclear Energy Corporation CEO, for the past 10 years has led the largest single-site, under-construction nuclear project in the world, which aims to provide energy to a rapidly growing region. The power plant is scheduled to begin operations this year, and the clean energy source is estimated to prevent 21 million tons of carbon dioxide emissions annually.

2000s

20 **TALAL QURESHI** '01 received the 2018 Best of New York Demonstrated Excellence in Project Management Award for his projects with the New York City Department of Technology & Telecommunications.

21 **VIRGIL RUSSELL** '01 was named director of sales and marketing for AQYR Technologies, a subsidiary of Windmill International Inc. Prior to joining AQYR, Russell was a regional sales manager for Data Device Corporation and worked in business development and sales positions in Harris Corporation's electronic systems and communication systems segments.

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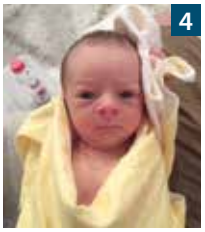
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continued from page 34

22 **DAVID ATKINSON** '02 visited Florida Tech to meet with men's soccer head coach **ROBIN CHAN**.

TRACY ZIEGLER '02 was selected to serve as the chief of resource management and science for the National Parks of Eastern North Carolina. For the past three years, she has been a National Park Service marine ecologist for the Natural Resource Stewardship and Science Directorate in the Water Resource Division, where she coordinated national programs on ocean and coastal issues.

23 **DANIEL CHARDON** '03 was named chief technology officer for MyPark in Miami. Before that, he served as IT strategic partner at Banco Popular de Puerto Rico.

24 **CHAD PATNODE** '04 welcomed his daughter, Catalina Grace, to his and the Panther family!

25 **RACHEL DANCE** '06 and Jesse Dance are the proud parents of Hartley Dance, who is already busy studying!

26 **MANISH JINDAL** '06 and the Alumni Association's Dallas Chapter met at Whiskey Moon in Plano, Texas, to catch up and socialize!

27 **REBECCA MEDVECKY** '06 is excited to present Summer Kay, born Aug. 15. This new Panther cub is welcomed by her mom, dad, sister and brother.

28 **STEVEN GOULD JR.** '07 was named in the 2018 Airport Business Top 40 Under 40, a prestigious award that recognizes young talent in the airport industry. Gould is airport director at Rock Hill–York County Airport and is responsible for maintaining operations at the airport while securing a well-defined future path. Gould notably implemented an innovative airport noise abatement program called "Flying Friendly in Rock Hill" and has secured more than $7 million in federal, state and local funding for capital improvement projects.

29 **MEGHAN NASH** '09 Psy.D. has joined the clinical psychology team at Mercy Behavioral Services. Nash previously worked at Family HealthCare Network in California and for the California Department of Corrections and Rehabilitation.

2010s

30 **GAËL LE BRIS** '11 was named in the 2018 Airport Business Top 40 Under 40, a prestigious award that recognizes young talent in the airport industry. He is a senior aviation planner and a technical principal at WSP USA based in Raleigh, North Carolina. Before joining WSP, he was the airside development manager at Paris-Charles de Gaulle International Airport, where he managed a large portfolio of complex projects in a changing regulatory environment.

31 **RICHARD LEAPER** '13 joined Milestone Environmental Services as vice president of sales and marketing. Milestone, an industry leader in oil and gas waste management, brought Leaper on for leadership, coaching, training and development of the sales team. He has more than 20 years of experience in oil and gas operations, product management and strategic marketing.

GWENDOLYN KAUFFMANN '14, '15 MBA, passed the four parts of the Certified Public Accountant, CPA, exam and works as an accountant at Adventist Health System.

ERNESTAS ZARSKIS '14, '16 MBA, who works at "Big Four" accounting firm Ernst & Young LLP, passed the four parts of the Certified Public Accountant, CPA, exam.

32 **STEFANIE JANSSON** '15 and **DANIEL KOLODNY** '15 were recently married in Treasure Island, Florida.

33 **CLYDE DOUGLAS BROWN III** '16 is set to marry Melanie Richard in Denham Springs, Louisiana. Brown works as a mechanical engineer at the Naval Surface Warfare Center Panama City Division.

HARRY HOBBS '17 DBA, Huntsville campus site director, wrote "Millennials in the Workplace: Gaining Their Long-term Employment in News Media Firms in North Alabama," which became the most downloaded dissertation in the history of the Florida Tech dissertation repository library.

THOMAS STEENBERG '18, former Florida Tech men's swimming team member, was named the Division II Conference Commissioners Association 2017–18 Men's South Region Scholar-Athlete of the Year—the first male and second overall student-athlete in school history to receive the award since it was established in 1995–96.

Welcomed a Panther Cub?

Contact us for a free infant T-shirt, bib or onesie. Then send a photo of your cub in his/her Panther swag with an AlumNote about yourself to share in the magazine.

For details, email **alumni@fit.edu**

SPECIAL PREVIEW

Excerpt from our 60th Anniversary publication,
60 for 60: Celebrating Sixty Years of Alumni at Florida Institute of Technology

Gene Apelado '96

LAUNCHING BRANDS

Gene Apelado earned his Bachelor of Science in Electrical Engineering from Florida Tech in 1996. Since then, he has gained more than two decades of experience working with and managing early-stage ventures. Gene currently serves as the co-founder and chief executive officer of Launch That LLC, an online marketing firm based in Orlando, Florida.

Launch That is a marketing venture company that specializes in building online brands for driving traffic and generating customers. Apelado coaches the executive management team and fosters loyal relationships with clients and partners. He has held his executive role since he co-founded the company in 2003.

Of leadership, Gene says, "Emotional intelligence is one of the most important character traits you can possess. It has helped me understand not only my customers, but also helped me build a strong team throughout the years."

Prior to founding Launch That, Apelado worked as account manager for global sales at Triton Network Systems Inc. He later worked at TriQuint Semiconductor as a sales account manager for CDMA network accounts. While a senior sales engineer for MeshNetworks, he performed product demonstrations and training for a startup company that conducted a successful exit to Motorola.

Gene also sits on the board of venture acceleration firm venVelo. An entrepreneur in the nonprofit sector, as well, he co-founded the charity Figtree Foundation in Central Florida, which strives to provide aid to youth in need throughout the region.

TO PURCHASE A COPY OF THE 60TH ANNIVERSARY BOOK, VISIT ALUMNI.FIT.EDU/60FOR60 OR CONTACT THE OFFICE OF ALUMNI AFFAIRS AT ALUMNI@FIT.EDU OR 321-674-7190.

TOM BOWMAN, who during his 35-year career at Florida Tech played an integral role in developing the university's academic and research initiatives, passed away Nov. 8. During his tenure, Bowman served as department chair for mechanical engineering, twice dean of the graduate school, acting dean of the College of Science and Liberal Arts, associate vice president for academic affairs and director of international academic programs.

JAMES H. BRENNA '77, a carpenter dedicated to restoring and improving Jersey shore homes, passed away Sept. 18 after a lengthy battle with cancer.

EUGENE FETNER, who held various positions, including assistant dean and director of admissions, during his 10-year career in Florida Tech's early development, passed away Sept. 11. After leaving, Gene remained an avid university supporter and will be greatly missed.

KATARINA "KAT" MOLLER, a five-year member of the Larsen Motorsports racing team who had taken courses toward a Florida Tech master's degree, passed away Nov. 15 in a racing accident in Sebring, Florida.

ROBERT "BOB" SAFFELL '90 MBA, a Navy veteran and 33-year Rockwell Collins engineer described by his employer as "the father of the transponder, and a legend in that," passed away Sept. 6, just two weeks after his 70th birthday.

NATHANIEL E. "NAT" VILLAIRE, professor emeritus at the College of Aeronautics, where he created the aviation safety degree program, served as graduate program chairman and continued his research and involvement even after his 24-year tenure, passed away Dec. 1.

FREDERIC EVITT VOSE '90 Ph.D. passed away Aug. 13. After earning his doctorate degree in oceanography at Florida Tech, his life's work was studying and protecting the aquatic environment, working for the University of Florida doing research and field study for the Department of Wildlife Conservation and Environmental Protection.

In Memoriam Phillip W. Farmer

PHILLIP W. FARMER, the longtime member and two-time chairman of Florida Tech's board of trustees whose guidance and generosity helped propel the university to the upper echelon of national research institutions, passed away Oct. 28 at age 80.

Having started at Harris Corporation in the early 1980s, Farmer was elected president, chief operating officer and board of directors member in 1993 and chairman of the board and chief executive officer two years later.

Around this same time, Farmer began his work shaping the future of another important Brevard County institution: Florida Tech. Joining the university's board of trustees in 1994, Farmer launched a nearly 25-year tenure during which he played a critical role in two successful fundraising campaigns that raised tens of millions of dollars for Florida Tech.

In addition to funding a $1.5 million endowment to create the Farmer Scholars Program, which provides a full, four-year scholarship awarded annually, Farmer secured many impactful gifts for the university, like those that helped fund the Harris Center for Science and Engineering, the Harris Student Design Center and Harris Village, the residence hall complex with one of the three buildings named for Farmer.

Farmer received Florida Tech's most prestigious award, the President's Medal, at the 2008 fall commencement ceremony, where he was the speaker.

"Without Phil Farmer, Florida Tech would undoubtedly be a lesser institution, and the many, many students whose lives he influenced would not be making their mark in the world today," said Dwayne McCay, university president.

A B T A O L I V E I R A I Q O M A O W E
E L D O O W W N S S E N I S U B I I D E
N N H B A I L E Y J N I J E T X B O C R
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J N H A C L T V V G T P V H N L P E C V
C H G W E Z A A E L D V A J R S F D O A
G A K E R T T R D N N E A X L G G D L E
M C C Z N I E H K J T M Y A S T N U L D
D K I L O U V N S M I I C S K R I O A N
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F O D I D U R P L O N M A L E A E H A S
P N O L Q H Y A A S O L Q B R C M L T R
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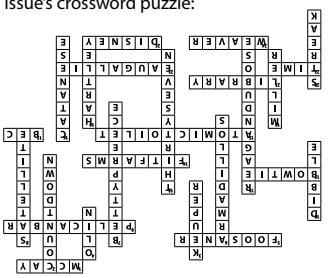
A P A R T I C L E X O G R Y M I X N G U
T Z U P T Y Z L L I P T E R H A B Q O O
S R U E N E R P E R T N E R P P G T A F

Now that you've read the entire magazine, you're ready to complete a fun puzzle featuring familiar terms you've read throughout the issue. The terms may be found up, down, forward, backward or on a diagonal.

Stumped? You'll have to wait for the answer key in the next issue. Good luck!

ANALYTICAL SPACE
BACTERIA
BAILEY
BENJAMIN
BUSINESS
CERN
CLARK
CLEARPATHAR
CODE
COLLABORATION
ENDEAVOR
ENTREPRENEUR
FIREWORKS
FOUNDER
GAMER GOO
HACKATHON
HOHLMANN
HOMECOMING
INGENUITY
INNOVATION
INSURALEDGER
INVENTION
OLIVEIRA
PARTICLE
PHYSICS
PILLZY
PROTOTYPE
STARTUP
SYED
TARSOLY
TENURE
WILLE
WOODLE

Were you stumped?
Here's the answer key to the Fall 2018 issue's crossword puzzle:



Florida Tech
Office of Marketing and Communications
150 W. University Blvd.
Melbourne, Florida 32901-6975

Then & Now

A lot has changed since the black-and-white photo was taken in 1968, but one fact remains: Surf's up means study-break time for Florida Tech students.

60 YEARS