FLORIDA TECH

FLORIDA'S **STEM** UNIVERSITY®

PRESIDENT'S REPORT 2019–2020

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A LETTER FROM THE PRESIDENT

In last year's annual report I discussed trajectory. That idea remains important, but with the added attribute of mid-course correction. The 2019–2020 academic year was certainly a time for adjustments, and I'm pleased to report that Florida Tech continues to be strengthened through the journey.

Last October, we publicly announced a bold step forward in the physical evolution of the campus with the construction of an $18 million Health Sciences Research Center. The announcement has been welcomed by the medical community as well as prospective students and their parents. It will be one more important way that we contribute to our primary mission of education and research.

The academic year was off to a good start, then in March we had to make the difficult decision to suspend campus face-to-face instruction for the remainder of the spring semester due to the COVID-19 pandemic. That mid-course correction was challenging for us all—students, parents, faculty and staff—but we executed in a way that preserved the integrity of our educational offerings as we quickly migrated to a remote learning model. We fared far better than some of our colleagues elsewhere in higher education.

By May, the unprecedented uncertainty wrought by the pandemic necessitated program eliminations and staff reductions to ensure that the university could continue achieving its core mission of STEM higher education. Our plans to persevere have preserved our ability to deliver what Florida Tech has always done best—educating bright students for promising careers in engineering, science and related fields.

I continue to be humbled by the effort and sacrifice of our university community and energized by the work there is to do in support of our educational mission. The support of our board of trustees has been nothing less than exemplary, and I'm deeply appreciative.

Even in the darkest and most disconcerting days of the pandemic, the bright future that a quality education provides should inspire us all to work harder and smarter. That remains my commitment—and the commitment of this Florida Tech team.

We look forward to the future with renewed optimism and determination.

T. Dwayne McCay, Ph.D.
President and CEO


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NAVIGATING THE NEW NORMAL.

Challenges can cause retreat, or they can trigger action. Florida Tech, faced with challenges as daunting as any in the university's history, opted for action. That action took many forms, but the end result was singular: success. As we highlight in this section, when the pandemic altered the very notion of higher education, all Panthers came together to guide us through.

The word “normal” suggests something that is usual or typical. When the unusual or atypical affixes itself to what is considered normal, we offer a new phrase: The “new” normal.

This seemingly contradictory construction has become a mantra across society since the coronavirus pandemic infiltrated our world, and evidence has now shown that the places that responded with innovation, hard work and a focus on the safety of their respective people were the best at adapting to this unwanted condition.

Florida Tech is one of those places.

From decisive action in the earliest days of the pandemic to a near-seamless transition to online learning when face-to-face instruction was put on hold, from the crack work of the university's multifaceted Pandemic Response Team to the execution of its Florida Tech Safe return-to-learn plan, Florida Tech met—and continues to meet—the challenges put before it.

Like the students who have returned to campus, Florida Tech has also learned from its experiences. Some of the innovations and adjustments hatched during these trying times will outlast them, leaving Florida Tech a more nimble, well-equipped and progressive place than it was before this new normal took hold.

The scene across the Florida Tech campus looks as one would expect at a university. Students are moving between classes, skateboarding, biking and walking. Some are lounging on the green spaces, clustered in small groups. Groundskeepers tend to the landscaping, still green and lush even as temperatures slowly cool.

But life at Florida Tech, as is the case for many universities, is quite different from how it may appear. Those same students present on campus? They are wearing face coverings. Signs for campus events are fewer, and signs about social distancing are everywhere. There are deeper changes, as well.

Melanie Matos notices the differences.

She graduated earlier this year with a bachelor's degree in chemical engineering and remains on campus pursuing her master's degree in that field. Campus is a bit less active now. The social aspect of residence life has changed in multiple ways, too. Social distancing means less time with groups of her friends, she is not participating in organizations that helped keep her busy as an undergrad, and there are fewer dinners out or drinks at the bar.

But these shifts in human interaction have produced welcome, personal touches in this unique era, such as the residence assistant who has alarms on her phone to remind her to text residents at noon and 6 p.m. to make sure they've eaten lunch and dinner.

This streamlining of social interaction has another benefit beyond minimizing risk, Matos said: a greater focus on her studies as she works toward that master's degree.

"It keeps me home a lot more, and then when I'm sitting at home, I'm like, 'I should be doing something, because I have all this time and it feels wrong to just sit around and do nothing all the time,'" Matos said. "So, I feel like I have been a better student for it. I was never a horrible student or anything, by any means, but I did my homework three days before the deadline. Now I do my homework two weeks before because I had nothing else to do."

When she ventures out for class, Matos experiences the other major effect of the pandemic. Classrooms are now equipped with cameras, allowing faculty members to teach both for the students in the room and those who have opted to participate remotely. It may seem like a minor addition, but this option is the culmination of a major, campuswide effort that started in the spring.

That was when deans and their faculty members, working closely with the Office of the Provost, had to reimagine vast swaths of curricula and retool classes for online teaching as a university grounded in technology since its founding at the dawn of the space race had to rely on technology in ways never experienced.

Scores of IT and Instructional Technology staffers wrangled programs like Zoom, Canvas and Panopto into wider use than ever before and developed online training on the fly to ensure everyone knew how to maximize these critical tools for teaching students remotely.

In short order, staffers led by Instructional Technology had convened in-person and webinar training courses on the various programs and tools, built several websites, created multiple videos, developed a list of faculty mentors who could also offer guidance, and participated in many, many meetings and brainstorming sessions.

It helped that Florida Tech was already well prepared to make the transition, with wide bandwidth, broad wireless access and strong cybersecurity protection.

"Our faculty have really stepped up," said Bino Campanini, senior vice president of student and alumni affairs. "To go from a traditional model to being told in March you're going to go online, then after the summer you're going to be in the classroom, but some of your students are going to be remote—the faculty has done a good job."

Matos sees some value in considering keeping online and hybrid classes beyond the pandemic. Similar to the discussion of working from home and the flexibility that provides, distance learning is something she believes has ongoing value.

"There's a million different ways to learn, and some people learn better visually, some people can see the text and PowerPoint slides and go from there and talk to the professor when necessary, and I think it's really important because there are people I know who can't make it to class every day," Matos said.

"It's really awesome to see it is feasible to have classes online with the only difference being it takes professors maybe an extra two minutes to start up Zoom and make sure they're recording," she continued. "Those two minutes to help dozens, if not hundreds, of students on this campus would be awesome to see going forward."

CREATING SAFE CHECK-IN FOR STUDENTS

Florida Tech this fall unveiled a creative and safe way to reimagine the student check-in process: the drive-through.

More than 640 first-year and transfer students, many arriving with their families, got processed upon their arrival to campus without leaving their vehicles. Student temperatures were taken, and they were provided masks and other Florida Tech swag as they entered the queue on County Club Road. If their student ID photo had already been uploaded, they would drive through various stations to get their completed student ID, housing keys, parking pass and orientation booklet, and then check in with Admissions—all without exiting their vehicle.

"The process was a major success," said Greg Connell, assistant vice president of housing and campus services. "It allowed students and parents to stay in their air-conditioned cars, and as an added benefit, it gave parents a chance to hear the information being provided to the students. In the past, when this was at the Clemente Center, only students went through the process."

After the check-in process, students proceeded to their residence halls to move in.

As Florida Tech President Dwayne McCay noted in a message to campus at the time, the new check-in process was part of the university's holistic focus on safety:

"The realities of the COVID-19 pandemic have necessitated a range of adjustments and accommodations to maximize safety and instructional flexibility. Our entire university community—faculty, staff, students and parents—have pulled together to meet this 'new normal' with an attitude of collaboration and a spirit of partnership, keeping safety as the highest priority."

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>
> —President Dwayne McCay

HELPING FRONTLINE WORKERS

As befits a university known for innovation and technology—as well as its community support—Florida Tech harnessed the power of its 3D printers and the ingenuity of its faculty, staff and students in spring 2020 to assist frontline workers in the Space Coast medical community dealing with the coronavirus pandemic.

Using 3D printers on campus and at the nearby Center for Advanced Manufacturing and Innovative Design, the team led by then-College of Engineering and Science Dean Marco Carvalho, now executive vice president and provost, and including student project coordinator Juan Avendano Arbelaez, lab director Deep Patel and electronic lab manager David Beavers produced and delivered dozens of face shields.

"I'm extremely proud of our Florida Tech team that, without hesitation, jumped into action to work days, nights and weekends to help our community," Carvalho said.

The team also produced 3D-printed face mask extensions and worked on designing face masks and testing and producing prototypes, including masks that can be sized for children and those that can be reused via a replaceable filter.

FLORIDA TECH, AIR FORCE USE AI FOR COVID RESPONSE

To better understand the effects COVID-19 was having on U.S. Air Force missions and operations, Florida Tech's Center for Advanced Data Analytics and Systems (CADAS) partnered with several Air Force teams to utilize the power of artificial intelligence and machine learning.

Working with the U.S. Air Force Air Combat Command/ Intelligence Data/Tech Futures Division and the Air Force Research Lab/Multi-Domain Sensing Autonomy Division, the CADAS team of Carlos Otero, Adrian M. Peter and Anthony O. Smith, along with several students, developed capabilities to rapidly gain situational awareness and support seamless integration of data-driven artificial intelligence/machine learning models for forecasting.

The work falls under a cooperative research and development agreement put in place between Florida Tech and Air Combat Command in 2019.

"This task provides invaluable experience to our students while helping in the critical mission to better understand and utilize COVID-19-related data that ultimately can help the Air Force manage and move beyond this challenging situation," Otero said at the time. "It's really given us an opportunity to showcase our capabilities at CADAS and to demonstrate our team's capabilities to provide end-to-end data analytics systems and solutions."

LARSEN MOTORSPORTS IGNITES VIRTUAL EDUCATION

With students homebound during the early stages of the coronavirus pandemic, Larsen Motorsports helped ensure they kept their minds fired up, just like the flame-blasting jet dragsters the Florida Tech partner is known for.

Working from their equipment and display-filled facility at Florida Tech's Center for Advanced Manufacturing and Innovative Design in Palm Bay, Larsen Motorsports owners Chris and Elaine Larsen and their team, including several Florida Tech students and alumni, produced a series of videos and worksheets highlighting the STEM-based work involved in operating a business based around jet-powered vehicles.

These virtual field trips kicked off with Chris Larsen's extensive tour of the Larsen Motorsports facility. Another featured a chat with NASA astronaut and Florida Tech executive Winston Scott, who talked about his experience on multiple space shuttle missions, on space walks and how he built and achieved his remarkable career.

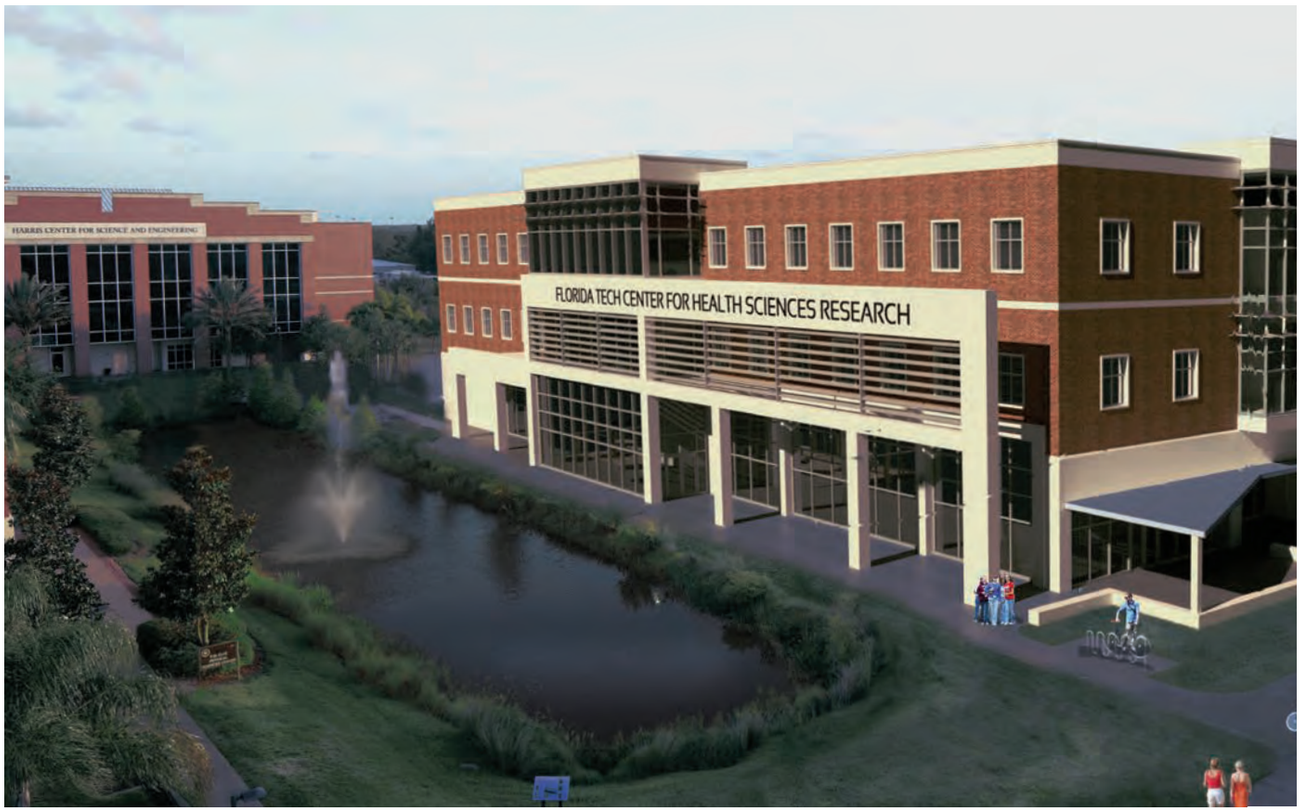
"There is a lot of science all around you, and we are able to take the science that's in our race shop and apply it to what these students are learning in the classroom," Elaine Larsen said. "We are able to engage the students in a new way. They need to be engaged; they need to be challenged."

VIRTUAL COMMENCEMENTS PROVE POPULAR

Florida Tech held its spring and summer commencement ceremonies virtually and will do so again Dec. 11 with the fall ceremony. This innovative approach has proven popular given the pandemic challenges, with more than 12,000 combined views on the first two events. The ceremonies feature remarks from Florida Tech President Dwayne McCay and Bino Campanini, Florida Tech's senior vice president of student and alumni affairs, and the names of all graduates presented on-screen, along with any honors and accolades and their photos, if they have been provided.

FOCUS ON THE FUTURE.

One definition of the word "vision" is the ability to plan for the future with imagination or wisdom. Those are certainly the hallmarks on display across the Florida Tech campus, as university leadership looks toward that future with an eye on unique and powerful educational opportunities and the evolving workforce. Here are a few visionary projects unfolding at Florida Tech.



BUILDING FOR THE FUTURE

Florida Tech will break ground this fall on one of its most ambitious and important expansions in years: the $18 million Health Sciences Research Center. To be located on the Olin Quad, the 61,000-square-foot building will bring cutting-edge technology, vigorous instruction and critical research opportunities to help fill the expected surge in demand in the biomedical engineering and science sectors.

The building will double the size of Florida Tech's undergraduate biomedical engineering program to 300 full-time, on-campus students, while boosting the undergraduate premedical program from 150 to 250 students. Florida Tech currently offers bachelor's, master's and doctorate degrees in biomedical engineering.

The center will be built on a vacant parcel of land south of the Olin Life Sciences Building and adjacent to the quad's newest building, the L3Harris Center for Science and Engineering, which opened in 2009.

The new Health Sciences Research Center will directly support Florida Tech's mission to provide high-quality education to a culturally diverse student body and to expand knowledge through basic and applied research. Students will have access to teaching laboratories that use augmented and virtual reality tools and space for orthopedics, tissue studies and advanced computational simulations.

Specialty equipment within the center is expected to include advanced microscopes, such as fluorescence, laser-scanning confocal and atomic force; virtual dissection tables; raman spectrometer; and tissue tension-torsion, planar biaxial and fatigue-testing machines.

"The excellence of a Florida Tech education and our unparalleled success in producing highly desirable graduates make this evolution on our campus and in our educational offerings a natural, powerful step forward," Florida Tech President Dwayne McCay said when the project was announced.

AFRICAN AMERICAN STUDIES PROGRAMMING LAUNCHED

Continuing to build a curriculum that reflects the human experience and harnesses the power of education to foster understanding, Florida Tech in July announced a new course for the fall—Modern African American Studies.

The course, offered by the School of Arts and Communication in the College of Psychology and Liberal Arts, will serve as a core component of the university's inaugural minor in African American studies. It is taught by Don Harrell, an African Studies scholar, ethnomusicologist, folklorist and musician.

The course Harrell will lead is a cornerstone of a new minor program Florida Tech is developing that will strengthen and enhance the university's humanities curriculum. The minor will have interdisciplinary courses aimed at studying and better understanding the social, political, economic and cultural forces that impact the lives of Black people in the U.S. and those in the Caribbean, Africa and around the world.

Courses under consideration for the new minor are focused on such topics as Black astronauts and their contributions to space science, issues at the forefront of the modern civil rights and social justice movements, Caribbean history and culture, explorations of race, gender and class, and studies of African-American literature and film.

"Implementing this course shows that Florida Tech is invested in dismantling the barriers present in institutions of higher learning and creating opportunities for Black voices to be heard," said Furaha Merritt, a senior majoring in information systems and president of the Black Student Union at Florida Tech.

ESPORTS PLAYING AT FLORIDA TECH

Florida Tech is developing an esports program, and it is about far more than young men and women sitting in comfy chairs playing video games against other teams.

Kenneth Lam, the university's director of esports, said the program will offer real-world learning in areas such as esports management, coaching, communication, partnerships and events. The program is also slated to both provide and take advantage of Florida Tech's academic resources—for example, allowing players to serve as behavioral analysis research subjects and reaping the benefits of the evaluation.

"So, 'sports,' yes, is a simple term," Lam told Florida Tech's *Ad Astra* magazine in August. "But there is a lot more that it entails."

Lam came to Florida Tech from Maryville University in St. Louis, where he helped start one of the top collegiate esports programs in the country. As at other programs, Florida Tech's esports teams are expected to compete in games such as League of Legends, Overwatch, Rocket League and Valorant.

Esports, or competitive, multiplayer video gaming, exploded on the professional level around 2013, followed by the collegiate scene in 2016. Lam noted that, like other programs at Florida Tech, the esports program will ultimately be about far more than just gaming.

"College is a place where you come to learn more about yourself, discover who you are and what you want to do," Lam said. "Esports is just another means for students to get to know themselves and engage with others."

FOLLIARD ALUMNI CENTER OPENS

The Folliard Alumni Center was completed this fall. The new building replaced the 1960s-era ranch-style house that the alumni staff had used as office space with a new, zero-energy facility featuring a host of cutting-edge renewable energy technologies.

Florida Tech students and faculty have been involved in the project since the beginning, from applying for the $282,000 Renewable Energy & Energy Efficiency Technologies (REET) Program grant from the Florida Department of Agriculture & Consumer Affairs' Office of Energy to securing matching donations from several community partners to modeling the building materials and systems to predict the energy performance during the design phase.

"That's really a highlight of the project: It's a teaching tool for students," says mechanical and civil engineering associate professor Troy Nguyen, who is the principal investigator of the Alumni Center project. "They will be able to see how sustainability and renewable energy principles are being practiced, and they can touch and feel how those things are built."

A model for a cost-effective, scalable, zero-energy commercial office building design in Florida climates, the Alumni Center will provide continued research and development opportunities for not only Florida Tech, but the whole community.

COMMUNITY CONNECTIONS.

From Florida Tech's founding in 1958 as Brevard Engineering College, people, businesses and agencies from across the region have come together in powerful partnerships with the university to provide timely opportunities and experiences for all involved. More than 60 years later, Florida Tech continues to add to these cherished community connections with unique events and important steps forward. Here's a look at highlights from the last year.

MOONSHOT MANDATE

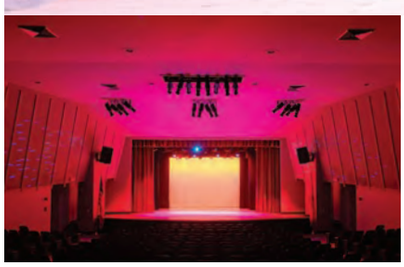
One of humankind's most important technological achievements received an appropriately monumental celebration at Florida Tech in 2019.

JFK's Moonshot Mandate: Then, Now, and Destiny, was a half-day symposium Nov. 6 presented by Florida Tech, the John F. Kennedy Library Foundation and the Universities Space Research Association that explored some of the key questions about the historic Apollo 11 launch that landed men on the moon for the first time.

Three panels of renowned experts, including astronauts Al Worden and Winston Scott, Florida Tech President Dwayne McCay, Steven Rothstein, executive director of the John F. Kennedy Library Foundation, and Kennedy Space Center Director of Engineering Shawn Quinn, tackled topics including the historical and cultural significance of President Kennedy's vision, the ways various agents, from universities to politics, shifted and shaped that vision to reflect our modern times, and what the future may hold with commercial space companies on the rise and lunar and Martian colonization inching closer to reality.

Worden, Apollo 15 command module pilot, told the assembled crowd, "It's going to rest on young people to do the things that have got to be done to get us where we need to go in space in the future."

Astronaut Al Worden speaks during the event, telling the assembled crowd, "It's going to rest on young people to do the things that have got to be done to get us where we need to go in space in the future."



LIGHT SHOW AT GLEASON PERFORMING ARTS CENTER

A nexus of campus and community engagement is the university's 53-year-old Gleason Performing Arts Center. The 483-seat venue named after benefactor W. Lansing Gleason, the former Eau Gallie mayor, has hosted concerts, lectures, plays and films that have allowed Florida Tech and Brevard County denizens to come together in the name of culture.

After a major project over summer 2019, that experience has become much more illuminating—literally.

The aging, 1960s-era lighting system that stretched from lobby to stage was replaced with cutting-edge LED lights, a move the center's Jeffrey Richardson called "a huge jump in technology." The 129 fixtures are bringing new capabilities and substantial cost savings.

Gone are the traditional lights that require colored "gels" to alter their white light—sheets of cellophane that would start slowly melting the moment the lights came on.

The new lights are all multi-color, allowing operators to produce a near-infinite spectrum by blending the red, green, blue, amber, white and lime LEDs within each individual fixture.

The new lighting system, far more efficient than the incandescent-like lights it replaced, is expected to cut the theater's electrical use in half. The upgrades and improvements move the theater toward becoming one of the most versatile venues available both on the stage and in the auditorium.

"Gleason was one of the area's earlier theaters when it opened and was advanced for its day," Richardson said. "Once again, it is at the head of the list."

WEVENTURE AWARDED MAJOR GRANT

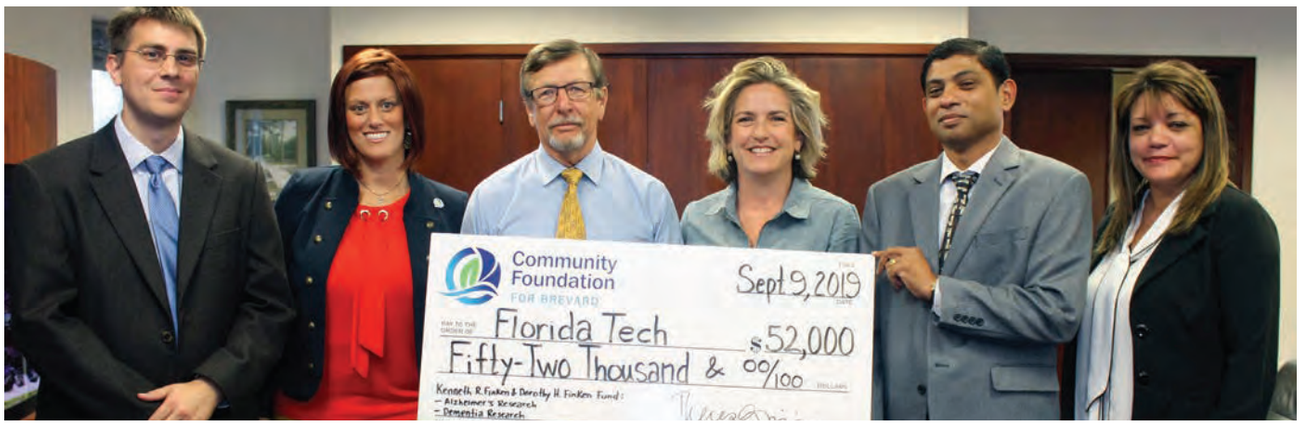
weVENTURE Women's Business Center, the innovative, Florida Tech-based organization that has offered coaching, business education and mentoring since 2007 as a key cog in the region's economic infrastructure, was awarded $420,000 from the U.S. Small Business Administration to further its outreach when it is needed most—during the coronavirus pandemic.

The summer 2020 grant, under the federal CARES Act, is allowing weVENTURE to expand its services assisting small businesses in Brevard, Indian River and St. Lucie counties in responding to and recovering from the impacts of the pandemic.

"During normal circumstances, weVENTURE helps women launch and grow their businesses," said weVENTURE Executive Director Kathryn Rudloff.

"However, in times of crisis, we accelerate our role helping entrepreneurs sustain their business by providing access to the information and resources they need to survive these unforeseen challenges."

The grant is allowing weVENTURE to cover the full cost of participation in the center's celebrated IGNITE 360® mentoring program for 31 businesses. It is also funding increased capacity for personalized business coaching, allowing the center to hire temporary staff to serve as business coaches. It is also producing increased capacity to provide educational training and information sessions focused on helping businesses respond to the pandemic, with new teams of subject-matter experts able to provide more in-depth education and training to business owners.



COMMUNITY FOUNDATION, FLORIDA TECH UNITE FOR MEDICAL RESEARCH

The Community Foundation for Brevard in September 2019 awarded two Florida Tech researchers $52,000 under its competitive Medical Research Grant to Find Cause and/or Cure for Alzheimer's, Cancer, and Other Pervasive Diseases initiative.

The funding, from the Kenneth R. Finken and Dorothy Hallam Finken Endowment Fund based at the Community Foundation, will allow ongoing research into Alzheimer's and dementia.

Over the last 12 years, Florida Tech researchers have been awarded 19 individual medical research grants via the Community Foundation that have a combined value of nearly $560,000.

Half of the latest grant went to Kunal Mitra, a professor of biomedical engineering, to further his research into a novel way to screen for Alzheimer's disease, a process that now is often costly, time consuming and invasive.

He is studying the use of a near-infrared spectroscopy system to monitor changes in oxygen supply to brain tissue in the aging population. In conjunction with blood tests for analyzing the blood plasma to target various internally produced substances due to metabolism, a new, inexpensive platform will be developed for early diagnosis of the disease.

Chris Bashur also received a $26,000 grant. The associate professor in biomedical engineering and his collaborators are developing a unique strategy that involves releasing a gaseous signaling molecule found naturally in the body—carbon monoxide—through molecules enclosed within ultrasound-sensitive microbubbles. The study will develop delivery methods that can provide controlled doses with the goal to establish a therapy for those with vascular cognitive impairment and dementia.

PHILANTHROPY IN ACTION.

Martin Luther King Jr. once said, “Life’s persistent and most urgent question is, ‘What are you doing for others?’” Over the last year, Florida Tech can proudly say that the university and its trustees, alumni and leadership answered that question with generosity and compassion. Here’s a closer look.

Support Amid the Pandemic

Aided by significant voluntary salary reductions from senior university leadership initiated by President Dwayne McCay and generous donations from members of the board of trustees, the Florida Tech Emergency Relief Fund established during the coronavirus crisis was able to provide financial assistance to individuals and families affected by the challenging business climate created by the pandemic.

Florida Tech employees who had documentable needs were assisted with a variety of support, including medical bills, mortgage or rent payments, childcare and food, electricity, gas and other necessities.

"Thank you again for what you and the Florida Tech community are doing," one recipient said. "True acts of kindness are the only way to truly make a difference in a world that is darkening."

The fund, which was at $165,000 in late summer, began when McCay asked senior faculty and staff leaders at Florida Tech to consider taking salary reductions of at least 10%. Many did so, with several making larger contributions. Inspired by that action, nine members of the university's board of trustees joined in pledging additional support.

"We must help one another where and when we can," McCay said. "I applaud and appreciate our leadership and our trustees for their generosity and compassion."

An earlier effort, the Special Day of Giving in May, drew pledges from more than 400 alumni, parents and friends to assist students in need because of the pandemic.

A Deep Investment in Florida Tech

Florida Tech President Dwayne McCay and University Research Professor and First Lady Mary Helen McCay designated a $1.25 million estate gift to Florida Tech in July 2019 to support two of their lifelong passions—education and faith.

Half of the McCays' gift will be used to enhance academic programs at the College of Engineering and Science and half will be used in support of the Catholic Campus Ministry.

"Many leaders steward their institutions for a few years and then move on to other opportunities, but the McCays have invested deeply in Florida Tech," said Robert Phebus, chairman of the Florida Tech board of trustees. "By creating this legacy, they have shown that the university is a core value for them."

The gift for the college will provide a significant building block for its future success, while the Campus Ministry gift will provide resources for the program's full-time minister and others to help students develop the strong values and moral leadership expected of true global citizens.

Dwayne McCay has been president and CEO of Florida Tech since July 2016. He also holds a joint appointment as professor in physics and space sciences and mechanical and aerospace engineering. He came to the university in 2003 to serve as provost and chief academic officer. He was named executive vice president and chief operating officer in 2011.

Mary Helen McCay is a university research professor and was a former NASA payload specialist astronaut. She has led an interdisciplinary team of researchers at Florida Tech focused on providing innovative solutions to the public and private sectors. Since joining the university in 2003, she has generated over $4.5 million in funding, partnering with Siemens Energy to build a state-of-the-art thermal spray and high heat-flux laboratory. Her current research is directed toward testing and improving thermal barrier coating materials at her Center for Advanced Coatings.

A Gift for the Students

There may be no greater Florida Tech exemplar of donating one's "time, talent and treasure" than the late Phillip W. Farmer.

Farmer's time and talent were on constant display during his nearly 25-year tenure on the board of trustees, which included two terms as chairman. He was motivated by the things that matter—helping students succeed, no matter their socioeconomic backgrounds, cultures or places of origin and providing them the best educational experience, from their residence halls to the equipment in their classrooms.

His generosity was as bountiful as the time he dedicated to Florida Tech.

In 2019, the Farmer estate gave a $1 million gift for the Farmer Scholars Program Endowment, supporting Florida Tech's most prestigious financial award Farmer started with a $1.5 million gift in 2009. The program provides a full, four-year scholarship to a Florida resident and high school graduate who is among the top 5% of his or her class and demonstrates exceptional academic achievement and outstanding personal character.

Included in the scholarship are all tuition and university fees, a room in L3Harris Village's Farmer Hall and the regular university meal plan. Additionally, the Farmer Scholar is given a stipend between the junior and senior years for enrichment through Florida Tech's summer study abroad program at Oxford University.

Over his lifetime, Farmer contributed over $12 million to Florida Tech. He passed away on Oct. 28, 2018.

$1 Million Gift to Help Weather Pandemic Challenges

The University Financing Foundation (TUFF) contributed $1 million to help Florida Tech in any way needed during the coronavirus pandemic, the university announced in July.

This gift honors Florida Tech President Dwayne McCay, who has worked closely with TUFF for more than a decade, and former Florida Tech vice president of financial affairs Jack Armul. TUFF CEO Kevin Byrne said in making this gift that McCay and Armul's professionalism and steadfast support of the vision for Florida Tech's success helped realize this vision.

Atlanta-based TUFF is a developer and advisor focused on creating vibrant physical environments for institutions of education and research. Founded in 1982, TUFF's mission is to help these institutions obtain facilities and equipment at below-market costs.

TUFF assisted Florida Tech in the past in the building of L3Harris Village student housing, Panther Dining Hall, the Panther Aquatic Center and the L3Harris Center for Science and Engineering.

The gift, which also honors four TUFF board members—Thomas Ventulett, Thomas Hall III, A.J. Robinson and David M. McKenney—demonstrates how strongly TUFF values the mission of the university and its past, current and future impact on the United States and the world.

A Day of Giving

Florida Tech held its fifth annual Day of Giving starting at midnight on Nov. 19, and Panthers near and far stepped up to support their university.

The 24-hour annual event attracted 1,984 donors—shattering the goal of 1,500 donors—who pledged more than $175,000 to the university, not including matching dollars. They represented 39 countries.

"Day of Giving is something truly special at Florida Tech," Gary Grant, senior vice president for development, said in announcing the results. "We are so proud of our alumni and thankful for their support, and we look forward to building on this success together, as we ensure Florida Tech remains one of the world's best universities."

The money raised goes to supporting Florida Tech's greatest needs, including financial aid, research and student activities.

Donations were also given to various groups and programs at the university, including athletics, the Alumni Center, the Joy and Gordon Patterson Botanical Garden, Catholic Campus Ministry, Continuing Education, Student Life, Evans Library, The Scott Center for Autism Treatment, weVENTURE and WFIT.

RESEARCH TO BENEFIT HUMANKIND.

The centerpiece of Florida Tech is its dedication and application to new research projects. Throughout multiple disciplines, faculty and students work to discover more about the world around them, creating solutions to current problems and furthering efforts to help improve our lives. Here's a look at some research highlights from the past year.

Internet Camera Privacy Flaws Discovered

Florida Tech computer science student Blake Janes discovered "systematic design flaws" in Ring, Nest, SimpliSafe and eight other manufacturers of internet-connected doorbell and security cameras that allow a shared account that appears to have been removed to remain in place with video feed access.

The companies were alerted to his discovery.

Janes found that the mechanism for removing user accounts does not work as intended on many camera systems because it does not remove active user accounts, thus allowing potential "malicious actors" to exploit the flaw to retain access to the camera system indefinitely, covertly recording audio and video.

The findings were presented in the paper, "Never Ending Story: Authentication and Access Control Design Flaws in Shared IoT Devices," by Janes and two Florida Tech faculty members from the university's top institute for cybersecurity research, L3Harris Institute for Assured Information, Terrence O'Connor, program chair of cybersecurity, and Heather Crawford, assistant professor in computer engineering and sciences.

"Our analysis identified a systemic failure in device authentication and access control schemes for shared Internet of Things ecosystems," the paper concluded. "Our study suggests there is a long road ahead for vendors to implement the security and privacy of IoT produced content."

The Balancing Act of Understanding Concussions

Research from May into concussions among student-athletes may have found a better way to understand the severity of these head injuries: balance tests.

In "Change in Balance Performance Predicts Neurocognitive Dysfunction and Symptom Endorsement in Concussed College Athletes," published in the *Archives of Clinical Neuropsychology*, Florida Tech Ph.D. students Andrew DaCosta and Andrew Crane, former Florida Tech psychology professor Frank Webbe and university psychology associate professor Anthony LoGalbo explored the change in balance performance in relation to neurocognitive functioning or symptom endorsement among student-athletes referred for possible concussion.

The researchers found that individuals who normally have great balance but demonstrate a notable decline in balance and verbally report balance problems exhibited poorer post-concussion neurocognitive performance, potentially suggesting a more acute injury.

Additionally, the research, which involved 68 Florida Tech student-athletes from multiple sports that had completed the university's standard preseason baseline testing and later suffered potential concussions, highlighted the importance of conducting preseason or early baseline balance tests to better illuminate any changes that may appear in post-concussion testing.

"What our research lends some credence to is without a baseline balance assessment, you would have less information when you're making clinical decisions about a person having a concussion after their evaluation," DaCosta said.

The project also won a student poster award at the National Academy of Neuropsychology conference in November.

3D Bioprinting Key in Florida Tech Cancer Research

Biomedical engineering professor Kunal Mitra's 11-month-long research project, "3D Cell Culture Model for Liver Cancer Treatment," used a 3D bioprinter built by university students to print various cancerous liver tissue samples. These samples were created by developing a mix of a specific hydrogel and cells.

The team then utilized pulse lasers, which emit light in bursts, to remove cancer from the tissue. While the team initially thought the pulse lasers would provide a significantly different result from continuous ones, research didn't support a stark change. Using various intensities to analyze which was the most effective, their research discovered the most effective cancer-removing laser was set at a frequency of 10 kilohertz.

"That's actually a huge challenge in therapeutic applications of lasers," Mitra said in November 2019. "The lasers will penetrate a certain wavelength, and the wavelength is a function of the color of the pigment, so skin color of people will make a big impact in treatment."

When testing cancer cells, researchers have previously used animals with cancer or injected them with cancer cells, an expensive and controversial practice. Bioprinting will allow a multitude of cancerous samples to be produced in a cost-effective, efficient and humane way.

Protecting an Even Playing Field

Assistant professor in chemistry Christopher Chouinard is working on research to better detect previously unidentified performing-enhancing drugs (PEDs) that are not yet found on the World Anti-Doping Agency's prohibited list.

An example of this testing's importance unfolded in the early-to-mid 2000s when the Bay Area Laboratory Co-Operatives, often referred to as BALCO in numerous media reports, distributed tetrahydrogestrinone, an orally active anabolic-androgenic steroid nicknamed "The Clear" for its inability to go undetected during testing. The steroid caused scandals across sports, ensnaring major athletes such as track star Marion Jones.

Chouinard and Florida Tech alumnus and research assistant Sam Maddox utilized ozone to create a chemical reaction with the sample, allowing them to analyze it for PEDs in a much more efficient and accurate way than current testing allows. This process, previously used in a different type of research involving lipids, allows testers to detect steroids that are difficult to differentiate from naturally produced testosterone.

"All of us have normal steroids in our body, and the chemists almost try to hide them in plain sight by saying, 'If we can make a synthetic steroid that's 10 times more potent than testosterone but looks exactly the same as testosterone in your analytical methods,' then that's how they get away with it," Chouinard said.

The research is funded by the Partnership for Clean Competition, a nonprofit organization founded in 2008 by the U.S. Olympic Committee, the National Football League, Major League Baseball and the U.S. Anti-Doping Agency.

Investigating Hurricane Damage in Low-Rise Buildings

Hurricane damage can have a huge impact on hotels, apartments and condominiums and other low-rise buildings. Mechanical and civil engineering professor Jean-Paul Pinelli is further investigating the hurricane damage potential of these buildings.

Following up on research grants analyzing the interior hurricane damage mechanisms of low-rise and high-rise buildings, Pinelli, alongside Florida Tech graduate student assistants Roberto Silva de Abreu and Zhuoxuan Wei, is developing numerical models to improve the damage projection capabilities of the Florida Public Hurricane Loss Model, used by the state of Florida to regulate the insurance industry.

The research's goal is to provide improved risk and vulnerability assessment models for the insurance industry and emergency managers. The models will also allow manufacturers and insurers to assess the cost/benefit relationship, on a statewide scale, of new mitigation products that can better withstand storms.

"Catastrophe models typically model the exterior damage and extrapolate it to the interior with some kind of judgement call, so if I have so many windows damaged, I expect to have this amount of interior damage," Pinelli said. "For the first time we're trying to model the physics of the problem, how much water gets in the building and once the water is in the building how it propagates."

CAMPUS ON THE MOVE.

From innovation and executive leadership to top-level storm safety and sound fiscal stewardship, Florida Tech had an active year across campus and beyond. Here's a look at events and achievements highlighting the university's impact and evolution.

Florida Tech Hosts International Delegates

Florida Tech and Melbourne became the first U.S. hosts to welcome the prestigious ISO 56000 Innovation Management World Congress and its cadre of international delegates in September 2019.

Hosted by Abram Walton, the elected U.S. delegate to the gathering and a professor at Florida Tech's Nathan M. Bisk College of Business, the 42-member Technical Advisory Group featured delegates from Brazil, China, Japan, Russia, Australia, Canada and much of Europe.

The group spent five days developing international innovation management system standards—known as ISO 56000—to help make innovation predictable, measurable and repeatable.

The standards developed are meant to highlight what firms and governments need to achieve to be internationally competitive.

Florida Tech President Dwayne McCay welcomed the group at a reception on the Florida Tech campus.

CarMax Board Chair, Alumnus Headlines Smith Lecture

Florida Tech trustee and alumnus Tom Folliard, who led one of the most influential and disruptive businesses in the U.S. marketplace—CarMax Inc.—shared his insights and experiences from the business world with a packed audience in October 2019 at the Hartley Room on the Florida Tech campus at the fall F. Alan Smith Distinguished Lecture Series.

Folliard presented "How a Florida Tech Graduate in Melbourne Helped CarMax Transform an Industry." He spoke about how CarMax grew so quickly and discussed the company's journey to the top of the industry.

After graduating from Florida Tech in 1989, Folliard began working at a local used car wholesaler. After a visit from the founders of what would become CarMax, he became employee No. 1 in 1993 when he was named senior buyer. He became director of purchasing in 1994. He was promoted to vice president of merchandising in 1996, senior vice president of store operations in 2000 and executive vice president of store operations in 2001. In 2006, he became president and chief executive officer, where he remained for the next decade.

Folliard retired as chief executive officer in August 2016 and currently serves as the non-executive chair of the board.

University 'StormReady' After Earning Designation

Florida Tech earned the National Weather Service's StormReady designation in 2020, an indication of the university's outstanding preparation for severe weather.

Being StormReady means Florida Tech is better prepared to save lives from the onslaught of severe weather through advanced planning, education and awareness, the National Weather Service noted.

The program encourages communities to take a fresh, proactive approach to improving local hazardous weather operations by providing emergency managers with clear-cut guidelines on how to improve their hazardous weather operations.

To earn the designation, Florida Tech had to establish or continue multiple steps, including establishing a 24-hour warning point and emergency operations center; having more than one way to receive severe weather warnings and forecasts and to alert the public; and creating a system that monitors weather conditions locally.

"This success is clearly a result of the vision, leadership, hard work and commitment by you and your Department of Security staff," David Sharp, meteorologist-in-charge, and Scott Spratt, warning coordination meteorologist, at the National Weather Service office in Melbourne said in a letter to security director Frank Iannone announcing Florida Tech's achievement. "[Florida Tech] students and faculty should take great pride in being part of a university that has achieved this recognition."

Foosaner Museum Property Finds Buyer

A developer with plans for a boutique hotel, parking garage, food hall and more purchased the Foosaner Art Museum properties located in downtown Eau Gallie, the university announced in April.

Orlando-based Northboro Builders Inc. acquired the museum and the adjacent Renee Foosaner Education Center.

Northboro CEO Larry Jarnes is the owner and operator of several commercial buildings in Melbourne in addition to leading Northboro Builders Inc., a company dedicated to revitalizing commercial properties throughout the country, including hotels, airports and restaurants.

"We reviewed several offers and ultimately felt that Mr. Jarnes' vision for the property was best for all involved," Florida Tech President Dwayne McCay said in announcing the deal. "We wish him every success."

Florida Tech acquired the former Brevard Art Museum in 2011 after a $1 million gift from the Foosaner Foundation and Dee Negroni-Hendrick. Upon taking ownership of the museum, the university spent approximately $1.8 million to bring its facilities up to code. Since Florida Tech took over operations of the museum, the university has spent more than $7 million to keep it open.

The museum will continue with exhibitions until July 1, 2021.

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