



# Pursuit

University of Central Florida  
College of Sciences  
2021-2022



# PURSUIT

2021-2022

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Biology Assistant Professor Kristy Lewis, Ph.D., studies aquatic ecosystems and their related food webs. This includes the impact of human events like habitat loss, oil spills and climate change on fish communities.

### **ON THE COVER**

Associate Professor Kelly Kibler, Ph.D., examines an oyster in the Indian River Lagoon. Kibler's research focuses on river and estuary "ecohydraulics," including how natural barriers like mangroves and oyster reefs can protect shorelines.





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# A MESSAGE FROM THE DEAN

Boundless curiosity is at the core of our research in the College of Sciences. You'll find it among our social scientists studying human behavior and represented among the equations of our chemists and astrophysicists. Just a small sample of what we've achieved by asking "why?" can be found on these pages.

## Over the past year:

- Big, clunky night-vision goggles could be replaced with a product as lightweight as sunglasses thanks to a new research partnership with MIT.
- Computer science and political science perfectly meshed when Craig Wilding M.S. '21 applied his electronics background to analyzing voter data.
- Realistic tests of planet and asteroid rovers are underway thanks to the simulated space dirt produced by the Exolith Lab.
- A new podcast is training media students and focusing a spotlight on Winter Park public records.
- Mathematical modeling techniques developed by graduate student Huntir Bass could revolutionize how conservationists approach the protection of endangered species.
- Older adult populations vulnerable to scams will benefit from a new "exploitation susceptibility" tool kit under development by Psychology Assistant Professor Nichole Lighthall, Ph.D.

Even in this research snapshot you can see our pursuit of knowledge makes a real, tangible impact on the communities that surround our campus and beyond. That's the true inspiration that drives our work every day in the classroom, lab and office.

Charge on COS Knights!



**Maggy Tomova, Ph.D.**

Dean, UCF College of Sciences

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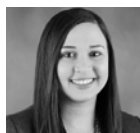
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# SCIENCE *Snapshots*

**Science (and learning) happens on multiple fronts in the College of Sciences. Here's a quick look at what we've achieved over the past year.**

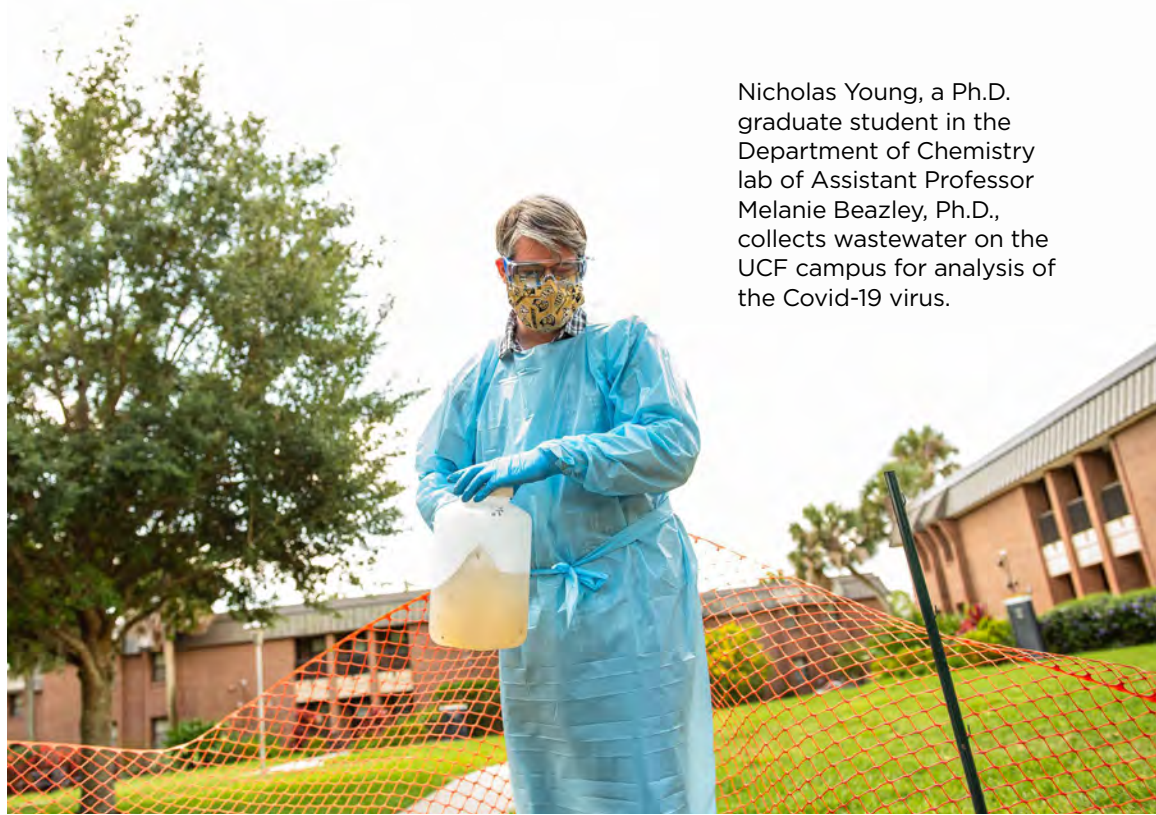


Biology student Anisa Khalid shares what she's learned participating in the Pepper Breeding Initiative at UCF.



Cristina Ortiz pauses her testing work in the Exolith Lab. The not-for-profit lab based in the Department of Physics produces high-fidelity soil that simulates the surfaces of the Moon, Mars and asteroids.





Nicholas Young, a Ph.D. graduate student in the Department of Chemistry lab of Assistant Professor Melanie Beazley, Ph.D., collects wastewater on the UCF campus for analysis of the Covid-19 virus.



Psychology students test drive a new virtual reality system that expands the capabilities of human behavior research.



# Welcome Dean Tomova

**Maggy Tomova, Ph.D., joined UCF's College of Sciences as dean in Fall 2021.**

Her appointment follows a distinguished career path, most recently as associate dean for the Natural, Mathematical, and Social Sciences in the College of Liberal Arts and Sciences at the University of Iowa. Now she guides the development of research and graduate programs, student success, philanthropy and the overall operations of UCF's largest college.

"Dr. Tomova brings experience facilitating faculty research and a passion for recruiting and supporting faculty, staff, and students with diverse backgrounds," Provost Michael Johnson, Ph.D., says. "She will bring a collaborative leadership style and strategic thinking to bear on the opportunities and issues that future years bring."

Before her prior role at the University of Iowa, Tomova served as the department executive

officer of the university's Department of Mathematics, where she led efforts to increase faculty research and recruit outstanding faculty members with diverse backgrounds.

She is a professor of mathematics whose research in low dimensional manifolds and knot theory has been supported by grants from the U.S. National Science Foundation.

Tomova holds a bachelor's degree in mathematics and biochemistry from California Lutheran University and earned her doctoral degree in mathematics from the University of California at Santa Barbara. She is completing a master of business administration degree at the University of Nebraska.

"UCF is a remarkable institution where world-class research and high-quality affordable and accessible education combine in a wonderful synergy. The excellence and diversity of the student body and the many successes of the alumni are a testament to the talents and dedication of the faculty and staff," Tomova says. "I look forward to working with everyone in continuing to achieve new milestones to benefit our students, the state and society. This is the work that inspires me, and I am honored and excited to be a part of this extraordinary community."





# Call for the Animals

**Rachel Williams '13, DVM, is in the business of making big impacts on communities of small animals. The graduate of the UCF pre-veterinary studies program notes there hasn't been a time in her life where she was inclined to do anything other than take care of critters and creatures of all kinds.**



While Williams currently serves as a surgery attendant at Massachusetts Veterinary Referral Hospital in Boston, Massachusetts, she spends her time pursuing her life's dream: being a voice for the furry friends that don't have one.

"This is my passion," says Williams. "I've always been enamored with animals and wildlife."

Williams began auditing college-level classes as a senior in high school, allowing her to

complete a four-year degree in only three. She credits Chris Parkinson, Ph.D., a former UCF professor, for encouraging her and creating a welcoming environment for learning.

"My time at UCF was amazing from the get-go," says Williams. "It attracted me for a number of reasons, but what really drew me in was the strength of their science programs and the support offered to students."

Williams packed her bags and headed to the West Coast after being accepted to veterinary school as a junior. UCF's program prepared her adeptly for the future of her academic career.

"Vet school is incredibly difficult to get into," says Williams. "I thought that one of the coolest things about UCF was the fact that many of my peers and I were accepted on our first try. We got to where we needed to go and many of us carried what we learned as undergraduates with us into our now professional lives."

Williams attended the Western

University of Health Science in California before being accepted to the University of Pennsylvania for her residency. One of the most impactful parts of the experience, says Williams, was becoming a teacher herself while mentoring students in clinical rotations.

After completing her three-year residency, Williams flew across country to begin her newest endeavor as a staff surgeon at Massachusetts Veterinary Referral Hospital.

"There really is no better feeling than an animal coming in, injured or in a dire state, and I can put a stop to that pain right there with my own hands," says Williams. "The gratitude you receive from everyone involved is unparalleled, and it is nice to be able to make a notable difference in the lives of these animals and their families."

# CALCULATED CONSERVATION



**UCF graduate student Huntir Bass, who is pursuing a master's degree in math, knows the power of math to solve problems.**

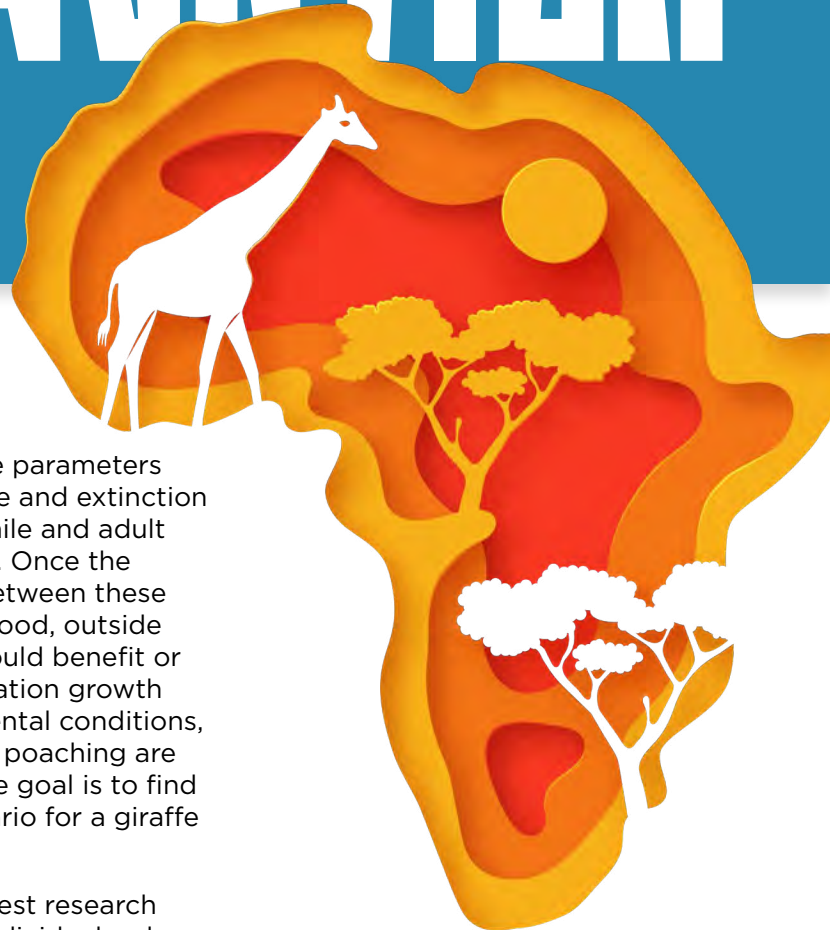
"Since I was little, I have always gravitated towards math," says the Mobile, Alabama, native. "I love how math can be used to discover and get a deeper understanding about the world around us. I learned mathematical modeling could be used in fields like mathematical biology, epidemiology and others. Giraffes are my favorite animal, so I know a lot about them. Combining my love of math, problem solving and giraffes, is how this research project developed."

The project, "Giraffe Population Behaviors: A Mathematical Modeling Introduction to Gain Understanding of Giraffes to Save Them from Extinction," looks to accurately depict population behaviors of giraffes to predict their population adaptations to different scenarios. Through various mathematical modeling techniques, Bass is

looking for the parameters for coexistence and extinction between juvenile and adult giraffe groups. Once the relationship between these two is understood, outside factors that could benefit or impede population growth like environmental conditions, predators and poaching are calculated. The goal is to find the best scenario for a giraffe herd to thrive.

Some of the best research comes from individuals who are passionate about a topic and want to make an impact. The giraffe population has been rapidly declining over the last four decades and Bass wanted to be part of turning that trend around.

"If I can mathematically model their population's behaviors and get my research in the right hands, I could possibly help increase the population growth," she says. "I also believe it could help other endangered species that have the same or similar population behaviors. This research matters to me because

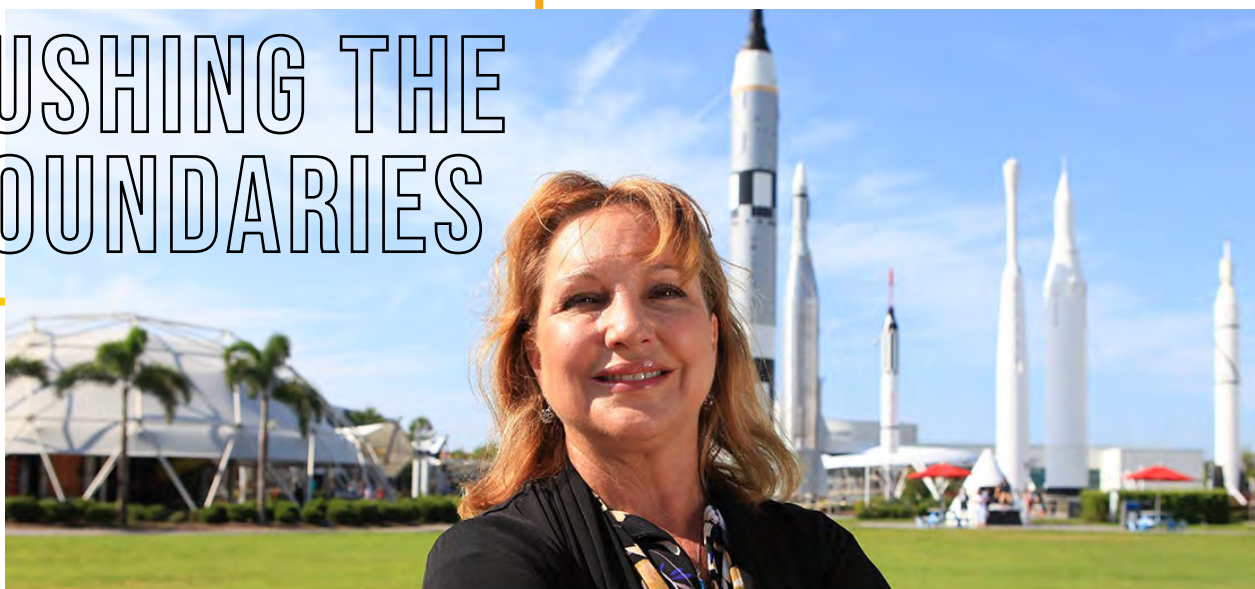


giraffes are my favorite animal, and it would break my heart to live in a world without them. I want to avoid the tragedy that the northern white rhino population has approached due to poaching, with only two females left in the world."

After graduation, Bass hopes to teach and help kids overcome their fear of math. But you never know. She says she's open to a career in research, especially if it helps conserve giraffes or other species in the world.



# PUSHING THE BOUNDARIES



**Kathleen Loftin '89 '00MS '09PhD represents UCF and the Department of Chemistry as the center chief technologist at Kennedy Space Center.**

Here she shares her inspirations for pursuing a career in STEM and her contributions to the field of space exploration.

**On being a modern scientist:**

People are always surprised to hear what I do. The women in my book club and in our bunco group will hear me talk about NASA and say, “Really? You’re a researcher in space exploration? You?” I guess they’re used to a stereotype of a scientist — it isn’t someone who kayaks and works the garden on weekends.

**On what keeps her inspired:**

A UCF professor said something I think about daily. The late Chris Clausen, my chemistry professor, would say, “What did you do to push the boundaries of science today?” That question still inspires me. It brings me out of the weeds to realize the magnitude of what we’re doing at Kennedy Space Center. Our work is much, much bigger than myself.

**On her role with NASA:**

My role is very technical. I oversee the research and technological efforts of the mission. ... When we go to the moon or Mars, there is a limit on what we can take. So we’re learning how to break down the moon’s soil into breathable oxygen and how to use the metals there to build launch pads, parts and infrastructure. From there we can learn how to sustain life on Mars in the future for months or years. How exciting is that?

**On finding her passion for science:**

This all started with rocks. They fascinated me as a young girl when our family would camp in north Georgia. I’d find quartz and amethyst, or jade when we traveled out west. In 8th grade I brought the rock collection to my science teacher, and she showed a genuine interest. Her encouragement helped me create an identity for myself in science.

**On rising to the challenge:**

Teachers sometimes underestimated me.

My chemistry teacher in 10th grade said, “Boys are better in science, so I don’t expect girls to do as well.” I can’t imagine a teacher saying that today. Back then, I took it as a challenge. I thought, “Game on! Let’s go!” I still feel that way.

**On her time at UCF:**

I’ve always felt that I got a lot of bang for my buck at UCF. As an undergraduate in chemistry, I could get my hands into meaningful research. It didn’t matter that I was a girl or that I didn’t have a bachelor’s degree yet. There were no limitations.

**On being limitless:**

My message for girls and women: Never doubt yourself. If anyone doubts you, use it as motivation. I still do that. We’re all capable of anything. There is no glass ceiling. Just look how far we’ve come and look what we’re about to do next.





# SOCIOLOGISTS STUDY PANDEMIC IMPACT

The health risks of childbirth and pregnancy among women of color grew higher in 2020 as the pandemic widened preexisting inequities.

This is among the findings two UCF sociologists presented in a chapter of the recently published “Social Problems in the Age of COVID-19.” Professor Shannon K. Carter, Ph.D., and Assistant Professor Bhoomi K. Thakore, Ph.D., blended their expertise on maternal issues to examine the impact overburdened hospitals, risk of virus exposure and telehealth made on pregnant women of color.

Even pre-pandemic, pregnant women in the U.S. were more than twice as likely to die from childbirth complications than women in other industrialized nations, according to Blue Cross Blue Shield. The risks grow higher among women of color, with Black women 3-4 times more likely to die than white women from childbirth complications.

Carter and Thakore name “unnecessary caesarean births, breastfeeding disruptions and postpartum depression” as the culprits, among others. But those are symptoms. The root of the problem is women’s unheard complaints, they posit.

“Black women are far less listened to by their obstetricians. Their pain is minimized and their symptoms are overlooked,” Carter says.

The pandemic widened the gap by overburdening hospitals in predominantly Black and

Hispanic communities with virus patients. That forced pregnant women to find help in a healthcare system strained to the breaking point.

They write: “Pandemics such as COVID-19 bring to light inherent problems with basing maternity care within an institution created to treat people who are sick.”


The book’s editors emphasized the need to pair problems with solutions. Carter and Thakore offered a more nuanced understanding of how race factors in medicine from doctors, versus expecting just the women to change their behavior. The historic role of midwives and doulas in the birthing process was minimized by the advent of formalized medicine, but recruiting and training these important figures could make a difference.

Both Carter and Thakore recognized the once-in-a-generation research opportunity the pandemic presented (even if they didn’t

anticipate the duration). Their goal is to put this book and their chapter into the hands of policy makers and community leaders who can use it to make significant changes and improvements.

“We hope that our research brings attention to some straightforward solutions,” Thakore says. “Ideally, it will also motivate funders to provide the necessary resources to these communities struggling every day with maternal healthcare access.”



A photograph of two firefighters in a smoky forest. The firefighter on the left is wearing a yellow helmet and jacket, holding a red-handled tool. The firefighter on the right is wearing a blue helmet with 'SAULSBURY' written on it and a yellow jacket. The background is filled with tall, thin trees and a thick layer of smoke or mist.

# ARBORETUM ABLAZE

The UCF Arboretum's success as a natural refuge from the bustle of campus life happens largely because of committed staff and volunteers, but there's another ingredient, too.



Agency partners such as the Florida Forest Service, Florida Department of Environmental Protection, St. Johns Water Management District, neighboring county natural resource departments, and many others brought together through the Central Florida Prescribed Fire Council contribute to its success. Additionally, community partners including Rollins College, The Nature Conservancy, Florida Native Plant Society and Florida Wildflower Foundation all play a part in creating a welcoming and blossoming environment on the fringe of campus.

“We could not accomplish the goals of our prescribed fire program at UCF without the support of these partner agencies. We do not have the equipment, personnel, or experience to do this on our own,” says Arboretum Director Jen Elliott. “These relationships built over 15 years now allow us to accomplish the goals of the program.”

The Arboretum was established in 1983 and spans approximately 83 acres. Responsibly maintaining that acreage is achieved through controlled burns completed in tandem with the Florida Forest Service’s (FFS) Wildfire Hazard Mitigation grant program. Safely burning underbrush rejuvenates the landscape and promotes wildlife habitats. The Arboretum has also collaborated with the Florida Native Plant Society to rescue and relocate plants from development sites into the Arboretum, including threatened Hooded Pitcher Plants.

The Arboretum exists in large part as a hands-on classroom, and Knights regularly invite Rollins Tars from across town to enjoy the living laboratory. Tours teach about the native Florida ecosystems and the importance of managing Florida’s diverse habitats.

Tracy Alt, an environmental studies major and intern on the Arboretum’s Learning by Leading Urban Horticulture team, sees firsthand the benefits of UCF’s natural resources as well as the collaborations and partnerships with these organizations.

“I have always enjoyed spending time in nature. Seeing an institution such as UCF work so hard to protect a significant portion of its main campus from development is inspirational,” Alt says.

Elliott expects the partnerships and collaborations will continue to grow as more agencies turn to UCF for assistance and insight, particularly in complex urban interface prescribed burning.

“We could not do this on our own. It is a huge undertaking and we are forever grateful for the relationships and partnerships we have built through the years,” Elliott says.



# PowerHouse

## PROGRAM



The University of Central Florida's graduate game design program is the best in the world for the third straight year, according to The Princeton Review and PC Gamer magazine.

The Florida Interactive Entertainment Academy (FIEA) has garnered the top spot, coming in ahead of New York University, Southern Methodist University, the University of Southern California and the University of Utah. UCF's undergraduate game design program also ranked highly at No. 13 for 2022.





The two programs are located at UCF Downtown in Orlando's Creative Village, where graduate and undergraduate students learn the tools and techniques to be artists, programmers and producers in the gaming industry. The Creative Village is also home to Electronic Arts' new office, putting students just steps away from internship and job opportunities.

"We appreciate the recognition of the tremendous effort of our faculty and students," says Ben Noel, executive director of FIEA. "The success of the alumni in the video game and simulation industries is what continues to drive the growth and evolution of the program. We focus on the development of top talent that will drive the next generation of developers in Florida and globally. Electronic Arts' relocation a block from our program is affirmation of our success."

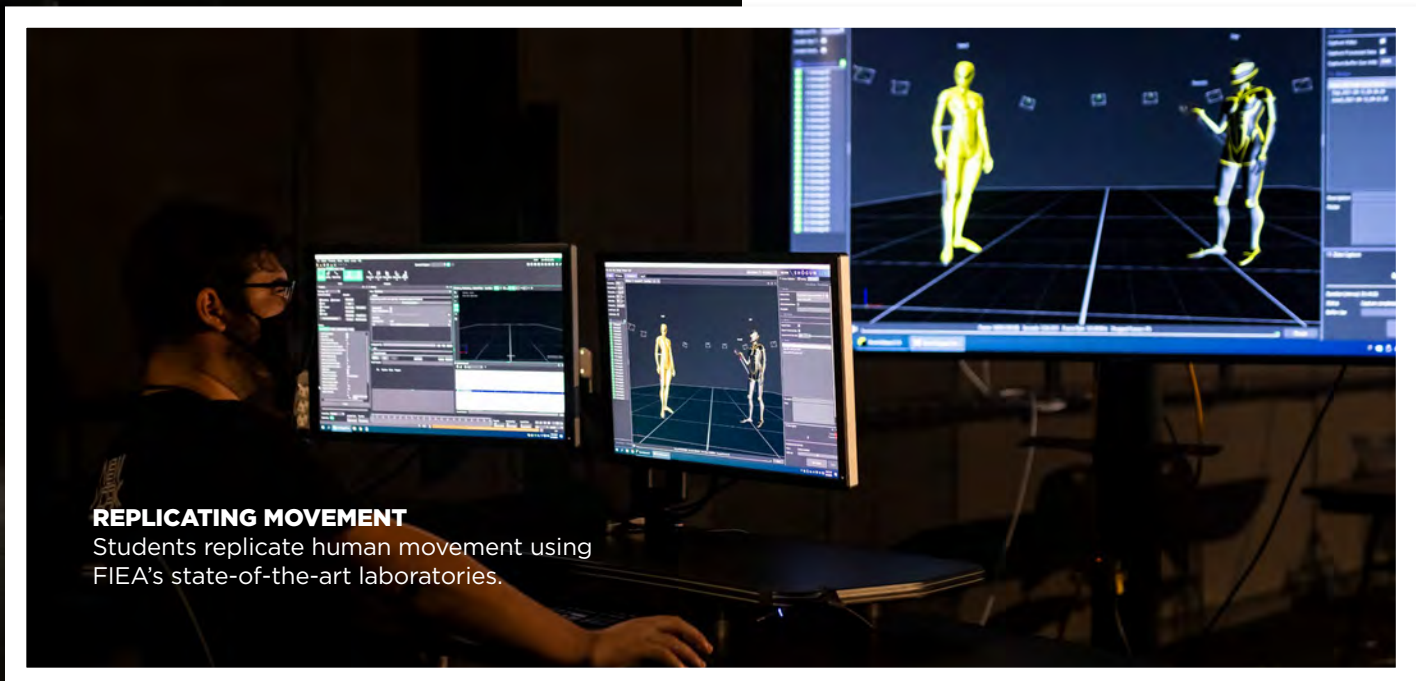
Henry Bell, a FIEA student who earned his undergraduate degree in film at the University of Kansas, is leading a team of 19 student producers, artists and programmers who are developing a full-fledged video game as their capstone project.

"It has been an invaluable experience to get to do everything a lead would do in industry," says Bell. "I feel so much more prepared to get a job."

The FIEA program has over 850 graduates now employed by more than 300 companies around the world. The starting salary for graduates is over \$70,000 annually. Top employers include Electronic Arts, Iron Galaxy and Epic Games.

Gaming has become a \$159 billion industry globally. Statistics from the Entertainment Software Association indicate video games and attached industries support more than 16,000 jobs and \$2.6 billion in economic impact in Florida. According to WalletHub, Orlando is the sixth best city in the country for gamers, in part due to its developer opportunities. An estimated 2,000 game developers are employed in downtown Orlando, bolstering the city's reputation as a technology and digital media hub.

"The continuing success of the graduate and undergraduate programs is evidence of the power of experiential learning in an environment that supports digital media," says Robert Littlefield, the director of the Nicholson School of Communication and Media.



**REPLICATING MOVEMENT**

Students replicate human movement using FIEA's state-of-the-art laboratories.

# Quite the Catch

**Thanks to a trio of donors with a passion for supporting the state's marine life, a new boat debuting Spring 2022 replaces a 1976 craft reaching the end of its lifespan.**

Researchers will now be using a new and specially outfitted 17-foot Brunswick Commercial & Government Products (BCGP) 170 Guardian for their work. The craft was provided by donations from the Folke H. Peterson Foundation and National Save the Sea Turtle Foundation, and made possible with a purchase discount from the Brunswick boat group companies that include BCGP, Boston Whaler and Mercury Marine.

"Boston Whaler and the Brunswick Commercial & Government Products Group supports environmental resource management and research efforts around the world," says Kris Neff, president of Boston Whaler. "Our boats are ideally designed to handle the rigors and long-term serviceability of demanding applications, so we are confident that we are helping make a difference. Supporting the University of Central Florida and the Marine Turtle Research Group is particularly satisfying because we are a Florida-based

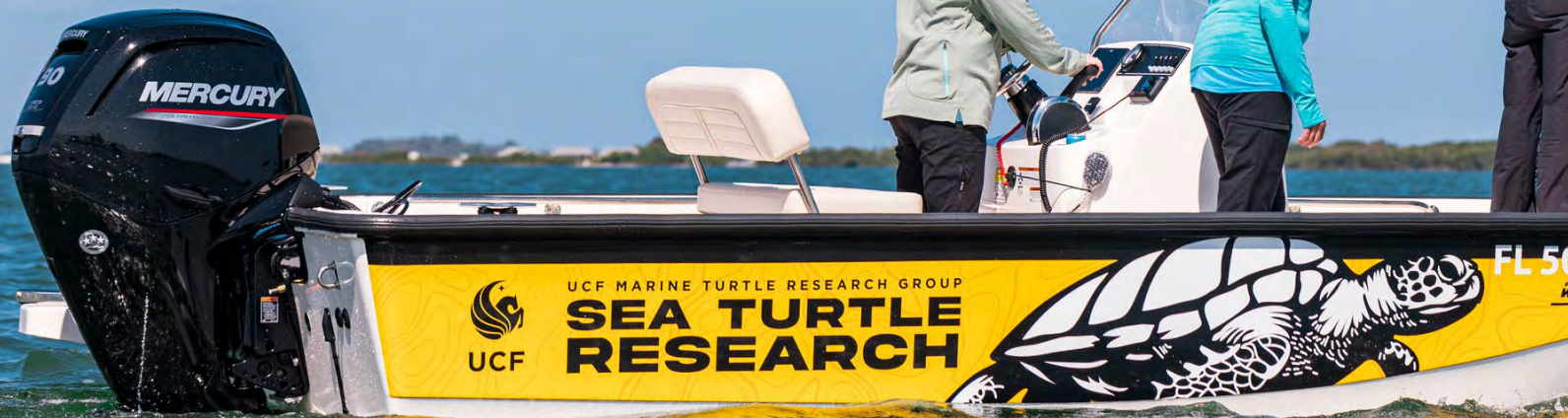
company, and because conserving sea life directly aligns with our customers' interests as boaters."

The MTRG is respected by scientists around the globe for its work unraveling sea turtle mysteries. Their legacy includes contributing to the establishment of the Archie Carr National Wildlife Refuge — a critical pocket of protected shoreline for annual nest sites. In 2021, they were the first to track young green sea turtles to the Sargasso Sea during their "lost years."

Some of their research happens on shore, but much more comes from interacting with sea turtles on the water. Strict protocols allow them to safely net the turtles without endangering other marine life in the Indian River Lagoon, particularly dolphins and manatees. Deploying the net requires a careful choreography of boats, a procedure that quickly falls apart when an engine fails.

"I need to know that the boat is safe and functional," says Associate Professor Kate Mansfield, Ph.D., director of MTRG. "If we're getting knocked around by the wind and the engine conks out, it's dangerous for us and the animals."

When MTRG began working with Boston Whaler to order a new boat they had several specific requests, including stripping all the creature comforts, like coolers. With limited room aboard and multiple people handling different roles, it's critical the net doesn't snag on anything, Mansfield says.





Another customization that sets this new craft apart is the additional balancing and buoyancy. Full-grown turtles weigh hundreds of pounds and hauling even smaller turtles aboard takes coordination. A heavy soggy net on the bow can also skew the balance.

Mansfield says the new boat offers foremost increased efficiency and safety for the MTRG research team, but it's also a win for turtle research.

"MTRG has been providing critical insights into the habits and behaviors of sea turtles for decades, and we still have so much more to learn," says Larry Wood, research coordinator for the National Save the Sea Turtle Foundation. "We are excited to partner with them and play a part in furthering their research."

"I know this one is going to hold up under the stress. It essentially ensures our long-term projects continue," Mansfield says.





# MEDIEVAL STUDIES PROPELS MODERN CAREER

**Jane Holstrom, Ph.D., is looking forward to a career that looks back in time as the first graduate of UCF's integrative anthropological sciences doctorate degree.**



Her journey to graduation began 12 years ago when she took her first anthropology classes as an undergrad at Minnesota's St. Cloud State University. That ignited a passion for studying skeletal remains that took her to the south of France to study the bones of an order of Benedictine monks called Cluniacs.

Four years of research and doctoral work produced her dissertation, "Examining Diet, Mobility and Social Dynamics in Southern Medieval France Using a Multi-Isotopic and GIS Approach."

The dissertation details what she learned about the diet and migration patterns of the ninth-13th century individuals who lived and worked at the site in Laudun, about 90 minutes northwest of the Mediterranean city of Marseilles. The history of Laudun includes a Roman settlement.

The "integrative" aspect of her terminal degree comes from the different disciplines applied to

unlock the secrets held by the bones. Stable isotope analysis of bone fragments reveals what people ate during that time and what percentage of the population were locals versus migrants. She also incorporated Geographic Information System (GIS) mapping to provide a more complete picture of site location.

Funding from the U.S. National Science Foundation Doctoral Dissertation Research Improvement Grant, Lambda Alpha Research Grant and Rust Family Foundation kept the work buoyant, along with UCF's Doctoral Research Support Award and the Trevor Colbourn Anthropological Endowment Fund.

"Being able to secure a project that I was genuinely interested in and getting the grants are definitely highlights from the past four years," she says.

Holmstrom's advisor, former Senior Associate Dean Tosha Dupras, Ph.D., praised her ability to navigate an international research project during a pandemic. Dupras also commends Holmstrom's commitment to the Department of Anthropology beyond research, including co-founding an Anthropology Mentorship Program.

"It has been a fantastic experience serving as Jane's advisor, and I am proud to now have her as a colleague," Dupras says.

Holmstrom was chosen as visiting Assistant Professor at Grinnell College in Iowa soon after graduation. She's also pursuing more medieval research, including a similar study of Cistercian nuns in Hyeres, France. A pilot study on the remains has already provided promising results, and Holmstrom is excited to begin radiocarbon dating the bones.

"I can't wait to get there," she says.



# WINTER PARK SUNSHINE

**Rooted in a government transparency mission, the Winter Park Sunshine Podcast provides UCF journalism students a wealth of leadership and professional experiences.**

One of those students, UCF junior Jackie Cardentey, says serving as the podcast's executive producer gave her real-world experience that was integral in guiding her career's path.

"This podcast is all about keeping the citizens of Winter Park informed about all that's going on in their community and making them better acquainted with their government officials," says Cardentey. "For me, this experience was invaluable in terms of learning the ins and outs of working on a major broadcast production. It was a lot of hard work, but I learned so much about what it takes to be a journalist."

The experiences that Cardentey gained while working on the podcast was integral to her landing her first internship at one of Central Florida's national network affiliates. A native of Miami, Cardentey aspires to be a broadcast journalist, working as a producer in a major U.S. media market. Projects like this are key to realizing her professional goals.

Spanning six episodes, the Winter Park Sunshine Podcast features interviews with Winter Park's vice mayor, chief of police and city commission candidates, among others. In addition, there are various organizations featured, such as the Winter Park-based Central Florida Down Syndrome Association of Central Florida, the city's Parks and Recreation department, and the Winter Park Sidewalk Art Festival. The podcast can be found on Spotify, SoundCloud and TuneIn.

The podcast is the latest endeavor of the Winter Park Sunshine Project, an ongoing community research endeavor within UCF's Nicholson School of Communication and Media. The focal point of the project is a searchable database — established and maintained by UCF student journalists — where users can access wide ranging information about the City of Winter Park. Within the database, users gain access to commission meeting minutes, campaign contribution records, voter data, employee salary information, and much more.

Through the Winter Park Sunshine Project, Nicholson faculty hope to instill in student reporters — like Cardentey — an appreciation for the responsibility of journalists to hold municipalities and elected officials accountable to the public.

"All of the information we've gathered is publicly accessible, but it might as well be hidden behind closed doors because your average citizen would have no idea where to access it," says Robb Lauzon, Ph.D., who oversees the Winter Park Sunshine Project as NSCM's first postdoctoral scholar. "I want Jackie and every student journalist who contributes to this project to walk away knowing that it is the responsibility of journalists to bring this information to light, keeping Central Florida's citizenry informed and engaged."





## VIDEOS INFORM FLORIDA VOTERS

A collaboration between the Florida Supervisors of Elections and UCF's Lou Frey Institute will leave first-time voters feeling a little less overwhelmed when stepping up to the poll.

The videos stem from a law passed July 1, 2021 by the Florida legislature requiring students to show competency in understanding the state's uniform ballot system. That translated to high school civics courses integrating the ballot system into the existing curriculum to ensure students better understand how Florida's ballots are constructed.

To make ballot content less overwhelming for students across the state, Orange County Supervisor of Elections Bill Cowles reached out to the Institute for help.

LFI's Director of Curriculum Chris Spinale was immediately inspired.

"In all honesty, voting is the biggest responsibility for citizens of America," says Spinale. "Once you turn 18, you're expected to register and engage. Our project at Lou Frey helps to lay everything out for that moment."

Spinale and his team have created a series of instructional videos, condensing information about Florida's ballot system into a mini-series accessible online.

The videos are something Spinale points to as a means of taking the stress off teachers who are expected to teach this newly required material.

"Teachers can use these videos instead of having to design their own, personal lesson around the ballot system," says Spinale. "Lesson planning can be time-consuming and stressful on its own. We want to take the pressure off teachers while making this information accessible for students for years to come."

The videos feature a comprehensive breakdown of Florida's uniform ballot structure for primary and general elections. The goal is to familiarize students with how the ballot looks and what to expect when viewing a poll for the first time.

"I like that our videos lay everything out," says Spinale. "It helps a pre-voter familiarize themselves with what they'll do when they step up to the ballot box."

The videos are live on LFI's website, as well as 67 Florida election supervisors' sites. They are completely free and easily accessible.

"Having that familiarity about the layout of the ballot structure helps the voter ahead of time," says Spinale. "The great thing about these videos being uploaded across the internet is that they're always available for referral."



# RESTORING HOPE FOR FIRST RESPONDERS

**While in Surfside, Florida, a first responder working the tragic collapse of the Champlain Towers South condo building approached Deborah Beidel, Ph.D., with fine jewelry he found among the rubble. He was worried about who it belonged to and the significance it held.**

“With discoveries like this, you’re helping people get a part of their relative back,” Beidel said to the first responder. “You’ve helped them get closure. You’ve helped them get a piece of their mom back.”

He hadn’t really thought of it that way.

It’s conversations like these that Beidel, executive director of UCF RESTORES, and faculty members David Rozek, Ph.D. and Amie Newins, Ph.D., engaged in with people linked to the South Florida town. They were on site as a mental-health resource for more than 300 first responders who had been tirelessly working since June 24 to uncover bodies.

UCF RESTORES — a nationally known nonprofit trauma research center and treatment clinic — is the mental health partner of the Florida Firefighter Safety Collaborative, a nonprofit organization that educates and trains firefighters on physical and mental health. The Collaborative called RESTORES to Surfside to be on hand to help first responders. They provided psychological first aid — meeting with the search and rescue teams when

they stopped for lunch or at the end of the day to check in on their mental wellbeing.

“Some were OK, and some needed to talk about what they saw. Our job is to let them know we’re there to help them and be there for them, now and down the line if they need it,” says Beidel, who alone spoke to about 100 first responders.

RESTORES has responded to other traumatic events, including the shootings at Pulse Nightclub in 2016 and in Las Vegas in 2017. The clinic has developed a number of strategies to help first responders process the stress of traumatic events like these that they work.

One service is a single session consultation line developed by Rozek, assistant professor of psychology, who also went to Surfside. The consultation line is free for first responders and in a 60-minute phone call they can talk about their stressors and develop a plan with coping strategies with the help of a RESTORES therapist. For those who need additional support, RESTORES offers more intensive individualized and group therapy.

“When you have people who have spent their lives being the helpers, it’s hard to ask for help,” Beidel says. “What we want them to know is that it’s OK to be OK. It’s OK to not be OK. It’s OK to be OK now, and not OK later. There’s no one reaction to trauma, and we want them to know we’re here to help them through it.”



# PHONE PHISHING

**UCF researchers are developing a tool for primary care providers that could help them protect senior citizens from scammers who steal everything from the elderly's life savings to their identity.**

The team led by Psychology Assistant Professor Nichole Lighthall, Ph.D., is working on exploitation susceptibility tool kits that could screen seniors' cognitive abilities. These abilities influence their ability to think critically, a necessary skill for avoiding scams and falling victim to fraud.

The FBI estimates fraud complaints cost adults over the age of 60 more than a \$1 billion in 2020, an increase of \$300 million over 2019. Common schemes like non-delivery of services, phony tech support and identity theft are especially a problem in Florida, with 20% of the population over the age of 65.

The research project will focus on identifying the factors that make victims most vulnerable, including pre-clinical stages of Alzheimer's disease. The research is funded by a four-year \$742,833 grant from the Florida Department of Health.

"It's important that we focus on older adults with mild cognitive impairments because they're typically operating on their own," Lighthall says.



"They're living independently but may have trouble remembering things, which increases their vulnerability to deception and exploitation."

The research team includes Bonnie Levin, Ph.D., professor of Neurology at the University of Miami, and Natalie Ebner, Ph.D., professor of Psychology at the University of Florida.

The team says their tool will help healthcare professionals screen for markers like an inability to read social and facial cues that betray someone's true intentions. Other tools in the kit may include surveys and cognitive tests. Home nurses and social workers could potentially use the kit for assessments in non-clinical settings.

The idea is that if the risk factor is identified early, the elderly or their family members and friends can be alerted and take preventative measures.

The tool kit will be developed in part by following older adults over a handful of years who are already showing mild cognitive impairments and tracking their progress. Research also focuses on the exploitation risk between different racial and ethnic groups.

The researchers are working with LIFE at UCF, the Legacy Pointe at UCF senior living community, professionals in media and technology, as well as experts in elder law to optimize the tool kit for use with vulnerable older adults.

"Relationships of undue influence and identity theft scams that drain financial resources are issues that legal experts face and they want to find a better way to help prevent older adults from becoming destitute in the most vulnerable times of their life," Lighthall says. "It's important that we provide resources to prevent further deception and exploitation."



# Practical Politics

Politics has always been a point of passion for graduate Craig Wilding, M.S.'21, who is using his background in the computer sciences to make an impact on the local political landscape.



Wilding recently won the Maps Across America “Redistricting Contest,” where he was tasked with redistributing a population of over 21.6 million people in a hyperreal simulation set in the state of Florida.

Judges were particularly impressed by the precision of Wilding’s map and gave him high marks for his representation of majority-minority demographics. His score on partisan metrics—including political bias, efficiency and declination—scored near perfect.

Wilding built a career around computer programming, but was intrigued enough by politics to return to school at 50. His background is something he nods to as a useful supplement to his current goals as a political scientist.

“I used to see politics as something people just argued about,” says Wilding. “Now I see it as an opportunity to research and solve problems. This view comes from my background. Computers were always breaking. It wasn’t something to argue about. It was always about how to fix it. I can apply that philosophy to politics.”

In the Fall of 2019, Wilding entered the School of Politics, Security, and International Affairs’ Master’s program, where his passion for political science finally had the chance to develop. For example, Wilding now uses his programming background to analyze voter data for the Seminole County Democratic Party. This niche area of data appeals to Wilding because of its capacity to propel worthy candidates forward on the campaign trail.

“The data I analyze can be translated into useable, political data that pushes progressive movements forward,” says Wilding.

Wilding plans to continue analyzing voter data and applying it to research-based roles rooted in local politics.

“In politics, you always have people arguing about who is right or who is wrong. There is no productivity in that,” says Wilding. “That’s what I would like to change. I want there to be less fragmentation, and more practicality.”



# STEPHEN W. HAWKING

## Center for Microgravity Research and Education

**UCF is the first American university to have a research center named after the late, world-renowned theoretical physicist Stephen W. Hawking.**

UCF proudly claims the first American university to have a research center named after the late, world-renowned theoretical Stephen W. Hawking.

The name change of UCF's Center for Microgravity to the Stephen W. Hawking Center for Microgravity Research and Education occurred in late 2021.

The establishment of this center brings to fulfillment Hawking's personal aspiration to support microgravity space research in the United States.

That enthusiasm was generated years ago after a zero-gravity flight at Cape Canaveral sponsored by Space Florida, which then connected him with UCF.

In the ensuing years, UCF continued to build its reputation as a space research institution and a team of specialists formed the Center for Microgravity Research. Physics Professor and Chair Joshua Colwell, Ph.D., who has worked on multiple NASA missions, began collaborating with a team of colleagues and students to build expertise in microgravity research — a key area of interest for Hawking.

Lucy Hawking, his daughter, says: "We are grateful to the University of Central Florida for honoring my father's legacy in this way. My father dedicated his life to advancing our understanding of the universe and encouraging generations of future scientists to build on his own work and that of his colleagues. He would have been proud of this collaboration with the US physicists of tomorrow."

The only other university to have a research center named after Hawking is the University of Cambridge in the UK. As a Ph.D. student, Hawking studied applied mathematics and theoretical physics, specializing in general

### **HAWKING VISIT**

Robert Hawking visits with Physics Professor Joshua Colwell at UCF's Center for Microgravity Research in December 2019.





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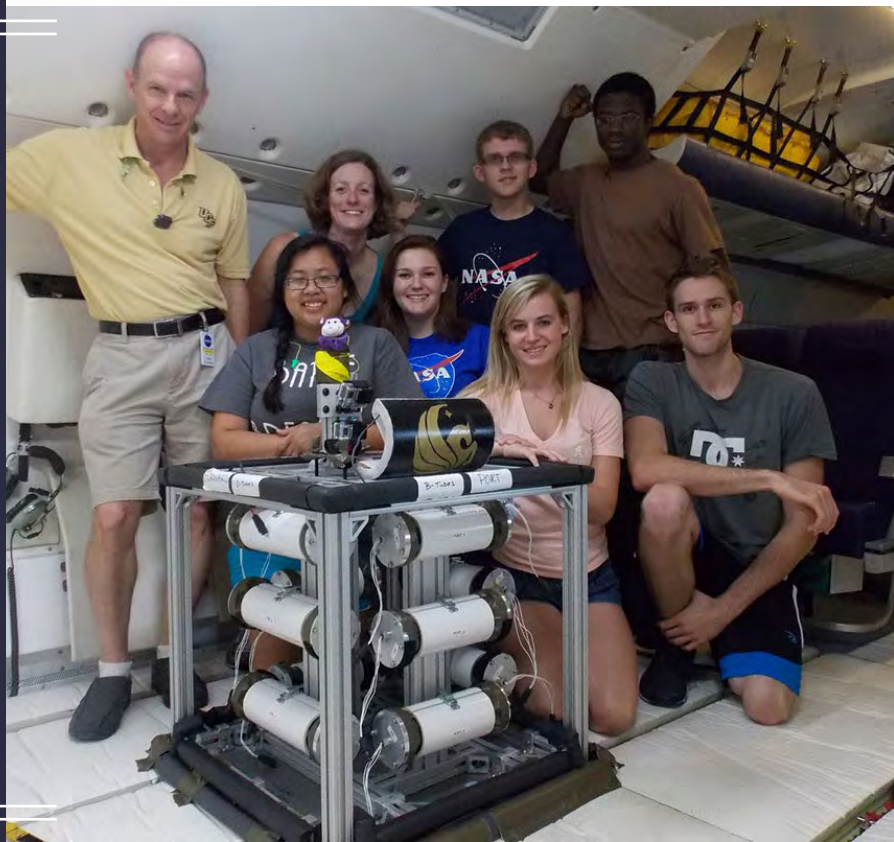
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**"We are honored to be entrusted with Professor Hawking's name and will continue to conduct world class space research, something that is part of UCF's DNA."**

**ALEXANDER N. CARTWRIGHT**  
UCF President

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relativity and cosmology. He eventually became the Lucasian Professor of Mathematics at the university, a position once held by Isaac Newton.

One other research center with a close personal connection to Hawking is the Stephen Hawking Center at the Perimeter Institute for Theoretical Physics in Waterloo, Canada, an independent research hub devoted to theoretical physics.

"We are humbled to be entrusted with Dr. Hawking's name," says Elizabeth Klonoff, UCF's Vice President for Research who helped build the relationship that led to the agreement. "UCF began in part to support our space industry in the 1960s, and we have grown to be well respected in planetary sciences. Our faculty are bold pioneers pushing the boundaries of knowledge, something Professor Hawking I know would appreciate."

"Space Florida is excited to see this goal of Professor Hawking now become the opportunity he envisioned here in Florida," says Frank DiBello, Space Florida President and CEO, who was the recipient of a letter from Professor Hawking that provided permission to use his name. "His brief experience in weightlessness triggered

that extraordinary imagination to recognize new possibility. UCF is well positioned to further that dream."

Hawking is considered one of the most important theoretical physicists of our time. His work on the structure of the universe, such as the Big Bang and black holes, helped establish our understanding of the cosmos. He also published books about space and science that are easily understood by the general public, including the longtime bestseller "A Brief History of Time." His impact on the field was so significant that he has a place in pop culture, appearing in movies, television sitcoms such as The Big Bang Theory, and even The Simpsons cartoon.

Despite being diagnosed with Lou Gehrig's disease early in his career and told he only had a couple of years left to live he went on to have a brilliant career expanding our knowledge of the cosmos. He died March 14, 2018, on Albert Einstein's birthday.

# COLLEGE OF SCIENCES VIRTUAL SPEAKER SERIES



## Lunch on the Coast | June – December 2021

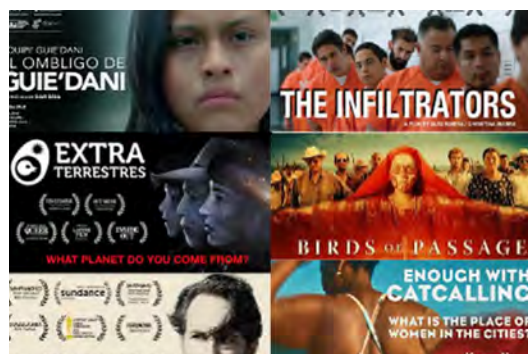
One goal of UCF Coastal is to grow public awareness about Florida’s amazing coastal resources.

Throughout the latter half of 2021, UCF Coastal hosted a monthly virtual speaker series called Lunch on the Coast that featured an all-women panel of speakers from the Coastal faculty cluster.

You can catch up on any of the topics discussed through UCF Coastal’s YouTube account.

## Latin/LatinX Film Festival | September – October 2021

The inaugural Latin American/LatinX Film Festival was held in honor of UCF’s status as a Hispanic-Serving Institution (HSI). This film showcased the arts, language and diverse issues important in a region of the world that is so significant to many of our students, faculty and staff.



## Kent Family Speaker Series | October 2021 & February 2022

This speaker series, courtesy of the Kent Family, featured two speakers. In October 2021, University of South Florida’s Professor of Anthropology John W. Arthur, Ph.D., spoke on the drinking of Indigenous beer and its use as an expression of identities.

In February 2022, University of South Carolina’s Distinguished Professor of Anthropology, Sharon DeWitte, Ph.D., spoke on the 14th-century Black Death in London in her talk “Sex, Stress, and Death: Health and Survival in the Context of Medieval Famine and Plague.”

## Women in STEM Day Celebration | February 11, 2022

In celebration of the United Nation’s inaugural International Day of Women and Girls in Science day, the College of Sciences hosted their first Women in STEM Day Celebration. Audiences celebrated the achievements of our inspiring UCF alumnae, women faculty and students in STEM with a faculty and grad student panel.







**Bulky night-vision goggles could be as trim and slim as a pair of sunglasses through a collaboration between the laboratory of Physics Professor Michael Leuenberger, Ph.D., at UCF and the Massachusetts Institute of Technology (MIT).**

The project is funded by a \$1.1 million-dollar grant from the Defense Advanced Research Projects Agency (DARPA).

“The goggles that currently exist in the field are too heavy and bulky,” says Leuenberger. “We’re proposing technology that will negate this issue, while simultaneously advancing what currently exists in the realm of night vision technology.”

Night vision technology has evolved considerably since its conception during World War II, when infrared searchlights were so heavy soldiers mounted them on flatbed trucks.

Leuenberger notes that despite the fact night vision technology is now accessible in the form of wearable headgear, the issue of injury and lack of mobility is still present. Today’s night vision optics weigh about 2 pounds, often leading to chronic spinal strain and limited mobility for wearers.

According to a 2016 study published in the journal of Aerospace Medicine and Human Performance, scientists found that night-vision gear worn by U.S. Air Force pilots leads to chronic stress of the neck vertebrae, especially under the pressure of high-Gs flight maneuvers.

The envisioned night-vision glasses will change current night-vision technology in three main areas: The weight will be close to sunglasses, allowing swift head movements; Night vision will be extended from just near-infrared (NIR)

to all the infrared bands with wavelength selectivity, which means the classic night-vision green will expand to the full red-green-blue spectrum; The peripheral range of view will substantially widen.

Getting to a prototype will be a years-long process, and it starts with proof of concept. Leuenberger’s lab is responsible for the theoretical modeling and calculations that will serve as a blueprint for the glasses’ overarching design. Co-principal investigator (Co-PI) Dirk Englund and his group at MIT are collaborating with Leuenberger’s group on the theoretical modeling and are working on the experiments.



**ALUMNI SPOTLIGHT**

# EASING WORRIED MINDS

**The long, anxious wait for news about the outcome of a loved one's surgery just got a little shorter thanks to the ingenuity of a UCF alumnus.**

The "Ease" app, short for "Electronic Access to Surgical Events," allows clinicians to send secure texts, photos and video updates to patients' families in real time during a procedure or hospital stay. Founded in 2013,

the app's use really grew during visitor restrictions put in place at hospitals across the country because of the pandemic.

"It is never acceptable to leave families of patients in the dark," says Matthew Kanagy '08 '14MBA, a double-graduate of UCF's digital media and professional business program. "If I can track my Amazon package down to the second it reaches my door, I should be able to get notifications on

**ADVANCEMENT FAST FACTS**

Total Gifts & Commitments	\$1,341,357
Number of Gifts	1,320
Number of Donors	725



<span style="color: blue;">■</span> Cash	\$1,341,357
<span style="color: darkblue;">■</span> Pledges	\$257,442
<span style="color: green;">■</span> Gift-in-kind	\$23,215



whether or not a family member in the hospital is doing OK.”

Kanagy started as the company’s chief operating officer. He shared the vision of CEO Patrick de la Roza, who developed the app in collaboration with three doctors at Orlando Health’s Arnold Palmer Children’s Hospital. Kanagy’s original career plans centered around video production and multimedia, but his experiences in healthcare revealed gaps in patient care he wanted to address.

“I kept asking myself, ‘how can I make an impact and take the technology used in other industries and translate them into healthcare?’,” says Kanagy. “There can be a real lag in technology adoption in the healthcare industry and I saw the opportunity to be a technology advocate for patients and families.”

In 2020, during the COVID-19 pandemic, more than 742,000 messages were sent via the application. Clinicians send updates on the status of patients via text, photos and videos through a HIPAA compliant and secure interface. Kanagy says customers and media have called Ease the “Snapchat for hospitals.” Updates from the Ease app disappear after 60 seconds, and nothing is stored on the recipient’s mobile device.

Vocera Ease is used in more than 100 hospitals across the country and has a 4.9 out of 5 star rating in the iOS App Store, with over 7,000 reviews. Survey comments about the application give hospital leaders and Vocera employees a sense of the appreciation, seeing what family members and patients gained from using the app.

“We found that the application became even more relevant during a frightening and unprecedented time,” says Kanagy. “COVID brought a lot of darkness, but Ease was a way for people to communicate and to shed a bit of light.”

## ALUMNI FAST FACTS

### Total COS Alumni

Staying connected to the university is key to the advancement of our students and programs. Our alumni can stay connected through mentoring programs, guest speaking opportunities, volunteering through our College of Sciences or Nicholson Alumni Chapters, or contributing to one of our many programs or scholarships.

### NSCM Alumni Mentorship Program

160 participants between alumni mentors and student mentees.

### NSCM Hall of Fame

Allison McGinley ‘96, news director at WKMG-TV, was inducted into the NSCM Hall of Fame at the first Nicholson School of Communication and Media Hall of Fame and Open House on April 29.

### COS Alumni Chapter

The COS Alumni Chapter co-hosted an alumni social during UCF Celebrates the Arts in April. Guests enjoyed a cocktail reception in the lobby of the Dr. Phillips Center for Performing Arts before attending **UCF Symphony Orchestra: An Exploration of the Sea and Land**.

**To get involved Visit:**  
[ucfalumni.com/sciences](http://ucfalumni.com/sciences)

## Donor Classification

Alumni	353	Friends	137
Staff	204	Corporations	34
Student	75	Foundations	16
		Organizations	6

## COLLEGE OF SCIENCES

The quality of our faculty and staff is the foundation of our academic mission. Each one of these individuals adds expertise that enhances the college's strengths in our disciplines across the physical, natural and social sciences.

## 2020-2021 FACULTY & STAFF

104

Professors

96

Associate Professors

65

Assistant Professors

132

Instructors & Lecturers

121

Staff

## 2021-2022 NEW FACULTY

*A warm welcome to the new faculty training the next generation of scholars, researchers and community leaders.*

### ANTHROPOLOGY



**Emily Zavodny, Ph.D.**  
*Assistant Professor*

**Research Interests:** Investigating how prehistoric human and animal populations successfully adapted to uncertainty and risk posed by marginal landscapes, resource scarcity, and/or changing climate and environments. Additional interests include how studying past resilience, sustainability and biodiversity can help us approach present-day social and environmental problems.

### CHEMISTRY



**Haline Werner, Ph.D.**  
*Lecturer*

**Research Interests:** Chemistry education, specifically the role of metacognition in chemistry and STEM, and the relationship between learning and student enjoyment of various teaching strategies.

### NICHOLSON SCHOOL OF COMMUNICATION & MEDIA



**Eric Adelson, Ph.D.**  
*Lecturer*

**Research Interests:** A journalist whose courses include News Reporting, Advanced Reporting, Freelance Writing and Journalism Readings.



**Betsy Kalin, Ph.D.**  
*Lecturer*

**Research Interests:** Women in film and media, social impact documentary, independent film, LGBTQIA film, film history, film distribution, outreach and engagement and editing.



**Robb Lauzon, Ph.D.**  
*Lecturer*

**Research Interests:** Conducting community-based research on the department's Transparency Project, Winter Park Sunshine. In his courses, students are guided through real-world research experiences that contribute to observable results.





**David Negrin**  
*Lecturer*



**Heerak Shah**  
*Lecturer*



**Giovanna Verela**  
*Lecturer*

**PHYSICS**



**Adam LaMee**  
*Assistant Professor*

**Research Interests:** Formative assessment strategies and performance assessment alternatives to large-scale, high-stakes science tests at the Center for Advancement of Learning and Assessment, FSU, and the CMS detector collaboration at CERN's LHC that discovered the Higgs boson.



**Ramses Ramirez, Ph.D.**  
*Assistant Professor*

**Research Interests:** Modeling the planetary atmospheres of potentially habitable terrestrial planets both within and outside our solar system.

**PSYCHOLOGY**



**Michael Chetta, Ph.D.**  
*Lecturer*

**Research Interests:** Hospitality, client satisfaction and qualitative analyses.



**Kimberly Kent, Ph.D.**  
*Associate Professor*

**Research Interests:** Clinical psychology.



**Raymonde Neal, Psy.D.**  
*Associate Professor*

**Research Interests:** Clinical psychology working with the Caribbean population and children/adolescents with special needs.

**STATISTICS & DATA SCIENCE**



**Chudamani Poudyal, Ph.D.**  
*Assistant Professor*

**Research Interests:** Actuarial data science, risk analytics, robust & computational statistical loss modeling with particular emphasis on the actuarial and financial loss data.



**Rong Zhou, Ph.D.**  
*Instructor*

**Research Interests:** Data Analysis, Bioinformatics, Biomathematics, and Numerical Computation. Teaches Statistical Methods I and Statistical Methods II.



**Mengyu Xu, Ph.D.**  
*Assistant Professor*

**Research Interests:** The covariance matrix estimation and time-varying network recovery from high-dimensional time series and the distribution theory of quadratic forms and high-dimensional hypotheses test.

# College of Sciences

## Fast Facts 2021-2022

### Fall 2021 Highlights

- Our **graduate program in video game design** ranked No. 1 in The Princeton Review for the third year in a row and the undergraduate program ranked No. 13.
- **Peter Delfyett** was awarded the 2021 Arthur L. Schawlow Prize in laser science from the American Physical Society for his pioneering work on ultrafast lasers.
- Experimental soil developed by the **UCF Planetary Sciences Group** directly impacts space exploration. NASA and commercial companies use the dirt domestically and globally to test equipment in development for Moon, Mars and asteroid missions.
- **UCF RESTORES** offers treatment services for healthcare workers and first responders experiencing traumatic stress as essential workers during the COVID-19 worldwide pandemic.
- UCF Online's **Psychology Bachelor's Degree** is ranked sixth in the nation for best online programs in U.S. News & World Report.
- UCF is a leader in data science establishing the nation's first data mining program in the 1990s. We offer Ph.D. in **Big Data Analytics** as well as two master's degrees and a bachelor's degree in data science.
- The **UCF Coastal** center faculty and researchers are working on critical research to keep our coastal communities healthy and strong through our UCF Coastal center. Finding ways to mitigate climate change, sea level rise, red tide, and other issues affecting our coasts.
- NSF funded **UCF Citizen Science GIS**, lead by Dr. Timothy Hawthorne in the UCF Department of Sociology, performs drone mapping and citizen science to mitigate flooding and litter in coastal communities in Belize.

### 2021-2022 Degree Programs

**24**

Bachelor's

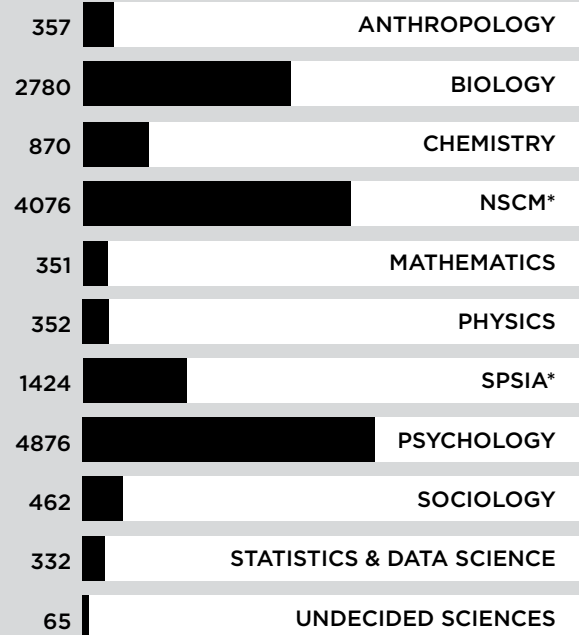
**16**

Master's

**10**

Doctoral

### Fall 2021 Declared Majors



\*Nicholson School of Communication and Media  
\*School of Politics, Security, and International Affairs

**23%**

UCF Undergrads  
Pursue COS Degrees

**UCF Total**  
71,928

**COS Total**  
15,962

### 2021 UCF Top Majors

**#1**

Psychology  
4,876 Students

**#4**

Biology  
2,780 Students

**#9**

Digital Media  
2,113 Students



## 2021-2022 Degree Programs

### Anthropology

- Anthropology B.A.
- Anthropology M.A.
- Integrative Anthropological Sciences Ph.D.

### Biology

- Biology B.S.
- Biology M.S.
- Integrative & Conservation Biology Ph.D.

### Chemistry

- Chemistry B.S.
- Forensic Science B.S.
- Chemistry M.S.
- Forensic Science M.S.
- Chemistry Ph.D.

### Nicholson School of Communication and Media

- Advertising/ Public Relations B.A.
- Communication and Conflict B.A.
- Digital Media B.A.
- Film B.A.
- Film B.F.A.
- Human Communications B.A.
- Journalism B.A.
- Media Production and Management B.A.
- Communication M.A.
- Digital Media M.A.
- Emerging Media M.F.A.
- Feature Film Production M.F.A.
- Interactive Entertainment M.S.
- Strategic Communication Ph.D.

### Mathematics

- Mathematics B.S.
- Mathematical Sciences M.S.
- Mathematics Ph.D.

### Physics

- Physics B.A.
- Physics B.S.
- Physics M.S.
- Physics Ph.D.

### School of Politics, Security, and International Affairs

- Int'l and Global Studies B.A.
- Political Science B.A.
- Political Science M.A.
- Security Studies Ph.D.

### Psychology

- Psychology B.S.
- Clinical Psychology M.A.
- Industrial/Organizational Psy M.S.
- Psychology Ph.D.

### Sociology

- Social Sciences B.S.
- Sociology B.A.
- Sociology B.S.
- Applied Sociology M.A.
- Sociology Ph.D.

### Statistics and Data Science

- Actuarial Sciences B.S.
- Data Science B.S.
- Statistics B.S.
- Statistics and Data Science M.S.
- Big Data Analytics Ph.D.

## 2021 Centers, Institutes and Initiatives

- UCF Arboretum
- Center for Global Economic and Environmental Opportunity
- Geographic Information Systems
- The India Center
- Intelligence Community Center for Academic Excellence
- iSTEM
- Kurdish Political Studies Program
- Lou Frey Institute
- UCF Marine Turtle Research Group
- Robinson Observatory
- National Center for Forensic Science
- UCF RESTORES

## 2021-2022 Scholarship Funding

 **254K** In Scholarships Awarded to Students

## 2021-2022 National Rankings



### U.S. News and World Report

*Best Graduate Programs:*

Atomic/Molecular/Optical Physics **#12**  
**#61**



### The Princeton Review

Graduate Video Game Design **#1**

Undergraduate Video Game Design **#12**

## 2021-2022 Research

**\$138** **MILLION IN PROPOSALS**  
*in College of Sciences research funding*

**309** **PROPOSALS SUBMITTED**  
*with COS Faculty as the lead Principal Investigator*

**133** **PROPOSAL COLLABORATIONS**  
*with COS Faculty as Co-PIs*

**\$25** **MILLION AWARDED**  
*in COS Research Funding*

**#2** **COLLEGE FOR RESEARCH PROPOSAL SUBMITTED**  
*in COS Research Funding*

**#3** **COLLEGE FOR RESEARCH PROPOSALS AWARDED IN FUNDING**  
*in Dollar Value*

