

# PURSUIT

Annual Report 2014-2015



**ACHIEVE**

**DISCOVER**

**PRESERVE**

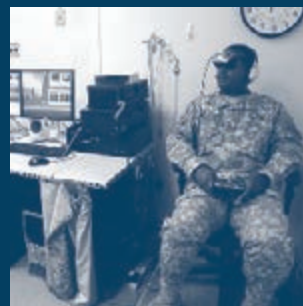
**CONNECT**



**UNIVERSITY OF CENTRAL FLORIDA**  
COLLEGE OF SCIENCES

# TABLE OF CONTENTS

Dean's Message	2
New Faculty	3-4
New Instructors	5-6
Sea Turtles	7
Coastal Research	8
Big Data	9-10
IC CAE	11-12
STEM	13-14
UCF RESTORES	15-16
NASA	17
Distinguished Speaker Series	18
COS Alumni	19-20



## DEPARTMENTS AND ACADEMIC AREAS

Anthropology	21
Biology	22
Chemistry	23
Nicholson School of Communication	24
Mathematics	25
Physics	26
Political Science	27
Psychology	28
Sociology	29
Statistics	30
Forensic Science	31
Arboretum	32
Global Perspectives	33
Lou Frey Institute	34
COS Facts	35-36
COS Donors	37
Dean's Advisory Board	38



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A MESSAGE FROM THE DEAN OF THE UCF COLLEGE OF SCIENCES

# MICHAEL D. JOHNSON

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Universities are an opportunity to pursue dreams – for a better life, to understand one's place in the cosmos, to discover new knowledge, and to make the world a better place.

The College of Sciences is the largest college at the University of Central Florida, with approximately 11,000 students. Programs in the College of Sciences span much of what has captured the human imagination, from uncovering the secrets of the natural world (in the life, physical and mathematical sciences) to understanding humans and the societies we form (in the social and behavioral sciences).

The College of Sciences at UCF aims to become nationally and internationally recognized for excellence in education and research in each of its disciplines; for contributing to the economic and intellectual growth of the region and state; and for educating students who are committed to excellence, leadership, service and lifelong learning.

Many of our faculty are ranked among the nation's best scientists and scholars. A majority support their research via contracts and grants awarded by governmental and industrial partners. Faculty members have won many national and international awards for research and teaching, are fellows of the American Academy of Sciences, serve as presidents of national scientific societies, and act as advisors to international, national and state agencies.

Our students are also among the university's most accomplished. Many conduct research with faculty, publishing in scientific journals and winning awards for presentations at national meetings. Many take advantage of professional internship opportunities in the metropolitan area and around the nation. Others participate in study-abroad experiences sponsored by their department faculty. Our students have won awards including Goldwater, Astronaut, Beckman, Fulbright and National Science Foundation scholarships and fellowships.

The College of Sciences provides students with the foundations needed for critical thinking as well as career and life success. We seek to conduct research that matters, and to prepare students to be thoughtful, ethical and engaged members of society locally, nationally and worldwide.

Our faculty and students throw themselves into these questions with passion and determination. I invite you to explore this world, and to follow your dream, with us.



**Michael D. Johnson, Ph.D.**  
Dean of the College of Sciences

# Welcome New Faculty



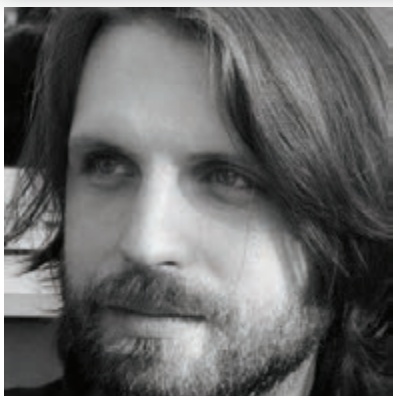
**Anna Savage, Ph.D., Assistant Professor**  
Biology Department

Anna Savage, Ph.D., earned her undergraduate degree in biology from Amherst College in Amherst and her M.A. and Ph.D. in ecology and evolutionary biology from Cornell University in Ithaca, New York. She worked as a postdoctoral fellow at the Smithsonian Institution's Center for Conservation and Evolutionary Genetics in Washington, D.C. from 2012 to 2014. Her research is focused on the role of amphibian immunogenetics and functional genomics in driving susceptibility to an emergent fungal pathogen.

**Candice Bridge, Ph.D., Assistant Professor**

Chemistry Department and the National Center for Forensic Science

Candice Bridge, Ph.D., studied chemistry at Howard University and received an ACS certified B.S. degree in 2004. In 2007, she completed her doctoral research in analytical chemistry, focusing on forensic sciences at UCF. She worked as a lecturer at Howard University in Washington D.C. and as a trace evidence examiner and a project manager at the Defense Forensic Science Center.



**William Kaden, Ph.D., Assistant Professor**  
Physics Department

William Kaden, Ph.D., earned his B.S. degree in chemistry from State University of New York at Oswego and his Ph.D. in chemistry from the University of Utah. Kaden was subsequently an Alexander von Humboldt Postdoctoral Fellow at the Fritz-Haber-Institute of the Max-Planck-Society in Berlin, Germany. His primary research focus is the detailed study of model-catalytic and two-dimensional systems under ever increasing degrees of complexity via a surface-science, vacuum-based approach.

**Kyungkook Kang, Ph.D., Assistant Professor**  
Political Science Department

Kyungkook Kang, Ph.D., received his undergraduate degree in political science from Yonsei University in Seoul, Korea, his M.A. in economics and a Ph.D. in political science and economics from Claremont Graduate University in California. He taught various courses on research methods and security studies at CGU and the University of Southern California. His academic works have appeared in journals such as International Studies Quarterly and International Interactions.





**Demet Mousseau, Ph.D., Assistant Professor**  
Political Science Department

Demet Mousseau, Ph.D., received her undergraduate degree in economics at Hacettepe University in Turkey. She completed her M.A. and Ph.D. degrees in political science at Binghamton University in New York. As a new professor at UCF, Mousseau is devising ways to engage students by introducing her various personal and professional interests into her lecture discussions.



**Jonathan Powell, Ph.D., Assistant Professor**  
Political Science Department

Jonathan Powell, Ph.D., received his undergraduate degree from Western Kentucky University and his Ph.D. from the University of Kentucky. His primary research and teaching interests lie in international relations and comparative politics. He is especially interested in civil-military relations, with regional interests in Africa and the Middle East. Powell's work has appeared in the Journal of Conflict Resolution, Journal of Peace Research, Foreign Policy Analysis, and African Security Review.



**Ramon Hinojosa, Ph.D., Assistant Professor**  
Sociology Department

Ramon Hinojosa, Ph.D., earned his undergraduate degree in sociology from Grand Valley State University in Michigan, his M.A. in sociology from the University of Illinois at Chicago, and a Ph.D. from the University of Florida. He worked as a tenure-track assistant professor of sociology at Marquette University in Milwaukee, Wisconsin. His research on veterans' post-deployment family reintegration and veteran caregiver issues led to being recruited to the Department of Veterans Affairs' Rehabilitation Outcomes Research Center in Gainesville, Florida where he worked as a research health scientist from 2010 to 2014.



**Melanie Sberna Hinojosa, Ph.D., Assistant Professor**  
Sociology Department

Melanie Sberna Hinojosa, Ph.D., received her M.A. in applied sociology at UCF and her Ph.D. from the University of Illinois at Chicago. She also obtained a M.S. in epidemiology from the Medical College of Wisconsin. Most recently, she worked at the University of Florida at the Institute for Child Health Policy where she examined disparities in the health outcomes of children with mental health disorders.



# Welcome New Instructors & Lecturers

**Cynthia Bayer, Ph.D.**  
Lecturer, Biology Department



B.S. in biology from the University of Rhode Island; Ph.D. in biology - molecular genetics from Syracuse University. After completing her Ph.D. she continued to study drosophila development as a postdoctoral researcher at the University of California, Berkeley and as a research associate at the University of Central

**Barry Edwards**  
Lecturer, Political Science Department



B.A. in economics and political science from Stanford University; J.D. from New York University School of Law; Ph.D. from the University of Georgia. Edwards has broad research interests in the fields of American politics, public law, and research methodology.

**Gregg Klowden, Ph.D.**  
Lecturer, Biology Department



B.S. from the University of Illinois; M.S. and Ph.D. from the University of Florida. He was recently re-hired as a lecturer after four years at the University of Central Florida as a visiting lecturer. His primary interests are in ecology, particularly of reptiles, invasive species, and in the tropics.

**Rachid Ait Maalem Lahcen**  
Instructor, Mathematics Department



B.S. in chemical engineering from Albaath University; M.S. in mechanical engineering and a mathematics graduate certificate from the University of Central Florida. His research interests vary from students' learning, Math self-efficacy, to applied math inverse problems.

**Gary LaPage**  
Instructor, Nicholson School of Communication



B.A. in communications from State University of New York at Oswego and M.S. in advertising from the University of Illinois. He has 20 years of professional experience in the fields of advertising and marketing.

**Paul Leader**  
Director of Debate and Instructor,  
Nicholson School of Communication



B.G.S. and J.D. from University of Kansas and M.A. from Eastern New Mexico University. Leader is the director of debate and an instructor of human communication.

**Jim McCafferty, Ph.D.**

Lecturer, Nicholson School of Communication

B.A. in speech communication and government and politics; M.S. in conflict management from George Mason University; Ph.D. in organizational communication from the University of Texas at Austin. McCafferty's interest areas include organizational communication, organizational conflict and conflict management, labor relations and communication theory.

**Gino Perrotte**

Instructor, Nicholson School of Communication

B.S. in business management from Grove City College and his M.A. in interpersonal communication from the University of Central Florida. Perrotte's research is focused on diversity-related studies, nonverbal communication and identity expression.

**Kim Smith, Ph.D.**

Lecturer, Nicholson School of Communication

B.A., M.A., and Ph.D. in communication from the University of Wisconsin-Milwaukee. Her research focuses on how people and organizations communicate in a changing, technologically-driven world.

**Lance Speere**

Instructor, Nicholson School of Communication

B.A. from Washburn University of Topeka, Kansas and M.A. in journalism from Kansas State University. Speere has more than 20 years of professional and teaching experience, and specializes in digital and multimedia journalism, along with news reporting and photojournalism.

**Sona Swanson, Ph.D.**

Lecturer, Mathematics Department

B.S. in mathematics from Bombay, India; M.S. in computer applications from University of Bombay; M.A. in mathematics from Bowling Green State University; M.S. in mathematics from University of Washington, Seattle; Ph.D. in mathematics (probability) from University of Washington. Research interests include probability and financial mathematics.

**Lana Williams, Ph.D.**

Lecturer, Anthropology Department

B.A. in sociology and anthropology, certificate in Maya studies and M.A. in liberal studies from the University of Central Florida; Ph.D. from the University of Western Ontario. Williams is a bioarchaeologist specializing in the analysis of human health and diet.





A woman with dark hair and sunglasses on her head is smiling while holding a sea turtle in the ocean. The turtle is being held up, and its head is visible. The background shows the blue ocean and a clear sky.

# saving the SEA TURTLES

UCF biologist Kate Mansfield, Ph.D., is leading a team of researchers to help unlock the mystery of the “lost years.” The “lost years” refers to the time after turtles hatch and head to sea, where they remain for many years before returning to near-shore waters as large juveniles. The time period is often referred to as the “lost years” because not much has been known about where the young turtles go and how they interact with their oceanic environment — until now.

Loggerhead turtles, along with other sea turtles, are threatened or endangered species. Florida beaches are important to their survival because they provide important nesting grounds in North America. More than 80 percent of Atlantic loggerheads nest along Florida’s coast.

“To help ensure species conservation, our research at UCF focuses on all stages of sea turtles’ life cycle from eggs to adults.”

**-Kate Mansfield,  
Ph.D.**





# Shelling out for **COASTAL CARE**

**T**hese tiny mollusks may be the eco-friendly heroes that end up saving Brevard County's Indian River Lagoon. The lagoon runs for 156 miles through five counties, including Volusia and Brevard, and has an estimated economic impact of \$3.7 billion per year. University of Central Florida students work alongside UCF biologist and professor Linda Walters, Ph.D., deploying "gardened" oysters into the lagoon with

hopes they will take root and help clean the waterway. The UCF biology students and Walters will monitor the growth and health of the oysters to see if they flourish and start filtering the lagoon's water. Oysters can clean up to 50 gallons a day for their 20-year life span with no ill side effects. If the experiment works, they could end up being the answer to the pollution that's hit the lagoon in the past few years.





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- CREATIVE
- TUTORIALS
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MEDIA

- VIDEO
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- MESSAGES

THE DAWN OF

BIG DATA

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One of the university's smallest departments is having a big impact on the Central Florida economy.



In real world terms, big data is anything too big to manage with an Excel spreadsheet or even 1,000 spreadsheets. It is the estimated 2.5 quintillion bytes per day that companies gather from the digital footprints we leave as we conduct our daily lives; posting on social media, using reward cards at stores, making insurance claims, surfing the Internet, and using Google for directions to a new restaurant.

Our digital activities create a vast and ever-expanding mass of data points, which convey detailed pictures about how we live: when we buy new shoes, why we seek medical treatment and what movies we prefer to watch. While recent news coverage about the National Security Agency has highlighted concerns about data collection, the field is considered to hold great commercial and life-enhancing promise.

Many uses for big data are only postulated, but scientists are already trying to improve cancer therapy by running torrents of

facts about drugs and tumors through special algorithms.

Netflix reportedly allocates computing power and limits streaming problems with sophisticated analyses of customer viewing patterns. The New York Times reported last year that Target detects pregnant customers based on their purchases and sends them coupons for disposable diapers and baby shampoo before some moms-to-be have announced their happy news.

In Central Florida, Walt Disney World, Sodexo, the Orlando Magic, Florida Blue, among others, eagerly hire UCF statistics students, some of whom were acquired as interns well before they had graduated.

It is widely recognized that Data Scientists will be in increasing demand in the future, as companies, medical organizations, government agencies and others seek the structural patterns buried deeply in big data.

UCF is the only university to offer a corresponding Ph.D. program in security studies to enhance the new IC CAE.



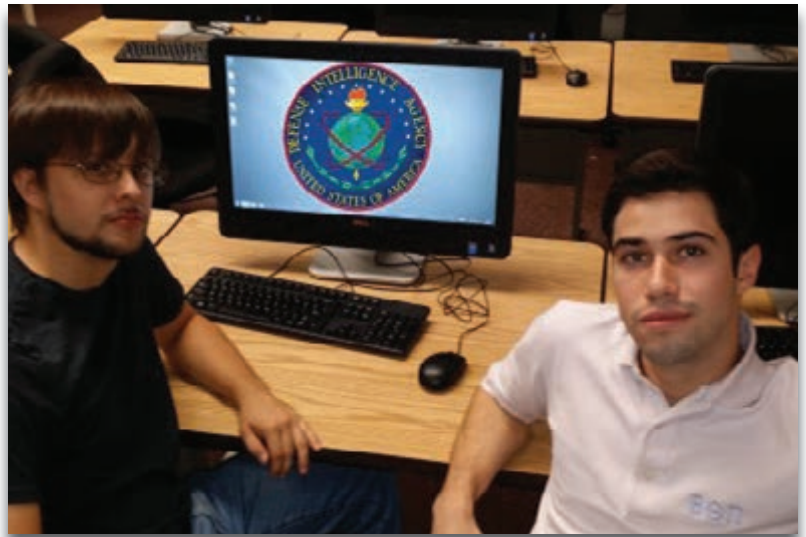
INTELLIGENCE COMMUNITY  
CENTER FOR ACADEMIC EXCELLENCE



The Intelligence Community Center for Academic Excellence assists undergraduate and graduate students in developing critical skills needed for future work in the intelligence community. This program helps educate students in the areas of intelligence and national security, and provides opportunities for creating connections with current members of the intelligence community.

The center is funded by a grant from the Defense Intelligence Agency based upon a Congressional mandate. The goal of this center is to create educational opportunities for students interested in careers in intelligence and national security, and to increase the number and quality of applicants in these areas.

The University of Central Florida is developing new classes to expand our existing roster of intelligence and national security courses. Starting in fall 2015, there will be a new minor, which will allow



students to develop a focus on intelligence and national security in their degree program and a graduate certificate in intelligence and national security will be offered. The center provides scholarship opportunities for study-abroad programs, and opportunities to attend related workshops and conferences outside UCF.

The IC CAE also hosts a speaker series. The speakers are experts in intelligence and national security, and they are often active members of the intelligence community. Topics will range from basic practices in the intelligence community to specialized topics like technology and cyber conflict. These events are open to all students.





# STEM

## Day at UCF



STEM day at the University of Central Florida is a bi-annual outreach event for local K-12 students interested in learning more about the study of science, technology, engineering and mathematics. The purpose is to increase their interest in STEM fields. Coordinated by the Center for Initiatives in STEM (iSTEM), many colleges and departments across the university are involved in the planning the day and the demonstrations that took place on campus.





# Initiatives

## IN STEM



Initiatives in STEM at the University of Central Florida is a collaborative effort involving the College of Sciences, the College of Engineering and Computer Science and the College of Education and Human Performance. The core mission is to promote and enhance collaborative efforts in STEM education and research, with a goal to bring coherence to the many STEM funded projects at UCF.

## PROGRAMS



The foundation of iSTEM's undergraduate STEM programs, EXCEL exists to increase student success in the first two years of their college career in a STEM discipline by providing enhanced academic experiences in math and science as part of a smaller learning community.



Girls EXCELLing in math and science exists to increase female student success in the first two years of their college career in a STEM discipline and decrease the retention gap between male and female STEM students.



Women In Science and Engineering Mentoring at UCF is designed to foster connections between upper division females in the STEM disciplines with seasoned industry leaders for a six-month mentoring experience.



Started in 2012 and funded by the National Science Foundation, COMPASS is a STEM recruitment program aimed at students who are unsure of which major or career to pursue in college, but want a head start exploring career options.



A man with short dark hair and blue eyes is sitting at a wooden table. He is wearing a blue and white plaid short-sleeved button-down shirt over a white t-shirt. He has a tattoo on his left forearm. In the background, there is a framed painting of reeds in water. The text "A Good Day to be ALIVE" is overlaid on the left side of the image.

A Good Day to be  
**ALIVE**



A vet with clear blue eyes, a clipped haircut and a soldier's bearing, former Spc. Bruce Chambers entered the U.S. Army to honor family tradition. He wanted to serve his country, as his father and grandfather did, and then build a civilian life with G.I. benefits.

Instead, 15 months as a calvary scout in Iraq earned him years of trouble. He developed drug habits, collected an other-than-honorable discharge and lost his benefits. War terrors surged on dark roads, with loud noises and in his dreams. One night, a police officer stopped him for an expired license plate and, seeing Chamber's belligerence, pulled out a gun. Chambers took off and was arrested after a car chase.

A judge sent him to a first-time offenders program, and soon after a health counselor suggested UCF RESTORES for treatment of post-traumatic stress disorder.

The program employs exposure therapy, using 3-D animation, motion, sounds and scents to recreate traumatic events and desensitize warriors to their memories. Again and again, Chambers experienced virtual recreations of the 2007 ambush of his Bradley Fighting Vehicle. He felt the bomb rock. He smelled kerosene and burning tires, heard shooting and then the explosion of another Bradley that had come to assist.

Slowly, his anger, depression and paranoia eased. He could discuss his experiences in group sessions with other combat veterans. "I learned that if you talk about it, it loses power over you," he said.

Today, Chambers and his girlfriend live in a tidy four-bedroom house filled with children. He holds down at least one job and thanks UCF RESTORES for his confidence in the future.

That's a common outcome for patients of the clinic, which has helped more than 150 vets put ghosts to rest and cope with PTSD.

# UCF RESTORES

UCF RESTORES is part of the department of psychology at the University of Central Florida. It is a clinical research center dedicated to the study of all facets of anxiety, trauma and

post-traumatic stress disorder. The center serves as an educational and consultative resource for the Central Florida area and maintains a liaison relationship with other major anxiety disorder centers nationally and internationally. Currently the clinic is engaged in collaborative efforts with researchers in Brazil, Norway and Spain.

# NASA

Providing the Future for Space Exploration

Several small-scale experiments aboard NASA's vomit comet, a plane that introduces astronauts to the feeling of zero-gravity spaceflight, have led to a NASA grant to study early planet formation aboard a satellite in low-Earth orbit for a year or more.

University of Central Florida physics professor Joshua Colwell, Ph.D., will place a thermos-sized experiment aboard a satellite as part of NASA's CubeSat Launch Initiative.

Colwell, whose area of expertise covers early planet formation, has been exploring how dust collides and forms into bigger chunks in the so-called protoplanetary disks where planets form around newborn stars. He's led teams of students aboard several zero-gravity flights (better known as vomit comets) and experiments that have flown on the International Space Station to study the phenomena that can only be observed in zero gravity.

He's also been working on an experiment at UCF's Center for Microgravity Research using drop towers to simulate the space environment where these collisions happen. The findings of those experiments have given him clues about how particles



interact, but as the chunks grow bigger, it appears they don't always stick together. So then how do planets form?

The experiment, which packs a lot of technical punch, will try to answer the following questions: When and why do particles stick, what happens when they don't, and what does that tell us about the early stages of planet formation?

The project, called Cu-PACE (for CubeSat Particle Aggregation and Collision Experiment) will be the first dedicated long-duration orbital experiment to study aggregation and fragmentation of dust aggregates in microgravity.

"The long duration afforded by the orbital CubeSat platform makes a qualitative advance because it allows us to observe more collisions than in suborbital or ground-based platforms enabling us to identify rare collisions that may be crucial to planet formation," Colwell said.

**Preparing the experiment "CATE" for flight:**  
from left to right: Chris Tiller (physics), Joshua Colwell, Ph.D., (professor/associate chair physics department), Brad Hoover (aerospace) and Sam Benjamin (physics)







# DISTINGUISHED SPEAKER SERIES

Each year, the College of Sciences presents a Distinguished Speaker Series. The series brings renowned speakers from across the country to enrich the lives of students, faculty, alumni and the community. Guest speakers address topics relevant to the natural, computational, social or behavioral sciences and to the societal implication of developments in these fields.

This year, the series took place at a local restaurant, Cocina 214, beginning in September 2014 and concluding in March 2015. Attendees enjoyed each talk in a relaxing environment, with dinner and drinks. Topics included Mass Shootings in America; The Maya Collapse;

Sports, Politics and Cultural Transformation; Wonders in Two Dimension with Graphene and Beyond; Managing Conflict in Relationships; and CSI in Real Life.

The 2015-2016 College of Sciences Distinguished Speaker Series will be announced soon. Check back at [www.sciences.ucf.edu/dss](http://www.sciences.ucf.edu/dss) for information on the upcoming series.



**Dr. James Alan Fox**  
Professor of Criminology at  
Northeastern University

"MASS SHOOTINGS IN AMERICA:  
MYTHS AND REALITIES"

Distinguished Speaker Series  
Talk 1

**Sept. 9, 2014**  
6:00 p.m.



**Dr. Arthur Demarest**  
Ingram Professor and Director of  
the Vanderbilt Institute of  
Mesoamerican Archaeology at  
Vanderbilt University

"THE MAYA COLLAPSE"

Distinguished Speaker Series  
Talk 2

**Oct. 15, 2014**  
6:00 p.m.



**Dr. Andrei (Andy) Markovits**  
Arthur F. Thurnau Professor and  
Karl W. Deutsch Collegiate  
Professor of Comparative Politics  
and German Studies at  
the University of Michigan

"SPORTS, POLITICS, AND  
CULTURAL TRANSFORMATION"

Distinguished Speaker Series  
Talk 3

**Nov. 12, 2014**  
6:00 p.m.



**Dr. Tony Heinz**  
Endowed Professor of Physics  
at Columbia University

"WONDERS IN TWO DIMENSIONS:  
LOOKING AT GRAPHENE  
AND BEYOND"

Distinguished Speaker Series  
Talk 4

**Jan. 14, 2015**  
6:00 p.m.



**Dr. Dan Canary**  
Professor of Human Communication  
at the University of Utah

"MANAGING CONFLICT  
STRATEGICALLY IN  
PERSONAL RELATIONSHIPS"

Distinguished Speaker Series  
Talk 5

**Feb. 11, 2015**  
6:00 p.m.



**Barry Fisher**  
Senior Forensic Advisor for  
the US Department of Justice  
ICITAP

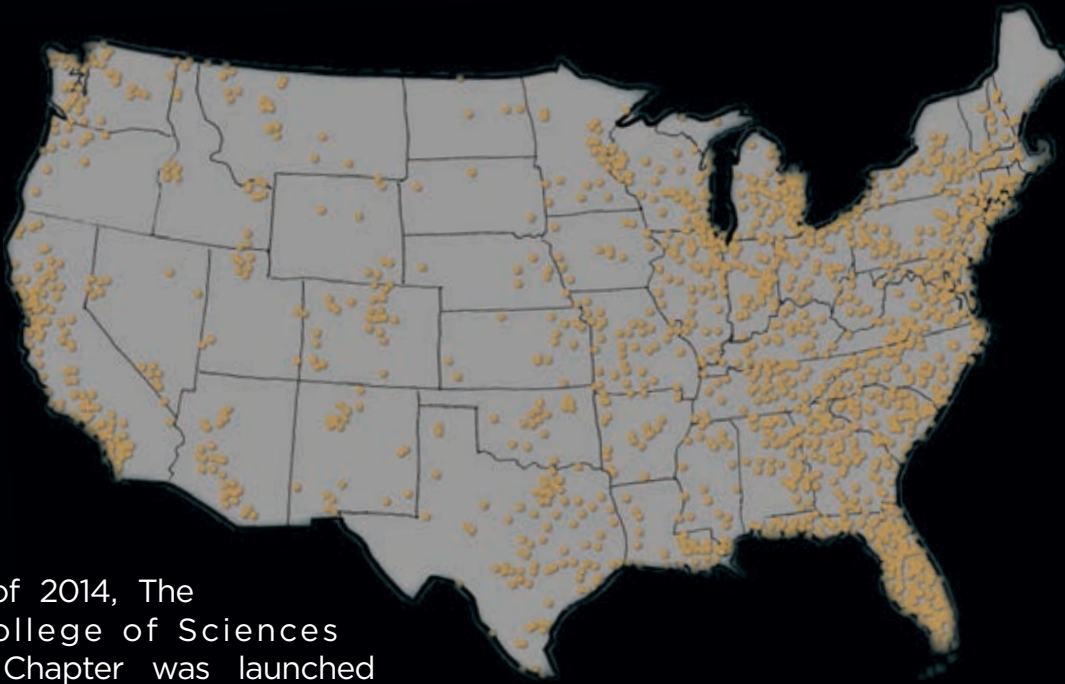
"CSI IN REAL LIFE:  
REALITIES OF MODERN  
FORENSIC SCIENCE"

Distinguished Speaker Series  
Talk 6

**Mar. 18, 2015**  
6:00 p.m.

# COS ALUMKNIGHTS

A network of 48,000



In July of 2014, The UCF College of Sciences Alumni Chapter was launched with an alumni board of volunteers representing the natural and social sciences. The UCF College of Sciences Alumni Chapter supports UCF Alumni Association and UCF College of Sciences initiatives by cultivating a legacy and nurturing lifelong relationships with the college's current and future alumni. Programmatic efforts focus on professional development and networking, while offering meaningful opportunities for engagement that generate multifaceted support for UCF.

*UCF College of Sciences alumni are invited to get involved and stay connected as Knights.*

**For more information:**

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

*Call:* 407.823.3491

*Email:* [sciences@ucfalumni.com](mailto:sciences@ucfalumni.com)



2014-15 UCF College of Sciences Alumni Chapter Executive Committee





This year, the College of Sciences hosted the inaugural Outstanding AlumKnights Awards. The event honors the college's most outstanding alumni from each of the nine departments and one school. The event also raises money for scholarships through a silent auction.



## The 2015 alumni honorees include:

Anthropology | **Keith Edwards**, '10, '11, president, Medstar Medical

Biology | **Alice Bard**, '86, '89, environmental specialist II, Florida Department of Environmental Protection Division of Recreation & Parks, Bureau of Parks, District 3

Chemistry | **Jennifer McKinley**, '94, '96, co-founder and chief operating officer, IRradiance Glass

Nicholson School of Communication | **Clay McMillan**, '90, president, CMI Production Services

Mathematics | **Aicha Elhor Gillespie**, Ph.D., '00, senior vice president of Citi Shared Services Global Re-engineering

Physics | **Clara Rivero-Baleine**, Ph.D., '01, '03, '05, mechanical engineer, Lockheed Martin Missiles and Fire Control

Political Science | **Ybeth Bruzual**, '05, morning news/political coverage anchor/moderator, News 13

Psychology | **Kristin Chase**, '03, director of organizational development department, Universal Orlando

Sociology | **Nicholas Guittar**, Ph.D., '01, '05, '11, assistant professor of sociology, Valdosta State University

Statistics | **Stephanie Urdahl**, '05, assistant vice president and actuary, Financial Solutions Pricing Department, Hannover RE



# ANTHROPOLOGY

## New Voices for Refugees in Italy



The National Geographic Society Young Explorers grant was awarded to anthropology master's student Adam Kersch. Kersch's research focuses on the experiences of refugees arriving across the Mediterranean to Sicily, as they flee poverty and political conflict in their countries of origin. Working with Joanna Mishtal, Ph.D., as his thesis chair, Kersch designed an independent research project, consisting of fieldwork in Sicily in the summer 2014 and spring 2015. This prestigious grant is a first in the history of the department.

## Leave No Bone Unturned

Patrisha Meyers, anthropology graduate student, traveled to Trinidad in December to work with John Schultz, Ph.D., associate professor, associate chair and undergraduate coordinator of the anthropology department, to examine a set of bones discovered during an excavation. A skull in a pot, six complete human skeletons and 36 incomplete skeletons were found during the excavation works at the Red House, Port of Spain. They were found to date back to between AD 430 and AD 1820.



## Hanging Off the Cliffs

Working under an excavation permit from Peru's Ministry of Culture, J. Marla Toyne, Ph.D., and her team of graduate students spent almost 30 days on the cliff in Peru, documenting the tombs and gathering skeletons and other artifacts. At least 120 human-made structures used as burial places were identified, including open chamber tombs, platforms and, surprisingly, walkways that connected groups of tombs. "Archaeology is a horizontal science — you dig down through layers of dirt — but in this case we've flipped it and gone vertical," says Toyne. "We want to take pictures and make maps and drawings in an environment where we may have to be suspended."



# BIOLOGY

## The Ant King

Joshua King, Ph.D., entomologist at UCF, studies the invasive “fire ant” species and has found some startling results. Contrary to popular belief, fire ants did not force native ants out of their natural habitats. Fire ants actually thrive because they move into areas where native species can’t survive – typically areas of massive soil disturbance, such as road-widening projects or mall construction. King has been featured on television shows and videos, including FOX news and a National Science Foundation video.



## Entomology Outreach



The Entomological Society of Central Florida at UCF provides a fun, hands-on environment to encourage scientific learning for all ages. The ESCF does outreach at least once a month at libraries, scientific organizations geared toward connecting children with science and local schools. The club recently visited Evans



Elementary school and presented an interactive demonstration. The students used microscopes to look at insects up close, observed insect specimens from UCF’s Bug Closet, and were able to pet and hold live Madagascar Hissing Cockroaches.

Will Crampton, Ph.D., is one of the world’s experts when it comes to electric fish.

## Monster Fish

Crampton has been involved with several television shows and natural history film productions including National Geographic Channel’s “Monster Fish,” The Discovery Channel, the BBC, the Smithsonian Institution and the Japanese company NHK.

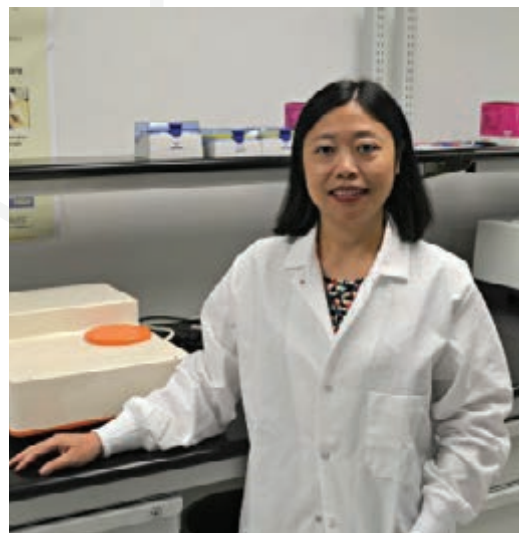


# CHEMISTRY

The UCF Chemistry Department is ranked ninth in the nation for providing career support to its students

## Detecting Cancer with Gold

A new test for early-stage prostate cancer, developed by Qun “Treen” Huo, Ph.D., is proving to be extremely fast, more precise, and way more cost efficient than current tests. The test costs less than \$1 and yields results in minutes. The test uses a small blood sample and tiny gold nanoparticles smaller than a freckle. When a cancerous tumor begins to develop, the body mobilizes to produce antibodies. Huo’s test detects that immune response. A few drops of blood serum from a finger prick are mixed with the gold nanoparticles and certain cancer biomarkers cling to the surface of the tiny gold particles, increasing their size and causing them to clump together.



## Data at the Speed of Light

A device resembling a plastic honeycomb yet much smaller than a bee’s stinger can steer light beams around tighter curves than ever before possible, while keeping the integrity and intensity of the beam intact.

“Direct laser writing has the potential to become a flexible means for manufacturing next-generation computer devices,” said Stephen Kuebler, associate professor of chemistry at UCF.

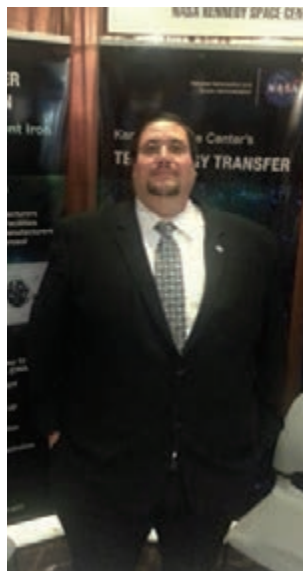
## SIMONE NOVAES CARD

Novaes Card gained valuable experience in her Ph.D. program through the guidance of Cherie Yestrebsky, Ph.D., which helped her secure her position at Agilent Technologies.



## ROBERT DEVOR

Robert earned his B.S. in chemistry in 2003 and Ph.D. in chemistry in 2008 from the University of Central Florida. His work in the UCF Industrial and Environmental Chemistry Laboratory, with very strong ties to Kennedy Space Center, helped him to gain employment.





# NICHOLSON SCHOOL OF COMMUNICATION

## CROSS-CULTURAL COLLABORATION

The students in NSC's Magazine Editing and Production class have a unique opportunity – to create their own issue of Centric magazine from start to finish. During the spring 2015 semester, those students had another interesting opportunity – to collaborate on an investigative news piece with students at Apeejay Styta University in India.



Their project, titled “A Cross-Cultural Look at Sexual Assault,” takes an in-depth look at sexual assault on college campuses, which is a topic that is newsworthy in both cultures. The Centric students published the project as an online exclusive on their website, [www.centric.cos.ucf.edu](http://www.centric.cos.ucf.edu), while the students at Apeejay Styta University created a piece for radio, the primary medium used in India.

By working together on this project, students at the Nicholson School and at Apeejay Styta have gained a cross-cultural understanding of, and have given a voice to, this important topic.

Nicholson School of Communication professor, Ann Miller, Ph.D., spent the spring 2015 semester conducting research in East Africa as part of a Fulbright award focused on AIDS and AIDS-related research. Miller's study is part of an on-going project which examines the association between an increasing level of sexual content in East African media with youths' sexual attitudes and behavior.

To date, Miller's research team has completed data collection. They are currently fine tuning a small grant proposal to develop a media literacy intervention. This intervention is to be conducted at local high schools by mass communication students.

**“Our ultimate goal is to build an understanding of what media are associated with which types of effects under what conditions,” Miller said. “We would like to use that knowledge to inform development of a media literacy intervention for either youth themselves or to train parents about effectively advising their children.”**



# MATHEMATICS

What does a student do with a math degree upon graduation?



UCF hosted a Mathematics Career Day to answer just that question. This event gave students the opportunity to hear from mathematicians about the great opportunities in their fields, how they

chose their careers and what they do in their careers on a daily basis. Students were also shown the classes they would need to take to earn the degrees offered in mathematics and had a chance to tour the learning environment at UCF.



UCF mathematics professor Mourad Ismail, Ph.D., was recently honored for his hard work and research in the field of mathematics. On the occasion of his 70th birthday, a conference on orthogonal polynomials, integrable systems and their applications was held in China in his honor. More than 100 mathematicians, including many leading experts in the fields, attended from all over the world.





# PHYSICS

## STEM Outreach



The Physics Department at UCF brings science to very young future scientists. First grade students from the Grand Avenue Primary Learning Center in Parramore took part in different science based activities during their visit to the UCF main campus. The concepts of gravity, electricity and momentum, to name a few, were all demonstrated in a fun and entertaining way. The goal of the day was to have each child experience STEM in a way that would inspire them and help them to develop curiosity about all the fields in science.

"This is the youngest and most inquisitive group of future STEM students that I have ever worked with."

-Jeff Bindell, Ph.D.

## Quantum Leap in Research

John Vastola, an undergraduate physics student, received an Outstanding Presentation award from the American Association of Physics Teachers at the 2015 Winter Meeting in San Diego, California. He presented "Using Integral Transforms to Evaluate Sums in Statistical and Quantum Mechanics." The conference is geared toward high school and college physics teachers. However, undergraduates interested in physics education were welcome



# POLITICAL SCIENCE

## LEGISLATIVE SCHOLARS INTERNSHIP



The Legislative Scholars Internship program is a full time, stipend supported position that places interns with state legislative offices during the Florida Legislative session. Each chosen intern is assigned to one to two members of the Central Florida Legislative Delegation, and will be expected to spend at least three months in Tallahassee with room and board provided, supporting the legislative member with research, constituent relations, bill tracking and other duties required in the daily operations of a legislative office during the session.



## STUDY ABROAD PROGRAM

Two UCF political science majors, Allegra Kauffman and Austin Chegini, attended Leuphana University in Lüneburg, Germany during the 2014 fall semester. As part of this exchange program, two German students enjoyed their fall semester at UCF. The exchange with Leuphana comes with a monthly scholarship of 600 euros.

In the spring, we have two students, Laura Mendoza and Amanda Hoffman, spending a semester at Canberra University in Australia and new study abroad opportunities will include Salzburg, Austria. All students participating in these exchange programs have praised their time abroad, which has greatly enriched their educational experience.

"This study abroad program helped me gain better interpersonal and cross-cultural skills. International experience is a MUST for almost all government jobs these days. There's no doubt in my mind that employers will see it favorably when reviewing my application." Chegini said.



# PSYCHOLOGY



## INTERACTIVE INNOVATIONS

Children growing up with social anxiety disorder or severe shyness often do not learn how to effectively engage in social encounters.

Pegasys-VR was created to give children who are shy a fun way to practice social interactions. It is a virtual environment school with six avatars that represent typical school personnel including adults and children.

A team of UCF students, faculty and staff recently attended the Otronicon technology event in Orlando to help develop a language for these avatars by having them interact with the children at the event. They want to help the avatars “come to life” as children practice social interactions. The avatars will be developed to be able to respond “naturally” to the child’s speech.

The entire program will eventually be available on the Internet, which will make distribution across the nation much easier.

**The research team responsible for creating Pegasys-VR was headed by principal investigator Deborah Beidel, Ph.D., Clint Bowers, Ph.D., Liqiang Ni, Ph.D. and the Institute for Creative Technologies at the University of Southern California and Virtually Better, Inc.**



# SOCIOLOGY

## OPERATION PRIMUS: THERAPY DOG PROGRAM



UCF alumnus Jessie Holton, '10, '12, wrote a grant proposal that has helped law enforcement more successfully handle child sexual abuse cases. Holton designed the proposal in his UCF Sociology course, Child Abuse in Society. While researching the topic, he discovered a law that provided for the use of therapy dogs that could be used to comfort victims of child abuse. As a Marine veteran, Holton recalled the many times that his own therapy dog had comforted him during difficult and traumatic times following his tours of duty.

His grant proposal initiated Operation Primus, the innovative and first in the country therapy dog program for children, allowing dogs to accompany children into questioning situations and courtrooms to reduce their anxiety. The program has helped reduce the anxiety of

children by 95 percent. This program has been so successful, it is now being adopted by other agencies across the nation.

Holton continues to work with the UCF Sociology Department through his position at the Brevard County Sheriff's Office. Current collaborations are underway in the areas of human trafficking, domestic violence and sexual offenders.

Founded in 1979, the University of Central Florida's Institute for Social and Behavioral Science promotes community-oriented research throughout the social and behavioral science disciplines. The institute houses a survey research laboratory, a center for qualitative methodologies and a center for outreach and public service.

## THE INSTITUTE FOR SOCIAL AND BEHAVIORAL SCIENCES

The institute recently conducted research for the Second Harvest Food Bank of Central Florida. The research helped determine if there were gaps in the current food distribution system and prepared a study to identify changes that could be made to help increase their capacity to deliver food to needy families. The Second Harvest Food Bank of Central Florida is a private, nonprofit organization that collects, stores and distributes donated food to more than 550 feeding partners in six Central Florida counties.





# STATISTICS

UCF professor of statistics, Mark Johnson, Ph.D., received the 2014 Shin Research Excellence Award. His submission, “An Examination of the Geographic Aggregation of Catastrophic Risk,” is the collaborative effort of Mark with FSU’s Randy E. Dumm and Charles C. Watson, Jr., of Enki Holdings LLC. The paper explores the development of long-term solutions for major catastrophic property exposures and benefits of geographic diversification on tropical cyclone portfolios.

# DATA MINING PROGRAM

The award-winning Data Mining Program at UCF was officially established in 2000. Faculty members have developed consulting relationships with industrial clients, inspiring relevant research directions, student employment opportunities and enhanced curriculum case studies. UCF students have started their careers with many of these industrial clients, such as Walt Disney World, Universal Studios, JPMorgan Chase & Co, the FBI, CIA and more.

The Data Mining Program hosts an annual symposium to allow students to meet local business partners. At the symposium, students have the opportunity to find full-time jobs and summer internships.



# FORENSIC SCIENCE

UCF's National Center for Forensic Science currently houses five forensic casework databases, three of which are used by fire investigators and fire debris analysts. The Ignitable Liquids Reference Collection is a compilation of more than 600 liquids that have the potential to start a fire. The Substrate Database contains data characterizing the decomposition products of household furnishings and building materials burned during a fire. The Thermal Properties Database provides valuable information about how much energy is released when these materials burn. The Smokeless Powders Database is used by analysts investigating bombings that utilize smokeless powder. The Y-STR Database is used by analysts

investigating sexual assaults and other crimes where DNA short tandem repeat information from the Y-chromosome is important. Information from these databases is routinely utilized by NCFS faculty, staff and students as a resource for forensic science research.

In a new effort, NCFS is working with more than 21 countries in the European Union to create an international database of ignitable liquids. The center will house the international database and assist its European colleagues in managing the information.

**"We analyze sample liquids like gasoline, and furnishings such as carpets, for their chemical composition, and then enter the information into our databases," Mary Williams said.**





# UCF ARBORETUM



The Arboretum is a creative learning community that uses the campus as a comprehensive outdoor laboratory to support relevant, experience-based learning, ecological research, and human connection with ecosystems and landscapes. It contributes to student development and engagement through diverse volunteer, service learning, and educational opportunities. Students contribute over 4,000 hours per year volunteering in Arboretum programs, and over 5,000 students per year use campus natural lands for outdoor classes or organized events.

In a collaborative effort with Knights Helping Knights pantry, the Arboretum donated over 1,000 pounds of fresh produce to the pantry from its organic community garden. The pantry was developed to provide food to fellow students if they fall on hard times.

“It’s really great that we can offer fresh produce to our clients,” Sasha Ruiz said, the volunteer coordinator for Knights Pantry and current UCF graduate student. “[The Arboretum] brings us carrots, greens, lettuce, mint — all sorts of things.”





Established in October 2007, the Global Perspectives office is designed to help develop UCF's international resources, capabilities and connections. Each year, in cooperation with its on-campus and off-campus partners, the office also embraces a primary, university-wide and community theme, along with one or more secondary themes. For 2014-2015, the primary spotlight is on "Shaping a World in Transition: The Power of Imagination, Invention and Innovation."

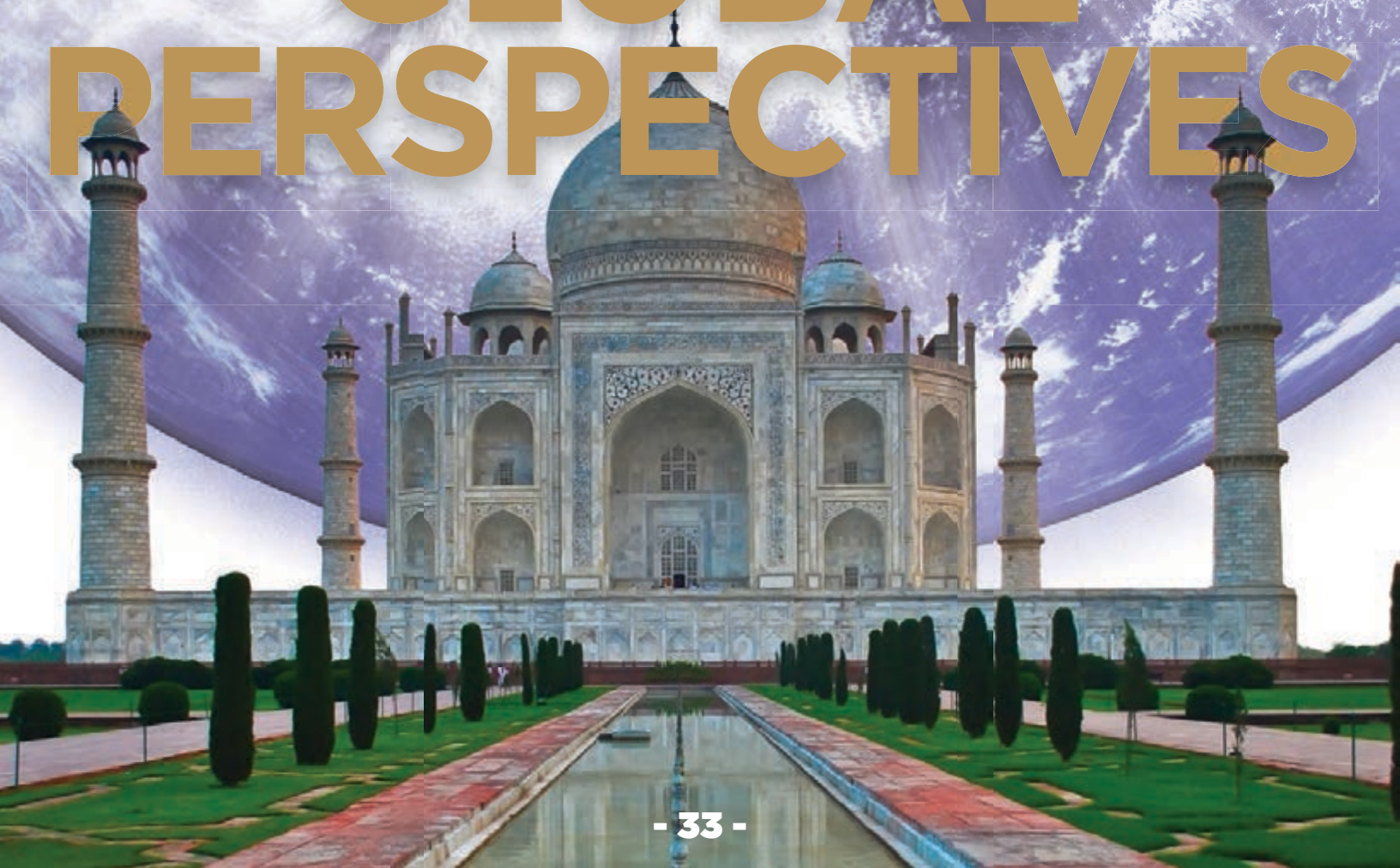
Recently, Global Perspectives co-hosted the 2015 Florida International Summit, where students, faculty, practitioners and community members learned about "Opportunities and Challenges for Human Society and Development."

The India Center and the Prince Sultan bin Abdulaziz bin Fahd Program for Strategic Research and Studies were established in 2012 and are jointly administered by the Global Perspectives Office and the Department of Political Science at the University of Central Florida.

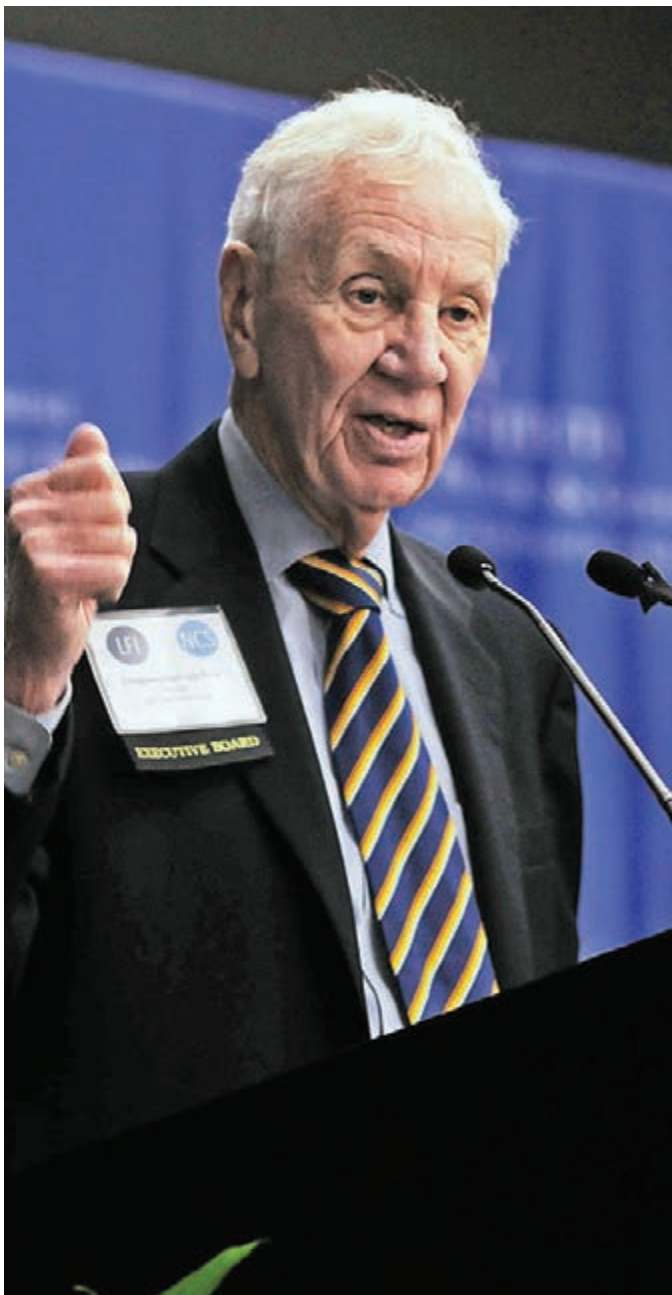
To Learn More, visit:  
[www.TheIndiaCenter.ucf.edu](http://www.TheIndiaCenter.ucf.edu)  
[www.ucf.edu/pmbfprogram](http://www.ucf.edu/pmbfprogram)



# GLOBAL PERSPECTIVES







The Lou Frey Institute of government, located in the department of political science at UCF, works to promote the development of actively engaged citizens through civic education, research, policy analysis, advocacy and experiential learning. The institute also works to help strengthen the civic education capacity of Florida's K-12 education system through the Florida Joint Center for Citizenship and partnership with the Bob Graham Center, creating the Civics-Mentor Teacher program. The CMT supports and educates Florida's K-12 civic educators.

As of 2010, studies revealed that only 27 percent of fourth-graders, 22 percent of eighth-graders and 24 percent of twelfth-graders scored proficient or higher in civics. Along with promoting new civics course requirements for middle school students, the institute works to leverage simulation or simulated experiences as a way for students to learn. One example is Justice Sandra Day O'Connor's iCivics, a web-based education project designed to teach students civics and to inspire them to be active participants in U.S. democracy.



**“Senator Graham says civics is not a spectator sport, and to really know how it works, you need to experience it. I believe we will be able to move forward and make the plan for simulated civics education possible.”**  
**- Doug Dobson, Executive Director of the Lou Frey Institute**

A quick look at the

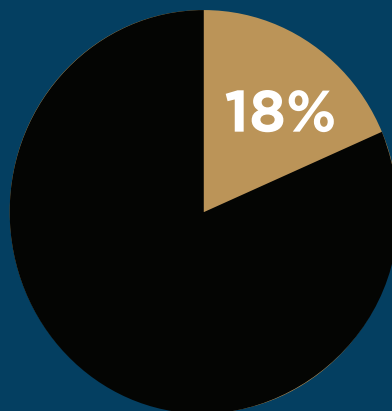
# COLLEGE OF SCIENCES



**\$4 MILLION  
DOLLAR  
GRANT**  
FROM THE CENTER FOR  
**LUNAR &  
ASTEROID**  
**SURFACE SCIENCE**

# UCF

UNDERGRADUATE  
**STUDENTS**  
PURSUING COLLEGE OF  
**SCIENCES**  
**DEGREES**



# \$76,000

in scholarships awarded to 30 UCF College of Sciences student recipients.

COLLEGE OF

SCIENCES

DEGREES

16  
degrees

BACHELORS

16  
degrees

MASTERS

9  
degrees

DOCTORAL



# DEPARTMENTS

UCF College  
of Sciences  
students per  
department



ANTHROPOLOGY  
362



BIOLOGY  
1,653



CHEMISTRY  
652



NICHOLSON SCHOOL  
OF COMMUNICATION  
2,088



MATHEMATICS  
270



PHYSICS  
264



POLITICAL SCIENCE  
1,226



PSYCHOLOGY  
3,727



SOCIOLOGY  
439



STATISTICS  
196

**#10** ranked Program in the  
**BIOLOGY** nation  
for the use of technology according to GraduatePrograms.com

**#9** ranked Program in the  
**CHEMISTRY** nation  
for providing career support according to GraduatePrograms.com

**#14** ranked Program in the  
**PHYSICS** nation  
for its atomic/molecular/optical programs according to US News & World Report

**#2** ranked Program in the  
**SOCIOLOGY** nation  
based on student ratings and reviews, according to GraduatePrograms.com

# Thank You!

## TO OUR COS DONORS



### **Benefactors Anthony J. and Sonja Nicholson**

The Nicholson family has a long history of philanthropy with the University of Central Florida. In 1996, the Nicholsons pledged a \$2 million donation to the university, and in return, the university named the School of Communication after them. The Nicholson School of Communication became the first program or building at UCF to be named after a person. Nicholson has served on the UCF Athletic Association since its inception and donated the Nicholson Fieldhouse, the first full-length indoor football field in the south.

The Nicholsons have also made available six scholarships for NSC students interested in studying abroad. These scholarships were inspired by the first scholarship luncheon hosted by the college in 2013, as was the Steven Sotloff Memorial Endowed Fund. This fund will have a \$25k initial matching fund challenge and will be offered for the first time in 2016.



### **Alfred G. Harms, Jr. Vice Admiral, U.S. Navy (ret)**

Vice admiral Harms and his wife, Gina, have been trusted and loyal members of the UCF family for many years. Harms worked for the University of Central Florida for eight years, from 2005 through 2013. In 2013, the Harms family gave the gift of an endowed fund to provide operational support for the UCF RESTORES clinic. UCF RESTORES is a clinical research center dedicated to the study and treatment of post-traumatic stress disorder.

“It was a very easy decision (to donate) from a business standpoint, but also a heartfelt goal to do something important for the university, for the environment and the state of Florida.”

Duane De Freese, planned gift donor, supporting UCF Biology





# PURSUIT

is an annual publication of the UCF College of Sciences. Issues can be viewed at  
[www.cos.ucf.edu/pursuit](http://www.cos.ucf.edu/pursuit)

## UCF COLLEGE OF SCIENCES

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The College of Sciences Dean's Advisory Board provides advice to the dean, helps connect the college to potential partners, and provides advocacy and support.

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