

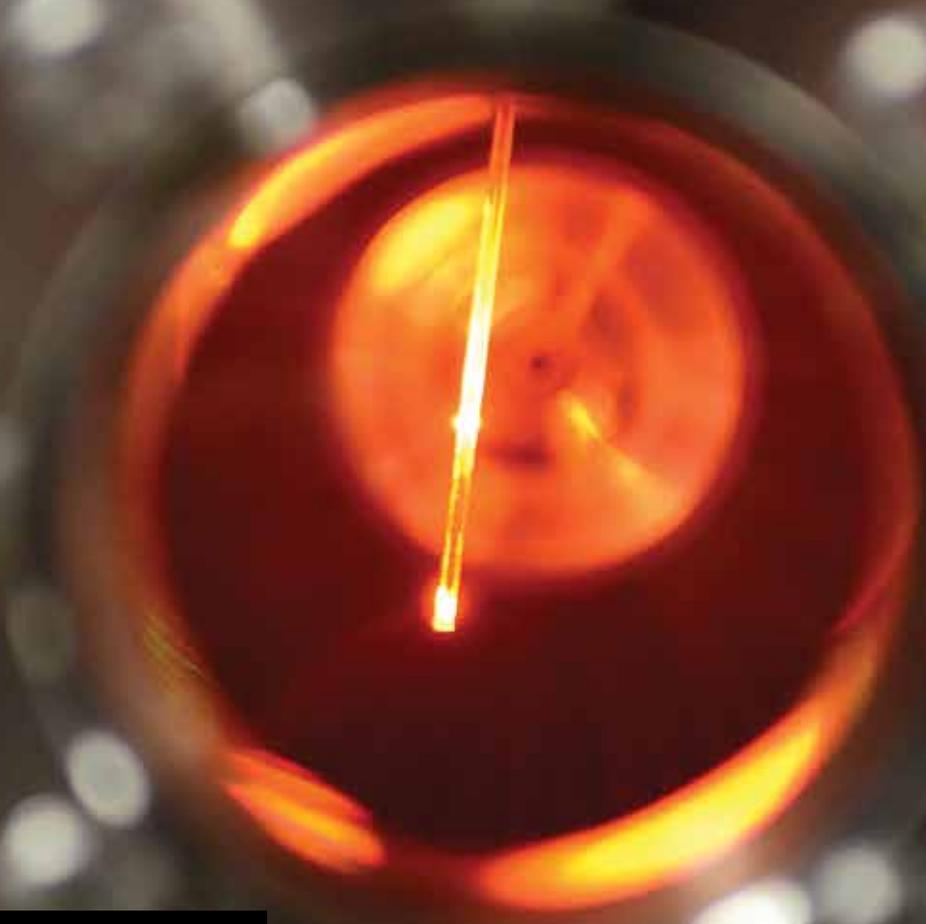
FY12 Annual Report

Accelerating Florida's Innovation Economy



UNIVERSITY OF CENTRAL FLORIDA
RESEARCH & COMMERCIALIZATION

This gas cell, in Professor Zenghu Chang's lab, is similar to those used to generate the world's shortest light pulses (see story, page 4).

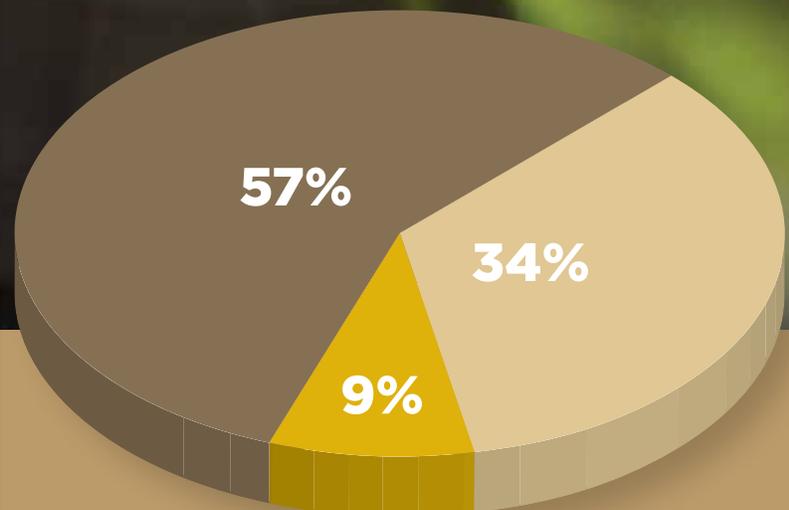


FISCAL YEAR 2012 RESEARCH BY ACADEMIC UNIT

College	Amount
College of Engineering & Computer Science	\$17,188,934
Institute for Simulation & Training	\$16,702,474
College of Sciences	\$14,444,689
Office of Research & Commercialization	\$13,607,226
Florida Solar Energy Center	\$11,219,526
College of Optics & Photonics	\$10,636,501
Burnett School of Biomedical Sciences	\$9,921,295
College of Education	\$7,947,132
Student Development and Enrollment Services	\$7,735,367
College of Health & Public Affairs	\$4,827,590
Administration & Other	\$3,455,429
College of Business Administration	\$2,601,608
NanoScience Technology Center	\$2,165,873
Advanced Materials Processing & Analysis	\$2,024,453
College of Medicine	\$1,596,719
Florida Space Institute	\$1,358,375
College of Arts & Humanities	\$1,168,610
College of Nursing	\$195,649
Rosen College of Hospitality Management	\$152,339
TOTAL	\$128,949,789

FISCAL YEAR 2012 FUNDING

TYPE	TOTAL FUNDING
Federal	= \$73,124,216
Industry	= \$44,543,576
State	= \$11,281,998



Research Funding Rises, Results Delivered, Imagination Ignited



For the second time ever, researchers at the University of Central Florida received more than \$125 million in grants, which not only help the local economy but are leading to remarkable discoveries that capture the imagination and provide hope for the future.

The total raised in grants was \$128.9 million, including \$73 million in federal funding. That's a 21 percent increase over last year.

The College of Engineering and Computer Science received the most with \$17.2 million, followed by the Institute for Simulation and Training with \$16.7 million and the College of Sciences with \$14.4 million.

Some notable federal funding includes five awards from the Defense University Research Instrumentation Program and two National Science Foundation CAREER awards. The university received \$44.5 million in funding from industry and another \$11.3 million from the state. Thirty-five researchers were inducted into our Millionaires Club, meaning they received at least \$1 million in funding throughout the year.

UCF has been recognized on multiple fronts as a leader in innovation. A study released last year shows that graduates of the UCF Business Incubation Program have a total economic impact of \$363 million annually. The Office of Research & Commercialization has received funding along with multiple partners for innovative initiatives, including \$1.3 million from the Economic Development Administration for a program focused on building cleantech companies and \$1 million from the Department of Energy for a program focused on connecting promising research in energy efficiency with the students and business development professionals who can grow companies.

In 2012, UCF patents were ranked among the top 20 internationally by IEEE, a sign that the technology discovered here continues to have an impact far beyond our region and highlighting once again the power of innovation.

Cheers!

Dr. M.J. Soileau
Vice President, Office of
Research & Commercialization

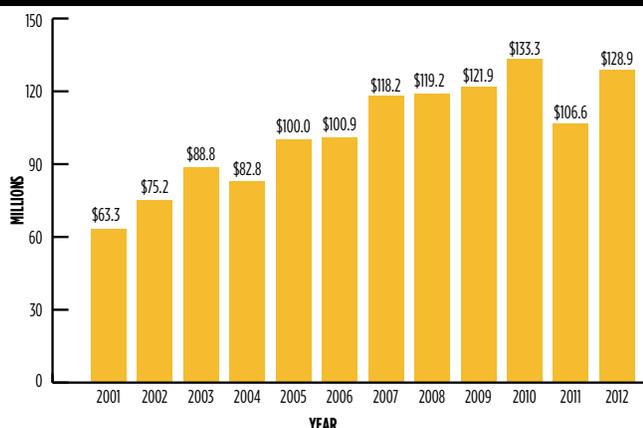
10-YEAR AWARDS / SUBMISSIONS

Year	Total Award	Total Submission
2003	\$88,828,913	\$398,440,003
2004	\$82,864,107	\$450,971,246
2005	\$99,995,506	\$352,616,388
2006	\$100,855,364	\$502,203,008
2007	\$118,216,069	\$1,011,340,993
2008	\$119,193,453	\$655,748,598
2009	\$121,911,236	\$569,968,662
2010	\$133,283,165	\$857,962,524
2011	\$106,617,140	\$700,218,912
2012	\$128,956,152	\$776,201,566

10-YEAR FEDERAL FUNDING

Year	Federal Award
2003	\$47,380,459
2004	\$40,692,263
2005	\$43,769,439
2006	\$47,010,550
2007	\$57,062,596
2008	\$57,313,368
2009	\$60,200,812
2010	\$75,771,465
2011	\$57,410,609
2012	\$73,124,216

12-YEAR UCF RESEARCH FUNDING HISTORY, 2001-2012

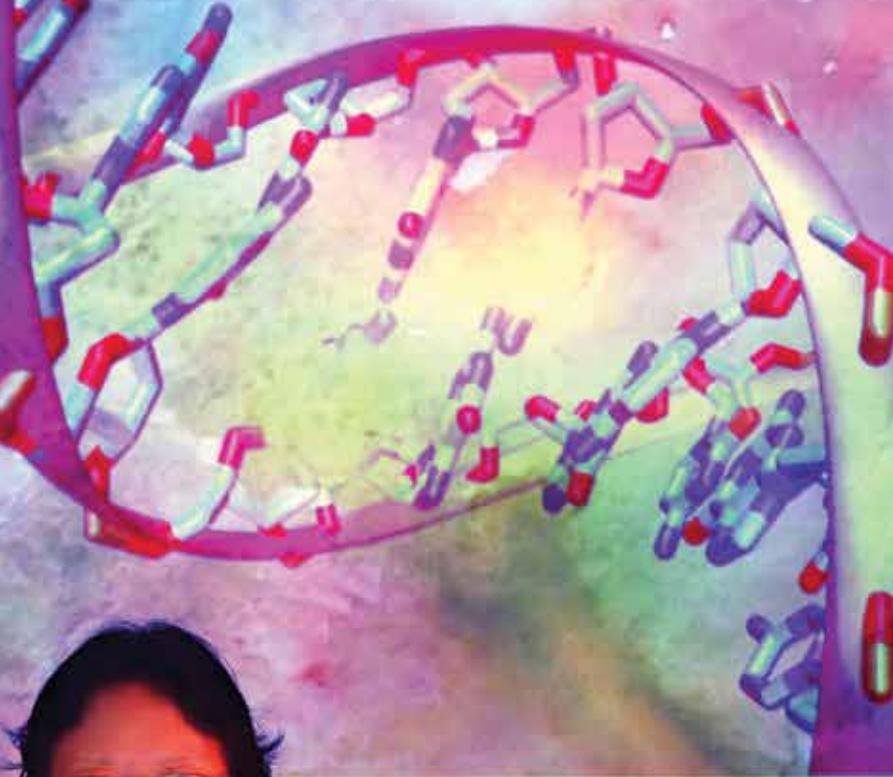


College of Engineering & Computer Science

Receives Most Funding With

\$17,188,934

Grants are supporting research ranging from development of a computer program to help differentiate skin cancer cells to participation in a regional research center to study the nation's transportation needs.



Haiyan Nancy Hu uses her computer to uncover patterns in gene expression.



**Harris Corporation Engineering Center,
College of Engineering & Computer Science**

CAREER Award Helps Mine DNA

Some might say it's in her DNA. Haiyan Nancy Hu spends her days at a computer unraveling and ordering staggering amounts of data, all in an effort to help biologists and geneticists make sense of the power of DNA.

Hu, an assistant professor of computer science, received a prestigious National Science Foundation CAREER award of \$684,172 to support her research in bioinformatics and computational biology.

She is an expert in data mining and developing algorithms to detect frequent patterns in massive networks of data. Hu applies this expertise to a biomedical field known as epigenetics, which studies how the proteins in human cells (phenotypes) change without affecting the underlying DNA.

Biologists who study epigenetics have created a wealth of data, but the field currently lacks an efficient way to mine and analyze the data, according to Hu. Her NSF CAREER work will seek to develop computer tools and algorithms to help biologists and geneticists unlock some mysteries of human health.

Her work could shed light on mysteries such as why one biological twin develops cancer later in life, but the other twin — who has the same DNA — does not.

The bioinformatics field is young, with rapid technological advancements occurring in just the past 15-20 years. This reality has created a situation full of opportunity for computer-savvy students.

Institute for Simulation & Training Brings In

\$16,702,474

The Institute for Simulation & Training (IST), which marked its 30th anniversary in 2012, has become a vital national asset, a world leader in its field, and the causal agent for the \$3 billion simulation and modeling industry in Central Florida.

IST has pursued research, developed programs, hired faculty members and trained students to support what has evolved into the center of the simulation and modeling industry in America.



Institute for Simulation & Training

\$1.5 Million Grant Advances Use of Avatars in Training

A \$1.5 million grant from the Bill & Melinda Gates Foundation will triple the reach of an innovative teacher preparation program developed at UCF that uses avatars in virtual classrooms to train future teachers.

TLE TeachLivE™ improves teacher practice and student learning by giving aspiring educators the opportunity to instruct a virtual classroom full of avatar students. The grant is to develop the lab's current model at universities across the country, with a focus in the areas of sustainability, technology and research.

TLE TeachLivE started as a pilot project at UCF in 2005. It has grown into a network of universities that use labs across the country to give education students the opportunity to practice in a computer-generated classroom.

College of Education Professors Lisa Dieker and Michael Hynes along with College of Engineering & Computer Science Professor Charles Hughes developed TLE TeachLivE with an interdisciplinary team that included members of the Synthetic Reality Lab at IST.



Professor Charles Hughes demonstrates the avatars behind TeachLivE.

Photo by Jason Greene



College of Sciences

Explores Life, Cosmos With

\$14,444,689

Researchers in UCF's College of Sciences have contributed to our understanding of the cosmos and our neighborhoods through funding for projects such as development of color calibration targets for Mars rover *Curiosity*, a statewide study of the impact of rising sea levels on Florida communities and, oh yes, discovery of a new planet, UCF-1.01.

Professor Zenghu Chang and his research team set a world record with a 67-attosecond laser pulse.



College of Sciences

World-Record Laser Pulse

A UCF research team has created the world's shortest laser pulse and in the process may have given scientists a new tool to watch quantum mechanics in action – something that has been hidden from view until now.

Professor Zenghu Chang from the Department of Physics and College of Optics & Photonics, led the effort that generated a 67-attosecond pulse of extreme ultraviolet light. The results of his research were published in the journal *Optics Letters*.

An attosecond is an incomprehensible quintillionth of a second. In other words, it would take 15 million billion pulses of the size Chang's team achieved to equal one second. The accomplishment is even more remarkable because the team did it without the use of specialized equipment such as a mile-long particle accelerator or a Superdome-sized synchrotron.

There is much excitement about the accomplishment and the promise Chang's work holds for helping scientists understand how the world's smallest building blocks actually work. The technique could lead scientists to understand how energy can be harnessed to transport data, deliver targeted cancer therapies or diagnose disease. The finding marks the first significant breakthrough in the laser pulse field in four years.

The Millionaires Club

These 35 inductees brought in 58 percent of UCF's 2012 Funding

Janet Andreasen	College of Education
Matthieu Baudelet	College of Optics & Photonics
Deborah Beidel	College of Sciences, Psychology
David Block	Florida Solar Energy Center
Larry Chew	College of Engineering & Computer Science
Eunice Choi	College of Business Administration
Alexander Cole	College of Medicine
Anne Culp	College of Education
Andrew Daire	College of Education
Henry Daniell	College of Medicine
Philip Fairey	Florida Solar Energy Center
Michael Georgiopoulos	College of Engineering & Computer Science
Lixing Gu	Florida Solar Energy Center
Scott Hagen	College of Engineering & Computer Science
Lynn Hansen	Student Development & Enrollment Services
Daniel Hull	Office of Research & Commercialization
Jayanta Kapat	College of Engineering & Computer Science
Stephanie Lackey	Institute for Simulation & Training
Eric Martin	Florida Solar Energy Center
Tammie McClellan	Institute for Simulation & Training
David Metcalf	Institute for Simulation & Training
Thomas O'Neal	Office of Research & Commercialization
Sampath Parthasarathy	College of Medicine
Brian Plamondon	Institute for Simulation & Training
Martin Richardson	College of Optics & Photonics
Eduardo Salas	Psychology, Institute for Simulation & Training
Susan Schleith	Florida Solar Energy Center
Jeanette Schreiber	College of Medicine
Mubarak Shah	College of Engineering & Computer Science
Ernest Smart	Institute for Simulation & Training
M.J. Soileau	Office of Research & Commercialization
Ronald Tarr	College of Engineering & Computer Science
Rosemarye Taylor	College of Education
Jose Vazquez Perez	Administration & Finance
Shin-Tson Wu	College of Optics & Photonics

M.J. Soileau, vice president for Research & Commercialization, President John C. Hitt, Provost Tony Waldrop and Tom O'Neal, associate vice president for Research & Commercialization, display plaques recognizing UCF Millionaires.



Photo by Adam Clayton

Millionaires, Innovators Matter!

Research millionaires and innovators were recognized last fall at a venue better known for celebrating touchdowns - the UCF Stadium Club.

The Millionaires Club has recognized the university's highest funded researchers since 2000. The Innovators Club was added in 2012 to acknowledge researchers who have filed invention disclosures, the first step in the patenting process.

The Millionaires Club began as a kind of tongue-in-cheek way to recognize high research achievers in a manner comparable to the way sports achievers are recognized.

From the inaugural class of six members, the Millionaires Club has grown nearly every year. These 35 inductees, eight percent of the funded faculty in 2012, brought in 58 percent of UCF's total research funding of \$128.9 million.

Reaching for Stars, Discovering Planets

Florida Space Institute Moves, Names Director

The Florida Space Institute (FSI) began a new era in 2012 with a new home in the Central Florida Research Park and the selection of a new director.



The Florida Space Institute unveiled a new logo in 2012.

Over the past 22 years, FSI has conducted research and trained hundreds of students in the mechanics of building satellites, payloads and other space hardware and in the science of launching them into space. FSI's facilities, previously near Kennedy Space Center, are now located in the UCF Partnership I Building, next to UCF's main campus.

Ramon "Ray" Lugo III took over as director of FSI in January, 2013. Lugo is a veteran NASA administrator and most recently served as director of the Glenn Research Center in Cleveland.

"It's a very exciting time to be in the business of space, and I'm especially excited to be returning to the place where I discovered my passion for the field," says Lugo, who received his B.S. in engineering at UCF in 1979.

Lugo's space career started at NASA's Kennedy Space Center in 1975 while he was attending UCF as a cooperative education student.

The Florida Space Institute is part of a broad statewide partnership started 22 years ago to support Florida's involvement in the burgeoning field of space exploration.

The end of the space shuttle program in 2011 and the subsequent debate over America's future involvement in space has coincided with recent changes at FSI.

In recent months, the center has funded \$400,000 in research projects designed to stimulate space research in areas as diverse as physics, chemistry, nanoscience and electrical engineering.

Lugo says his emphasis will be to increase collaboration across all the state institutions and increase the funding for research at all FSI-affiliated institutions.

Three projects led by Physics Professor Josh Colwell were selected by NASA's Flight Opportunities Program for suborbital rocket flight and parabolic airplane flights. The flights give researchers the opportunity to conduct experiments in conditions identical to the microgravity environment found in space. An experiment to study the behavior of dust on the surfaces of asteroids flew in August in a parabolic aircraft similar to those used by astronauts in training. Undergraduate student Joe Howard and Post-Doctoral Researcher Adrienne Dove are shown with an experiment module as the plane enters its free-fall or weightless mode.



COLLEGE OF SCIENCES

Invention Shows True Colors of Mars



Credit: NASA

Professor Daniel Britt's device is helping the Mars Rover capture pictures such as these.

The exciting and colorful images being beamed back from the planet Mars are true to life, thanks to a Physics team.

Professor Daniel Britt built two calibration targets that sit on the Curiosity rover, which has been exploring the red planet since August.

The colorful images that the rover has been sending back to Earth during its two-year mission are a result of Britt's innovation.

That's because the materials used to portray the actual colors – through calibration targets – were made in UCF labs.

"All the Mars landers carry color calibration targets for the same reason photographers worry about color balance," Britt says. "Different lighting conditions can change the apparent color of objects.

"On Mars, we are 50 percent farther from the sun looking through an atmosphere of carbon dioxide and yellow dust at an alien landscape. Having known red, green and blue color targets makes it possible to return to true color."



Credit: NASA

COLLEGE OF SCIENCES

Hot Find: UCF-1.01

Last summer, UCF detected what could be its first planet, only two-thirds the size of Earth and located right around the corner, cosmically speaking, at a mere 33 light-years away.

The exoplanet candidate, called UCF-1.01, is close to its star, so close it goes around the star in 1.4 days. The planet's surface likely reaches temperatures of more than 1,000 degrees Fahrenheit. The discoverers believe that it has no atmosphere, has only two-thirds the gravity of Earth and that its surface may be volcanic or molten.

"We have found strong evidence for a very small, very hot and very close-by planet with the help of the Spitzer Space Telescope," says Kevin Stephenson, a recent Ph.D graduate from UCF and lead author of the paper, which appeared in *The Astrophysical Journal*.

Kevin Stephenson used NASA's Spitzer Space Telescope to discover UCF-1.01.



Credit: NASA/JPL-CALTECH



CREOL, THE COLLEGE OF OPTICS & PHOTONICS

Nanoparticle Discovery Opens Door for Pharmaceuticals

What a UCF student thought was a failed experiment has led to a serendipitous discovery hailed by some scientists as a potential game changer for the mass production of nanoparticles. Soroush Shabahang, a graduate student in Ayman Abouraddy's lab at CREOL, made the finding that could ultimately change the way pharmaceuticals are produced and delivered.

The discovery was based on using heat to break up long, thin fibers into tiny, proportionally sized seeds, which have the capability to hold multiple types of materials locked in place.

The work, published in *Nature*, opens the door to a world of applications.

NANOSCIENCE TECHNOLOGY CENTER

Nanoscientist Receives \$2 Million NIH Grant, Prestigious Award



Professor Ming Su is using nanoparticles to focus radiation therapy on cancerous tumors.

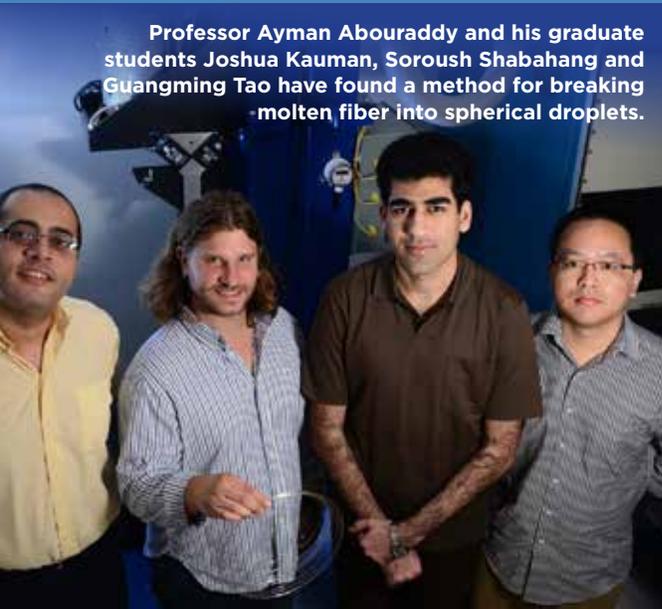
The National Institutes of Health (NIH) awarded Ming Su its coveted New Innovator Award, which comes with a \$2 million grant.

Su, associate professor at UCF's NanoScience Technology Center, is the only researcher from a Florida university to be selected and only one of 82 recipients nationwide.

The award recognizes visionary science that exhibits the potential to transform scientific fields and speed the translation of research into improved health, according to the NIH director's office. Su's research focuses on using nanoparticles to concentrate and precisely direct radiation energy to destroy cancerous tumors. Su says nearly half of cancer patients receive radiation therapy at some point during treatment, but X-ray doses can damage normal tissue around the cancer.

The idea of using nanoparticles to improve radiation therapy has been studied for the past several years as a way to enhance the potency of the cancer-killing radiation, while limiting damage to surrounding healthy cells.

Professor Ayman Abouraddy and his graduate students Joshua Kauman, Soroush Shabahang and Guangming Tao have found a method for breaking molten fiber into spherical droplets.



NANOSCIENCE TECHNOLOGY CENTER

Nanoscientist's Work Leads to First Human-on-a-Chip Systems

Functional human-on-a-chip systems, which will ultimately allow for drug testing without the need for animals in preclinical drug testing, are coming to fruition thanks in large part to work in a unique UCF laboratory and extensive funding by the NIH.

In fact, one of the first projects awarded by NIH's bold new center for developing new medical treatments and tests with a minimum of bureaucratic roadblocks, the National Center for Advancing Translational Sciences, is supporting nanoscientist James J. Hickman's work to create chips that behave like human organs.

Hickman, whose research team is working with Michael Shuler of Cornell University, is building modules that re-create cardiac and neural systems for the \$9.5 million project that will ultimately join 10 organs on a single chip. Other collaborators on the project are the Sanford-Burnham Medical Research Institute, GE Global Research, RegeneMed and Walter Reed Army Hospital.

Hickman, who created the Hybrid Neuronal Systems Laboratory at the NanoScience Technology Center when he arrived at UCF in 2004, has spent the last 15 years methodically demonstrating the breakthroughs required to enable the re-creation of complex biological systems on silicon-based chips.

"It's taken many trials over many years to get to this stage, but we are fully focused on replicating the functions of the body's most critical organs on a chip," Hickman says.

The payoff could reduce, if not eliminate, the need for animal trials for new preclinical drug testing and would allow researchers to see the effects of more aggressive treatments during clinical trials without endangering lives.

The NIH and the Defense Advanced Research Projects Agency have pledged up to \$140 million to ultimately create systems that simulate the entire body.

Hickman and Schuler's project is one of 10 focused on body-on-a-chip systems. Other research is exploring the types of cells that could be used as tissue sources for the systems.

Hickman's team has racked up a series of firsts in recent years, gaining attention in 2011 for using stem cells to grow neuromuscular junctions between human muscle cells and human spinal cord cells derived from stem cells. The finding was a critical component to the development of systems to re-create full body function.

His research focus has historically been with neuronal cells and associated problems such as Alzheimer's disease, ALS (Lou Gehrig's disease) and spinal cord repair. A year ago, his lab successfully converted stem cells from umbilical cords into oligodendrocytes, key brain cell, which could lead to treatments for some of those diseases without the ethical issues associated with using embryonic stem cells.



Photos by Jason Greene

Professor James Hickman, above, created the Hybrid Neuronal Systems Laboratory at UCF in 2004. His research team is working to replicate the function of human organs on a silicon chip smaller than the human hand.

Researchers in Nation's Top 10

UCF earned five research grants worth approximately \$1.2 million from the Defense University Research Instrumentation Program (DURIP), placing UCF among the top 10 award recipients in the country.

The money coming to UCF will help an array of projects including a program that blends the physical and virtual worlds by incorporating avatars and robots to help train medical personnel and soldiers before they leave for dangerous missions.

DURIP awards totaling \$54.7 million will help 190 researchers at 100 academic institutions purchase state-of-the-art research equipment, which will benefit science education, medical training and the preparation of soldiers before heading to war.

The Massachusetts Institute of Technology, Purdue University, the University of Michigan and the University of California San Diego all landed five awards each. Only the Georgia Institute of Technology, University of Maryland, University of Washington and Pennsylvania State University earned more grants.

- ◆ A system for aligning and dispersing carbon nanotubes to allow for the creation of a new class of super-strong materials, led by Chengying Xu, College of Engineering & Computer Science
- ◆ Completion of a unique facility in the Townes Laser Institute that will allow a laser system to operate at record-high power, led by Martin Richardson, Florida Photonics Center of Excellence
- ◆ Enhancement of high-performance computing and robot-training equipment to expand research capabilities in robotics, artificial intelligence and evolvable hardware as well as to give students real-world experience, led by Mingjie Lin, College of Engineering & Computer Science
- ◆ Purchase of video cameras, unmanned aerial vehicles for carrying the cameras and a cluster of computers for processing data obtained from the footage to improve research into the areas of motion tracking, behavior recognition and human and anomaly detection, led by Mubarak Shah, College of Engineering & Computer Science
- ◆ A project to create human-controlled robotic “physical-virtual avatars” that can now reproduce a remote human operator’s facial expressions and head movements, led by Professor Greg Welch, Institute for Simulation & Training and College of Engineering & Computer Science



Greg Welch poses with his lifelike avatar.

Photo by Karen Norum

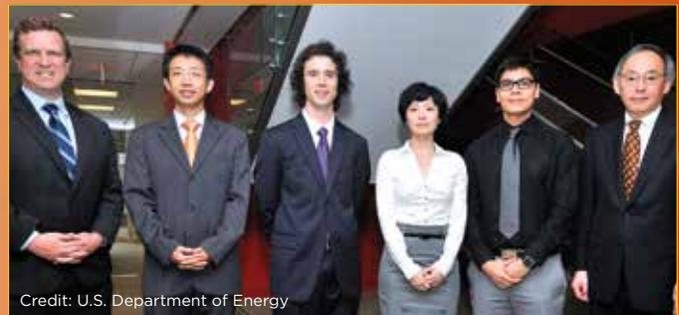
COLLEGE OF ENGINEERING & COMPUTER SCIENCE

Student Team Wins \$100K Prize and Trip to White House

A student entrepreneur team from the College of Engineering & Computer Science won the top prize of \$100,000 and a summer trip to the White House in a competition sponsored by the U.S. Department of Energy.

Mesdi Systems uses electricity to generate uniform droplets for use in high-precision industrial coatings. The company is focusing on large-format batteries used in electric vehicles and grid energy storage.

Although the company did not win the National Clean Energy Business Plan Finals, Founder Brandon Lojewski says the opportunity to meet venture capitalists and question U.S. Secretary of Energy Steven Chu was invaluable. “This has all shown me what I want to do with my life,” says Lojewski, who is completing his master’s degree in mechanical, materials and aerospace engineering.



Credit: U.S. Department of Energy

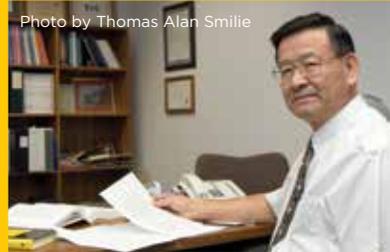
From left, David Danielson from the Department of Energy, Weiwei Deng, College of Engineering & Computer Science, Brandon Lojewski, Cheng Li, post-doctoral researcher, Johan Rodriguez, graduate student, and Steven Chu at the Finals competition in Washington D.C.

The competition, the National Clean Energy Business Plan Finals, gave Mesdi Systems and five other finalists a whirlwind introduction to the complicated world of company formation. “Getting the feedback from investors really opened our eyes,” Lojewski says.

COLLEGE OF HEALTH & PUBLIC AFFAIRS

\$1.6 Million Grant Funds Rural Health Care Study

A \$1.6 million grant from the National Institutes of Health is helping a College Health & Public Affairs (COHPA) researcher guide policy decisions on medical reforms in rural America.



Tom Wan is leading the study on rural health care in eight southern states.

The research focuses on more than 3,800 rural health clinics. The COHPA team is studying Southern states — Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina and Tennessee, which account for approximately 25 percent of all Rural Health Clinics in the country.

“The study is timely,” says Thomas T.H. Wan, an associate dean for research for the College of Health and Public Affairs and one of the lead researchers for the grant. “We lack information on standards and best practices in rural health. It’s critical to have this information as we design and implement ways to reform health care delivery.”

In the US, about 20 percent of all people ages 65 and older live in nonmetropolitan areas. Rural Health Clinics have played an important role in meeting the needs of these adults for more than 30 years. Clinics have increased over the past two decades from 314 in 1990 to 3,846 clinics in 2011, according to UCF’s Judith Ortiz, the other lead researcher for the new study. However, Rural Health Clinics have struggled to keep pace.



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COLLEGE OF MEDICINE

Professors’ Work Helps Detect Crohn’s and Other Bowel Diseases

Blending their research into one effort, two UCF faculty members have created a scientific technique that may help doctors better understand inflammatory bowel diseases.



Saleh Naser, left, and J. Manuel Perez, have found a nanoparticle-based technique to help detect Crohn’s.

Professor Saleh Naser and Associate Professor J. Manuel Perez have developed a nanoparticle-based technique that allows doctors to effectively and quickly detect pathogens that cause Crohn’s and other inflammatory bowel diseases.

The technique, which was published in *PLOS ONE*, builds off of a previous polymerase chain reaction DNA-based technique that Naser and Perez developed, by adding nanosensors labeled with probes that detect and bind themselves to certain bacteria.

Taking advantage of this nanotechnology, Naser hopes that this will help scientists better understand where hard-to-trace diseases, such as Crohn’s disease, come from.

Innovation Initiatives Generate Results

Since 1996, the **Florida High Tech Corridor Council** has generated more than \$1.3 billion in quantifiable downstream impact to the Florida economy and 4,000 new jobs.

The UCF Business Incubation Program (UCFBIP) has had a direct economic impact of more than \$363 million a year since it began in 1999. Every dollar invested by each local government's incubator returns approximately \$5 to invigorate its community.

The Florida Economic Gardening Institute at UCF (GrowFL) has helped to create an estimated \$510 million in annual economic impact. The 550 companies aided by this effort have boosted state and local tax revenues by \$18.7 million beyond the costs of the program. For every dollar invested

by the state, GrowFL returns \$5.50 in economic benefits. More than 3,300 direct, indirect and induced jobs have been created by GrowFL.

The **National Entrepreneur Center** coached and trained more than 12,000 business people and connected with more than 200,000.

The **Office of Technology Transfer** managed 127 intellectual property disclosures, 154 patent applications and 74 issued patents supporting UCF innovation.

The **Venture Lab** provided business counsel to 160 clients, including 40 incubator companies and 39 faculty.



Officials open the ninth location of the UCF Business Incubation Program in Apopka.

Innovation Support

Expanded UCF Business Incubation Program Increases Economic Impact

An updated study of the University of Central Florida's Business Incubation Program (UCFBIP) demonstrates the program's impact on the regional economy, showing a total economic output from client and graduate companies that exceeds \$360 million annually. Since 2009, when the Florida High Tech Corridor Council (FHTCC) originally commissioned a similar study, the UCFBIP has grown to include new facilities around the region that have produced additional jobs and increased the level of employee earnings.

"In the past two years – 2009 through mid-2011 – in the midst of the most severe national and statewide economic downturn in decades, the UCFBIP has proven instrumental in the creation of almost 1,500 new jobs with earnings in excess of \$62 million annually in the metropolitan Orlando region," reported William H. Owen, CRE, president and CEO of the research firm that conducted the study, W. H. Owen Consulting.



UCF Business Incubator Program
incubator.ucf.edu



GrowFL
growfl.com



UCF Venture Lab
venturelab.ucf.edu



UNIVERSITY OF CENTRAL FLORIDA
RESEARCH & COMMERCIALIZATION

UCF Office of Research & Commercialization
research.ucf.edu



UCF Small Business Development Center
bus.ucf.edu/sbdc/



Florida High Tech Corridor Council
floridahightech.com



National Entrepreneur Center
nationalec.org



UNIVERSITY OF CENTRAL FLORIDA
OFFICE OF TECHNOLOGY TRANSFER

UCF Office of Technology Transfer
tt.research.ucf.edu



UCF Spinoff Boosts Economy

A visit to OptiGrate Corporation offers an inside look at how UCF and its technology partnerships are creating jobs, wealth and a high-tech future for Florida.

OptiGrate, a high-tech UCF startup, brought to market the innovative technology of volume Bragg-grating optical filters. The filters are high-end optical components used in many industries including defense, aerospace, telecommunications, and microchip fabrication.

The company, which started in 1999 and has steadily expanded, currently provides 30 jobs with a median salary of \$45,000 a year.

In 2008 the company developed a revolutionary compressor expanding the use of ultra-short laser pulses in materials processing and medical applications. In 2011 OptiGrate was named a “50 Florida Companies to Watch” award winner. In 2012 the company moved to a larger manufacturing facility and was awarded the President’s Award by the Manufacturers Association of Central Florida in the small manufacturer category.

OptiGrate has a unique licensing agreement that gives the company access to the research and development potential of scientists at UCF’s prestigious CREOL, The College of Optics & Photonics. The company is a UCF spinoff, incubated by UCF and now part of the GrowFL program.

Professor Leon Glebov, left, founder of OptiGrate, and his son, Alexai Glebov, president and CEO, show glass that is used to create OptiGrate’s filters.



‘Shark Tank’ Investors Feed on Incubator Alumnus’ App

It was a feeding frenzy on the season-ending episode of ABC’s “Shark Tank” after Phil Dumas, a UCF College of Engineering & Computer Science and Incubation Program alumnus, presented his business concept to five investors on the nationally televised show.

“Shark Tank” features entrepreneurs in need of business capital who pitch their concepts to a panel of wealthy, business-savvy investors (the sharks), hoping they offer investment cash.

All five investors offered deals to Dumas after he skillfully pitched his invention of a keyless door lock that works using a smartphone application.

GrowFL Helps Homegrown Company Prosper

Engineering & Computer Simulations (ECS) co-founder and president Waymon Armstrong took advantage of incubation and innovation program services to grow into a major grant recipient and nationally recognized developer of military training and simulation programs.

The company, housed across the street from the university, is a graduate of the UCF Business Incubation Program and a client of GrowFL.

ECS, founded in 1997, is a leading provider of advanced learning solutions for the Department of Defense, government agencies and commercial clients and has grown to approximately 50 employees with an average salary of \$82,000 per year.

In 2010 ECS received the National Small Business of the Year award because of its commitment to employees, involvement in the community, and customer satisfaction. Through work with the military, ECS became one of the first companies in the world to repurpose commercial video game technology to support education and learning.



Waymon Armstrong, co-founder and president of Engineering & Computer Simulations Inc., is a graduate of UCF's College of Engineering & Computer Science.

FLORIDA SOLAR ENERGY CENTER

FSEC Helps 100 Schools Soak In Power

More than 100 Florida schools are soaking up solar rays to power their buildings thanks to an award-winning program at the Florida Solar Energy Center.

FSEC, a UCF research institute, is providing each school with a 10-kilowatt, solar photovoltaic (PV) system valued at more than \$80,000. These systems allow schools to capture the sun's rays and turn them into energy to help reduce electricity costs. They also serve as generators during a power outage.

The program was selected by the Solar energy Industries Association (SEIA) and the Solar Electric Power Association (SEPA) as an honorable mention in the 2013 PV Project of Distinction Awards for its collective benefit to the community and innovative use of policy and financing.

Each ground-mounted, 1,000-square-foot PV system is capable of providing enough power to run a small appliance like a fridge, overhead lighting or series of electrical outlets.

The systems will reduce energy costs by up to \$1,500 a year and decrease greenhouse gas emissions.

Schools are getting the systems through the SunSmart Schools E-Shelter Program, which was created with a \$10 million stimulus grant. A leader in solar energy research, FSEC is coordinating the program and providing educational materials for teachers to use with students, as well as training for school faculty and staff.

“Florida decision-makers are increasingly pointing to UCF and Central Florida as leading the way today in creating the Florida economy of tomorrow ...



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Florida leaders realize that we need a broader approach to thrive in an increasingly competitive world, and research universities such as UCF can make all the difference.”

– President John C. Hitt
Focus on Excellence Breakfast, November 2012



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The stainless steel mirrored sculpture titled *Axiom, 2011*, hangs in the foyer of the Physical Sciences building opened that same year. The artwork features 118 suspended tetrahedrons that are derived from information distinct to each element in the period table. The piece created by Kristin Jones and Andrew Ginzler, was purchased with funds from the Florida Art in State Buildings program.

Photo by Jason Greene