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The Innovator

Center for Innovation & Entrepreneurship

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Summer 2014

## The Innovator, Volume 3 Issue 5, Summer 2014

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*University of Central Florida*

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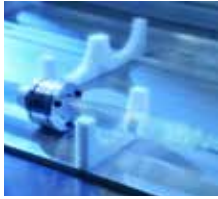
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# THE innovator

A NEWSLETTER SHOWCASING NEWS, HIGHLIGHTS AND PARTNERS INVOLVED IN THE ENTREPRENEURIAL ECOSYSTEM AT THE UNIVERSITY OF CENTRAL FLORIDA



■ VOLUME 3  
■ ISSUE 5  
■ SUMMER 2014

## UCF Consolidates its Innovation and Entrepreneurship Programs

Carving out opportunities has been the cornerstone of UCF's commitment to innovation and entrepreneurial success. Over the past decade, several important and successful initiatives have been built by UCF, thereby contributing to the Central Florida region being recognized as one of the most comprehensive and best-integrated collections of

CONTINUED ON PAGE 4

## New Smart Sensors Research Partnership Aims to Boost Florida in Growing Industry

UCF will partner with Osceola County and the Florida High Tech Corridor Council to establish a state-of-the-art research and incubation facility focused on the next generation of universal smart sensors.

The goal of the Florida Advanced Manufacturing Research Center is to recruit or create the world's first industry-led smart sensor consortium. Formed to make Florida a global leader in a rapidly growing industry, the center will be the home of research aimed at advancing technologies that will shape the future of automobiles, surgical devices, home appliances and a host of other devices.

As these innovations become

ready for the marketplace, the center's partners envision a growth in high-wage jobs for Central Floridians as existing companies expand and new companies move to the region to collaborate with the center's researchers.

"This center holds great potential for becoming another economic game changer for our entire region – and the timing for such an endeavor could hardly be better," said UCF President John C. Hitt.

Sensors allow us to see, hear, touch, taste, and smell beyond our capabilities. Sensors can detect things that we cannot, such as deadly carbon monoxide. They can show how diseases such as cancer and Alzheimer's disease



The world sensors market is projected to reach \$7.8 billion by next year according to Global Industry Analysts Inc.

affect the human body, helping doctors provide more effective drug treatments.

The world smart sensors market is projected to reach \$7.8 billion by next year, according to Global Industry Analysts Inc., and global demand is

CONTINUED ON PAGE 11

## UCF Member of NSF's National Innovation Network UCF Awarded NSF I-Corps Site Grant

UCF has partnered with the National Science Foundation (NSF) to create Florida's first link to one of the agency's hottest new funding and innovation strategies, NSF's I-Corps program

The NSF Innovation Corps, or I-CORPS, is the agency's signature effort to push scientists and engineers outside of their

laboratories and into the marketplace where they can learn first-hand what is required to make products that consumers want. The primary goal of NSF I-Corps is to foster entrepreneurship that will lead to the commercialization of technology that has been supported previously by

CONTINUED ON PAGE 9



I-Corps program executive committee: Ivan Garibay, Cameron Ford, Tom O'Neal, Pallavoor "Vaidy" Vaidyanathan and Oscar Rodriguez. Not pictured, Timothy Kotnour.

## HIGHLIGHTS

- PAGE 2** UCF Receives \$2M for Defense Research, Starter Lab opens
- PAGE 3** UCF Opens Starter Space, New NanoTechnology
- PAGE 5** Cyber defense team takes first place, Reinhart Receives Kappe Award
- PAGE 6** UCFBIP Celebrates 15 Years
- PAGE 7** UCF Innovations Nationally Recognized
- PAGE 10** FAN Invests over \$1 Million in 2013

## UCF Receives Nearly \$2 Million for Defense Research

UCF earned five research grants this week worth nearly \$2 million from the Defense University Research Instrumentation Program, placing UCF among the top three university award recipients in the nation.

Awards totaling \$39.9 million will help 149 university researchers at 84 academic institutions purchase state-of-the-art research equipment, which will benefit science education, medical training and the preparation of troops.

“Our strategy of focusing on research that stimulates the local and state economies has served us very well in competing for these federal awards,” says M.J. Soileau, vice president for Research and Commercialization at UCF. “Our faculty have consistently shown that they can compete with the best and the equipment purchased with these awards will position them even better for future funding. This is particularly important since most contracts and grants are for specific work to be done and have little or no money for purchase of major capital equipment.”

The money coming to UCF will purchase major equipment for projects in the College of Optics and

Photonics (CREOL) and the Institute for Simulation and Training (IST) in partnership with the College of Nursing.

**The CREOL projects include:**

- Professor Martin Richardson will receive \$702,000 from the Army Research Office for equipment to develop an ultrafast, high-energy laser facility that will allow researchers from across the nation to study different areas of laser science in multiple atmospheric environments. The system will be assembled on the UCF campus and then moved to the Townes Innovative Science & Technology Experimental Facility on nearby Merritt Island. He is working with professors Matthieu Baudelet, Lawrence Shah and Magali Durand.

- Professor Kathleen Richardson will receive \$627,000 from the Air Force Office of Scientific Research to purchase an advanced X-ray diffraction system for the development of novel infrared optics; high-power solid-state laser and nuclear detector materials as well as a variety of other material research and education programs largely focused on materials advances critical to the Department of Defense. She is working with professors



Four of UCF's five awards are for research at the College of Optics and Photonics.

Romain Gaume of CREOL and the NanoScience Technology Center, and Yongho Sohn of the Advanced Materials Processing and Analysis Center.

- Professor Sasan Fathpour will receive \$324,000 from the Office of Naval Research for purchase of a plasma-enhanced chemical vapor deposition system that will enable preparation of thin films. He is working with professors Dennis Deppe, Peter Delfyett, Mercedesh Khajavikhan and Winston Schoenfeld.

- Professor Leonid Glebov will receive \$149,000 from the Army Research Office for equipment to capture large-aperture holograms. The work will benefit the Army by allowing creation of Bragg gratings, a

type of optical reflector, that is used in multiple applications.

- Professor Greg Welch from the College of Nursing, IST and the College of Engineering and Computer Science received \$178,000 from the Office of Naval Research to purchase specialized humanoid robots with computer-rendered or rubber “skin” faces that allow the robots to perform as surrogate humans. The work he is conducting, along with professors Arjun Nagendran in IST and Charles Hughes in the College of Engineering and Computer Science, will create an integrated platform for testing and developing these surrogate humans and associated computer graphics and animation to assist in training for the military, healthcare and teaching.

## UCF Starter Lab to Open

The UCF Starter Lab is an inviting environment where emerging innovators and entrepreneurs — also referred to as “starters” — can enjoy a comfortable, open space to develop, explore and collaborate on ideas with peers. Located in room 135 at the College of Business Administration, this 1,500-square-foot area can be easily configured to suit both individuals and large groups.

Art, craft and modeling materials are available for starters to create minimal viable prototypes reflecting their ideas. The lab provides the perfect environment for developing models designed to generate feedback from potential

customers/users, as advocated by the Blackstone LaunchPad entrepreneurship program.

The possibilities and projects generated in this lab are endless. Special thanks to UCF Starter Lab partners the Florida High Tech Corridor Council, Research Assessment and Innovation for Social Enterprise and Mobile Makers.

### Features Include

- Whiteboard tables, boards and walls
- Large outdoor patio
- Surrounding garden with seating for over 60 people
- Spacious design and experimentation area



(From left) Dr. Paul Jarley, Ph.D., dean College of Business Administration; Randy Berridge, president, Florida High Tech Corridor Council; Cameron Ford, Ph.D., director, Center for Entrepreneurial Leadership and Blackstone LaunchPad; Tom O'Neal, Ph.D., associate vice president, Office of Research & Commercialization.

## UCF to Open Start-up Space for Tech Entrepreneurs

The Florida Interactive Entertainment Academy (FIEA), UCF's graduate video game development program, announced plans to open a state-of-the-art digital-media workspace designed to encourage start-up companies.

The new FIEA Ventures program will initially be available to academy alumni and will be housed at UCF's Center for Emerging Media in downtown Orlando. It is expected that some of the first clients to come into FIEA Ventures will be working on video games, animated film, simulation and mobile and web products.

Scheduled to open this fall, the 5,000-square-foot space will provide office and meeting space, a 20-seat theater, mentorships, equipment, and access to technology and expertise. Tenants will also have access to the center's audio, motion capture and film studios, collectively called Studio 500, all at 500 W. Livingston St.

“FIEA's success in developing graduates for high-wage, local industries has increased entrepreneurship, and this new program will place our recent graduates in a perfect atmosphere to start a successful small business,” said FIEA executive director Ben Noel.

Companies and individuals will be selected using an application process in which clients will be asked to detail their concept, technology needs, potential staffing, market prospects and business

plan. If accepted, the applicant can stay in FIEA Ventures for up to one year. In addition, clients will also have access to the center's faculty and staff, who will help with development and access to industry partners.

“As the No.2 ranked graduate school for game development, FIEA is an anchor for the Creative Village,” said Orlando Mayor Buddy Dyer. “Now, with the launch of FIEA Ventures, the University of Central Florida is taking an innovative approach to ensure its talented alumni become Orlando's next generation of successful tech entrepreneurs.”

FIEA Ventures is a part of UCF's Office of Research and Commercialization, which supports economic growth by being a liaison between UCF and local and national economic-development partners.

Other partnerships include UCF's Business Incubation Program, which has grown into one of the biggest and best in the world; the UCF Venture Accelerator, where technology entrepreneurs transform ideas and intellectual property into business plans; the GrowFL program that serves second-stage companies, and the Blackstone LaunchPad, which focuses on student entrepreneurs.

“This innovative facility will boost both UCF's presence downtown and Orlando's vision of a Creative Village in the city's core,” said Tom O'Neal, UCF's associate vice president for Research and



The new FIEA Ventures will be located in UCF's Center For Emerging Media, located in downtown Orlando. The Center already hosts digital media, film and art classes as well as Flying Horse Editions, CityLab, EA Innovations Lab, CREATE, Studio 500 and an MFA program.

Commercialization and director of the UCF Business Incubation Program. “This partnership will be an incubator of ideas and commerce to benefit both the university and the community.”

## New NanoTech May Provide Power Storage in Cables, Clothes

Imagine being able to carry all the juice you needed to power your MP3 player, smartphone and electric car in the fabric of your jacket?

Sounds like science fiction, but it may become a reality thanks to breakthrough technology developed at a UCF research lab.

So far electrical cables are used only to transmit electricity. However, nanotechnology scientist and professor Jayan Thomas and his Ph.D. student Zenan Yu have developed a way to both transmit and store electricity in a single lightweight copper wire.

Their work is the focus of the cover story of the June 30 issue of the material science journal *Advanced Materials* and science magazine *Nature* has published a detailed discussion about this technology in the current issue.

Copper wire is the starting point but eventually, Thomas said, as the technology improves, special fibers could also be developed with nanostructures to conduct and store energy.



UCF Professor Jayan Thomas and his Ph.D. student, Zenan Yu, have developed a way to transmit and store electricity in your pocket.

More immediate applications could be seen in the design and development of electrical vehicles, space-launch vehicles and portable electronic devices. By being able to store and conduct energy on the same wire, heavy, space-consuming batteries could become a thing of the past. It is possible to further miniaturize the electronic devices or the space that

has been previously used for batteries could be used for other purposes. In the case of launch vehicles, that could potentially lighten the load, making launches less costly, Thomas said.

Thomas and his team created a supercapacitor on the outside of the copper wire. Supercapacitors store powerful energy, like that needed to start a vehicle or heavy-construction equipment.

Although more work needs to be done, Thomas said the technique should be transferable to other types of materials. That could lead to specially treated clothing fibers being able to hold enough power for big tasks.

Thomas is a faculty member at the UCF Nanoscience Technology Center with joint appointments in the College of Optics and Photonics (CREOL) and the College of Engineering and Computer Science. He's received media attention over the past few years for his work on lasers and advanced nanomaterials.

## UCF Consolidates its Innovation and Entrepreneurship Programs

FROM PAGE 1

entrepreneurship initiatives in the United States.

These initiatives contributed to Orlando being recognized by Entrepreneur Magazine as having “one of the most highly coordinated entrepreneurial engines in the country” and the most recent news from the National Science Foundation’s I-Corps Sites grant – one of five in the nation and the only university in the state to be awarded, for its best practices and innovation network. These programs have a positive impact on the region’s innovation and entrepreneurs. They have also helped UCF, Central Florida, and the state of Florida, earn a better reputation in terms of the entrepreneurial ecosystem that exists here.

The successful initiatives introduced by the Office of Research and Commercialization (ORC) over the last decade, exemplify UCF’s long-standing commitment to creating opportunities for innovation and entrepreneurial success and manifest the university tagline, “UCF Stands for Opportunity.” These efforts have led to the creation

of the Center for Innovation and Entrepreneurship (UCF CIE).

Collectively the ORC and UCF efforts have enabled the region to become recognized as one of the most comprehensive and best integrated collections of entrepreneurship initiatives worldwide and positively impact its innovation and entrepreneurs. Additionally, these efforts have helped UCF, Central Florida, and the state, earn an outstanding reputation for its contributions to the entrepreneurial ecosystem.

The UCF CIE is a university wide program that consolidates and coordinates UCF’s major innovation and entrepreneurship activities. Its mission is to promote innovation, wealth creation, and the economic vitality of the Central Florida region.

UCF is a catalyst for research that fuels the entrepreneurial activities necessary to introduce exciting and new innovations to society - thus creating opportunities. Access the entry point to a suite of award-winning innovation services at UCF.

Connect at cie.ucf.edu and create your business opportunity!



UNIVERSITY OF CENTRAL FLORIDA  
CENTER FOR INNOVATION & ENTREPRENEURSHIP

PROGRAMS PARTICIPATING IN CIE

Blackstone LaunchPad  
University of Central Florida



UNIVERSITY OF CENTRAL FLORIDA  
VENTURE ACCELERATOR



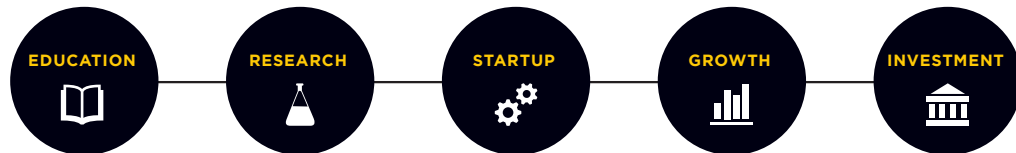
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## CELEBRATE FLORIDA’S ENTREPRENEURIAL SPIRIT

PRESENTED BY GROWFL IN ASSOCIATION WITH THE EDWARD LOWE FOUNDATION



FLORIDA COMPANIES TO WATCH™  
CELEBRATING SECOND-STAGE ENTREPRENEURS

October 23, 2014  
Hard Rock Live in Orlando

In its fourth year of celebrating entrepreneurship, **Florida Companies To Watch**, presented by **GrowFL**, in association with the **Edward Lowe Foundation**, is a distinctive awards program to honor second-stage companies that demonstrate high performance in the marketplace, exhibit innovative products, services or processes, or otherwise make their company “worth watching.”



TICKETS NOW ON SALE AT [FLCTW.GROWFL.COM](http://FLCTW.GROWFL.COM)

## Cyber Defense Team Takes First in Nation, Victory Photo Displayed in Times Square

An eight-member UCF team that started as a grassroots effort to educate the community about cyber attacks and how to defend against them was just named the best cyber defense team in the nation at the Raytheon National Collegiate Cyber Defense Competition. The team placed first edging out the Rochester Institute of Technology, which placed second and the University of Alaska at Fairbanks, which took third.

There is no cash prize, but the UCF team had its photo displayed in Times Square in recognition of its excellence. The students also will be flown in to tour Raytheon’s Government Cyber Operations center near Washington, D.C., this summer.

Raytheon and other organizations interested in enhancing cybersecurity, including U.S. Homeland Security, McAfee, Boeing, Walmart and Amazon, among others, sponsored this year’s competition. The competition, in its ninth year, was organized to help students gain hands-on experience that merges theory and practice, to create awareness about cyber



UCF Cyber Defense Team Celebrates Win at Raytheon National Collegiate Cyber Defense Competition.

defense and to give higher education institutions a way to gauge the effectiveness of their programs.

UCF’s team beat nine other regional winners at the two-day competition in San Antonio, including

the Air Force Academy, the University of California, Berkeley, and Western Washington University. In 2013, the first year the UCF team competed – it took 10th place in the nation.

The team members are Carlos Beltran, Alexander Davis, Kevin DiClemente, Grant Hernandez, Austin Brogle, Jason Cooper, Mark Ignacio and Troy Micka.

On the flight home, instead of celebrating, team members began strategizing for next year’s competition, Nedorost said.

Because of recent cyber attacks against Target and Neiman Marcus, where credit card and other personal information was stolen, to basic risks such as not securing a Wi-Fi connection at home, the team tries to educate the public by dropping the technical jargon and offering tips the average person can use.

The team’s skills and outreach activities are drawing the attention of local industry. Other security professionals, such as Grooveshark, Raytheon, and ProTiviti, have presented to the club this year.

## Reinhart Receives Kappe Award for Environmental Engineering



Debra Reinhart

Debra Reinhart, Pegasus Professor and assistant vice president for the Office of Research and Commercialization, received the 2014 Stanley E. Kappe Award for extraordinary service in advancing public awareness of the betterment of the environment.

Reinhart received her bachelor’s degree in environmental engineering at UCF, where she has served in administrative roles that include executive associate dean of the College of Engineering and Computer Science and interim dean of the NanoScience Technology Center. She has also

worked in the private sector, serving as chief of the research and development division of the Bureau of Pollution Control in Atlanta as well as a consulting engineer for companies in that area.

From 2011–13 Reinhart served as the environmental program manager at the National Science Foundation (NSF) in Washington, D.C., where she reviewed proposals and worked with universities across the country to achieve the agency’s goals. She received her master’s degree and doctorate from the Georgia Institute of Technology, and her research in solid waste management that focused on optimized waste collection and sustainable operation of landfills has been supported by both government agencies and private companies.

She is a co-PI on UCF’s STEAM project, an innovative five-year effort to match UCF scientists and students in the fields of science, technology, engineering and mathematics with student artists to interpret science through art. The project is funded by NSF.

Reinhart has served on numerous professional boards and is a registered professional engineer in Florida and Georgia and a fellow of the American Society of Civil Engineers and the American Association for the Advancement of Science.

The Stanley E. Kappe Award was established to honor the man who served the American Academy of Environmental Engineers and Scientists as executive director from 1971–81.

### UCF Fact Did you know?

- UCF optics researcher Shin-Tson Wu, whose work has significantly advanced the liquid crystal displays used every day on smartphones, computer monitors and television screens, is among six inventors named as the first inductees of the Florida Inventors Hall of Fame.
- *The Intellectual Property Owners (IPO)* recently published a list of the top 100 universities worldwide granted U.S. patents in 2013. UCF made the top 100, ranking 38th.

## UCF's Business Incubation Program Celebrates 15 Years of Growing Businesses and Economy in Central Florida

Approximately 300 entrepreneurs, government officials, and administrators from the University of Central Florida are expected to gather at the UCF Office of Research and Commercialization on October 1, 2014 to celebrate the 15th anniversary of the UCF Business Incubation Program. The milestone celebration will highlight the program's historic contributions to the Central Florida economy, as well as some of the achievements of its startup companies.

The UCF Business Incubation Program was established in October 1999 to help diversify and improve the Central Florida economy by helping accelerate the growth and financial stability of early-stage companies who have the potential to create high-wage jobs within the community.

Since its inception, the UCF Business Incubation Program has helped more than 100 firms reach its maturation point in the incubation

process, and currently assists just shy of 150 startup companies.

In 2013, a regional economic impact study, commissioned by the Florida High Tech Corridor Council, revealed that in a 20-month period, the activities of the current and graduated firms sustained a total of more than 3,350 jobs in Central Florida.

In the same 20-month period, the study also revealed that these companies had a total regional economic output of more than \$18.5 million in state and local tax revenues.

"For me, the most impressive finding was the return on investment," said Thomas O'Neal, Ph.D., executive director of the UCF Business Incubation Program. "The study concluded that during the study period, the UCF Business Incubation Program helped generate a fiscal return of \$6.16 for every \$1 of public investment."

According to Dr. O'Neal, the

study ultimately confirmed the idea he had 15 years ago when he first founded the program, that a focused university-based incubation program can be one of the most effective ways private enterprise can stimulate local economic development, spur job growth and help rebuild the economy.

However, the economy and local startups aren't the only things that have grown over the past 15 years. The UCF Business Incubation Program, originally called the UCF Technology Incubator, has expanded from one facility to an award-winning network of eight incubators located across four counties throughout the Central Florida region.

Today, the UCF Business Incubation Program is an economic development partnership between UCF, the Florida High Tech Corridor Council, the cities of Apopka, Kissimmee, St. Cloud, and Winter Springs, as well as Orange, Osceola, Seminole, and Volusia counties.



### NBIA Names Former UCFBIP Startup Incubator Graduate of the Year



From left: Alexei Glebov, Ph.D., president & CEO of OptiGrate; Jeffrey Schutte, director of sales experience at Turnstone - the award sponsor; Gordon Hogan, director of the UCF Business Incubation Program; Thomas O'Neal, Ph.D., executive director of the UCF Business Incubation Program.

The UCF Office of Research and Commercialization would like to congratulate OptiGrate Corp., who was recently recognized by the National Business Incubation Association as the "2014 Incubator Graduate Company of the Year." OptiGrate, who revolutionized the manufacturing of volume Bragg grating filters, which regulate the wavelength of light transmitted by laser beams, is a graduate company of the UCF Business Incubation Program.

### UCF to Provide Tech Transfer and Commercialization Services to University in Columbia

The UCF Office of Research and Commercialization (ORC) was selected by Universidad Autónoma de Occidente (UAO), a private research university established in Cali Colombia, to provide technology transfer and commercialization services and build capacity of the UAO technology transfer staff. The primary funding for this project came from a US \$3.5 million competitive grant fund established by iNNpuls, the innovation agency of the Colombia national government, for Colombian institutions to use to work with an international university partner to strengthen their technology transfer capacities.

UCF ORC staff will be working with UAO technology transfer and entrepreneur staff and selected researchers to develop commercialization plans for 8 technologies developed by UAO and available for licensing. In addition, UAO technology transfer leadership will be trained in UCF ORC programs, methods, and process for technology commercialization. At the end of the program, a final presentation on project outcomes and recommendations will be given to UAO and iNNpuls governing personnel.



Representatives from UCF's ORC meet with a delegation from UAO in Colombia to explore tech transfer and commercialization services.

## UCF Science Innovations Nationally Recognized

Two UCF scientists have earned national awards due to their innovative early-stage technologies. Their inventions will benefit both the fueling of future commercial spacecraft and the efficiency of solar panels.

*TechConnect World* selected UCF engineering professors Sudipta Seal and Neelkanth Dhere as winners of the 2014 TechConnect National Innovation Awards. The organization is the world's largest multidisciplinary, multisector conference and marketplace of vetted innovations, innovators, and technology business developers and funders. Winners were selected for the potential positive impact their technology will have on a specific industry sector.

Awardees from Harvard University, the Lawrence Livermore National Laboratory, King Saud University and the Korea Institute of Industrial Technology were also among the 67 winners named. The award winners were recognized at the National Innovation Summit and Showcase, which took place June 15-18 in Washington, D.C.

Seal, director of both the Advanced Materials Processing and Analysis Center and the NanoScience Technology Center, was recognized for his work in nanotechnology. Dhere, a professor at UCF's Florida Solar Energy Center, earned the award for his work in solar power.

Seal and his team found a way to engineer

nanoparticles that grow within solid and liquid substances used for propellants in collaboration. These propellants are used to fuel commercial space launch vehicles and government satellite launches. It's an industry that makes an estimated \$1 billion to \$2 billion annually. By having nanoparticles grow within the substances, Seal can make the propellants more efficient and less expensive to produce. Co-inventors include former UCF engineering professor Eric Petersen, now a professor of engineering at Texas A&M University, and UCF graduate students David Reid and Robert Draper.

"This is great news," Seal says. "This technology has many applications, including opening up the field of polymer composites."

Dhere and his team of graduate students developed a new way to prepare absorber films for photovoltaic solar panels, making them more efficient and less expensive. Dhere's method includes a new process for using the metal organic compound diethyl selenium. The new approach is also safer than the traditional route used in the industry, Dhere says. The novel process can be easily calibrated to large-scale panels, which utility companies can then use to generate power from sunlight. This power is then fed into the electrical grid to provide energy to homes around the country. Starting next year, Dhere predicts that electricity produced from photovoltaics

will cost less than electricity from natural gas, which will increase demand in solar panels, making his team's findings even more important.



Sudipta Seal, one of two UCF winners of the 2014 TechConnect National Innovation Awards, and his team have engineered a more efficient and less expensive way to produce propellants.



Solar Panels developed by Neelkanth Dhere, a professor at UCF's Florida Solar Energy Center, and his team of graduate students are safer, more efficient and less expensive.

### Clean Tech Innovation Could Mean Big Savings for Fleet Owners

A Florida-based company, in partnership with UCF researchers, has developed an innovative technology that will reduce fossil fuel usage in commercial trucks, potentially saving fleet owners more than \$2 million a year while reducing carbon emissions into the atmosphere.

Professor Thomas Wu and his research team from the College of Engineering & Computer Science and researchers from MagLev Energy Inc. (MEI) invented the motor/generator technology and accompanying electronics that power an all-electric Auxiliary Power Unit (APU).

The unique design enables the device, appropriately called

Silent NightT, to operate without generating harmful emissions like fossil-fuel powered APUs.

MEI partnered with truck manufacturer Peterbilt for early-stage testing on a fleet vehicle owned by Walmart. Peterbilt found the device performed far better than existing APUs, said Jon Harms, Maglev president and CEO.

No-idle regulations in many jurisdictions throughout the country require commercial drivers to shut off their engines for meals, deliveries and mandatory rest stops.

Current models are estimated to save a trucker between \$45 and \$48 per day, and up to \$15,000 annually. With nearly zero maintenance and no need for fossil fuel, a 6,000-truck fleet

using the Silent NightT could save more than \$2 million per year.

The device is still in the prototype stage and MEI officials expect to sell the product in limited quantities by year end and full production by mid-2015.

The work was funded by MEI and the Florida High Tech Corridor Council Matching Grants Research Program. Silent NightT uses highly efficient lithium ion batteries together with a proprietary high-efficiency motor design to cycle through an industry-leading 10 hours of air conditioning (at 10,000 BTU's) or heat, said Harms. In addition, the APU can also power up to 2,500 watts of power simultaneously - enough for lights and a small



From left, Maglev Chief Financial Officer Martin Epstein and UCF College of Engineering & Computer Science Professors Louis Chow and Thomas Wu with research equipment.

television or computer and other amenities. The system recharges when the truck is operating.

MagLev and UCF are developing the technology for use in other clean-energy applications. Visit maglev-energy.com for more information.

## UCF Blackstone LaunchPad Sheds Light on Student's Entrepreneurial Success with Quarterwear

The Blackstone LaunchPad at UCF, located in the Student Union on the main campus, is a program that encourages entrepreneurial activity and thinking through services such as one-on-one coaching and daily startup seminars and workshops. With over 635 student starters and more than 544 ventures on record, student Oluwafunlola Falade is one of the LaunchPad's many success stories.

Falade won this year's Business Plan Competition and the 11th Annual Joust Business Plan Competition. His winnings earned him \$13,000 in cash prizes along with \$55,000 in essential business services. Quarterwear, his winning business proposal, is a crowd-funded platform

that sells trendy clothing while giving a portion of its proceeds to charity.

Falade is extremely passionate about his work at the LaunchPad, inspiring others with his infectious enthusiasm. As a student fellow, he coaches startups, is involved in marketing communications and promotes the LaunchPad's initiatives through the use of social media. "We have the best team. My team is truly dedicated to helping students out and launching ventures," Falade says.

The College of Business Administration provides high-quality academic programs designed to give students a competitive advantage in the world of business. The college establishes partnerships with some of



From left: Jonathan A. Kennedy, '94 & '96, of Natus; Julie Gaines of LSQ Funding; Oluwafunlola Falade; Jeffrey Adler of Silver Fox Capital Group, LLC; Andrew Fore, III, '76 & '83, of Alvarez & Marsal; Dr. Cameron Ford, director of the Center for Entrepreneurial Leadership/Blackstone LaunchPad at UCF.

the nation's most innovative leaders to model new and best practices that harness evolving technology. In addition, the college promotes a unique culture of engagement, risk-

taking, cross-disciplinary collaboration and data-driven decision-making in an effort to ensure students are well prepared to enter a dynamic marketplace.

## UCF Member of NSF's National Innovation Network

FROM PAGE 1

NSF-funded research.

"We are going to be teaching people how to be entrepreneurs," said Tom O'Neal, associate vice president for the Office of Research & Commercialization and I-Corps Site Executive Program Director. "Our strategy is to increase the number of successful spin-out companies based on research and innovation."

UCF has one of the nation's best innovation and entrepreneurial networks and the \$300,000 NSF I-CORPS funding will enable it to reach even more potential inventors and innovators, with a goal of recruiting and training 96 entrepreneurial teams that could result in 96 new companies in three years. The new program will offer \$3,000 to 32 teams annually to be used as early development seed money to turn their entrepreneurial ideas into potentially viable companies. Development of prototypes, customer research and travel to meetings

with potential customers would all be acceptable expenses, said Ivan Garibay, researcher at the Center for Innovation and Entrepreneurship and I-Corps Site Program Director.

Teams will consist of an entrepreneurial lead (who could be a student), an industry mentor, and an academic lead (typically a faculty member).

UCF is one of 15 universities nationwide that is leading an I-CORPS site. NSF has also established five regional I-Corps centers, or nodes, located in such innovation hotspots as Washington DC, New York City, Michigan, San Francisco and Massachusetts.

By utilizing a group of experienced advisors to mentor and coach the selected teams, the NSF is counting on cultivating more qualified applicants for larger funding awards, such as the \$50,000 offered by the NSF I-Corps Teams program, and up to \$1.4M in awards from the NSF SBIR program

The I-CORPS program, which will be housed at UCF's newly established Center for Innovation and Entrepreneurship (CIE), is developing a

new generation of entrepreneurs and increasing the economic impact of fundamental research by combining a method for company creation that has proven successful in Silicon Valley with hands-on coaching and feedback from consumers.

A selected group of teams will be participating in a fall pilot program called the Lean LaunchPad Bootcamp. UCF students and faculty, who are interested in participating in the bootcamp can submit an application found on the website: icorps.cie.ucf.edu.

The CIE is the collective home for UCF's existing entrepreneurship programs and will be an integral part of both the identification of potential team members and the follow-up mentoring and coaching activities. A specific goal of UCF's I-CORPS program is to increase the numbers of women and underrepresented minorities involved in starting companies.

Application information is available at by contacting Ivan Garibay(ivan.garibay@ucf.edu; tel: 407-882-1163).

## UCF-Based Research Fuels \$100K Win for Central Florida Entrepreneur HySense Technology Gas-Leak Technology Places First at CAT5 Competition



HySense Technology CEO Nahid Mohajeri and production manager Monica Kowalczyk accept the grand prize check of \$100,000 for placing first in the CAT5 Awards at the Innovation Concourse of the Southeast 2014 in Orlando.

A UCF spinoff company received the \$100,000 first-place award at the CAT5 Awards at the Innovation Concourse of the Southeast: Manufacturing and Safety event in Orlando. The company took the top prize from a pool of more than 80 technology-based companies.

HySense Technology, founded by UCF Florida Solar Energy Center researcher Nahid Mohajeri, develops and produces an intelligent tape that changes color in the presence of hydrogen and other gases. "This is real validation, just the fact that people, the judges, believe in us," Mohajeri said.

Mohajeri developed technology to detect hydrogen leaks wherever it is stored or transported as part of a \$10 million grant from NASA's Kennedy Space Center. Her company later licensed the technology from UCF. HySense is marketing a specialty beige tape that turns black when hydrogen is detected. It can be wrapped around

or attached to surfaces where gas might leak.

Mohajeri has five customers so far, and is aiming for \$90,000 in total revenue this year. "To have an awards program like this in Central Florida is huge," she added. "As scientists, we are very much aware that low wages are an issue in the region. But these awards can bring more high-paying jobs here. When people see that we have this level of support, that makes a difference."

The CAT5 Awards is hosted by Space Florida and UCF. It showcases tech companies in the Southeast that attracts additional venture funding for Florida's entrepreneurs. "The CAT5 Awards support the idea that technology businesses are a key component to the enhancement of Florida's future innovation-based economic growth," said Tom O'Neal, associate vice president of Research and Commercialization at UCF. "HySense is a clear example of innovation-based economic growth."

### UCF Fact Did you know?

- Technology developed jointly by UCF and NASA has just been internationally recognized as one of the most technologically significant products to enter the marketplace last year by the R&D 100 Awards. The advanced safety solution, known as Intelligigment™, was made available to the commercial market last year through HySense Technology – a company founded by one of the UCF researchers and technology inventors.
- In just eight weeks a team of grad students at UCF pioneered a prosthetic that costs \$350. Aerospace engineering student Albert Manero (Fulbright Scholar) led the team that was made for 6 year-old, Alex Pring – offering a new "bionic" arm and hand. The team made the device, using a 3-D printer and off-the-shelf gears and batteries. Blueprints for the arm are posted online for all to use.

## UCF BMC Winner to Compete at IBMC

The annual Business Model Competition (BMC), presented by the Blackstone LaunchPad at UCF, took place in February as winner Oluwafunlola Falade received a \$3,000 cash prize, and automatic entry into the International Business Model Competition (IBMC) hosted by Brigham Young University. The BMC was sponsored by Nperspective – CFO Services and DigiThinkIT.

"I thought that Falade's presentation was great," stated Center for Entrepreneurial Leadership director and BMC sponsor, Cameron Ford. "It exemplified the benefits of exploring one's business ideas by

speaking with potential users. He was able to fail his way toward success quickly, inexpensively, and with little risk other than a few bruises to his ego. He now seems positioned to explore his proposal in greater depth with a few lead users, and we hope his efforts lead to a successful new venture."

The purpose of the International Business Model Competition is to devise a new way of thinking regarding entrepreneurship. The IBMC takes a novel approach; instead of focusing on the outputs of entrepreneurship they place a higher importance on the inputs: developing



Oluwafunlola Falade at the 11th Annual Joust Business Plan Competition.

and improving business models through deep customer interaction. Thousands of international student

teams compete each year for their chance to win up to \$25,000 to aid them in pursuing their business venture.

Powered by the UCF College of Business Administration, the UCF Blackstone LaunchPad is an innovative program that treats entrepreneurship as a viable career path. The program teaches students how to transform their ideas into thriving businesses. By connecting entrepreneurs with mentors, experts and resources, the program provides the advice, counsel and network necessary to get their ideas off the ground.

## FAN Invests over \$1 Million in 2013

The UCF Florida Angel Nexus is in the business of streamlining Florida's investment process. In 2013 FAN was able to exceed its substantial investment goal of \$1 million dollars, investing in promising early-stage Florida companies.

### What FAN Accomplished in 2013

In 2013 FAN had a busy year closing the deal on three exciting early-stage companies within the growing technology industry. FAN's largest investment, Azzly, delivers web-based patient care and revenue management services to small and mid-sized doctors offices and health care providers. Azzly won 2013's best pitch at the Florida Venture Forum 2013 Early stage Venture Capital Conference, and Workforce Solution's inaugural Research & Technology Award.



Another innovative organization that FAN teamed with in 2013 is flexReceipts. The ecofriendly company is a consumer and vendor online receipt management system that eliminates the need for paper receipts. The product also offers analytic data on customer buying patterns, and

provides direct marketing options. flexReceipts is also in the process of developing their mobile application for consumer use.

ConvergTV became another exciting investment in 2013 for FAN. A UCF Business Incubation Program participant, ConvergTV offers consumers the ability to choose customizable television content, available on virtually every type of viewing device. The content is created by independent producers seeking to monetize their quality content through ConvergTV. The company is in the process of partnering with mobile video aggregate Vidora, which will allow ConvergTV to offer live and on-demand programming on mobile devices.

### Where Does FAN See Themselves in 2014?

Already in 2014 FAN is working on closing two investments, with Kairos and SPIRIT. Kairos is a facial recognition API and product, while SPIRIT is a juvenile justice ERP platform. In addition to these two potential investments, Mevesi business analytics for pharmacy use, a strong possible investment, is in due diligence.

FAN will continue the establishment and development of FAN chapters. These chapters seek to increase collaboration among investors and entrepreneurs to reduce redundancies and inefficiencies in the investment process.

The successes and ventures of 2013 will continue to be pursued in 2014; FAN will continue to expand their syndication support including, their network of entrepreneurs, investors, mentors, and other connections. Additionally FAN would like to continue to build their portfolio, raising follow-on capital.

### Join the FAN network

Early-stage companies that have revenue and aggressive plans to scale can learn more and apply to FAN through its website. Once a company begins the application process, they can potentially gain access to the UCF Mentor Network. FAN's advisors and community partners can also help companies:

- research their markets
- refine their plans
- align pro forma financials
- define their financial/intellectual capital needs
- perfect their pitch
- develop a cohesive presentation to potential investors and/or strategic partners.

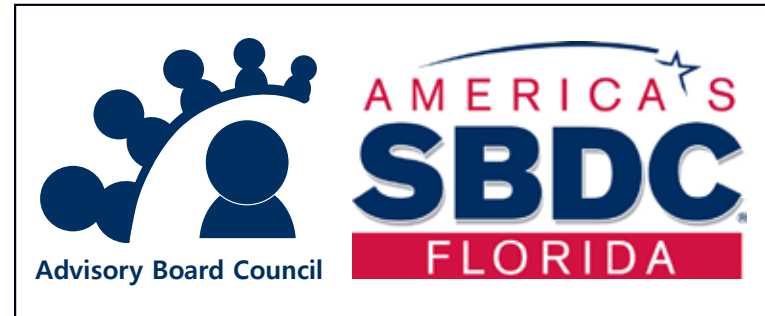
In addition to qualified scalable companies, FAN is seeking accredited investors, mentors, and investment groups. For more information visit FloridaAngelNexus.com, email info@FloridaAngelNexus.com or call 407-716-8563.

## Florida SBDC at UCF's Advisory Board Council Program Volunteer Experts Helping Businesses Grow

Entrepreneurs and small business owners are challenged every day with hard choices, unfamiliar situations and difficult decisions just running their companies. Finding the time and expert assistance to think strategically, consult with industry and subject matter experts and plan for the future too often takes a back seat to putting out the daily fires.

To assist these hard pressed business leaders with finding the time and help they need to work "on" the business, not just "in" it, the FSBDC at UCF launched the Advisory Board Council (ABC) program in 2003. For the past eleven years, the ABC program has been helping established business owners better understand their opportunities and grow their companies to the next level of success.

The FSBDC at UCF's Advisory Board Council is an economic development program that operates within the Florida Small Business Development Center at UCF and is funded in part by Orange County Government. The program is a no-cost professional advisory service for qualified companies. By acting as a matchmaker between businesses and volunteer advisors, all of whom are professionals in Central Florida, the Advisory Board Council program acts to positively impact local businesses through revenue growth



and job creation. Businesses have also benefitted by identifying ways to improve operations, marketing, and financial management; reduce costs; and implement leadership development and succession planning strategies, among other significant initiatives.

Since its launch, the ABC has assisted more than 150 companies, deploying more than 500 advisors who have volunteered their time for a total of almost 28,000 hours. Establishing an advisory board for an FSBDC at UCF client is as much an art as it is a science. After completing and submitting an application, the client meets with Jill Kaufman, the program manager, who learns of the company's challenges and explains the program. She then hand picks volunteers from a group of local industry and business professionals to make up the board. After an orientation period, the FSBDC at UCF client and his/her board meet on a regular, usually quarterly, basis and work together to

chart a course and put together an action plan to address the companies needs and help it grow its business.

The companies that have participated in the program rave about the benefits they have gained from their Advisory Boards. Here is what two of them have said:

"Our Advisory Board from the SBDC at UCF has been invaluable," said Joe Sefcik, co-founder of Employment Technologies Corporation (ETC), a pioneer and the world's #1 developer of employment simulations. "Their input, consulting and coaching have helped us make important decisions and chart the direction of the company. Having these objective, external experts put 100% of their focus on our business allows us to better benchmark our performance and guide our thinking. We are grateful for the support we have received from our Advisory Board."

"I would recommend the Advisory Board Council to any entrepreneur that is ready to realize

their vision," remarked Yanet Herrero, President of Kings Service Solutions, a fast growing Central Florida building maintenance company. "The process will transform your business culture and inevitably your business success. We learned how to make the organization's mission and vision come alive and become part of the company culture," explained Yanet. "Among the biggest benefits coming out of the board's recommendations included improved financial management, HR policies, quality control and risk management. I started with an idea for what my business could be and by the end of the term in the ABC program it was so much more than I expected," said Yanet. "The Advisory Board Council program gave me the tools to attain what I wanted for our company."

For business owners looking for assistance with growing their company, the Advisory Board Council is the answer. It is a next-level, business support service, assisting established Orange County businesses by matching them with experienced business professionals with a diverse range of skills who work together on a "custom-fit" advisory board. For more information, please contact Jill Kaufman, the ABC program manager, at jkaufman@ucf.edu or 407-420-4850.

## UCF Blackstone LaunchPad Generates Astounding Student Impact

Established in 2008 at the University of Miami, the Blackstone LaunchPad is a national model that fosters entrepreneurship through higher education. This program encourages entrepreneurial activity and thinking among students of all disciplines, faculty and even alumni with the purpose of creating a new generation of business people who can contribute to the recovery of the economy.

The UCF Blackstone LaunchPad, established in September 2013 and located in the Student Union on the main campus, is available to all UCF students, regardless of major, and provides free coaching tailored to the needs of each student. Additional services include: daily startup seminars and workshops, just-in-time resources, and access to a mentor network and subject-matter experts.

The vision for the LaunchPad is to present UCF students with entrepreneurship as a viable career path and empower students with the skills and knowledge necessary to become successful business leaders. Supporting students who are working towards creating new business ventures is also part of this vision.

"Central Florida is an ideal region for a Blackstone LaunchPad," states Cameron Ford, director of both the Center for Entrepreneurial Leadership and the Blackstone LaunchPad. "This is due in large part to our growing entrepreneurial ecosystem, where talent is abundant and a strong set of mature support services are already in place."

For more information, visit [ucf.thelaunchpad.org](http://ucf.thelaunchpad.org)

### Blackstone LaunchPad University of Central Florida

The LaunchPad's numbers are astounding. In the span of just two academic semesters, the UCF Blackstone LaunchPad has:

- Whiteboard tables, boards and walls
- Held 710 coaching sessions;
- Attained 635 student starters
- Recorded more than 544 student ventures

## New Smart Sensors Research Partnership Aims to Boost Florida in Growing Industry

FROM PAGE 1

expected to increase dramatically in the years to come.

"We've asked ourselves for years what comes next after Medical City and it's this infrastructure project," said Rick Weddle, president and CEO of the Orlando Economic Development Commission – a partner in the new center — and current

president of the International Association of Science Parks and Areas of Innovation. "This is how the communities of the future are being built and this is what technology-led economic development is all about."

The center will be built on 20 acres owned by Osceola County near the intersection of U.S. 192 and Florida's Turnpike, across U.S. 192 from Osceola Heritage Park.

The Osceola County Commission on

Monday evening approved a memorandum of understanding with UCF and the Florida High Tech Corridor Council. Osceola County committed to investing \$61 million for design, construction and equipment costs associated with the 100,000-square-foot center. UCF will lease the building for \$1 a year for 30 years and will operate the center.

# Central Florida International Trade Office is Open

## Central Florida International Trade Office Dedicated to Assisting in Global Trade

Companies looking to engage in international trade in Central Florida now have a central place to connect to tools, information and local resources regarding importing and exporting. The National Entrepreneur Center (NEC) is home to the newly formed Central Florida International Trade Office (CFITO) which received \$65,000 from both Orange County government and JP Morgan Chase to establish the office. The CFITO now provides a single location to coordinate inquiries and access information pertaining to international trade in Central Florida.

International trade plays a major role in the economy of metro Orlando and the greater Central Florida region. As of August 2013, the state's total merchandise trade exceeded \$105 billion, and Orlando, which is centrally located between the ports of Tampa Bay and Port Canaveral, represents an ideal location for those interested in importing or



Central Florida dignitaries cut the ribbon to celebrate the official grand opening of the Central Florida International Trade office in March.

exporting goods and services. By streamlining access to existing resources, providing connections, and highlighting the region's infrastructure, the CFITO can provide local companies with an easy way to explore international trade opportunities.

"The goal of this new initiative is to accelerate international trade as our region's economy continues to grow," says Mayor Teresa Jacobs. "The creation of the CFITO will enable companies in Orange County to tap into key trading markets and expand their

export endeavors."

"Small businesses keep our local economies moving forward and global competitiveness is key to bolstering their success," says Michael Dosal, market manager and president for Chase Bank in Central Florida.

Currently, the office is working to identify and create a database of active importers and exporters located throughout the Central Florida region, which includes Orange, Osceola, Seminole, Volusia, Brevard, and Lake counties. By identifying and connecting with these companies, the CFITO can develop programs and training and provide events to address the needs and challenges experienced by local international trade companies

The CFITO is located within the National Entrepreneur Center at 3201 East Colonial Drive, Suite A20 in Orlando. For more information, visit [cfito.org](http://cfito.org) or call 407-420-4848.

# UCF Receives Florida's Only Air Force Equipment Award

## Research Technology to Enable Fast Optical Communications

A UCF optics researcher has received the state of Florida's only equipment award from the U.S. Air Force's Defense University Research Instrumentation Program.

Axel Schülzgen, a professor in the College of Optics and Photonics (CREOL), and his colleagues were awarded \$870,000 to purchase equipment that will create the glass preforms necessary for producing fiber optics.

Optical fibers are the backbone of most telecommunications systems, transporting vast amounts of data via the Internet and telephone connections, fueling a multibillion global industry.

With the new equipment, Schülzgen and his team will be able to make their own preforms — cylindrical chunks of glass — the

raw material for fiber-optic cable.

Preforms, which the researchers currently purchase for as much as \$30,000 each, are fed into the furnace of a fiber draw tower where the molten glass is ultimately stretched into the fibers integral to creating fiber optics.

The fiber draw tower was customized and installed at UCF shortly after Schülzgen's arrival in 2009. The tower is something typically found in large industry labs, which makes its access to CREOL students even more important, providing them the ability to learn the state-of-the-art methodology on real-world equipment.

"With this addition to our tower, we will have a one-stop shop for creating fiber optics here at

UCF," Schülzgen says.

After the fibers are created they are jacketed, wrapped in bundles and used to carry data across oceans and continents. This is the technology that enables fast optical communications through a globally connected Internet.

The award provided for the purchase of a modified chemical vapor deposition lathe system, which will allow the college to produce a wider variety of fibers and participate in more specialty research.

CREOL will complete construction of a new facility in the Central Florida Research Park to hold the new lathe system by September.

For more information, visit [research.ucf.edu](http://research.ucf.edu).



UCF CREOL students learn state-of-the-art methodology on real-world equipment, customized for Dr. Schülzgen and his team.

# Optics and Photonics Professor, Peter Delfyett Receives Medalist Award

Peter Delfyett, a professor of optics in UCF's College of Optics and Photonics, recently won the Florida Academy of Sciences 2014 Medalist Award for his outstanding contributions toward the advancement of science.

The award was announced at the 78th Florida Academy of Sciences meeting at Indian River State College last month. Delfyett was unable to attend the meeting, so he was presented the award during Optics Day at UCF by Dave Karlen of the Environmental Protection Commission of Hillsborough County and the president of the academy, and Dr. Sanjay Sesodia from Barry University presented the award to Delfyett, along with M.J. Soileau, vice president for the Office of Research and Commercialization and the founding director of CREOL, and Bahaa Saleh, dean of the College of Optics and Photonics.

Delfyett, who has been at UCF since 1993, has appointments in UCF's electrical engineering and physics departments, and holds the titles of trustee chair and Pegasus Professor, the highest academic honor a UCF faculty member can receive.

"Our group pursues research in the

development of very fast photonic technologies that have applications in fiber optic communication and signal processing," Delfyett said.

Some of the research he has worked on at UCF includes developing semiconductor diode-based lasers that produce the world's shortest pulses and the world's highest power from a laser diode, and generating an optical timing signal that is the most accurate ever generated from a laser diode.

The professor has been granted 36 patents and recently has been researching lasers that produce many colors simultaneously, which could be used in laser-based radar, optical communications, optical search engines and other processes.

Some of his patents were licensed to a startup company, Raydiance, which uses lasers for advanced manufacturing techniques in making fuel injectors and stents for arteries to help maintain blood flow.

Delfyett is the second UCF researcher to receive the academy's Medalist Award. Christian Clausen, who has been a chemistry professor at UCF since 1977, won the award in 2003. He and his colleagues develop environmentally friendly materials and synthesize catalytic agents that help



UCF researcher presented with Florida Academy of Sciences Medalist award during Optics Day - from left, David Karlen, M.J. Soileau, honoree Peter Delfyett, Sanjay Sesodia, and Bahaa Saleh.

destroy toxic materials.

"I appreciate the Florida Academy of Sciences recognition because it recognizes what we do here every day at the College of Optics and Photonics — CREOL — share a love of science with a new generation and, at the same time, impact the development of Florida's high-tech economy," Delfyett said.

# UCF VP Honored for Economic Development Efforts



M.J. Soileau Received Chairman's Award from Orlando Economic Development Commission

The Metro Orlando Economic Development Commission (EDC) recently honored a UCF vice president who developed a leading research institute and shaped the intellectual infrastructure needed to attract top faculty, students and industry to the region.

M.J. Soileau, the first director

of the now internationally recognized Center for Research and Education in Optics and Lasers (CREOL), now serves as vice president for UCF's Office of Research and Commercialization. He received the Chairman's Award at the EDC's annual awards dinner on April 3.

The Chairman's Award, first presented in 2007, recognizes a long-term contributor to the work of the Orlando EDC.

Soileau is laser focused on what he considers to be the fundamental missions of a research university, which includes serving as a hub for intellectual pursuit and coupling research expertise to the economic needs of the region.

Under Soileau's leadership, research funding earned by UCF faculty

members has increased to more than \$100 million annually for each of the past nine years. As a result, UCF now ranks among the world's top universities for patents earned by faculty members.

Soileau also helped guide the UCF Business Incubation Program since its founding in 1999. The National Business Incubation Association named the program National Incubator Network of the Year in 2013.

"M.J.'s intelligence, tenacity and passion have helped our university grow into one of the nation's major metropolitan research universities and, more important, have helped UCF make major contributions to the economic growth and diversity of the Central Florida region," said President

John C. Hitt.

Soileau arrived at UCF in 1987 and has served as a vice president since 1999. He received his Ph.D. in electrical engineering/quantum electronics from the University of Southern California and also holds an M.S. in physics and optics from the University of Utah and a B.S. in astronomy and physics from Louisiana State University. He has received multiple awards and recognitions, including the Gold Medal of the Society from the International Society for Optics and Photonics and the Esther Hoffman Beller Medal by The Optical Society. In 2011, the Institute of Photonic Sciences in Barcelona, Spain named him the first recipient of the Distinguished Service Appreciation Medal.



## World Leader in LCD Research Selected for National Award

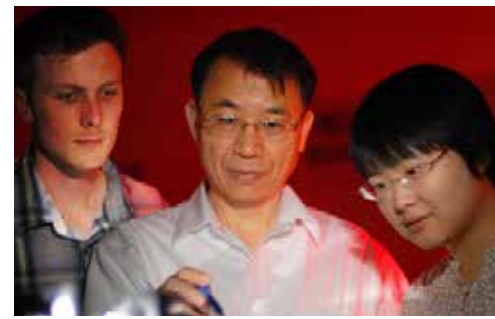
A world-renowned UCF optics researcher, who specializes in liquid crystal displays and is among the university's top patent generators, is being recognized again by the nation's premier optics society.

Shin-Tson Wu, Pegasus Professor of optics, has been selected to receive the Esther Hoffman Beller Medal from The Optical Society (OSA) for his broad and significant impact to academia and industry in photonics education. Wu and his liquid crystal displays lab team conduct research that is leading to increasingly lifelike flat-screen displays.

Wu has received nearly 80 U.S. patents for his work, both at UCF and at a research lab in California, and has been instrumental in the development of displays that are brighter, more energy efficient and both bigger and smaller than ever. In 2010 he

received the OSA's Joseph Fraunhofer Award/Robert M. Burley Prize; in 2011 he received the Slottow-Owaki Prize from the Society of Information Display (SID); and in 2008 he received the G.G. Stokes Award from the International Society for Optics and Photonics and the SID Jan Rajchman Prize.

"Dr. Wu is an extraordinary example of the influence one exceptional faculty member can have on an industry," says Bahaa Saleh, dean of UCF's College of Optics and Photonics. Saleh, who is also a recipient of the Esther Hoffman Beller Medal, said the international recognition such awards generate helps the college continue to attract highly regarded faculty and talented students, which in turn generates funding and innovative technology. M.J. Soileau, founding director of the Center for



Shin-Tson Wu, who specializes in the science behind liquid crystal displays, has received multiple national and international awards for his work.

Research and Education in Optics and Lasers and current vice president for the Office of Research and Commercialization, also received the honor. Wu will receive the award at the OSA's annual meeting in Tucson, Arizona, in October.

Your organization or company can join UCF in making an economic impact by sponsoring research, collaborating with our researchers, taking advantage of our licensing opportunities, assisting in the formation of start-up companies, and commercializing products that can solve today's pressing problems. The OTT helps you harness the power of discoveries made at UCF.

### AT A GLANCE: FY 2013

	Provisional	U.S. Utility	Foreign	Total
Patent Applications Filed	77	120	47	244
Patents Issued	n/a	71	6	77
Total No. of Patents Issued*	n/a	619	86	705

\*Cumulative first patent issued to UCF in 1989

### Services Provided to UCF Faculty, Students, and Staff

- Management of intellectual property
- Strategic transfer of inventions to marketplace
- Negotiations of partnership agreements
- Formation of spinout companies
- Educational outreach in technology commercialization & entrepreneurship

## Nanotech Leads to Breakthrough in Stealth Technology

Controlling and bending light around an object so it appears invisible to the naked eye is the theory behind fictional invisibility cloaks.

It may seem easy in movies, but it is difficult to create in real life because no material in nature has the properties needed to bend light in such a way. Scientists have created artificial nanostructures called metamaterials that can do the job, but the challenge has been making enough of them to turn science fiction into a practical reality.

UCF Assistant Professor Debashis Chanda may have just cracked that barrier, however. The cover story in the March edition of the journal *Advanced Optical Materials* explains how Chanda and fellow optical and nanotech experts were able to develop a larger swath of multilayer 3-D metamaterial operating in the visible spectral range. They accomplished this feat by using nanotransfer printing, which can potentially be engineered to modify the surrounding refractive index needed for controlling propagation of light.

"Such large-area fabrication of metamaterials following a simple printing technique will enable realization of novel devices based on engineered optical responses at the nanoscale," says Chanda.

The nanotransfer printing technique creates metal/dielectric composite films, which are stacked together in a 3-D architecture with nanoscale patterns for operation in the visible spectral range. Control of electromagnetic resonances over the 3-D space by structural manipulation allows precise control over propagation of light. Following this technique, larger pieces of this special material can be created, which were previously limited to micron-scale size.

By improving the technique, the team hopes to be able to create larger pieces of the material with engineered optical properties, making it practical to produce for real-life device applications. For example, the team could develop large-area metamaterial absorbers, which would enable fighter jets to remain invisible from detection systems.

Other members of the research



UCF Researcher Chanda and fellow optical and nanotech experts developed breakthrough technology by using nanotransfer printing, which can potentially be engineered to modify the surrounding refractive index needed to control propagation of light - making objects seem invisible.

team include Li Gao, Youngmin Kim, Kazuki Shigeta, Steven Hartanto and John Rogers from the University of Illinois at Urbana-Champaign; Abraham Vasquez-Guardado and Daniel Franklin from UCF; Christopher Progler from Photonics; and Gregory Bogart from the Sandia National Laboratories.

Chanda joined UCF in Fall 2012 from the University of Illinois at Urbana-Champaign, and holds joint appointments with the NanoScience Technology Center and

the College of Optics and Photonics. He has published multiple articles on light-matter interactions and metamaterials and is a reviewer for multiple journals in his field. In recognition of his pioneering works, Chanda was awarded a Department of Energy solar innovation award and a Natural Sciences and Engineering Research Council award, among others. He also earned a National Science Foundation Summer Institute fellowship in 2013.

## UCF Researchers Meet with Legislators to Encourage Congressional Support for Photonics

### Initiative Promotes Photonics Vital Role in Economic Growth, National Security

Representatives from the University of Central Florida (UCF) were among volunteers in industry and research labs from 16 states who visited dozens of Congressional offices urging support for legislation to continue the advancement of photonics research. Photonics plays a crucial role in innovation, economic growth, competitiveness and bolstering national security. Seventy-one percent of UCF's annual Center for Research and Education in Optics (CREOL) budget is derived from federal funding. Robert Bernath, Business Development manager, Bahaa Saleh, dean of UCF's Center for Research and Education in Optics and Lasers, College of Optics and Photonics (CREOL COP) and student Amy Van Newkirk, represented the university in Washington D.C. in March. The team's primary mission was to stress the importance of maintaining a certain level of federal funding to ensure CREOL remains a leading research institute.

The visits were organized by the National Photonics Initiative (NPI). Nearly 200 representatives from across the country attended the Science-Engineering-Technology Working Group (SETWG) Congressional Visits Day. The team from UCF met with six Senators and House members, Senator Marco Rubio (staffers), Senator Bill Nelson, Representative Alan Grayson (staffers), Representative Patrick Murphy (staffers),

Representative John Mica, and Representative Bill Posey to emphasize the critical need for federal funding for science research and to encourage them to re-authorize bills which provide financial support for advanced manufacturing and optics research.

#### NPI volunteers in general encouraged:

- The bipartisan Revitalize American Manufacturing and Innovation Act of 2013 (RAMI), to establish manufacturing institutes known as the Network for Manufacturing Innovation (NMI); the institutes would function through a public-private partnership between the federal government, local governments, universities, research institutes and industry to accelerate manufacturing innovation in technologies with commercial applications.
- Reauthorization of the bi-partisan America COMPETES Act (originally passed in 2007 and expired in December 2013) to ensure American competitiveness in the global marketplace, and adding language specifying photonics to reflect the industry's critical role in the ongoing innovation of many other sectors.
- Establishment of a National Photonics Prototyping and Advance Manufacturing Facility within the Department of Defense's manufacturing mandate, possibly through inclusion of language in the National Defense Authorization Act (NDAA); establishment of such a facility could produce



The UCF team included Dean Bahaa Saleh, graduate student Amy Van Newkirk, and Robert Bernath (Office of Research & Commercialization).

critical defense applications for warfighters, as well as drive new generations of high-tech commercial applications such as a more secure Internet, enhance medical diagnostics, and portable sources of renewable energy.

"UCF's CREOL has been instrumental in developing many new and innovative uses for Photonics, many of which have much grander impact than have yet been considered," said MJ Soileau, vice president for Research and Commercialization and the founding director of CREOL. "The USA must continue to lead in photonics research and innovation - which has demonstrated benefits for economic growth and national security. Ongoing funding is really a necessity. Hopefully, the legislators agree."

# Florida Companies To Watch Celebrates Entrepreneurship

Second-stage companies provide jobs, economic development, and innovation. Florida Companies To Watch provides national recognition and “Rock Star Status” to these businesses through an annual awards program.

GrowFL and the University of Central Florida in association with the Edward Lowe Foundation, as well as sponsors Cherry Bekaert, Wells Fargo, Florida High Tech Corridor, OUC, Carlton Fields, Jordan Burt, Filmscape Productions, At LARGE Inc., Suntrust, Moneycorp, Edwards Financial Services, and Fifth Third Bank make this awards program possible.

Companies To Watch is a unique awards program that honors second-stage companies that demonstrate high performance in the marketplace, exhibit innovative products or processes, or otherwise make those companies “worth watching.”

“Being selected for the Florida Companies To Watch awards program provides growing businesses the credibility and recognition that distinguish them among their competitors. In Florida, they account for 5 percent of the companies and nearly 30 percent of the jobs,” said Tom O’Neal, executive director of the



2013 Florida Companies to Watch award winners.

Florida Economic Gardening Institute and associate vice president for the UCF’s Office of Research and Commercialization.

Fifty companies from around the state will comprise the winning class of 2014 and join an esteemed group of 150 Florida alumni honored since 2011. A previous winner includes 21st Century Learning Solutions, based out of Seminole County.

“When GrowFL first informed us we were one of the winners, we knew we had reached a major growth stage,” said Victoria Rath, CEO of 21st Century Learning Solutions. “Our mission is to create innovative, and media rich online course content that appeals to many different learning styles and is transferable across multiple delivery

methods and formats. Since winning the 2013 Florida Companies to Watch award, we have tripled our list of clients as well as started conversations with several companies to participate as a subcontractor on government contracts.”

Award winners are selected by a panel of judges representing areas of economic development, banking, entrepreneurship and small business, based on evidence of fast and/or high growth in employment rates and revenue.

Florida Companies To Watch Winners will be given the rock star treatment on October 23, 2014 at the Hard Rock Live in Orlando, FL. Tickets are now on sale at [flctw.growfl.com](http://flctw.growfl.com).

## Engineering Leadership & Innovation Institute at UCF (eli<sup>2</sup>)

**...Because Engineering Leaders Aren’t Born...They’re Developed**

Developing tomorrow’s talent today is crucial for the sustainability and growth of advanced technology, engineered systems and global solutions. Private industry, government agencies, academic institutions and professional organizations share a common need for bright and gifted engineering and computer technology leaders. The Engineering Leadership & Innovation Institute at UCF (eli<sup>2</sup>) was born out of recognizing a gap in providing adequate resources and tools to develop tomorrow’s industry leaders.

eli<sup>2</sup> provides students with lifelong engagement to support and cultivate engineering and

computer science students at every level (undergraduates, new professionals, mid-level managers and executives). The overall mission of the program aims to help students discover their burning desire while boosting their confidence to create, innovate, collaborate and deliver world-changing solutions.

The eli<sup>2</sup> program is supported by key strategic partnerships with top tier corporations including:

- Duke Energy
- Texas Instruments
- Harris
- NASA
- Lockheed Martin
- Siemens

- Walt Disney World

Success is achieved when the transformation process takes the undergraduate engineer through steps to reach and earn an executive level position. As their leadership journey continues, project and technical managers receive ongoing mentoring and training from eli<sup>2</sup>, which complement internal corporate development programs for executive leadership development. Financial support from Progress Energy (now Duke Energy) helped launch eli<sup>2</sup> in 2008. They continue to fund and support the program today.

### The Innovator Publication Information

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