Clean Energy News

UNIVERSITY OF SOUTH FLORIDA

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KEY CERC RESEARCH

- *Photovoltaic Thin Film*
- *Photocatalytic Detoxification and Disinfection*
- *Solar Thermal Power*
- *Hydrogen Production and Storage*
- *Combined Power/ Cooling Thermodynamic Cycle*
- *Rectenna Solar Energy Conversion*
- *Biomass and Biofuels*
- *Carbon Capture and Sequestration*

INSIDE THIS ISSUE

Technology Translates: Jobs

Florida Governor Rick Scott met with business, political and education leaders at USF in December during a tour of new technologies and to assess the economic potential of university research to create jobs. Looking at the best and brightest inventions USF has generated in the last few years, Scott heard an overview of dozens of state-of-the art research projects, business development and entrepreneurial services, during his statewide jobs tour.

The governor toured a large collection of emerging technologies in the atrium of USF Connect (an incubator for spin-off companies created by USF researchers and other high-tech start-ups), surveying presentations on drug development, marine science technologies, equipment for people with disabilities, and emerging solar energy technology.

Governor Rick Scott greets CERC graduate student Michael Celestin.

The CERC and FESC displayed ground breaking research into rectenna-based solar energy harvesting, photocatalytic detoxification and disinfection, and concentrated solar power generation.

Scott, who won office on a pro-business and job-creation platform, also met with area education, business and political leaders in a town hall-style format to discuss the state's economic recovery. Scott maintains that his 7-step business plan to invigorate the State's economy includes teaming up universities more with the private sector. Scott is determined to keep his campaign pledge of creating 700,000 jobs in 7 years.

Media interviewed Gov. Rick Scott while touring the Research Park.

Scott's advocacy for entrepreneurship echoes a central theme of USF President Judy Genshaft's decade-long administration: research universities are key economic engines and harbor the expertise, innovation and creativity to create new industries.

Gov. Rick Scott and USF President Judy Genshaft discussed teaming up universities with industry.

"USF works as an economic engine for work sites producing new jobs and companies, President Judy Genshaft said. Many of the new technologies have already created jobs. "This is phenomenal," she said.

Scott vows to lower regulatory barriers hindering businesses coming to FL, reduce the size of state government & aggressively position FL nationally & internationally as a good place to do business.

Tampa Bay Solar Tour

Tampa Bay's sunshine has a lot of uses … and making electricity out of sunbeams excited the public during the October "Tampa Bay Solar Tour" hosted by the CERC. This is the second year that CERC has hosted the Tampa Bay's leg of the National Tour of Solar Homes of the American Solar Energy Society. The annual tour is held in conjunction with National Energy Awareness Month.

This year's self-guided tour offered flexibility for the community to view the volunteer exhibitor's solar energy systems. Home locations ranged from Tampa, to Plant City, to Land-o-Lakes, to St. Petersburg to Apollo Beach.

The solar tour offered an opportunity to tour innovative green homes and buildings to see how ordinary people can use solar energy, energy efficiency, and other sustainable technologies to reduce monthly utility bills and help tackle climate change. A focus of the tour is on energy-saving techniques and sustainability through building design, energy efficient appliances, and use of green materials during remodeling.

Now in its 15th year the ASES National Solar Tour is the world's largest grassroots solar event. More than 160,000 participants visited some 5,500 buildings in 3,200 communities across the U.S.

Jon Butts of "Eco-Farm" in Plant City embraces sustainable living. The organic garden generates its electricity and hot water from the sun. The sun powers the farm's refrigerator, fertilizer injection pump, oven, dehydrator, golf carts, electric bikes, and a truck.

Eco-Farm's thin film PV panels.

CERC graduate student Rudy Ratnadurai (L) explains the on-campus charging station to solar tour attendees. The station generates 20,000 watts of solar electricity from its PV array.

"The nation that leads the clean energy economy will be the nation that leads the global economy; and America must be that nation."

US President Barack Obama

Teach-In

Clean Energy Man breezed in to the 2010 Great American Teach-In, visiting students at Cox Elementary School in Pasco County during November. In its 17th year, the Teach-In continues to surprise, delight and educate students with its wide array of topics. As part of the event, CERC's Kofi Dalrymple as Clean Energy Man made an exciting presentation including a homemade solar oven. Other presentations included fire and police officers, a pilot, a news reporter, and a therapy dog. "We were looking for a way to get adults and kids to come over and observe all the cool CERC stuff. 'CEM' embodies both the coolness and intellectual genius of our work," reflected Dalrymple. "He leaves a strong mental image, especially for children. Everyone keeps talking about clean energy as the way of the future, but when 'CEM' shows up, people just seem to get it!"

Honors, Awards, Activities

FACULTY

- Invention: CERC affiliate faculty and Physics professor Dr. Xiaomei Jiang's research has produced the smallest working organic solar cells that generate electricity on see-thru glass. The spray-on organic photovoltaic coating which remains transparent when applied onto glass is a significant breakthrough. This first-ever technology will help combat escalating energy costs and concerns over the environment. Her invention was unveiled in September and was successfully transferred to industry.

- Achievement: FESC affiliate faculty Matthias Batzill of Physics won an Outstanding Research Achievement Award from the USF during the October "Research One Week".

- Best Paper: CERC post-doctoral fellow Dr. Sarada Kuravi and colleague Dr. Sesha Srinivasan of Tuskegee University won Best Paper for "Effect of Nb_2O_5 on the Hydrogen Storage Characteristics of Li-nMg-B-N-H Complex Hydrides" at the 2010 International Conference on Engineering and Meta -Engineering (ICEME) in Orlando during the Spring.

STUDENTS

- Graduated: CERC graduate student Huijuan Chen earned her Ph.D. degree in Chemical Engineering for her research into "The Conversion of Low-grade Heat into Power using Supercritical Rankine Cycles." Dr. Chen has already netted employment with GE in New York State.

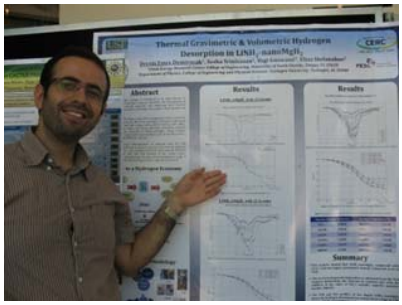
- REU Winners Honored: CERC-sponsored Anthony D'Angelo was among other successful College of Engineering Research Experience for Undergraduates (COE REU) winners honored at a reception at the Library of Congress in October. D'Angelo's work "Advanced Hydride Materials for Hydrogen Storage" won the 2009 REU award. The reception was co-sponsored by the Council on Undergraduate Research and the National Conferences on Undergraduate Research.

Research One

Celebrating USF's interdisciplinary research, the annual *Research One Week* was held in October highlighting the projects of faculty, staff and student researchers, scientists, scholars and inventors. The over-arching theme was "Tracking the Spill" referring to the impact of the Gulf Oil spill and the pivotal role of USF Marine scientists. CERC and FESC graduate students made poster presentations of their clean energy research at the IDRB Galleria.

CERC graduate student Kofi Dalrymple won Honorable Mention for his poster "The Application of the Fermi Function and the Weibull Distribution for Modeling Survival and Resistance of *E. coli* to Photocatalytic Disinfection." Dalrymple was awarded a $100 travel grant in October. His advisors are Lee Stefanakos and Yogi Goswami.

During "Research One Week", CERC graduate student Dervis Demirocak presented his research on "Thermal Gravimetric and Volumetric Hydrogen Desorption in $LiNH_2$-nanoMgH_2"



Clean Energy Symposia

- Dr. Sunity Sharma of Ameratek Corp. (Santa Clara, California) presented "Decorative Metallic Coatings to Printing Circuits" in October.

- Dr. D.K. Aswal of Bhabha Atomic Research Center (Mumbai, India) presented "Hybrid Nanoelectronics" during the Summer.

Visitors

CERC affiliate scientist Dr. Sesha Scrinivasan explained our hydrogen storage systems research to scientists from Qubic and Future Engines interested in advanced novel materials, during a visit to CERC this Summer. Qubic and Future Engines are developers and marketers of ground-breaking renewable energy products and consulting services.

CERC affiliate scientist Dr. Sesha Srinivasan (L) illuminates a sample for Eric McCall of Future Engines, and Shawn Okum of Qubic.

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CERC

Community Awareness

- Energy, environment and economics … that's what the "E3 Fall Forum: The Art of Sustainability" was about, held in September at the Straz Center for Performing Arts in Tampa. For the second consecutive year, CERC displayed at the E3. This regional forum on local initiatives looks at sustainability, building, alternative fuels and energy management.

CERC graduate students Rudy Ratnadurai and Saeb Besarati (C-R) explain our research.

- Raising on-campus awareness about sustainability, the USF Office of Sustainability and the Student Environmental Association co-hosted a public awareness day with the theme of energy and oil independence in October. Held at the Marshall Center Amphitheater, the CERC displayed a variety of solar powered toys and information flyers.

CERC graduate student Kofi Dalyrmple talks about solar energy to students.

Thermal Energy Heats Up Dynamic Research

Enhanced phase change material (PCM) capsules will be key to cost efficient thermal energy storage (TES). CERC will produce encapsulated PCM capsules of different sizes and melting ranges for use in several energy storage applications, such as space heating and cooling, solar cooking, solar water heating, industrial process heat, greenhouse and waste heat recovery systems.

CERC's research, "Innovative Latent Thermal Energy Storage System for Concentrating Solar Power Plants," won the coveted European E.ON Award for 2010, during a ceremony held in Berlin, Germany in September. PI Yogi Goswami is partnering with researcher Manuel Romeo from Spain's IMDEA Energia in Madrid. E.ON's generous awards for international ground-breaking energy research included $800K to CERC, which furthers the science of capturing latent heat for use in generating power.

(L-R) Ranga Yogeshwar of E.ON presents the 2010 E.ON Research Award to co-PIs Dr. Manuel Romero (2nd from the left) and Dr. Yogi Goswami (far right).

The E.ON Research Award supports outstanding projects worldwide which develop future technologies in the field of energy. This year's winners include five research teams from Europe and the USA who submitted proposals on the topic of "Heat Storage for Concentrating Solar Power". Concentrating solar power (CSP) technology can be used to focus the sun's rays to generate heat and electricity. CSP plants combined with heat storage can produce climate friendly electricity around the clock.

The award ceremony was held on "Energy Day", the climax of the 2010 Science Year, as part of a joint event organized by E.ON and the German Federal Ministry of Education and Research. Representatives from politics, science and industry took part in a panel discussion on the issue of solar power. Dr. Georg Schütte, State Secretary at the Federal Ministry of Education and Research, and Prof. Klaus-Dieter Maubach, member of the E.ON Board of Management, made the presentations.

MEDIA SPOTLIGHTS CLEAN ENERGY

"Concentrated Solar Power Plant Coming to USF."
http://www.youtube.com/watch?v=AyII_sTmDkQ
and http://cerc.eng.usf.edu/

"A Whole New Meaning to the Sunshine State." College of Engineering Newsletter *EnVision* November issue.
http://www2.eng.usf.edu/about/docs/fall_enVision_2010_low.pdf