

Clean Energy News

University of South Florida

NUMBER 9

SPRING 2012



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

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Revenge of the Electric Car

USF's Patel School of Global Sustainability and public television channel, WEDU, hosted a special screening of "The Revenge of the Electric Car" as part of the "Community Cinema" event in March, at the Patel Center.

The film's director, Chris Paine, took his crew behind the closed doors of Nissan, GM, and the Silicon Valley start-up company Tesla Motors to chronicle the story of the global resurgence of electric cars.

Without using foreign oil, this new generation of car seems to be America's future. Still, daunting obstacles persist, like battery life and driving range limits, production costs and consumer friendly pricing. Additionally the consumer infrastructure of charging stations has not been

built, making long trips problematic.

A panel discussion followed the film, moderated by Dr. Christian Wells, director of the USF Office of Sustainability. CERC Director Prof. Lee Stefanakos provided thought provoking comments to the panelists following the screening.

Dr. Stefanakos expressed his view that the present production of electric cars by three major companies is a very important development and will contribute significantly to the widespread use of electric cars.

However, Dr. Stefanakos also pointed out that considerable additional research and development is still needed in battery technology and battery capacity in order to increase the vehicle

range to a point comparable to that of internal combustion cars. Important developments must also take place in Electric Vehicle (EV) charging and charging station infrastructure.

"The high cost of EVs must also be reduced, something that may happen as the production of EVs increases," Dr. Stefanakos said.

WEDU
Join Us for an Exclusive Screening
REVENGE OF THE ELECTRIC CAR
YOU CAN'T KILL AN IDEA WHOSE TIME HAS COME.
On the Top Ten from **Critic's Pick**
"fascinating, a hugely entertaining portrait!"
Wednesday, March 21st
5:30 pm @ Patel Center for Global Solutions
USF - 4202 East Fowler Ave., CGS101
Join the panel discussion following the film. Moderated by:
Dr. E. Christian Wells
This event is FREE, but due to limited seating reservations are required.
Visit wedu.org/events/community-cinema
or call 813-254-9338 x 2241 to register.

WEDU
CINEMA
USF
UNIVERSITY OF SOUTH FLORIDA

Solar Carport Renovated

Thin film photo-voltaic technology has the promise to change the horizon for solar.

This second generation of photo-voltaics creates a very portable solar panel

The original CERC PV array car port was the nation's first 20,000 watt solar/electric charging station for electric vehicles. During the Spring, half of the system was renovated with new thin film PV modules to provide an additional 10kW of electricity to be tied to the USF utility grid.

An award from the USF Student Green Energy Fees and TECO matching funds made the project possible. CERC professors Zhixin Miao, Lee Stefanakos oversaw the renovation.

(Top) A workman installing new PV modules;

(Bottom) New thin film PV modules atop the CERC's electric car port charging station, located adjacent to the Engineering buildings.



Outstanding Dissertation

USF CERC recent Ph.D. graduate Dr. Huijuan Chen was awarded the USF 2011 Outstanding Thesis and Dissertation (OTD) Award, at the USF Scholars of Excellence "Scholarship and Leadership in Action" ceremony during April.



(L-R) USF President Dr. Judy Genshaft presents the OTD award to Dr. Huijuan Chen, in April.

The OTD Award recognizes graduate alumni whose research exemplifies the highest quality. The award recognizes those USF graduates who have demonstrated exceptional performance and whose thesis or dissertation has resulted in significant impact to the discipline at the national level.

Dr. Chen's dissertation is entitled "The Conversion of Low Grade Heat into Power Using Supercritical Rankine Cycles." Chen graduated from the Dept. of Chemical and Biomedical Engineering in November 2010. Dr. Chen currently works for GE in Schenectady, New York.

Honors, Awards, Activities

- CERC co-director Yogi Goswami was named a Fellow of the American Assoc. for the Advancement of Science (AAAS), in Washington, in March. AAAS Fellows are recognized for contributions and efforts on behalf of the advancement of science, or, that its applications are scientifically or socially distinguished.
- CERC affiliate faculty, Prof. Babu Joseph won the USF 2010-2011 Outstanding Undergraduate Teaching Award. President Judy Genshaft presented the award during the Awards Banquet in February.
- Yogi Goswami was awarded the USF 2011 College of Engineering Outstanding Research Achievement Award. President Judy Genshaft presented the award during the Awards Banquet in February.
- CERC affiliate professor Dr. Wilifredo Moreo coordinated meetings and presentations for academic collaboration with faculty from the Universite Nacional, Bototá, Colombia, in April. Yogi Goswami gave a presentation and tour of the CERC laboratories.
- CERC Ph.D. student Jamie Trahan gave a talk and lab tour to students from Bradenton's Bayshore High School "Women in Science and Engineering" (WISE) group in May. Trahan explained the RE research conducted at the CERC.
- Two students working with CERC affiliate faculty Prof. Babu Joseph have won awards:
 - Ali Gardezi received the 2012 Outstanding Graduate Student Research Assistant Award from the Chem'l + Biomed. department Advisory Board. Gardezi also placed as a Finalist in the 2012 US DOE-sponsored "MegaWatt Ventures."
 - Justin Stottlemeyer won 3rd place at the 2012 AIChE regional conference at Clemson University in South Carolina, for his presentation "Density Functional Theory Studies of Co Catalysts and Reaction Mechanisms for Fischer-Tropsch Synthesis".

Solar Tree at the Zoo

A solar tree has taken root at the Lowery Park Zoo. A collaboration between Tampa Electric (TECO) Energy, Lowry Park Zoo and CERC director Prof. Lee Stefanakos has given rise to the innovatively fueled "solar tree" kiosk.

The kiosk acts as a portal to several information categories at the zoo. The homepage has links to exhibits across the zoo. One page links to the power collection stations at the Elephant Exhibit, the Solar Tree, and several TECO power solar arrays located in Tampa.



The solar tree is a work in progress, said William Dobson of RBK Architects in Tampa.

"The tree is designed on the concept of the sun's energy being absorbed by the leaves of trees in the process of photosynthesis," Dobson said.

Each one of the "branches" uses a single solar PV panel located on its end which collects 5 watts of power. The direct current voltage is collected in tandem with 26 other PV panels through each of the electrical conduit "branches", for a total output of 52 watts of power.



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“Engineering Expo 39”

Tampa Electric’s (TECO) Big Bend Power station held young engineers attention at the College of Engineering’s 39th Engineering EXPO in February. Though coal-fired, Big Bend meets strict environmental regulations through the use of flue gas desulfurization systems, which remove sulfur dioxide produced when coal is burned.



This year’s Expo theme was “Imagine Your Future.” The Expo is free and open to everyone, young or old, with an interest in science, technology, engineering and math. The popular event draws thousands of K-12 students and their teachers to learn how engineering and science play a big part of their everyday lives.

CERC’s Master’s graduate Drupatie Latchman, who now works for TECO Energy, described Big Bend for the children.

Latchman graduated in 2010 from Chem. & Biomedical Engineering. Her thesis is entitled “Carbon Dioxide Capture from Fossil Fuel Power Plants Using Dolomite.”

International Scholars

- **Myriam Solis Lopez:** Ms. Solis Lopez is spending six months with the CERC investigating photocatalysts in water purification. Her home university is the Universidad Nacional Autónoma de México (UNAM), in Mexico City, Mexico.
- **Yuichi Tomazawa:** Dr. Tomazawa is spending six months with CERC developing micro-sized valves in the microfluidic channel for electrochemical detection of cortisol from human blood. He obtained his Ph.D. in materials science from the Japan Advanced Institute of Science and Technology (JAIST), in Kanazawa City, Japan.
- **Thi Minh Huynh Thu Nguyen:** Mrs. Nguyen spent a month with CERC continuing her Ph.D. studies which center on renewable energy technologies. Her home university is the Keio University in Yokohama, Japan. She returned to Viet Nam after her time with CERC.
- **International Recruitment:** In February, the USF’s Media Innovation Team interviewed CERC’s Prof. Yogi Goswami in the laboratory as part of a public outreach film to encourage and recruit students from around the world. Dr. Goswami spoke about CERC’s research into clean & renewable energies.



Clean Energy Symposia

- February: Dr. Rahul Singhal, of the University of Puerto Rico, gave a seminar on “Biofuels: Some Limitations.” He addressed some limitations for the production and commercialization of biofuels as a renewable and sustainable energy sources.
- March: Dr. Elham B. Makram, of the Electric Power Research Association at Clemson University, Clemson SC, gave a seminar on “Coastal Wind Energy Impact on South Carolina Transmission System.” She discussed the power transmission system of South Carolina and the effect of wind energy penetration on the grid.
- May: Dr. Mohammad Abutayeh, of NextEra Energy Resources, Juno Beach, FL, gave a seminar on “Solar Power Generation.” He discussed how such renewable energy can be generated directly via photovoltaic cells or indirectly via concentrating solar power systems (CSP); noting that CSP systems can be directly integrated into existing power plants.