## APPENDIX A – DESCRIPTION OF RESEARCH PROJECTS

| Projects | Summary |
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| **THRUST 1: Overarching** | |
| | **Title:** *Power Generation Expansion Portfolio Planning to Satisfy Florida's Growing Electricity Demands*<br>**PI:** Tapas Das, **Co-PI**: Ralph Fehr - USF<br>**Description**: The objectives of the proposed research include: 1) developing a comprehensive generation technology based portfolio optimization methodology, 2) developing carbon revenue redistribution strategies to achieve goals of emissions control policies (cap-and-trade), and 3) develop educational resources to enhance training of scientific workforce for the state of Florida. The research will directly address three major challenges: fulfillment of the growing power demand, meeting the emissions control targets, and supply of technology workforce. The potential economic impact of the proposed research on the State of Florida is expected to be very high, since an energy-secure environment is a basic necessity to support the current trend of explosive growth both in industry and human resources.<br>**Budget:** $71,906<br>**External Collaborator:** Argonne National Lab |
| | **Title:** Joint Optimization of Urban Energy-Water Systems in Florida (Thrust 2: Efficiency) |
| | **Title:** Combined Cooling, Heat, Power, and Biofuel from Biomass and Solid Waste (Thrust 3: Biomass) |
| | **Title:** Design, Construction, and Operation of CSP Solar Thermal Power Plants in Florida (Thrust 4: Solar) |
| | **Title:** Development of High Throughput CIGS Manufacturing Process (Thrust 4: Solar) |
| | **Title:** Solar Photovoltaic Manufacturing Facility (Thrust 4: Solar) |
| | **Title:** Research to Improve Photovoltaic Cell Efficiency (Thrust 4: Solar) |
| | **Title:** An Integrated Sustainable Transportation System (Thrust 4: Solar) |
| | **Title:** PV Energy Conversion and System Integration (Thrust 4: Solar) |
| | **Title:** Integrated PV/Storage and PV/Storage/Lighting Systems (Thrust 4: Solar) |
| | **Title:** Reliable and Resilient Electrical Energy Transmission and Delivery Systems (Thrust 7: Storage & Delivery) |
| | **Title:** Secure Energy Systems – Vision and Architecture for Analysis and Design (Thrust 7: Storage & Delivery) |
| **THRUST 2: Enhancing Energy Efficiency and Conservation** | |
| | **Title:** Innovative Proton Conducting Membranes for Fuel Cell Applications<br>**PI:** Ongi Englander, **Co-PIs:** Anant Paravastu, Subramanian Ramakrishnian - FSU<br>**Description:** This project was initiated in January 2009 as an interdisciplinary effort among Englander (Mechanical Engineering), Paravastu (Chemical and Biomedical Engineering) and Ramakrishnan (Chemical and Biomedical Engineering). The work was divided into two main tasks: (1) the fabrication and characterization of silica and latex-supported membranes, and (2) the incorporation of protein nanomaterials inside the silica membranes. Three female students have participated and contributed to the project (see below). Two of the students (Holley and Kissoon) have received/will receive MS degrees in Materials Science. Two of the students (Kissoon and Witherspoon) belong to underrepresented groups.<br>**Budget:** $30,000<br>***This project has been completed*** |
| | **Title:** Sustainably Integrated Advanced Building Subsystems (OGZEB)<br>**PI:** A. "Yulu" Krothapalli, **Co-PI:** Justin Kramer - FSU |

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| | **Description:** This project focused on the development of building subsystems that minimize the use of natural resources and carbon-based energy in Florida while also using materials that are renewable and sustainable. A key component of this project was the Off-Grid Zero Emissions Building, which allowed for the testing of these subsystems. This team forms the engineering team participating in the Team Florida's Solar Decathlon Competition. Lessons learned from the Off-Grid Zero Emission Building are incorporated into Team Florida's design. This project is complete.<br>**Budget:** $503,168<br>***This project has been completed*** |
| | **Title:** Insight into Membrane Degradation Mechanisms Through Verification of Chemical and Mechanical Degradation Test Capabilities<br>**PI:** Darlene Slattery, **Co-PIs**: Len Bonville, Marianne Rodgers - UCF/FSEC<br>**Description:** The objectives of the program were to gain insight into fuel cell membrane degradation mechanisms including both chemical and mechanical degradations. In order to achieve this objective, the Membrane Electrode Assembly Durability Test System, MEADS, was verified, after which chemical degradation tests were conducted. By performing post mechanical testing and analyzing the data, the impact of accelerated degradation tests on the cell performance decay, chemical decomposition and mechanical weakening of the membranes were evaluated. This project is complete.<br>**Budget:** $351,518<br>***This project has been completed*** |
| | **Title:** Energy Efficient Building Technologies and Zero Energy Homes<br>**PI:** R. Vieira, **Co-PIs:** P. Fairey, J. Sonne - UCF/FSEC<br>**Description:** The project consists of two elements: 1) the construction of two flexible research homes at FSEC to conduct research on advanced building energy efficiency technologies under controlled conditions; and 2) a staged, field retrofit study in a small number of unoccupied homes to measure and document the effectiveness of a series of retrofit measures that can be deployed using current technology. The project will also conduct an annual meeting where other FESC participants, other university members and utility, industry, the U.S. Department of Energy and other stake holders who will be briefed on plans and progress. Inputs from meeting participants will be sought.<br>**Budget:** $1,224,000 |
| | **Title:** Joint Optimization of Urban Energy-Water Systems in Florida<br>**PI:** James P. Heaney - UF<br>**Description:** Urban water infrastructure systems for providing water supply, collecting and treating wastewater, collecting and managing stormwater, and reusing wastewater and stormwater require major energy inputs. End users of the water require even more energy to heat this water for showers and baths, clothes washing, cooking and other uses. Increasingly, cities will rely on alternative water supplies such as desalination that require much more energy per gallon of water produced. Conservation is the ideal way to save energy and water by managing the demand for these precious commodities. Major strides have been made in reducing indoor water use from about 75 gallons per person per day to as low as 40 gallons per person per day. However, these gains are being offset by concurrent increases in outdoor water use for irrigation that range from 30 to 300 gallons per person per day depending on irrigation practices and the size of the landscape. From a water use perspective, perhaps the greatest challenge will be the expected growing competition for water if certain energy options are implemented in order to reduce our current dependence on foreign oil. Several recent national studies warn of this impending energy-water crisis. This project will build on our extensive experience in evaluating urban water conservation options to include the implications for energy use and to develop integrated energy-water management systems that are |

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| | compatible.<br>**Budget: $72,000** Back to Thrust 1: Overarching |
| | **Title:** Planning Grant: High Performance and Low Cost Fuel Cells for Future Vehicles<br>**PI:** Jim Zheng, **Co-PIs:** Richard Liang, Chuck Zhang, Ben Wang - FSU<br>**Description:** The objective of this project is to provide an innovative approach to revolution of current energy storage and conversion technology and greatly leverage FSU position in the strategic important area for sustainable energy. The project was performed by Drs. Jim Zheng and Richard Liang at the Department of Electrical and Computer Engineering and Department of Industrial Engineering, respectively. First to demonstrate preliminary results in high performance of energy storage and conversion materials and devices in order to seek outside funding consistent with the vision of IESES. The deliverables were conference proceedings and journal papers and proposal submissions for additional funding. This project is complete.<br>**Budget:** $15,000<br>**Research Integration (collaboration):** NCSU and NHMFL on advantage batteries; Industrial Engineering on fuel cells; Maxwell Technologies, Inc. and Ionova Technologies, Inc. on supercapacitors; CAPS on microgrids; MARTECH on thermoelectric; Shanghai Institute of Technical Physics on photovoltaic; N. Dai, F.Y. Huang, S.L. Wang, X.N. Li, J.P. Zheng (co-PI), and D. Wei, "An International Collaboration Group on Solar Cell Technologies Development", Sponsor: Chinese Academy of Sciences, Budget: $877,193 (￥6,000,000 RMB), Project Dates: 4/09-4/14.<br>***This project has been completed*** |
| | **Title**: NIRT: C-MEMS/CNEMS for Miniature Biofuel Cells<br>**PI:** Marc Madou, Co-PIs : Chunlei Wang, Sylvia Daunert and Leonidas Bachas - FIU<br>**Description:** In recent years, the quest for alternative sources that can autonomously power bioMEMS devices, especially those geared for in vivo applications, such as monitoring and drug delivery, has been the focus of research by scientists and engineers as new power sources will prove critical for the advancement of the field. Current batteries are still less than optimal and often present drawbacks related to safety, reliability and scalability. An ideal power source for implantable devices should take advantage of natural compounds present in the body of an individual and use them as fuel to produce power in a continuous and reproducible manner, as long as the patient's physiological functions remain steady. Biofuel cells, which are capable of converting biochemical energy into electrical energy, have been deemed as a potential solution to the drawbacks presented by conventional batteries, but the power density and operational lifetime requirements for implanted devices have not been met yet. To that end, we are integrating genetically engineered catalytic proteins and carbon-based 3 dimensional (3D) MEMS/NEMS structures to create new biofuel cells. The biofuel cell electrode surfaces, especially fractal electrode array, presents significantly increased surface area as compared to traditional architecture, increasing the biocatalyst loading capacity considerably for high power throughput. The genetically engineered enzymes inherently increase enzyme stability, consequently increasing biofeul cell lifetime. The scaled fractal electrode surface plays a role in wiring the enzymes to the biofuel cell anode, which increases the electron transfer efficiency from the enzyme to the electrode for an increase in the overall performance of the biofuel cells. Furthermore, C-MEMS/C-NEMS architectures will enable the reproducible fabrication of low cost carbon-based electrode structures.<br>**Budget:** $171,432 (PI portion) (total amount: $1,000,000) - *Not Funded by FESC.* |
| | **Title:** Fabrication of Nano Fractal Electrodes for On-Chip Supercapacitors<br>**PI:** Chunlei Wang - FIU<br>**Description:** Nature has always strived for the highest efficiency in all organisms. Just as nature has |

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| | benefited from fractal structures in almost all of its organisms, biomimetic fractal designs in electrochemical devices such as power conversion & storage devices and sensors can also lead to benefits in scaling. Our proposed concept is geared to take advantage of the scaling relationship between interface area and overall volume. Fractal electrode design is believed as a promising solution to optimize surface area while minimizing the internal resistance. We will fabricate and characterize carbon-based microelectrodes pyrolyzed from photolithographically patterned photoresist, which exhibits nano fractal geometry by design. In contrast with the current research trend of, first fabricating carbon nanostructures (CNTs, CNFs, etc), and then lithographically defining an electrode at the convenient location on the substrate, our novel methods will integrate the fabrication of the micro and the nano- structures using simple process thus bridging the gap that separates these two scales. Since the fabrication methods are all based on IC manufacturing methods, it will be easy to integrate into microchips.<br>**Budget:** $150,000 - *Not Funded by FESC.* |
| | **Title:** Energy Efficient Technologies and The Zero Energy Home Learning Center<br>**PI:** Stanley Russell, **Co-PIs:** Yogi Goswami **Graduate Assistant**: Mario Rodriguez - USF<br>**Description:** The project is to create and evaluate an affordable residential scale Zero Energy building that will function as an exhibition of energy efficiency and Zero Energy Home [ZEH] technology on or near the University of South Florida campus. The project will feature the most cost-effective combination of renewable solar energy with high levels of building energy efficiency. The building will incorporate a carefully chosen package of the latest energy-.efficiency technologies and renewable energy systems to achieve the most successful and reliable results.<br>The building will utilize Photovoltaic solar electricity and solar domestic hot water heating systems using the grid as an energy storage system, producing more energy than needed during the day and relying on the grid at night. Plug-in hybrid automobile technology offers a promising means of providing distributed energy storage for such homes but has not been sufficiently tested. Using a systems approach to couple zero energy home technology with PHEVs we will explore opportunities to develop marketable products that meet Florida's energy and environmental goals.<br>**Budget:** $344,600<br>**External Collaborators:** FSU College of Engineering- Justin Kramer, Brenton Greska; UF- Department of Interior Design- Maruja Torres, Nam-Kyu Park; UF Rinker School of Building Construction- Robert Ries; UCF Florida Solar Energy Center- Stephanie Thomas Ries; Beck Construction; Hees and Associates Structural Engineers. |
| | **Title:** Unifying Home Asset & Operations Ratings: Adaptive Management via Open Data & Participation<br>**PI**: Mark Hostetler, **Co-PI:** Hal S. Knowles, III - UF<br>**Description**: Recent environmental, social, and economic challenges are fostering a wave of interest in maximizing energy efficiency and conservation (EE+C) in existing U.S. homes. Long standing programs, ratings, and metrics are being reapplied into new stimulus initiatives such as the *Recovery through Retrofit*[3] program. Simultaneously, electric and gas utilities are expanding their demand side management (DSM) programs from weatherization and conventional technology replacement incentives to include conservation behavior campaigns with "recommendation algorithms" designed to assist in homeowner energy retrofit decision making. Furthermore, loan programs are emerging to address the financial barriers that commonly limit initiation of the necessary retrofits.<br>Collectively, these approaches most often project future home energy performance based on engineering |

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| | models of the physical characteristics of homes (i.e., "asset ratings"). Yet to date, the marketplace is inadequately integrating historical household energy consumption patterns (i.e., "operational ratings") into the decision tree to optimize retrofit program efficacy and consumer benefits. Moving toward the unification of asset and operational ratings is crucial for successful program management, proper monitoring/measurement/verification (MMV), loan risk assessment, and for the persistence of reduced home energy use over time. However, unification will not be easy. This research project combines qualitative and quantitative research methods in social science and building science using Florida case studies to evaluate the opportunities and constraints of asset and operational rating unification and the steps necessary to get there. Relationships between our project and the collaborative, transparent, and participatory nature of "open government" initiatives are also being explored.<br>**Budget**: $24,000<br>**External Collaborators:** Nick Taylor (Ph.D. Student, UF School of Natural Resources & Environment), Jennison Kipp (Assistant In, UF Program for Resource Efficient Communities) |
| | **Title:** Meteorological Factors Affecting Solar Energy Efficiency<br>**PI:** Paul Ruscher **Co-PIs:** (formerly Yaw Owusu, Hans Chapman - FSU<br>**Description:** There are numerous meteorological factors that limit the efficiency of solar energy systems in the tropics. Depletion of available solar energy at the surface by increased water vapor, cloudiness, temperature of the solar panel system, pollution, are sometimes overlooked, because engineering specifications for design are often based upon midlatitude continental air masses. The typical tropical atmospheric reduction factors were reviewed using a state of- the-art solar energy model for this project. In addition, meteorological variability can be quite extreme in the tropics and many engineering studies on feasibility of renewable energy sources in general are often based upon "typical" year criteria, rather than longer term climatologies. It is suggested that climatological data be utilized to more accurately portray the variability of output to be expected at a typical installation. Many of these variables are already widely available from a combination of surface and upper air meteorological stations, as well as remote sensing data from satellites. We demonstrated the sources for these data as well as strategies for teaching about solar energy efficiency using routine observations from school-based weather stations. This project is complete.<br>**Budget:** $15,000<br>***This project has been completed*** |
| **THRUST 3: Developing Florida's Biomass Resources** | |
| **Algae** | |
| | **Title:** Establishment of the Center for Marine Bioenergy Research: Systems Approach to BioEnergy Research (SABER)<br>**PI:** J. Kostka (he has left FSU), **Co-PIs**: William Cooper, Ivonne Audirac, Amy Chan-Hilton,Ellen Granger – FSU<br>**Description:** IESES' Systems Approach to Bio-Energy Research (SABER) is particularly focused on coupling algal cultivation to wastewater nutrient remediation. SABER has partnered with the City of Tallahassee's T. P. Smith Waste Water Treatment Plant in order to study the growth of local fresh water algae in waste water for use as biofuel. The two main objectives of this project are to: 1) perform both laboratory and field experiments to test for species-specific growth potentials, as well as for the effects of different environmental parameters, including light, carbon dioxide, and nutrient availability on microalgal growth rates and lipid production, and 2) determine the extent to which microbes (i.e. bacteria), which are exceptionally abundant in waste water, act as either competitors (for nutrients, carbon) or symbiotically with algae. To do this we are examining the bacterial community present in the waste water and detecting |

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| | community shifts that occur during algae cultivation. We are also examining the nutrient uptake dynamics between bacteria and algae by monitoring the usage and production of nitrogen, phosphorous, and carbon-containing compounds. Finally, a number of advanced analytical chemistry techniques are being used to characterize wastewater before and after algae cultivation. With a better understanding of the microbial and biogeochemical processes occurring in waste water during algae cultivation, engineering approaches may be proposed in order to further optimize algal growth in waste water.<br>**Budget:** $494,135<br>**External Collaborators:** City of Tallahassee<br>***This project has been completed*** |
| | **Title:** Constructual Optimization of Solar Photo-Bioreactors for Algae Growth<br>**PI:** Juan Ordonez - FSU<br>**Description**: This was a planning grant (15K, only). The work was targeted towards placing us in a more competitive position in future submissions in the area of bio-fuels. By the end of this one-year effort we now have a complete design of a small-scale photo-bioreactor for algae growth, obtained additional funds that will allow us to build a large-scale photo-bioreactor and conduct the necessary research for its optimal design and operation. This project is complete.<br>**Budget:** $15,000<br>**External Collaborators:** Federal University of Parana, Brazil<br>***This project has been completed*** |
| | **Title:** Optimization of Algae Species for Biofuels Production Using Genetic Altration<br>**PI:** Ed Phlips- UF<br>**Description:** This study will begin in June, 2011, and will focus on genetically altering selected species of algae to optimize their performance in biomass production systems aimed at biofuels. Two approaches to genetic alteration will be explored: mutagenesis and transformation.<br>**Budget:** $15,000 |
| **High Energy Crops** | |
| | **Title:** Energy Intensive Crop Development<br>**PI:** Gary Peter , Matias Kirst, Don Rockwood - UF<br>**Description:** To build a commercially viable, industrial scale system to produce transportation fuels and electricity from biomass requires both efficient conversion technologies and environmentally sustainable, cost effective supplies of biomass. In the US, Florida ranks first in its annual growth of plant biomass, because of its large cultivable land area and its subtropical climate, even though substantial land areas that can be planted are not currently in agricultural or forest production. The development of high yielding production systems for dedicated energy crops is considered essential for a sustainable, biomass to energy industry to be established, because the long-term availability of sufficient amounts of reasonably priced biomass is one of the most important factors in the site selection for new biofuel and bioenergy facilities. Dedicated energy crops are ones that 1) have high yields with minimum energy inputs in terms of agronomic practices, water and nutrient applications, 2) can be harvested, transported and processed efficiently into fuel or power, and 3) can be grown sustainably for generations without adverse environmental affects, or significantly impacting the food supply. We will evaluate likely energy crop species, *Eucalyptus* and southern pine to provide important yield and best management practices for growing these species for bioenergy conversion. We will also provide important chemical composition information that will impact the conversion efficiency of this biomass to ethanol, and identify and characterize important genes that regulate wood chemical composition<br>**Budget:** $432,000 |

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| | **Title:** Water-Use Efficiency and Feedstock Composition of Candidate Bioenergy Grasses in Florida<br>**PI:** Lynn E. Sollenberger, **Co-PI's:** John Erickson, Joao Vendramini, Robert Gilbert - UF<br>**Description:** Florida ranks first in the USA in annual growth of plant biomass because of a large cultivatable land area, high rainfall, and long growing season. In order to capitalize on these advantages, the agricultural production sector and biomass conversion industries require information regarding which crops are adapted to particular Florida regions and local environments, how much biomass can be produced during what times of the year, which crops produce the most biomass per unit of water used, and which crops have the desired yield and composition for particular bioenergy applications. Research conducted to date has quantified the seasonal biomass supply provided by the most likely crops for use in Florida, identified crops and management practices that result in most efficient water use, and described the chemical composition of these plants to allow estimates of potential energy production per unit of biomass. Florida growers and industry representatives have gained access to this information through on-line resources, presentations by several of the project investigators at the Florida Farm to Fuel Conference, and by attending the Bioenergy Crop Field Day at the University of Florida Plant Science Research and Education Unit. Seven graduate students are being trained through this project and undergraduate students are gaining invaluable research experience via internships mentored by project investigators. Faculty involved in the FESC project have formed collaborations regarding agronomic and breeding projects with Speedling, Inc., SERF, and BP. Both SERF and BP plan to construct ethanol facilities in Florida that would create an estimated 400 temporary construction jobs and 140 permanent jobs each.<br>**Budget:** $191,981<br>**External Collaborators: :** Speedling, Inc., Nutri-Turf, Inc., British Petroleum (BP), and Southeast Renewable Fuels (SERF) |
| **Biochemical Conversion** | |
| | **Title:** Development of Biofuel Production Processes From Synthetic and Biomass Wastes<br>**PI:** Pratap Pullammanappallil - UF<br>**Description:** With the ever-increasing price of petroleum and its finite supply, it is of high priority to develop domestic sources of transportation fuel, as well as other chemicals. Ethanol is an attractive alternate fuel that is being produced from corn starch. It is necessary to target other feedstocks for biofuel production and develop processes that have a minimal environmental impact. There is considerable ongoing research on developing processes and catalysts for conversion of biomass to biofuels like ethanol (called cellulosic ethanol process). But this project addresses other feedstocks with the following objectives: 1) development of biocatalysts for the conversion of waste biodegradable poly lactic acid based plastics to ethanol and 2) development of processes that processes for the production of additional fuels like biogas, bio-oil and biochar from the waste and byproducts of a cellulosic ethanol plant for the cleanup and reuse of these waste streams<br>**Budget:** $192,000<br>**External Collaborators:** University of Central Florida |
| | **Title:** Engineering Biocatalysts for Hemicelluloses Hydrolysis and Fermentation<br>**PI:** James F. Preston - UF<br>**Description:** Our goal is to develop biocatalysts for the cost-effective production of fuel alcohols and chemical feedstocks from underutilized sources of renewable biomass and evolving energy crops. To reach this goal protocols for efficient saccharification of hemicellulose fractions from these resources will be developed.<br>Objectives are to:<br>1. Develop improved enzyme-mediated saccharification protocols of hemicelluloses with existing |

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| | bacterial biocatalysts for production of biofuels and chemical feedstocks.<br>2. Develop Gram positive biocatalysts for direct conversion of hemicelluloses to biobased products.<br>3. Develop systems with bacterial biocatalysts for efficient bioconversion of the hemicellulose fractions of perennial energy crops (poplar, eucalyptus, switchgrass, energy cane) to targeted products.<br>**Budget:** $192,000<br>**External Collaborators**: Collaborations are in various units within the University of Florida: L.O. Ingram and K.T. Shanmugam, Microbiology and Cell Science; F. Altpeter, Agronomy; G. Peter, Forest Resources and Conservation. |
| | **Title:** Thermophilic Biocatalysts for the Conversion of Cellulosic Substrates to Fuels and Chemicals<br>**PI:** K.T. Shanmugam - UF<br>**Description:** Biomass is an attractive source of sugars for a state like Florida that produces very limited amount of corn for fermentation to produce ethanol as transportation fuel or other products such as lactic acid that can be converted to bioplastics. Florida currently generates about 8.7 million tons of dry cellulosic biomass per year (US-DOE) that can be converted to about 0.7 billion gallons of ethanol. With specific energy crops and short rotation trees cultivated for energy production using the abundant sunshine and water resources, the ethanol produced from biomass can be significantly increased to meet the demand for transportation fuel in the State of Florida. Before biomass-based fuels and chemicals become an economic reality, several key steps in the depolymerization of biomass to constituent sugars need to be addressed. One is depolymerization of cellulose to glucose by fungal cellulases before fermentation to ethanol by microbes. The current estimated cost of fungal cellulases is $0.32 per gallon ethanol produced and this cost is targeted for reduction to $0.10 or less by year 2012 (DOE). We have demonstrated that by increasing the temperature of Simultaneous Saccharification and Fermentation (SSF) of cellulose from 30-35 ºC to 50-55 ºC, the amount (and associated cost) of cellulases can be reduced by the required 3-fold with the current commercial enzyme preparations. A microbial biocatalyst that produces ethanol or other chemicals as the main fermentation product and can also function at this higher temperature and pH 5.0 in conjunction with the fungal cellulases in the SSF process is a critical component of this process. We have identified a thermophilic facultative anaerobe, *Bacillus coagulans*, with versatile metabolic capability as the microbial platform for the SSF of biomass to products and engineering this L(+)-lactic acid producing bacterium to produce ethanol. *The primary objective of this proposed study is to construct a B. coagulans derivative that produces ethanol as primary product of fermentation and to enhance the ethanol productivity of the engineered derivative.*<br>**Budget:** $192,000<br>***This project has been completed*** |
| **Bio gasification** | |
| | **Title:** Combined Cooling, Heat, Power, and Biofuel from Biomass and Solid Waste<br>**PI:** William Lear, **Co-PI:** J.N. Chung - UF<br>**Description:** The goal of this project is to provide the underlying research and demonstration of a novel technology which would enable the economic utilization of dispersed biomass and solid waste resources to produce electric power, cooling, heat, and transportation fuels. This integrated gasification and power generation system combines University of Florida advances in high-temperature gasification, hydrogen generation and separation, and advanced gas turbine systems. Their integration is expected to result in significant improvements in the cost, emissions, feedstock flexibility, and water requirements, all in a relatively compact, modular plant system. This in turn will enable much greater utilization of renewable energy supplies, helping the development of a sustainable energy supply infrastructure.<br>**Budget:** $576,000 |

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| | **External Collaborators:** Siemens Power Generation, Florida Turbine Technologies, Energy Concepts Co., Nu-Power Technologies LLC, PlanetGreenSolutions Inc., LPP Combustion, LLC.<br>Back to Thrust 1: Overarching |
| **Thermo-Chemical Conversion** | |
| | **Title:** Production of Liquid Fuels Biomass via Thermo-Chemical Conversion Processes<br>**PI:** Babu Joseph, **Co-PIs:** Yogi Goswami, Venkat Bhethanabotla, John Wolan, Vinay Gupta - USF<br>**Description:** The objective of this project is to develop technology for the economical thermo-chemical conversion of lingocellulosic biomass (non-food grade biomass such as agricultural waste, bagasse from sugar mills, citrus peels, switch grass, municipal green waste, etc.) to clean burning liquid fuels. Five of the major advantages of this process over a biochemical route to production of ethanol are: (i) it does not utilize food-grade feed stocks and therefore complements and does not compete with the agricultural food production in the state, (ii) the fuel produced is similar to those derived from petroleum unlike ethanol derived fuels which have at least a 25% lower energy content, (iii) the conversion is accomplished in using fast chemical reactions unlike the slow biological reactions for fermenting alcohol, (iv) the process does not require large amounts of water and associated energy costs of separating the water from the fuel as in bioethanol processes, (v) it can utilize a wide variety of biomass sources unlike the biochemical route which cannot work with high lignin containing biomass.<br>**Budget:** $554,447<br>**External Collaborators:** Prado & Associates |
| | Title: Feasibility, Sustainability and Economic Analysis of Solar Assisted Biomass Conversion<br>**PI:** Babu Joseph, **Co-PI:** Q. Zhang - USF<br>Description: The main deterrent for commercialization of biomass conversion processes is the cost of conversion; particularly the need to sacrifice as much as 30% of the energy content in the biomass for the thermo chemical conversion step. We want to research and develop the concept to use solar thermal energy from concentrating units to provide energy for the biomass gasification step. We also propose to evaluate the sustainability of such a process.<br>Overall Objective: The overall objective is to conduct a theoretical analysis of solar assisted thermo chemical conversion of biomass from the point of view of energy efficiency, economic feasibility, environmental impact, and long term sustainability of renewable energy production.<br>**Budget:** $45,238 |
| | **Title:** Integrated Florida Bio-Energy Industry<br>**PI:** Ali T-Raissi **Co-PIs:** N.Z. Muradov, D.L. Block - UCF/FSEC<br>**Description:** The aim of this project continues to be production of liquid hydrocarbon fuels derived from lignocellulosic and aquatic biomass employing a two-step thermocatalytic process. In the first step, pre-treated biomass is gasified with oxygen (or air) and steam yielding synthesis gas (syngas) containing hydrogen and carbon monoxide. In the second step, syngas generated by the gasifier enters a Fischer Tropsch (FT) synthesis unit where it reacts to form a range of liquid hydrocarbon fuels – including diesel.<br>**Budget:** $648,000 |
| | **Title:** Biofuels Through Thermochemical Processes: Approach to Produce Bio-Jet Fuel<br>**PI**: Anjaneyulu Krothapalli - FSU<br>**Description:** The objective of this project was to develop technologies to produce biojet and biodiesel fuels from sustainable sources such as bio-oils and hydrogen produced from biomass generated synthetic gas. Novel processing concepts, reactor design and catalyst systems are employed in this integrated approach to convert any cellulosic biomass and any nonedible bio-oils into bio-jet fuel (Figure 1). Feedstock flexibility offers significant cost and logistic advantages to this approach. Unlike other processes which use only the |

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| | oil derived from a plant, the entire plant can be used as feedstock source and the proposed approach can also convert the more challenging lignocellulosic component. This project is complete.<br>**Budget:** $229,572<br>***This project has been completed*** |
| **THRUST 4: Harnessing Florida's Solar Resources** | |
| **Solar Testing Facility** | |
| | **Title:** Solar Systems Testing Facility<br>**PI:** James Roland, David Block - UCF/FSEC<br>**Description:** Over the past four years, the Florida Solar Energy Center (FSEC) has received a significan increase in demand for solar and PV systems testing and certification. This occurrence has resulted i requiring the Center to correspondingly amplify its capabilities to respond to the increased demand. Thus, th objective of this task was to construct a solar and PV systems testing facility by adding walls, windows, door and A/C to an existing Florida Solar Energy Center roof only facility. The enclosing of this existing spac was done for the purpose of increasing laboratory space and to allow for laboratory testing of solar wate heating systems and PV modules and inverters. The action was taken following a study which determined thi project was the most cost effective means of adding valuable indoor laboratory space.<br>**Budget:** $600,609<br>***This project has been completed*** |
| **Solar Thermal** | |
| | **Title:** Concentrating Solar Power Program<br>**PI:** Charles Cromer, R. Reedy - UCF/FSEC<br>**Description:** The objective of this effort is to produce a detailed Florida map of the solar direct beam and global resource available for use in Florida whereby a potential user of solar energy can enter their location latitude and longitude and receive a table of solar energy monthly averages for that specific site as derived from the past eleven years of data. The concept is to use NOAA satellite photos and utilize the brightness of the cloud cover as a clearness factor predictor of the solar energy that gets through to the ground below.<br>**Budget:** $52,000<br>**External Collaborators:** FPL<br>***This project has been completed*** |
| | **Title:** Development of Novel Water Splitting Catalysts for the Production of Renewable Hydrogen<br>**PI:** Helena Hagelin-Weaver - UF<br>**Description:** This project focuses on the development of iron-based catalysts for the thermochemical splitting of water into hydrogen and oxygen. The thermochemical process of splitting water is particularly well-suited for the utilization of solar energy to provide the heat for the reaction and is a way to produce a renewable hydrogen fuel. As hydrogen is difficult to transport and store, producing hydrogen on site for power plants using proton exchange membrane (PEM) fuel cells or internal combustion engines to generate electricity or for the production of chemicals, such as liquid hydrocarbon fuels, is a very attractive approach. The project uses a two-step process in which water is passed over a reduced iron oxide to generate hydrogen while the oxygen is taken up by the oxygen-deficient iron oxide (Step 1: FeOx-1 + H2O □FeOx + H2). In the second step the resulting iron oxide is heated to desorb oxygen and regenerate the oxygen-deficient iron oxide to close the catalytic cycle (Step 2: FeOx □FeOx-1 + ½O2). The main objectives of the project are to develop mixed metal oxide catalysts that 1) will release oxygen at temperatures lower than 1500°C (Step 2), while still maintaining water-splitting activity (Step 1) and 2) are stable up to the temperature necessary for the oxygen desorption step.<br>**Budget:** $ 100,000 |

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| | **Title:** Enhanced and Expanded Solar Thermal Test Capabilities<br>**PI:** J. Del Mar**,** R. Reedy - UCF/FSEC (PI use to be J. Walters)<br>**Description:** The Florida Solar Energy Center (FSEC) serves the State of Florida by providing independent, third-party testing and certification of solar equipment for the main purposes of providing product value in the marketplace, especially for products that are not widely "proven" with consumers such as solar water heating systems and solar electrical (photovoltaic) systems. Even more important, third-party certification provides protection to reputable manufacturers, ensuring that lower quality products, often from foreign markets, do not compete head-to-head with Florida and U.S. products unless they meet the same standards.<br>**Budget:** $809,295<br>**External Collaborators:** Solar thermal manufacturers |
| | **Title:** Solar Fuels for Thermochemical Cycles at Low Pressures<br>**PI:** Jörg Petrasch - UF<br>**Description:** The project focuses on the production of solar fuels from solar thermochemical cycles employing metal/metal oxide redox pairs. These thermochemical cycles consist of a high temperature endothermic solar driven reduction step and a low temperature, slightly exothermic water or CO2 splitting step. The high temperature step typically proceeds at temperatures above 2000 K. Hence, it poses a range of material and design challenges. According to Le Chatelier's principle, the temperature for the solar dissociation reaction decreases as the pressure inside the reactor is reduced. The central hypothesis of the project is that operating the high temperature step of metal/metal oxide solar thermochemical cycles at reduced pressures will lead to significantly relaxed temperature requirements, while the work necessary to produce the pressure difference will not significantly reduce the overall efficiency of the process.<br>The main goal of the project is to demonstrate the feasibility of carrying out high temperature thermal reduction of metal oxides in rarefied conditions using high intensity solar radiation from UF's solar simulator.<br>**Budget:** $ 100,000<br>**External Collaborators:** Wojciech Lipinski, University of Minnesota |
| | **Title:** Solar Thermal Power for Bulk Power and Distributed Generation<br>**PI:** David Hahn, **Co-PIs:** James Klausner, Renwei Mei, Helena Weaver - UF<br>**Description:** While there are many different approaches to hydrogen generation, the most attractive means is to split water molecules using solar energy. The current approach is to develop highly reactive metal oxide materials to produce intermediary reactions that result in the splitting of water to produce hydrogen at moderate temperatures (<1000 K). It is envisioned that the metal oxide reactors will ultimately be mounted within a solar concentrating reactor, and irradiated via heliostats. This Task is structured toward the overall goals of solar-driven, thermochemical hydrogen production, with associated efforts toward the enabling surface science, catalysis, particle science, material synthesis, nano-structures, multiscale-multiphase physics modeling, and process simulation that will enable the realization of solar hydrogen-based fuels to power the transportation economy. Successful efforts as targeted in this project are a critical step toward increased renewable-resource based fuels and energy, reduction of GHG emissions, and establishment of a new power industry in Florida.<br>**Budget:** $446,400 |
| | **Title:** Design, Construction and Operation of CSP Solar Thermal Power Plants in Florida<br>**PI :** Yogi Goswami, **Co-PIs:** Lee Stefanakos, Muhammad Rahman, Sunol Aydin, Robert Reddy - USF<br>Florida utilities are mandated to achieve 20% renewable energy contribution to their generation mix by 2020. While technologically feasible with solar energy, the capital costs are high – presently, capital costs |

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| | range from $6,000-$7,000/kW for PV and $3,500-$4,000/kW for concentrating solar thermal power. This project targets the development of solar thermal power technology for bulk power and distributed generation, which will diversify energy resources in Florida and reduce greenhouse emissions by utilizing renewable sources. Also, there will be economic impacts with the establishment of new power industry in Florida, which will help the electrical utilities of the state to meet the renewable portfolio standards. The project has three main tasks; the first one is to develop design methodologies and standards for the proven solar thermal power technologies in combination with bio or fossil fuels based on Florida conditions and resources. Secondly, the project aims to set up demonstration and test facilities for these technologies for optimization for Florida conditions, and the final task is to develop and commercialize innovative technologies based on new thermodynamic cycles.<br>**Budget:** $882,000<br>**External Collaborators:** Sopogy Inc. and Gulf Coast Green Energy.<br>Back to Thrust 1: Overarching |
| | **Title:** Multi-Generation Capable Solar Thermal Technologies<br>**PI:** A. Krothapalli, **Co-PI:** Brenton Greska - FSU<br>**Description:** The objective of the research was to develop and demonstrate small-scale solar thermal technologies that can be used separately, in conjunction with one another, or with existing waste heat producers, thus improving the overall system efficiency. This project is complete.<br>**Budget:** $544,226<br>***This project has been completed*** |
| **Clean Drinking Water** | |
| | **Title:** Low Cost Solar Driven Desalination<br>**PI:** James Klausner - UF<br>**Student:** Fadi Alnaimat/ Ph.D<br>**Description**: This work concerns the development of a cost effective, low power consumption, and low maintenance desalination process that is powered by solar energy. The solar diffusion driven desalination (DDD) process is most suitable for decentralized applications. While theoretical models have been developed to analyze the evaporation and condensation processes of the solar DDD under transient operating conditions (Alnaimat et al., 2011), experimental investigations have been conducted to validate the theoretical models. In this reporting period, the overall distillation performance of the solar DDD has been investigated under different design and operating conditions. The best operating modes have been proposed to improve the water production and reduce the specific energy consumption.<br>**Budget:** $252,000<br>**University:** UF |
| | **Title:** Clean Drinking Water using Advanced Solar Energy Technologies<br>**PI:** Lee Stefanakos **Co-PI's:** Yogi Goswami, Matthias Batzill, Maya Trotz, Sesha Srinivasan - USF<br>**Description:** Availability of fresh water is one of the biggest problems facing the world and Florida is one of the most vulnerable to fresh water shortages. Moreover, Florida ground water is contaminated in many locations from leaky underground tanks, agricultural pesticides, and other chemicals. Although it is possible to desalinate abundant seawater, conventional systems are too energy intensive. Solar energy can provide the needed energy, and innovative new solar vacuum (USF) and humidification/dehumidification (UF) desalination systems can provide adequate fresh water for the state's needs. Systems are being developed for both bulk water desalination and small community needs/disaster response. We will also develop photocatalytic disinfection to remove contaminants and integrate these technologies with solar PV for complete water supply systems. |

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| | Photocatalysis is a promising water treatment technology capable of utilizing solar light. However, the construction of an effective photocatalytic disinfection system for water purification is currently limited by the lack of reliable models to aid in the design and testing of these systems. Simplified models have been proposed, but most are inadequate because they rely on traditional disinfection theories which are not applicable to photocatalysis. Therefore, the major goal of this research is to develop a model for photocatalytic disinfection based on fundamental processes which may then be used to design water treatment systems in the state of Florida.<br>**Budget:** $326,756<br>**External Collaborators:** NA |
| **Low Cost PV Manufacturing** | |
| | **Title:** Enhanced and Expanded PV Systems Testing Capabilities at FSEC<br>**PI:** S. Barkaszi, **Co-PI:** R. Reedy - UCF/FSEC<br>**Description:** An important FSEC function is consumer protection from poorly designed and manufactured PV modules and systems. FSEC's test capabilities were established over 10 years ago and were adequate at the time to test PV modules for certification. However, PV costs have fallen and competing electric utility rates have risen. In the last two years, these curves have crossed under some economic scenarios and incentive programs, and the demand for PV module testing and system certification has jumped. Thus, this task will provide for enhanced and expanded PV testing and certification capabilities. The task will also be done in close coordination with FSEC's work with the U.S. Department of Energy's PV program.<br>**Budget:** $196,018 |
| | **Title:** Development of High Throughput CIGS Manufacturing Process<br>**PI:** Neelkanth Dhere - UCF/FSEC<br>**Description:** A reduction in the cost of CIGS and other thin film PV modules is required for broad PV applications. The objective is to develop a high-rate deposition process for synthesis of CIGS absorbers and other layers by employing in-line and batch deposition techniques. The goal is finally to attract a PV manufacturing company to Florida by developing a high-rate manufacturing process for $CuIn_xGa_{1-x}Se_2$ (CIGS) solar cells.<br>**Budget:** $141,620 Back to Thrust 1: Overarching |
| | **Title:** Florida Opportunities for PV Manufacturing and Applications<br>**PIs:** D. Block, J Fenton, P. Fairey, W. Schoenfelds, R. Reedy - UCF/FSEC<br>**Description:** The overall goal of this project is to assist in the development of a photovoltaic (PV) manufacturing industry in Florida. The project objective is to conduct a review of the state, national and international PV manufacturing data for the purposes of establishing industry practices and an industry data base. The data base will then be available to assist Florida in establishing PV manufacturing firm(s).<br>**Budget:** $81,120 |
| | **Title:** Development of Low Cost CIGS Thin Film Hot Carrier Solar Cells<br>**PIs:** Gijs Bosman, **Co-PI:** Tim Anderson - UF<br>**Description:** Our study is focused on hot carrier solar cells for cell conversion efficiency improvement in a low cost, high throughput CIGS system. The rapid thermalization loss of hot photoexited carriers interacting with the lattice can potentially be reduced through phonon engineering in the absorber layer; the subsequent extraction of the hot carriers may be realized through device engineering of energy selective contacts.<br>**Budget:** $450,000 |
| | **Title:** Solar Photovoltaic Manufacturing Facility to Enable a Significant Manufacturing Enterprise within the State and Provide Clean Renewable Energy |

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| | **PI:** Don Morel – USF, **Co-PIs:** Chris Ferekides, Lee Stefanakos - USF<br>**Description:** The primary goal of this project is to enable the establishment and success of local solar photovoltaic manufacturing companies to produce clean energy products for use within the state and beyond and to generate jobs and the skilled workforce needed for them. Thin film technologies have shown record efficiencies of 20%, and present tremendous opportunities for new Florida start-up companies. USF, UCF, and UF are collaborating to develop a pilot line facility for thin film solar technologies, which will serve as a test bed for making ongoing improvements in productivity and performance of solar modules, develop advanced manufacturing protocols, and help train a skilled workforce to ensure the success of new companies.<br>**Budget:** $1.6M<br>**External Collaborators:** Mustang Solar, a Division of Mustang Vacuum Systems<br>Back to Thrust 1: Overarching |
| **Advanced PV Device Program** | |
| | **Title:** Research to Improve Photovoltaic (PV) Cell Efficiency by Hybrid Combination of PV and Thermoelectric Cell Elements.<br>**PIs:** Nicoleta Sorloaica-Hickman**,** Robert Reedy - UCF/FSEC<br>**Description:** Photovoltaic/thermoelectric (PV/TE) cell integration is a promising technology to improved performance and increase the cell life of PV cells. The TE element can be used to cool and heat the PV element, which increases the PV efficiency for applications in real-world conditions. Conversely, the TE materials can be optimized to convert heat dissipated by the PV element into useful electric energy, particularly in locations where the PV cell experiences large temperature gradients, i.e. use the thermoelectric module for cooling, heating and energy generation depending on the ambient weather conditions. Thus, the goal of this research effort is to research and develop nanoscale design of efficient thermoelectric material through a fundamental understanding of the materials properties and to design and build a photovoltaic thermoelectric (PV/TE) hybrid system.<br>**Budget:** $167,820<br>Back to Thrust 1: Overarching |
| | **Title**: PV Devices Research and Development Laboratory<br>**PI:** Robert Reedy **Co-PI's:** Nicoleta Sorloaica-Hickman, Neelkanth Dhere - UCF/FSEC<br>**Description:** The primary challenge facing the PV industry is to dramatically reduce the cost/watt of delivered solar electricity by approximately a factor of 2 to 3, to increase the manufacturing volume by a factor of 10 and to improve the cell efficiencies by a factor of 2 to 3. This task will conduct R&D on basic science of PV cells and develop a world class PV cell laboratory for future cell research. The R&D will focus on developing new and improved PV cells such as organic PV, nano-architectures, multiple excitation generation, plasmonics, and tandem/multi-junction cells.<br>**Budget:** $450,250 |
| | **Title:** Beyond Photovoltaics: Nanoscale Rectenna for Conversion of Solar and Thermal Energy to Electricity<br>**PI:** Shekhar Bhansali, **Co-PIs:** Elias Stefanakos, Yogi Goswami, Subramanian Krishnan - USF<br>**Description:** The main objective of the proposal is to commercialize and scale up a new technology, rectenna to convert waste heat energy to electricity. Although the prediction of highly efficient (~85%) solar rectennas was published almost 30 years ago, serious technological challenges have prevented such devices from becoming a reality. Since the ultimate goal of a direct optical frequency rectenna photovoltaic power converter is still likely a decade away, we plan to convert optical solar radiation to thermal radiation (~30 THz regime) using an innovative blackbody source. Leveraging the research efforts of the world-class |

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| | team members, we plan to further develop the rectenna technology that is within reach of efficient radiation conversion at 30 THz. A fully integrated, blackbody converter and 30 THz rectenna system will be capable of converting at least 50% of solar and thermal energy into usable electrical power, clearly demonstrating a truly transformational new technology in the renewable energy technology sector.<br>**Budget:** $598,500<br>**External Collaborators:** Bhabha Atomic Research Center, India |
| **PV Integration** | |
| | **Title:** PV Energy Conversion and System Integration<br>**PI:** I. Bataraseh, **Co-PI's:** J. Shen, Z. Qu, X. Wu, W. Mikhael, L. Chow – UCF (PI use to be N. Kutkut)<br>Description: The objective of this project is to develop a system-driven Plug'N'Gen solar power system demonstrating architecture of decentralized, low-cost, mass-produced, PV panel-mounted micro-inverters. This system will be able to compete with today's centralized multi-kW PV inverters that require cost prohibitive professional installation. The project tasks are: 1) novel inverter topology and control concepts; 2) advanced digital control algorithms; 3) SmartTie interface with the utility grid; and 4) low cost and ultra-compact PV inverter in package.<br>**Budget: $1,267,000**<br>Back to Thrust 1: Overarching |
| | **Title:** Non-Contact Energy Delivery for PV System and Wireless Charging Applications<br>**PI:** Jenshan Lin - UF<br>**Description**: Innovative non-contact energy delivery method will be used in photovoltaic energy generation system to accelerate the system deployment. Instead of delivering electric power using cables penetrating through building structures, magnetic field coupling allows power to be transferred wirelessly through building walls and roofs. In the meantime, the DC electric energy from photovoltaic cells is converted to AC energy. This enables the photovoltaic system to be quickly set up or relocated, and the collected solar energy from outdoor system can be conveniently delivered to indoor appliances. Techniques to achieve high efficiency at high power delivery through different building structures will be studied for this plug-and-play architecture.<br>In addition, the technique and the system can also be used for non-contact charging of electric vehicles. The transmitter/charger can be placed as a mat on garage floor or parking space. The receiver inside vehicle will pick up the energy delivery through magnetic coupling. This eliminates the need of connecting charging wires to vehicles and exposed metal contacts, which is a safer method of charging electric vehicles<br>**Budget: $**252,000 |
| | **Title:** An Integrated Sustainable Transportation System<br>**PI:** David Norton, Keith Duncan – UF (Formerly Eric Wachsman (PI) and Shirley Meng (Co-PI);left UF)<br>**Description:** The proposed vehicle, operating on biofuel while in transit and charged by the sun while parked, is the ultimate sustainable transportation system operating completely on renewable American energy resources. Moreover, the use of solid oxide fuel cells (SOFCs) rather than an IC engine in this hybrid vehicle results in a dramatic improvement in efficiency and reduction in emissions. SOFCs are the most efficient technology for converting energy from hydrocarbon fuels to electricity on a "well to wheels" basis. In contrast, the more conventional fuel cells require hydrocarbon fuels to first be converted to $H_2$, with resultant efficiency losses, followed by losses due to $H_2$ transport and storage. Therefore, on a system-basis SOFCs hold the potential for producing the least $CO_2$/kWh from conventional fuels, and if designed to operate on biofuel would in effect be carbon neutral and operating on a renewable resource. *If developed this vehicle would be a transformational change in transportation technology.*<br>**Budget:** $594,000 |

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| | **External Collaborators:** Solid-State Energy Technology, Inc., Lynntech, Inc., Planar Energy Devices, Inc., CFX Battery, Inc. Back to Thrust 1: Overarching<br>***This project has been completed*** |
| | **Title:** PV Power Generation Using Plug-in Hybrid Vehicles as Energy Storage<br>**PI:** J. Shen, **Co-PI:** I. Batarseh - UCF<br>**Description:** The objective of this project is to develop and demonstrate an alternative PV power generation architecture that uses plug-in hybrid vehicle as the energy storage and transfer element with a total system cost target of $3.50/W. The tasks include developing efficient, reliable, and inexpensive maximum power tracking DC/DC battery chargers and 3-phase converters. A 10kW demonstration solar carport charging station will be built on UCF campus. A plug-in hybrid vehicle with a 25kWh battery bank (battery-only driving range of 50-100 miles) and onboard bidirectional AC charging system will be demonstrated<br>**Budget:** $380,816<br>**External Collaborators:** City of Tavares, FL |
| | **Title:** Integrated PV/Storage and PV/Storage/Lighting Systems<br>**PI:** Franky So, **Co-PI:** Jiangeng Xue - UF<br>**Description:** The goal is to increase the efficiency and reduce the cost of solar power through the integration of PV, Li-battery, and LED lighting technologies. Since all components are in the form of thin films, the PV/battery/LED system can be integrated as a single module. Since half of the materials cost of each device is the substrate, integrated module will also reduce materials costs and processing steps. Importantly, their integration further eliminates the need for inverters since they are all low-voltage devices. Such an integrated device can be used to store energy during the day and power the LED panel for lighting in the evening. In addition, we will explore the possibility of fabricating a semi-transparent module. The success of this Task will lead to a novel solar-power lighting panel that can be used as a sky light during the day and a lighting panel during the night without using grid-power. We not only will develop the technologies, but also integrate devices and perform technology-economic evaluation, including life-cycle costs.<br>**Budget:** $576,000 Back to Thrust 1: Overarching |
| **THRUST 5: Ensuring Nuclear Energy & Carbon Constrained Technologies for Electric Power in Florida** | |
| | **Title:** Reducing Residential Carbon Emission in Florida: Optional Scenarios Based on Energy Consumption, Transportation, and Land Use<br>**PI:** Tingting Zhao**, Co-PI:** Mark Horner - FSU<br>**Description:** In 2007 the Governor of Florida established targets for greenhouse gas (GHG) emissions, which mandate that the State of Florida aims to reduce emissions to 2000 levels by 2017 and to 1990 levels by 2025. To fulfill these goals, not only is the development of renewable sources of energy and fuel needed, but it is also necessary to achieve more sustainable energy and fuel consumption patterns. This project is dedicated to the latter objective, i.e., exploring the effectiveness of optional scenarios for households' consumption of energy and transportation fuels with respect to carbon dioxide mitigation. Human land use is another major concentration of this research, as changes in the built environment and vegetation cover may create sources or sinks of carbon dioxide and hence affect the intensity and origins of carbon emissions.<br>The proposal of this project consisted of three major steps: 1) calculating the Florida baseline carbon dioxide emissions from residential energy and fuel consumption as well as human land uses; 2) developing models of household behavior regarding various energy/fuel conservation and incentive options based on a residential survey; and 3) forecasting energy/fuel demand and $CO_2$ emission levels in 2017 and 2025 |

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| | throughout the state of Florida based on the scenarios created in step two.<br>This project was planned to be completed within two years. The PIs concentrated mainly on 1) journal publications on carbon inventory analysis at the state level; 2) finalizing the household energy consumption survey (including sampling design), which is composed of over 30 questions dedicated to household energy practice and responses to energy-saving incentives; and 3) preparation for the external grant application to the NSF Geography and Spatial Sciences (GSS) program. Data collection from the survey is complete and data analysis is underway.<br>**Budget:** $60,844<br>***This project has been completed*** |
| | **Title:** Planning Grant: Enhanced Thermal Performance and Microstructure Simulation of Nuclear Fuels<br>**PI:** Justin Schwartz - FSU<br>**Description:**The objective of this proposal was to perform preliminary investigations to determine the viability of improved oxide nuclear fuels through high thermal conductivity coatings such as "BeO." To meet Florida's sustainable energy demands, they pursued the option of enhanced oxide nuclear fuel performance by considering the potential for improved thermal behavior through high thermal conductivity oxide coatings. This work will included a literature search of past investigations of the impact of enhanced thermal conductivity on nuclear fuel and reactor performance, the temperature and irradiation dependence of the thermal conductivity of BeO and other high thermal conductivity oxides, the chemical and thermal compatibility of BeO and nuclear fuels (UO2, PuO2, ThO2 and MOX), and initial studies into BeO coatings on HfO2 particles, where HfO2 serves as a benign surrogate for nuclear fuel oxides. This project is complete.<br>**Budget:** $15,000<br>***This project has been completed*** |
| | **Title:** Biocatalytic Lignin Modification for Carbon Sequestration<br>**PI:** Jon Stewart - UF<br>**Description:** After cellulose, lignin is the second most abundant forma of carbon in plants. Lignin's complex structure makes it difficult to use this material in value-added products, and ahte vast majority of lignin is currently burned to provide energy for factory operations. While burning plant derived lignin does not add to global greenhouse gas levels, having options to remove lignin from the global carbon cycle would lead to diminished atmospheric CO2 levels. This could be accomplished by chemically altering lignin's structure to facilitate long-term terrestrial sequestration or using it in value-added products that would not be discarded immediately. We will use Nature's catalysts (enzymes) to tailor the chemical structure of lignin for both deep-well injection (by using lignin derivatives as drilling "muds") and for materials that can be used in building, packaging, and other manufactured products.)<br>**Budget:** $200,000 |
| | **Title:** Database Infrastructure for Integrative Carbon Science Research<br>**PI:** Sabine Grunwald. **Co-PI:** Tim Martin - UF<br>**Description:** Rising $CO_2$ concentrations in the atmosphere and effects on global climate change have been well documented, and future impacts are uncertain but potentially devastating. Florida's natural and agro-forest ecosystems have much potential to sequester carbon in biomass and soils due to unique climatic and landscape conditions. However, research gaps exist to accurately assess carbon pools and fluxes at coarse scales, ranging from county to the region and larger. The overarching objective of this project is to address |

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| | these obstacles by creating a terrestrial carbon information system (called "TerraC") for the carbon science community, focused on ecosystems in Florida. The information system will be administered through the UF Carbon Resources Science Center (http://carboncenter.ifas.ufl.edu ), a multi-disciplinary Center dedicated to research in support of enhanced agricultural and natural resource carbon management.<br>**Budget:** $199,440 |
| | **Title:** Creation of Carbon Sequestration Data, Technologies and Professional Cohorts for Florida<br>**PI:** Mark Stewart, **Co-PIs:** Jeffrey Cunningham, Maya Trotz - USF<br>**Description:** Rising concerns over increasing levels of greenhouse gases, especially carbon dioxide, have led to suggestions to capture carbon dioxide at fixed sources, such as fossil fuel power plants, and sequester the carbon for millennia by injecting it underground. Florida overlies many thousands of feet of carbonate rocks which may be suitable for geologic sequestration of carbon dioxide. This project will investigate the potential for geologic sequestration of carbon dioxide in Florida, the physical and chemical changes that may occur as a result of injection, assess the potential for escape of injected carbon dioxide, determine the risk, if any, to aquifer systems used for water supplies, develop methodologies for Florida utilities to predict the performance and risks of proposed sequestration projects, and educate a cohort of geologic sequestration professionals to create a carbon sequestration industry in Florida.<br>**Budget:** $479,640<br>**External Collaborators:** Tampa Electric Company (TECO); Florida Power and Light (FPL); Environmental Consulting and Technology (ECT), Inc.; Los Alamos National Laboratory. |
| **THRUST 6: Exploiting Florida's Ocean Energy Resources** | |
| | **Title:** Southeast National Marine Renewable Energy Center<br>**PI:** Susan H. Skemp**, Co-PIs:** Howard P. Hanson, James VanZwieten - FAU<br>**Description**: The research and development program being conducted by the Southeast National Marine Renewable Energy Center (SNMREC) is structured to be the catalyst that will enable the ocean energy industry in Florida toward determining solutions to answer the state's energy challenge. This project focuses on determining the potential of harnessing the ocean current resource and ocean thermal energy conversion (OTEC). The regulatory process both at State and Federal levels continues to evolve as the roles and interdependencies of the individual agencies are more clearly articulated. In addition, knowledge to make these decisions is being defined and targeted on a micro level necessary to assess individual devices. SNMREC's mission is to bridge the gap between concept and commercial deployment of ocean energy technologies by providing at-sea testing facilities for both ocean current and thermal energy research and for technology development. Research cuts across environmental, ecological, resource and technology.<br>**Budget: $8,750,000**<br>**Universities:** UCF, FSU, ERAU, University of Miami, Oregon State University, University of Washington, Pennsylvania State University, University of New Hampshire, University of Hawaii, University of Edinburgh, Heriot-Watt University, Nova Southeastern University, Virginia Polytechnical Institute, Florida Institute of Technology, Embry-Riddle Aeronautical University<br>**External Collaborators:** Numerous industry and State and federal government as well as FFRDCs, such as National Renewable Energy Laboratory, Woods Hole Oceanographic Institution, U.S. Department of Energy, U.S. Department of Interior (Bureau of Ocean Energy Management and Regulation and Enforcement), U.S. Department of Commerce (National Oceanic and Atmospheric Administration), and Florida Department of Environmental, Protection, to name a few. |
| | **Title:** Buoy Array for Ocean Wave Power Generation<br>**PI:** Z. Qu, **Co-PI**: K. Lin - UCF |

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| | **Description:** The objective of this project is to develop a novel design that can extract ocean wave energy for commercial consumption. The design detailed herein is unique in that it is a wave point energy harvester that is small in size and contains all of the mechanical components directly within the buoy. The project focuses mainly on the mechanical system within the buoy as well as methods to control the electrical load on the system. Different mechanical systems have been developed and tested on a motion platform to simulate a vertical wave motion—these systems have been analyzed and compared in order to provide an ever-increasingly effective design. The Harris Corp. have acted as new collaborators with the project since October 1st 2010, funding four UCF senior design teams in the development of a buoy for wave power generation.<br>**Budget:** $150,000<br>***This project has been completed*** |
| **THRUST 7: Securing our Energy Storage and Delivery Infrastructure** | |
| | **Title:** The Future Florida Grid: Ensuring a Reliable and Resilient Electrical Energy Transmission and Delivery System in a Changing Environment<br>**PI:** Steinar Dale, **Co-PIs:** T. Baldwin, O. Faruque, J. Langston, P. McLaren, R. Meeker, K. Schoder, M. Steurer - FSU<br>**Description:** The project research goal is to address the challenges of the reliable movement of electrical energy throughout the state as the power system is transformed to include far more renewable and alternative sources, increased use of distributed energy resources (including storage and electric vehicles), emergence of microgrids, possible expansion of new very-large centralized baseload (nuclear), and incorporation of new power conversion, transmission, measurement, communication and control technologies (smart grid).<br>This project has also supported ongoing participation and contributions in national, state, and local power and energy stakeholder groups, including the Gridwise Alliance, the North American Synchrophasor Initiative (NASPI), the American Society of Mechanical Engineers' (ASME) National Energy Committee, the Institute of Electrical and Electronics Engineers (IEEE) Power Engineering Society (PES), Florida's Great Northwest Alternative Energy Advisory Council, and the Tallahassee-Leon Economic Development Council (EDC) Energy and Environment Roundtable.<br>**Budget:** $431,982 Back to Thrust 1: Overarching<br>***This project has been completed*** |
| | **Title:** Microgrids for a Sustainable Energy Future<br>**PI:** Chris S. Edrington, **Co-PIs:** Helen Li, Juan Ordonez, Jim Zheng, Mischa Steurer - FSU<br>**Description:** The primary aim of the project was to address research and development in the area of microgrids. Specifically the focus was in the area of PV and Plug in Hybrid Electric Vehicles integration, microgrid modeling and control, grid-tying inverters/converters, energy storage, tri-generation, and standards development for smart grids.<br>**Budget:** $719,333<br>***This project has been completed*** |
| | **Title:** Real-Time Power Quality Study For Sustainable Energy Systems<br>**PI:** U. Meyer-Baese, **Co-PIs:** Helen LI, Simon Foo, Anke Meyer-Baese, Juan Ordonez - FSU<br>**Description:** The main objective of this project is the collection of preliminary data for IESES proposals that can be used to seek local, national and international sources of external funding from private and government sponsors. The overall project has been split up in several independent subprojects to allow a timely completion of the tasks. All tasks have been completed successfully.<br>**Budget:** $15,000 |

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| | ***This project has been completed*** |
| | **Title:** Planning Grant: Advancing Knowledge of Network Theory for Analysis and Design of Smart Power Grids<br>**PI:** Svetlana V. Poroseva. **Co-PIs:** Yousuff Hussaini, Per Arne Rikvold - FSU<br>**Description:** With power grids evolving towards increasing size, complexity, and integration, it has become more difficult to describe and predict their behavior, even under normal operational conditions. With technological development, climate change, and activities in the political arena, adverse circumstances (natural disasters, intelligent adversary, software design errors, human errors, etc.) have become more probable and costly events. The Project seeks to provide industry and government with advanced analytical and computational tools necessary for the automated evaluation of the structural resilience and reliability of power grids. The potential applications of the Project's results go beyond power grids. Any infrastructure essential to our society and economy (e.g., computer, communication, transportation) can benefit from the Project's results. This project is complete.<br>**Budget:** $15,000<br>***This project has been completed*** |
| | **Title:** Investigating the Effect of Appliance Interface Design on Energy-use Behavior<br>**PI:** Paul Ward**, Co-PIs:** Ian Douglas, David Eccles - FSU<br>**Description:** The primary objective of this research project was to identify the behavioral factors that contribute to energy in/efficiency in the home. In particular, this project was designed to (a) examine current state-of the science on behavioral factors that affect energy efficiency, (b) report on the efficiency of typical energy consuming technology used in the home as well as existing programs designed to improve efficiency, and (b) investigate the types of human-technology interactions and other behavioral factors that lead to in/efficient energy use. To achieve these objectives this project proposed to use laboratory-based experimental and field-based methods to (i) identify interface-design factors that constrain individuals to behave in locally optimal but globally sub-optimal ways, and (ii) survey how cognitive, technological, and motivational behavioral issues affect use in the home environment.<br>**Budget:** $247,720<br>***This project has been completed*** |
| | **Title:** Energy Delivery Infrastructures<br>**PI:** Lee Stefanakos **Co-PIs:** Zhixin Miao - USF (Formerly Alex Domijan (PI) and Arif Islam (Co-PI). Left USF).<br>**Description:** The proposed project is to simulate the effects of a renewable energy generation system in a microgrid context to the distribution grid system. The proposed project is to simulate the combination of renewable distributed generation and a battery system to assess the effects during critical conditions such as power system peak.<br>A research opportunity is to investigate how existing tools can be applied to properly representing dynamic and transient behaviors of microgrids. Therefore, in this project we propose using simulation tools to model a microgrid and investigate how well we can reproduce its measured behavior in the field<br>**Budget:** $485,184 |
| | **Title:** Micro Battery Defense Development<br>**PI:** Chunlei Wang - FIU<br>**Description:** The microbattery market for new miniature portable electronic devices such as cardiac pacemakers, hearing aids, smart cards, personal gas monitors, micro electromechanical system (MEMS) devices, embedded monitors, and remote sensors with RF capability is increasing rapidly. Thin-film lithium batteries are among the most advanced battery systems that can scale down to the dimensions that |

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| | match the MEMS devices. However, these two-dimensional (2D) batteries are necessarily thin in order to maintain effective transport of Li ions. In order to power MEMS devices with limited device area (areal "footprints"), batteries must somehow make good use of their thickness. Three-dimensional (3D) configurations offer a means to keep transport distances short and yet provide enough material such that the batteries can power MEMS devices for extended periods of time. In this project, we focus on developing functional 3D microbatteries based on our carbon microelectromechanical systems (C-MEMS) technique. These microbatteries could offer order of magnitude increases in electrode surface area and charging capability than thin film batteries at the same size scale.<br>**Budget:** , $192,418.30 – *Not Funded by FESC* |
| | **Title:** Electrostatic Spray Deposition of Nanostructured Porous Metal Oxide Composite<br>**PI:** Chunlei Wang - FIU<br>**Description:** Recently, conversion reactions of interstitial-free 3d metal oxide structures (such as CoO, CuO, and NiO) with structures unsuitable for intercalation chemistry have nevertheless been shown to exhibit large, rechargeable capacities in cells with lithium. The specific capacities of these materials, which are potential candidates for the negative electrode, can be as high as 1,000 mAhg-1 (about three times of commonly used graphitic carbons). However, practical implementation using these metal oxides is hampered by the large capacity loss of the first cycle and poor material cyclability. These problems are partially attributed to the significant volume changes that occur during lithium uptake and removal (molar volume change of ~100%), which causes mechanical failure and the loss of electrical contact at the anode. They are also due to aggregation of metal nanoparticles that appears during the process of discharging the metal oxide anodes. In order to overcome these two challenges and develop excellent rate capabilities and high power densities of Li-ion batteries, metal oxide composite electrodes with hierarchical mixed conducting network structures will be synthesized. We propose the preparation and testing of multi-component metal oxide anode films with a variety of morphologies using a simple and versatile method based on the electrostatic spray deposition (ESD) technique. The ESD technique enables us to reproducibly fabricate thin film ceramic materials with simple, low-cost and controllable designed morphologies. ESD-derived ceramic thin films we obtained including 3-D reticular, spongy-like, hollow sphere, dense, etc morphologies. The structures of these films can be easily tailored by changing the precursor solution component(s) and adjusting the substrate temperature. In this project, we plan to fabricate porous metal oxide materials, MxOy (M=Fe, Co). Material characterization methods (such as: SEM, TEM, AFM, BET, etc) will be used to study the correlation between ESD parameters and surface morphologies.<br>**Budget:** $88,378.711 - *Not Funded by FESC* |
| | **Title:** Fabrication and Investigation of Porous Tin Oxide Anodes for Li-Ion Micro Batteries<br>**PI:** Chunlei Wang - FIU<br>**Description:** The requirement of higher energy capacity microbatteries demands the exploitation of new substitute materials with higher energy capacity than traditional graphite. SnO2 has been considered as one of the most promising substitutes for the carbon anode in Li-ion batteries due to its high Li+ storage capacity. However, the practical application of SnO2 as anode is restricted by poor cyclability and rate capability due to large volume change during cycling, which can cause disintegration and electrical disconnection from current collector. In this project, we propose the preparation and testing of tin oxide anode films with a variety of porous morphologies using Electrostatic Spray Deposition (ESD) technique. Our research focus will be developing an ESD processing to fabricate tin oxide electrode with different pore sizes ranging from macropores to mesopores and down to micropores; constructing hierarchical porous tin oxide electrode by controlling process parameters and introducing a surfactant or polymer additives, and material characterization and electrochemical analysis in order to investigate the correlation |

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| | between morphology and electrochemical performance and understand the underlying mechanism. The proposed research will significantly enhance our understanding of fundamental issues regarding intrinsic properties of porous SnO2 films as anode for Li-ion batteries.<br>**Budget:** $100,000 - *Not Funded by FESC* |
| | **Title:** Very High Energy-Density Ultracapacitors<br>**PI:** E. Bakhoum, UWF<br>**Description:** A new type of ultracapacitor that offers a capacitance density on the order of 500 Farads per cubic centimeter or higher has been created. The principle behind the new ultracapacitor structure is the insertion of a 100 nm-thick layer of barium strontium titanate as an interface between the activated carbon electrode and the electrolyte. The new ultracapacitors are highly needed in hybrid vehicle applications; as any significant increase in the energy storage capability of the ultracapacitors leads to substantial improvement in the fuel efficiency of hybrid vehicles. Two manuscripts about this new development were published in 2009. Additional research is ongoing. - *Not Funded by FESC* |
| | **Title:** Secure Energy Systems<br>**PI**: Pramod Khargonekar - UF<br>**Description**: The goal of this project is to investigate the concept of secure energy systems and formulate a concrete vision of a broad-based, comprehensive research program. An additional project goal is to develop architecture for modeling, analysis, and design of secure energy systems. An energy system consists of a collection of interconnected subsystems representing energy generation devices, energy consumption devices, transmission, distribution, and storage devices, and communications and computing devices. Such systems are dynamic and its operation is influenced by external perturbations. Definition of the system and it environment depends on the problem of interest. This project is motivated by strong interest among key decision makers in understanding and assuring security of energy systems in the face of various natural and man-made threats. Increasing penetration of renewable energy sources and capabilities offered by smart grid have the potential to enhance or degrade security of energy systems. Thus, these new developments present additional motivation for understanding of secure energy systems. Whereas there is an intuitive understanding of security and assurance, much work remains to be done in formulating precise definitions that cover problems of interest and devising an overall architecture that may facilitate a system level analysis and design of such secure energy systems. Taking into account rapid changes in the energy issues in a wide variety of private and public sectors, this project is a proactive effort to develop a vision and architecture for analysis and design of secure energy systems. It is expected that the results of this project will lead to future development and integration of specific analysis and design algorithms and software that will assist system designers in assessing and ensuring an appropriate level of system security.<br>**Budget**: $220,000<br>Back to Thrust 1: Overarching |
| | **Title:** Optimization, Robustness and Equilibrium Modeling for the Florida Smart Grid<br>**PI:** Panos Pardalos - UF<br>Description: This project began in January 2011. It aims to develop algorithms for optimal design and functioning of Florida's next generation of power transmission and distribution systems that will incorporate the new realities of the grid. The goal is to create innovative real time capabilities for 1) optimal location of renewable energy source; 2) detection and prevention of instabilities and outages; and 3) operating models including generalized Nash equilibrium problems in the electricity market.<br>**Budget**: $30,000 |
| **Policy** | |
| | **Title***:* Economic Impacts of Renewable Energy and Energy Efficiency Policies |

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| | **PI:** Theodore Kury – UF (PI use to be Mark Jamison)<br>**Description**: To serve its mission and contribute to FESC's fulfillment of its mission, PURC is conducting the three projects described below. These projects will be completed in two years and will deliver policy relevant reports and academic quality papers. The projects are:<br>1) Economic and Job Impacts of State Renewable Energy and Energy Efficiency Policies<br>This project will provide empirical estimates of state renewable energy and energy efficiency policies on economic development and jobs.<br>2) Electric Grid Impacts of State Renewable Energy and Energy Efficiency Policies<br>This project will provide an estimate of the impacts of renewable energy policies on the electric grid. It will fill a gap in the literature for Florida, which as to date focused on the impacts on electricity generation.<br>3) Effects of Energy Commodity Profit Margins on Effectiveness of Energy Efficiency Programs<br>This project will test an assumption that is built into many state energy policies and that is held by many policy makers at the national level, namely that utilities would improve consumer energy efficiency practices if utility prices were decoupled from utility profits.<br>**Budget:** $150,000 |
| | **Title:** Environmental Impacts of Energy Production Systems: Analysis, Evaluation, Training, and Outreach<br>**PI:** Amy B. Chan-Hilton, **Co-PIs:** Gang Chen, Wenrui Huang, Michael Watts, Ming Ye, Paul Lee - FSU<br>**Description:** The goal of this project is to develop tools and conduct research to objectively assess environmental and water resources needs and constraints while developing prudent energy strategies and policies. The focus of this research will be on fuel cycle and energy production systems. The objectives of this project were to analyze the environmental and water resources demands and potential impacts, specific to Florida's unique geographical challenges, of fuel cycle systems and develop an objective environmental impact screening and evaluation tool or decision support system for energy planning and policy making by Florida's industry, utilities, and government.<br>As Florida develops its long-term energy strategy, multiple efforts are ongoing to develop and apply a wide range of energy technologies that are sustainable and carbon-neutral. But pragmatic issues related to environmental impact and sustainability need to be addressed before these technologies may be implemented. This project directly addressed the FESC's Thrust 6 on "Energy systems and their environmental and economic impacts." This project also directly addresses IESES's Objective 4 on unique geographical challenges and Objective 5 on sustainable energy engineering, science and the sustainable energy economy.<br>**Budget:** $118,470<br>**External Collaborators:** Florida Department of Environmental Protection<br>***This project has been completed*** |
| | **Title:** Promoting Energy and Land Use Through Land Use, Transportation and Green Infrastructure Polices<br>**PI:** Tim Chapin, **Co-PIs**: Ivonne Audirac, Chris Coutts, Greg Thompson, Mark Horner - FSU<br>**Description:** In response to the many issues related to energy provision, energy sustainability, and GHGs, in 2007 Governor Crist created an Action Team on Energy and Climate Change. This group was tasked with investigating and recommending strategies for reducing GHG emissions, creating more sustainable energy systems in Florida, and for establishing Florida as an international leader in innovative energy provision. Related to this, the 2008 session saw the Florida Legislature pass HB 697 which, among many things, requires every local government in the state to address energy systems and GHG emissions explicitly within their comprehensive plans. Currently, the linkages between energy planning, environmental and economic sustainability, land use and transportation planning, and GHG reductions have |

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| | never been stronger in Florida. This project is aimed at continuing the momentum in Florida for developing broad-based solutions to these problems by helping to develop a knowledge base for informing state policy in the areas of energy, sustainability, and land use and transportation planning.<br>**Budget:** $168,185<br>***This project has been completed*** |
| | **Title:** Political and Economic Institutions Regarding Siting of Energy Facilities<br>**PI**: R. Mark Isaac, **Co-PIs:** Douglas Norton, Svetlana Pevnitskaya - FSU<br>**Description:** The "Hold-Out" project evaluates the "hold-out" concept, which is discussed repeatedly in the context of public policies regarding land acquisition and facilities siting, but a clear definition is elusive. To economists, the most likely definition is that a profitable amalgamation of land parcels by one buyer from competing sellers does not occur because of the failure of the private bargaining process. However, sometimes the term seems to be used more for delay instead of failure in bargaining, or even the very different concept of creation of any bilateral bargaining situation of the buyer and the "last" or "holding-out" seller, which may be inconvenient to the buyer but is immaterial in terms of economic efficiency unless efficient trades actually fail. The experimental design is complete, the programming is complete, Institutional Review Board approval has been obtained, and we have conducted two complete experimental treatments. This research was presented at one of the Presidential Sessions at the 2009 Meetings of the Southern Economics Association in November in San Antonio.<br>**Budget:** $79,621<br>***This project has been completed*** |
| | **Title:** Experimental Investigation of Economic Incentives of Policies, Institutions and R&D in Environmental Conservation<br>**PI:** Svetlana Pevnitskaya, **Co-PI:** Dmitry Ryvkin - FSU<br>**Description:** Policies and institutions aiming at reducing pollution and battling climate change often do not reach desirable results because actual decisions of governments and economic agents deviate from those predicted by theory. We employed methods of experimental economics to find and explore such deviations and their causes, and used the findings to modify theory and design better policies and institutions. In this project, we constructed a theoretical model of decisions in a dynamic environment with costs of pollution and climate change, while testing the theory in laboratory experiments with human subjects. We studied actual behavior and explore responses to changes in the environment, production technologies, investment in clean technology and institutions. This project is complete.<br>**Budget:** $43,217<br>***This project has been completed*** |
| | **Other** |
| | **Title:** Fusion Energy Spheromak Turbulent Plasma Experiment-STPX<br>**PI:** Charles A. Weatherford, **Co-PIs:** Kyron Williams, Ephrem Mezolin - FAMU<br>**Description:** The Florida A&M University's Center for Plasma Science and Technology (CePaST) has nearly completed the construction of a spheromak fusion reactor. A spheromak is one of a general class of experiments used to investigate key plasma physics principles relevant for the development of magnetically confined, controlled thermonuclear fusion as a source of electrical power. This project involves collaboration between Florida A&M University CePaST, West Virginia University, and Auburn University. The spheromak turbulent plasma physics experiment (STPX) is being constructed at FAMU in a facility especially built for the STPX experiment. Fusion research is a key element in the nation's long term energy supply strategy, The spheromak concept may be a possible alternative to the tokamak concept (deployed at ITER) which affords access to fundamental fusion science issues supportive of fusion while allowing us to |

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| | maintain and nurture an American fusion scientific workforce. This project will determine, using a fast duty cycle between theory, experiment, and simulation, the essential elements required for full kinetic modeling of an entire spheromak plasma using ab initio MHD with direct modifications from new turbulence physics. The project will focus on the management of fluctuations and transport in a spheromak plasma using new turbulence physics models and comprehensive helicity control. We will employ high time- and spatial-resolution measurements of electron temperatures, ion temperatures, and magnetic field fluctuations to investigate, understand, and eventually control reconnection driven heating as a means of increasing the plasma temperature of spheromak plasmas. We will use divertor diagnostics of radiation and particle transport along with edge biasing for electric field control to explore the effects of driven flows on confinement and heating in spheromak plasmas with microparticles and will investigate the effects of MW pulses coupled to protons on the plasma current and confinement.<br>**Budget:** $950,000 – *Not Funded by FESC*<br>**Universities and External Collaborators:**<br>Dr. Earl Scime, West Virginia University<br>Dr. Ed Thomas, Auburn University<br>Dr. Simon Woodruff, Woodruff Scientific, Inc |
| | **Title:** Marketing Strategies to Incentives Entrepreneurship and Innovation in the Development of Sustainable Energy<br>**PI:** Joe Cronin - FSU<br>**Description:** The objective of this project was to investigate the role of market pull strategies in advancing sustainability goals. Specifically, the intent is to identify what "drives" consumers' attitudes and behaviors relative to sustainable products. This includes consumers' personal attitudes, opinions, and beliefs, their perceptions of their own and organizations' abilities to affect or change the environment in which they live, and their personal characteristics (e.g., demographics). In addition, in collaboration with the College of Communications, the strengths and weaknesses of the various communication modalities that can be used to deliver sustainability knowledge to consumers (e.g., advertisements, testimonials, expert word-of-mouth communications, public relations, publicity, etc) were assessed. Specifically, the research attempts to identify the optimal market pull modality; that is, the means by which to deliver to consumers the knowledge that drives the purchase of sustainable goods and services. The overall objective of the research is to provide much needed market pull information for organizations embarking on "green" marketing strategies; that is, firms in the process of developing or expanding their mix of environmentally friendly goods and services.<br>**Budget:** $191,555<br>***This project has been completed*** |
| | **Title:** Energy Sustainable Florida Communities<br>**PI:** Richard Feiock, **Co-PIs:** Ivonne Audirac, Keith Ihlanfeldt - FSU<br>**Description:** The objective of NESC is to stimulate innovation and energy investments that will accelerate energy savings by local governments by sharing best practices and organizing and managing large scale collaboration and bulk buying projects.<br>Florida State University has been working with U.S. DOE contributing surveys, research and outreach assistance to assist in efforts to promote investment, collaboration, and bulk purchasing by local governments that will achieve significant cost savings. This includes organizing NESC conference calls co-hosted by hosted by FSU and DOE, conducting several surveys, and hosting a meeting of Florida local government EECBG sub-awardees.<br>These initial research efforts and conference calls have been successful in identifying broad interest in |

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| | collaboration and bulk buying. They also revealed significant barriers to collaboration that need to be addressed including issues related to coordination within governments, among governments and with other organizations.<br>We are now undertaking activities to address these barriers to collaboration at three levels: First we are conducting focused regional workshops throughout the state. By bringing interested governments in each region together with experts in collaboration, governance, finance, and purchasing we will identify specific projects and design the mechanisms to put the projects in place. Second, are expanding our statewide dialogue on a more systematic basis and share the insights and successes of our regional workshops. Third, we are working with universities and other partners throughout the U.S. to share strategies and insights and help replicate our successes in other states. By expanding our efforts and formalizing the network we will make large scale energy savings a reality.<br>**Budget:** $125,424<br>***This project has been completed*** |
| | **Title:** Development of a Renewable Energy Research Web Portal<br>**PI:** Charles R. McClure, **Co-PIs**: Ian Douglas, Chris Hinnant - FSU<br>**Description:** This project identified, organized, and made available via a web portal, research generated as part of the FESC effort as well as other selected related information resources and tools as identified by FESC participants. The goal of this project was to provide IESES, FESC, researchers, and others in the state of Florida with the research information they need to accomplish statewide energy goals. An initial product from this project was an operational web portal that identifies, organizes, and provides access to a range of FESC and other research related to renewable and alternative energy information. A second product was research results on extending technologies that allow users to share information and grow/sustain the web portal through a range of social networking techniques. This research attempts to position FSU to seek additional external funding related to interactive databases and web portals. The ultimate expected outcomes resulting from the project include increased IESES and FESC researcher productivity; increased leverage and collaboration of FESC resources and funding; and improved policy- and decision-making regarding the future uses and development of renewable and alternative energy in Florida.<br>**Budget:** $194,542<br>***This project has been completed*** |
| | **Title:** Planning Grant: Hydrogen Storage Using Carbon-Based Adsorbent Materials<br>**PI:** Efstratios Manousakis - FSU<br>**Description:** This project was a theoretical investigation of a variety of carbon based nano-porous materials, such as activated carbon or single-wall or multi-wall carbon nanotubes, which can be used to store and transport hydrogen. We find that by doping with metallic elements, the micro-surfaces of these carbon-based porous materials provide increased van der Waals forces to the adsorbed hydrogen molecules; this effect significantly enhances the volumetric energy density for hydrogen storage and we caried out a full theoretical investigation to find the optimum conditions. This project is complete.<br>**Budget: $15,000**<br>***This project has been completed*** |
| **Education and Outreach** | |
| | **Title:** Florida Advanced Technological Education Center (FLATE)<br>**PI:** Marilyn Barger - UF<br>**Description:** FLATE (Florida Advanced Technological Education Center) is FESC's partner to develop statewide curriculum frameworks for technical A.S./A.A.S. degree programs supporting existing and new |

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| | energy business sectors. FLATE develops the frameworks and facilitates their progress through the multiple sequential industry-validation, student competencies based, FLDOE procedure. FLATE also develops new courses and provides faculty professional development as required for each new program of study. Additionally FLATE helps colleges in the State College System implement the new frameworks in their institutions. To support the new curriculum, FLATE will work closely with the FESC Public Outreach and Industry Partnership programs to provide additional professional development opportunities for teachers and faculty to upgrade and update their STEM knowledge base.<br>**Budget:** $300,000<br>**External Collaborators:** Brevard Community College; Tallahassee Community College; Daytona State College; Central Florida Community College; Polk State College; Florida State College at Jacksonville; Valencia Community College; School District Hillsborough County; Florida Department of Education – Division of Adult and Career Education; West Side Technical School; WFI Banner Center for Energy; Advanced Technology for Energy and Environment Center (ATEEC); University of West Florida, Dept of Construction Technology; WFI Banner Center for Construction; WFI Banner Center for Alternative Energy; USF College of Engineering; Madison Area Technical College ATE project for Alternative Energy certifications; Milwaukee Area Technical College Energy Conservation and Advanced Manufacturing Center (ECAM); Florida Energy Workforce Consortium (FEWC); TECO; Progress Energy; ISTEC (Ibero Science and Technology Education Consortium). |
| | **Title:** Outreach Activities for FESC<br>**PI:** Pierce Jones, Kathleen C. Ruppert, Hal S. Knowles III, Nicholas Taylor, Barbra Larson, Craig Miller- UF<br>**Description:** Developing educational outreach programs and materials designed to deliver practical, applicable information and knowledge on energy-related topics to the general public as well as targeted to specific audiences such as builders, planners, engineers, architects, small businesses, local governments, and utilities through the Cooperative Extension Service and others. By focusing educational programming on climate and efficient use of energy and water, the program aims to provide the knowledge needed by building and energy professionals, local governments, and the general public, to significantly reduce greenhouse gas emissions in Florida.<br>**Budget:** $497,670<br>**External Collaborators:** Primarily DCA, FSU, UCF (FSEC), USF, and DEP with many others as well. |
| | **Title:** UFTR Digital Control System Upgrade for Education and Training of Engineers and Operators<br>**PI:** Gabriel Ghita – UF (PI use to be Alireza Haghighat; he has left UF)<br>**Description:** The goal of this project is to contribute to a major initiative on design, licensing and construction of a fully digital control system for the University of Florida Training Reactor (UFTR). This makes the UFTR the first operating nuclear power plant in the United States that uses a fully digital control system. This facility will provide for the training and education of the necessary workforce in the area of digital control and instrumentation for nuclear reactors. With this effort, a new focus/certificate on digital control and instrumentation will be developed at the Nuclear and Radiological Engineering (NRE) Department. Further, the UFTR facility will offer training courses for community colleges (Central Florida, Indian River, and Jacksonville) in the State of Florida, personnel from nuclear utilities and government agencies including the Nuclear Regulatory Commission (NRC). The project has already received significant funding from industry and government in form of grants, contracts, equipment/systems, and engineers' time.<br>**Budget:** $308,000<br>**External Collaborators:** Several engineers from AREVA NP Inc & Siemens Corporation |

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| | **Title:** Energy and Efficiency Video Public Service Announcements<br>**PI:** Andy Opel, **Co-PIs:** Phil Steinberg, Leslie France-Patterson, Laura Arpan, Ian Weir - FSU<br>**Description:** This interdisciplinary team produced 6-8 short (30-second/one-minute) video public service announcements (PSAs) that address issues of energy and efficiency and one 12-15 minute informational documentary targeted to Florida legislators and the Governor's office. These videos will be tailored to reinforce existing IESES efforts.<br>**Budget:** $200,720<br>***This project has been completed*** |
| | **Title:** Planning Grant: Climate modeling and Outreach Activities<br>**PI:** Shawn R. Smith, **Co-PIs**: Steve Cocke, David Zierden, James O'Brien, Julie Harrington - FSU<br>The objective of the planning grant is to develop at least one external funding proposal that focuses on areas of climate modeling and/or climate outreach that support the activities of the IESES. The focus of our activities has centered on evaluating the potential offshore wind resource in the northeastern Gulf of Mexico and elsewhere in Florida's waters. Preliminary research has been completed using observations from instrumented Air Force towers and buoys in the waters around Florida. The existence of wind power capacity has been identified at the assessed locations. Due to the sparseness of in-situ wind data in the region, a numerical modeling approach will need to be pursued to develop a wind climatology with sufficient spatial and temporal scales to further define the offshore wind power capacity.<br>A vast portion of the work conducted focused on outreach and education. When we began our project, the idea of offshore wind power in Florida was not even on the radar of the Florida Legislature or the renewable energy sector at large. We worked to raise the visibility of offshore wind as an energy resource for Florida by attending meetings, connecting with the wind power industry in Florida, and briefing two members of the Florida Legislature and presenting to the Florida Energy and Climate Commission. As a result of these connections, we submitted a preliminary proposal to Siemens Wind Power and have developed a network of colleagues both within FSU and the private sector that are interested in further developing Florida's offshore wind resource.<br>**Budget:** $15,000<br>***This project has been completed*** |
| | **Title:** Visiting Law Professor<br>**Principal Investigator:** JB Ruhl, Jim Rossi **Co-PI:** Uma Outka - FSU<br>**Description:** Two-year Visiting Scholar, Uma Outka, at the College of Law researched the interface between land use law and innovative energy solutions and delivering academic symposia and graduate student seminars on the research scope, comprising Sustainable Energy Research Project (SERP) within Environmental and Land Use Law Program. This project is complete.<br>**Budget:** $214,603<br>***This project has been completed*** |
| **FESC Phase 2 Technology Commercialization** | |

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| | **Title:** Development of a Low Cost Concentrating Solar Energy System Using Solar Sausages<br>**PIs:** David VanWinkle, Sean Barton – UF<br>**Description:** Beginning in late 2010, weekly meetings have been held at HHH offices in Tallahassee that include representatives of the several entities involved in deploying the "Solar Sausage" concentrating system at the Yulee St. site in Tallahassee. The entities include Pro Solar Inc., Barkley Consulting Engineers Inc., Winton Engineering PA, and Applied Research and Design Inc. A series of 50-foot long prototype sausages were made and inflated on site. Many issues were identified that needed to be resolved before manufacturing and deploying several hundred solar sausages on site including methods of constructing, mounting, and operating the balloons, distribution of air and electricity, and removal of heat.<br>**Industry Partner:** Hunter and Harp Holdings (HHH) |
| | **Title:** Stress Evolution in Solid-State Li-Ion Battery Materials<br>**PI:** Kevin S. Jones – UF<br>**Description:** Li-ion battery (LIB) technology is promising for use in electric drive vehicle (EDV) and stationary energy storage applications. However, challenges with materials safety, performance, cost, and manufacturing scalability have largely prohibited LIB implementation in these situations. Challenges in stress evolution during the fabrication and processing of the elements of the cells remain and are not well understood. In this study the roles of component fabrication and processing conditions on the resulting stresses in the materials are being evaluated. Thin film battery components will be deposited on stainless substrates using a novel fabrication method invented and patented by Planar Energy and the components will be subjected to different annealing treatments. A novel curvature measurement system will be used to characterize the stress in the component layers both after deposition and annealing and structural analysis techniques will be used to correlate the resultant component material microstructure and crystallographic phase(s) with the measured stresses.<br>**Industry Partner:** Planar Energy |
| | **Title:** SWNT Based Air Cathodes for Fuel Cells & Metal Air Batteries<br>**PI:** Andrew G. Rinzler – UF<br>**Description:** The goal of this project is to develop and use novel gas diffusion oxygen reducing electrode (air cathode) based on single wall carbon nanotube (SWNT) films in zinc-air batteries and fuel cells. Metal-air batteries, utilizing surrounding air as an inexhaustible cathode material have the highest specific and volumetric energy density of any primary battery system available. Gas diffusion oxygen electrodes, where molecular oxygen is electrocatalytically reduced, are vital to battery and fuel cell performance. The air cathode should be permeable to air or another source of oxygen, but must be substantially hydrophobic so that electrolyte will not leak though it, and have an electrically conductive element connected to external circuitry. Generally, conventional air cathode is a thick multilayer film comprising carbonaceous powder mixed with nanoscale metal catalyst to promote oxygen reduction and hydrophobic polymer additive pressed onto electrically conductive layer. While noble metals such as platinum that are commonly used as catalysts in conventional air cathodes offer the advantages of intrinsic catalytic activity, their deficiency in resource, high costs, and susceptibility to catalyst poisoning, have become a serious concern for commercial applications. An optimized SWNT based air cathode catalyst that would constitute a significant improvement in existing technologies is being developed. This new system avoids precious metals, is not poisoned, is thin, light-weight, and resists electrolyte flooding.<br>**Industry Partner:** nRadiance LL |

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| | **Title:** Uni-Directional Impulse Turbine for the Powering of Offshore Monitoring Systems<br>**PI:** Zhihua Qu, **Co-PI:** Kuo-chi Lin – UCF<br>**Description:** Numerical modeling and experimental testing of turbine for wave energy conversion. The University of Central Florida and Harris Corporation have joined efforts to design, build and analyze a wave powered abandoned oil well monitoring system for use in the Gulf of Mexico. This system proposes a fully automated oil leak detection system which is self-powered by the local ocean energy which is converted to electricity, conditioned and sent from the surface buoy to the ocean floor to supply power for an abandoned oil well monitoring system.<br>**Industry Partner:** Harris Corporation |

## APPENDIX B – ACCOUNTABILITY MEASURES – DATA

### 1. Competitive Grants Applied by all SUS faculty in Energy Area

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

SUS energy faculty submitted **259 funding proposals amounting to $334,176,368** during the twelve-month period of Oct 1, 2011 through Sep 30, 2012. The information was collected through the databases at each university, published news releases, and faculty input. The database information was reviewed carefully and listings that are not energy related were deleted.

Due to confidential nature of this information, the listing of the proposals submitted is not given in this report; however the break down by university and by agency are provided below:

| University | # of Proposals Submitted | Funding Requested |
|---|---|---|
| FAU | 10 | $6,021,633 |
| FSU | 6 | $3,076,887 |
| UCF/FSEC | 76 | $157,308,363 |
| UF | 145 | $132,057,106 |
| USF | 22 | $35,712,379 |
| **TOTALS** | **259** | **$334,176,368** |

| Agency | # of Proposals Submitted | Funding Requested |
|---|---|---|
| DOD | 5 | $614,532 |
| EDA | 2 | $2,310,434 |
| Industry | 58 | $9,578,240 |
| NASA | 3 | $1,475,975 |
| NSF | 69 | $54,632,453 |
| Other | 62 | $42,545,914 |
| US DOE | 55 | $213,175,478 |
| USDA | 5 | $9,843,340 |
| **TOTALS** | **259** | **$334,176,368** |

## 2. Competitive Grants Received by All SUS Faculty in Energy Area During Oct. 1, 2011 to Sep 30, 2011 Period (Back to top)

All SUS energy faculty information is listed below to show the scope of the SUS research program. This information might be helpful in forming collaborative teams, informing the outside world (e.g., industry) of FESC's research interests. The information was collected through the databases at each university, published news releases, and faculty input.

The SUS faculty received **274 research and education awards totaling $64,473,021** during the twelve-month period of Oct 1, 2011 through Sep 30, 2012. Note many of the awards were based on proposals submitted prior to this period, but the number demonstrates the competitiveness of the SUS faculty in this arena. The information was collected through the databases at each university, published news releases, and faculty input. The database information was reviewed carefully and listings that are not energy related to energy were deleted.

| # | Faculty | University | Source/Agency | Project Title | Start Date | End Date | Amount |
|---|---|---|---|---|---|---|---|
| 1 | S. Skemp | FAU | US DOE | Southeast National Marine Renewable Energy Center - Advanced Water Power Projects (Renamed 2008 Solicitation) | 9/30/2010 | 8/31/2013 | $250,000 |
| 2 | Marilyn Barger | FLATE | NSF | Florida's Advanced Technological Education Center of Excellence | | | $2,800,000 |
| 3 | Chris Edrington | FSU | RCT Systems | Intermediate Transient Support of High Rate Pulsed Loads | 7/17/2012 | 1/21/2013 | 25,000 |
| 4 | Dale Steinar | FSU | Office of Naval Research | Additional MVDC Tasks - The Swampworks Program | 5/1/2012 | 4/30/2013 | 807,702 |
| 5 | Gang Chen | FSU | UF | Usage of Microbial Fuel Cell Technology in Landfills | 10/1/2011 | 09/31/12 | 35,000 |
| 6 | Richard Feiock | FSU | UF | Putting Solid Waste To Work | 9/15/2012 | 9/14/2013 | 40,000 |
| 7 | Richard Meeker | FSU | DOE | The Sunshine State Solar Grid Initiative | 12/6/2011 | 10/31/2012 | 443,149 |
| 8 | Richard Meeker | FSU | FL Tech Devl. | MegaWatt Ventures | 9/6/2012 | 9/30/2012 | 3,650.33 |
| 9 | PI: Dr. Ali Orooji; CoPI(s): Dr. Issa Batarseh | UCF/FSEC | Eustace-Kwan Family Foundation | RF - Computer Programming Team (ID: 1048341) | 8/1/2008 | 4/15/2015 | $0 |
| 10 | PI: Dr. Issa Batarseh | UCF/FSEC | NSF | US-Jordan Cooperative Science: Chaos Theory on Micro-Inverters for Photovoltaic (PV) Systems (ID: 1052937) | 10/1/2012 | 9/30/2014 | $89,504 |
| 11 | PI: Dr. Issa Batarseh; CoPI(s): Dr. Louis Chow, Dr. Wasfy Mikhael, Dr. Zhihua Qu, Dr. Zheng Shen, Dr. Xinzhang (Thomas) Wu | UCF/FSEC | State of Florida (Legislature) | Florida Energy Systems Consortium (ID: 1048032) | 7/1/2008 | 6/30/2013 | $300,000 |
| 12 | PI: Dr. Zheng Shen | UCF/FSEC | NIST | Development and Electro-Thermal-Mechanical Characterization of High Temperature Packaging for Wide Bandgap Power Semiconductors (ID: 1045628) | 10/1/2007 | 8/31/2011 | $408 |

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|---|---|---|---|---|---|---|---|
| 13 | PI: Dr. Zheng Shen | UCF/FSEC | UCF/I-4 | I4: NASA SBIR Phase II: High-Temperature, Wirebondless, Ultra-Compact Wide Bandgap Power Semiconductor Modules for Space Power Systems (ID: 1052023) | 7/1/2011 | 6/30/2012 | $24,988 |
| 14 | PI: Dr. Zheng Shen | UCF/FSEC | Advanced Power Electronics (APECOR) | NASA SBIR Phase II: High-Temperature, Wirebondless, Ultra-Compact Wide Bandgap Power Semiconductor Modules for Space Power Systems (ID: 1052021) | 7/1/2011 | 9/30/2012 | $68,735 |
| 15 | PI: Dr. Zhihua Qu | UCF/FSEC | UCF/I-4 (16408104) | Autonomous and Cooperative Control of Unmanned Air Systems (ID: 1047046) | 7/1/2008 | 6/30/2012 | $558 |
| 16 | PI: Dr. Zhihua Qu | UCF/FSEC | UCF/I-4 | I-4: Modeling and Control of Unmanned Aerial Vehicles (ID: 1051675) | 7/1/2011 | 6/30/2012 | $5,000 |
| 17 | PI: Dr. Zhihua Qu | UCF/FSEC | L3 Communications Link Simulation & Training | Modeling and Control of Unmanned Aerial Vehicles (ID: 1051676) | 7/1/2011 | 12/31/2012 | $15,000 |
| 18 | PI: Dr. Zhihua Qu; CoPI(s): Marcel Ilie | UCF/FSEC | Florida High Tech Corridor Council | I-4: Unidirectional turbine for wave energy extraction (ID: 1053530) | 7/1/2011 | 6/30/2012 | $10,000 |
| 19 | PI: Dr. Zhihua Qu; CoPI(s): Marcel Ilie, Dr. Kuo-Chi Lin | UCF/FSEC | Harris Corporation | Power-generation buoy and deep-sea monitoring system (ID: 1051436) | 9/1/2010 | 8/7/2012 | $10,000 |
| 20 | PI: Colleen Kettles | UCF/FSEC | Leonardo Technologies, Inc. | Space Coast Clean Cities Coalition Support 2012 (ID: 1053428) | 11/16/2009 | 10/31/2012 | $25,000 |
| 21 | PI: Dr. Ali Raissi | UCF/FSEC | Harris Corporation/GCSD Division | Analysis and Interpretation of the HARRIS Hydrocarbon Upgrading Project (ID: 1053308) | 11/8/2011 | 6/30/2012 | $19,657 |
| 22 | PI: Dr. Ali Raissi | UCF/FSEC | Harris Corporation | Hydrocarbon Upgrading Study with the Bitumen Quantitative Investigation (ID: 1053726) | 2/1/2012 | 9/30/2012 | $32,603 |
| 23 | PI: Dr. Ali Raissi | UCF/FSEC | Florida Solar Energy Center | Large-Quantity Production of the Chemochromic Hydrogen Sensing Pigment (ID: 1053933) | 3/19/2012 | 6/30/2012 | $17,057 |
| 24 | PI: Dr. Ali Raissi | UCF/FSEC | Cella Energy Limited | Nanostructured Polymer Scaffolds as H2 Storage Materials (ID: 1053544) | 5/1/2012 | 5/31/2014 | $295,251 |
| 25 | PI: Dr. Ali Raissi; CoPI(s): Dr. Jong Baik, Dr. Nazim Muradov | UCF/FSEC | Florida Solar Energy Center | A Combined Gasification Fischer-Tropsch Reactor for Liquid Fuel Production being developed at FSEC | 4/5/2012 | 7/5/2012 | $96,085 |
| 26 | PI: Dr. Darlene Slattery; CoPI(s): Mr. James Roland | UCF/FSEC | Florida Solar Energy Center | Laboratory Renovation (ID: 1054076) | 6/1/2012 | 8/30/2013 | $400,000 |
| 27 | PI: Dr. David Block; CoPI(s): Dr. James Fenton, Dr. Ali Raissi | UCF/FSEC | US DOE | Transfer of DOE Agreement DE-FC36-04GO14225 Florida Hydrogen Initiative to Florida Solar Energy Center (ID: 1047934) | 5/1/2009 | 12/31/2012 | $1,342,729 |
| 28 | PI: Dr. David Block; CoPI(s): Mr. John Harrison | UCF/FSEC | US DOE | Phase 2 of the Southern Region Resource and Training Program as Part of the Southern Alternative Energy Training Network (ID: 1052716) | 10/1/2011 | 12/30/2014 | $1,000,450 |

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| 29 | PI: Dr. David Block; CoPI(s): Mr. Philip Fairey, Dr. James Fenton | UCF/FSEC | State of Florida (Legislature) | Florida Energy Systems Consortium (ID: 1048385) | 7/1/2008 | 12/31/2012 | $40,000 |
| 30 | PI: Dr. James Fenton; CoPI(s): Dr. Nahid Mohajeri, Dr. Darlene Slattery | UCF/FSEC | US DOE | Lead Research and Development Activity for DOE's High Temperature, Low Relative Humidity Membrane Program (Topic 2 of DE-PS36-05GO95020) (ID: 1043309) | 4/1/2006 | 5/31/2012 | $224,104 |
| 31 | PI: Dr. Lixing Gu; CoPI(s): Mr. Richard Raustad | UCF/FSEC | US DOE | Continuity and Innovation in the Development and support of Energy Plus (ID: 1052240) | 6/20/2011 | 6/19/2013 | $1,328,000 |
| 32 | PI: Dr. Lixing Gu; CoPI(s): Mr. Richard Raustad | UCF/FSEC | Florida Solar Energy Center | Increase DX Cooling Coil Efficiency by Reducing Coil Surface Tension (ID: 1054078) | 6/1/2012 | 5/31/2014 | $157,493 |
| 33 | PI: Dr. Marianne Rodgers | UCF/FSEC | Office of Research & Comm. | IH: Development and Characterization of Anion Exchange Membranes and Anion Exchange Ionomers for Alkaline Fuel Cells (ID: 1054035) | 5/1/2012 | 12/31/2012 | $7,500 |
| 34 | PI: Dr. Nahid Mohajeri | UCF/FSEC | Florida Solar Energy Center | Preparation of Irreversible Chemochromic Pigments for Hydrogen Sensor Application (ID: 1054150) | 5/15/2012 | 10/15/2012 | $5,916 |
| 35 | PI: Dr. Neelkanth Dhere | UCF/FSEC | PV Integrated | Prepare CigSeS Cell Coupon and Test PV Modules at High Voltage (ID: 1052975) | 10/1/2011 | 9/30/2012 | $18,000 |
| 36 | PI: Dr. Neelkanth Dhere | UCF/FSEC | Instituto Militar de Engenharia | Science Without Borders Program (ID: 1053957) | 7/1/2012 | 12/31/2012 | $14,089 |
| 37 | PI: Dr. Neelkanth Dhere | UCF/FSEC | Corning, Inc. | To Execute the Comprehensive Test Plan for Corning Inc. (ID: 1052841) | 1/1/2012 | 6/30/2013 | $636,470 |
| 38 | PI: Dr. Nicoleta Hickman | UCF/FSEC | UCF/Space Research Initiative | Electrostatic Dust Hazard Prediction and Control for Lunar and Mars Missions (ID: 1050094) | 4/6/2009 | 6/30/2012 | $52,066 |
| 39 | PI: Dr. R. Paul Brooker | UCF/FSEC | Florida Solar Energy Center | Vanadium and Bromine Redox Flow Batteries (ID: 1054079) | 4/15/2012 | 10/14/2012 | $81,500 |
| 40 | PI: Dr. Winston Schoenfeld; CoPI(s): Mr. Robert Reedy | UCF/FSEC | SEMATECH | PV Manufacturing Consortium (ID: 1053069) | 9/1/2011 | 8/31/2016 | $3,606,853 |
| 41 | PI: Mr. Carlos Colon; CoPI(s): Mr. Danny Parker | UCF/FSEC | Florida Natural Gas Association | Side by side Testing of High Efficiency Condensate Natural Gas and Hybrid Solar Hot Water Heating (ID: 1053108) | 10/1/2011 | 9/30/2013 | $24,000 |
| 42 | PI: Mr. Danny Parker | UCF/FSEC | US DOE | ARRA-Technical Assistance to Lawrence Berkeley National Laboratory with the Home Energy Saver Software (ID: 1052739) | 1/31/2012 | 12/30/2012 | $47,914 |
| 43 | PI: Mr. David Chasar; CoPI(s): Mr. David Click | UCF/FSEC | Atlantic Housing Partners | Task 1: Energy Analysis and Performance Testing of Multifamily Dwellings (ID: 1046460) | 8/10/2007 | 12/31/2012 | $9,570 |
| 44 | PI: Mr. David Chasar; CoPI(s): Mr. David Click | UCF/FSEC | Atlantic Housing Partners | Task 3: Energy Analysis and Performance Testing of Multifamily Dwellings (ID: 1046558) | 8/10/2007 | 12/31/2012 | $15,430 |
| 45 | PI: Mr. David Chasar; CoPI(s): Mrs. Janet McIlvaine | UCF/FSEC | US DOE | Building Energy Model Development for Retrofit Homes (ID: 1054138) | 6/19/2012 | 9/30/2012 | $68,838 |

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| 46 | PI: Mr. David Click; CoPI(s): Mr. Houtan Moaveni | UCF/FSEC | AAA Solar Source | Acceptance Test-FDOT Turkey Lake (ID: 1054547) | 8/29/2012 | 9/28/2012 | $1,350 |
| 47 | PI: Mr. David Click; CoPI(s): Mr. Houtan Moaveni, Mr. Robert Reedy | UCF/FSEC | Florida State University | SUNGRIN Simulation-Assisted Understanding of the High-Penetration PV Effects and Requirements (ID: 1054485) | 5/1/2012 | 8/31/2015 | $50,000 |
| 48 | PI: Mr. David Click; CoPI(s): Mr. John Del Mar | UCF/FSEC | Colegio Rochester | Rochester Solar System Design Review (ID: 1053708) | 3/15/2012 | 4/30/2012 | $1,763 |
| 49 | PI: Mr. Eric Martin; CoPI(s): Mr. David Chasar, Mr. James Cummings, Mr. Philip Fairey Mrs. Janet McIlvaine, Mr. Danny Parker, Mr. Robin Vieira, Mr. Charles Withers | UCF/FSEC | US DOE | Building America Partnership for Improved Residential Construction (BA-PIRC) Task Order 3 (ID: 1053456) | 4/9/2012 | 12/31/2012 | $1,680,404 |
| 50 | PI: Mr. James Cummings; CoPI(s): Mr. David Click, Mr. Houtan Moaveni, Mr. Robert Reedy, Mr. Charles Withers | UCF/FSEC | Florida Power and Light | Assessment of Energy and Peak Demand Savings of a Solar-Powered Space Conditioning System (ID: 1052396) | 11/4/2011 | 12/31/2013 | $108,112 |
| 51 | PI: Mr. John Del Mar; CoPI(s): Mr. David Click | UCF/FSEC | US DOE | Combined Photovoltaics/Thermal (PVT) Systems (ID: 1049611) | 9/28/2009 | 12/31/2012 | $20,002 |
| 52 | PI: Mr. John Del Mar; CoPI(s): Mr. Houtan Moaveni | UCF/FSEC | Sarasota County Sustainability Office | ARRA - Solar Water Heating for Sarasota County Government (ID: 1052306) | 5/3/2011 | 8/30/2012 | $5,622 |
| 53 | PI: Mr. John Harrison; CoPI(s): Mr. David Click, Mr. John Del Mar | UCF/FSEC | Orlando Utilities Commission | Solar Technical Services to OUC (ID: 1048986) | 7/30/2008 | 7/31/2013 | $20,329 |
| 54 | PI: Mr. John Sherwin; CoPI(s): Mr. Danny Parker, Mr. John Sherwin | UCF/FSEC | US DOE | ARRA: Technical Subtopic 4.1: Improving Best Air Conditioner Technology by 20-30% through a High Efficiency Fan and Diffuser Stage Coupled with an Evaporative Condenser Pre-Cooler (ID: 1049806) | 7/1/2010 | 12/31/2013 | $65,368 |

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| 55 | PI: Mr. Philip Fairey; CoPI(s): Mr. David Chasar, Mr. James Cummings, Mr. Eric Martin Mrs. Janet McIlvaine, Mr. Danny Parker, Mr. Robin Vieira, Mr. Charles Withers | UCF/FSEC | National Renewable Energy Lab (KNDJ04033902) | Building America Partnership for Improved Residential Construction (BA-PIRC) Task Order 2 (ID: 1052401) | 7/27/2011 | 9/30/2012 | $50,417 |
| 56 | PI: Mr. Richard Raustad | UCF/FSEC | Florida Solar Energy Center | Advanced HVAC Performance Test Facility (ID: 1054077) | 7/1/2012 | 6/30/2015 | $837,293 |
| 57 | PI: Mr. Richard Raustad | UCF/FSEC | Associated Gas Distributors of Florida | Measuring Commercial Fryer Electric and Gas Usage for the Associated Gas Distributors of Florida (ID: 1053666) | 4/1/2012 | 3/30/2013 | $60,000 |
| 58 | PI: Mr. Richard Raustad; CoPI(s): Dr. Lixing Gu | UCF/FSEC | US DOE | ARRA: Technical Topic 2.1: Modeling Variable Refrigerant Flow Heat Pump and Heat Recovery Equipment (ID: 1049804) | 7/1/2010 | 6/30/2013 | $147,512 |
| 59 | PI: Mr. Robert Reedy; CoPI(s): Mr. David Click, Mr. Kristopher Davis | UCF/FSEC | US DOE | Development, Demonstration and Commercialization of Smart-Grid Inverters for Wider PV Technology Utilization (ID: 1047294) | 6/25/2008 | 10/31/2011 | $224,023 |
| 60 | PI: Mr. Robin Vieira | UCF/FSEC | State of Florida (Legislature) | Building America Task Order 2 Match from FSEC (ID: 1052906) | 5/1/2011 | 9/30/2012 | $10,000 |
| 61 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 1.1 Inverter High-Risk Component Operating Temperature Study (ID: 1052895) | 8/9/2011 | 10/1/2012 | $20,782 |
| 62 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 1.2 Design and Install Monitoring on Sanford Federal Center GSA PV System (ID: 1052952) | 8/9/2011 | 10/1/2012 | $97,291 |
| 63 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 3.1 System Long Term Exposure Study (ID: 1052954) | 8/9/2011 | 10/1/2012 | $19,099 |
| 64 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 3.2 Inverter Long Term Exposure Study (ID: 1052955) | 8/9/2011 | 10/1/2012 | $30,530 |
| 65 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 3.3 High Voltage Bias Tests (ID: 1052956) | 8/9/2011 | 10/1/2012 | $39,091 |
| 66 | PI: Mr. Stephen Barkaszi | UCF/FSEC | Sandia National Laboratories | Task 3.4 Module Testing and Certification (ID: 1052957) | 8/9/2011 | 10/1/2012 | $29,371 |
| 67 | PI: Mr. Stephen Barkaszi; CoPI(s): Mr. Joseph Walters | UCF/FSEC | US DOE | Measurements for Defining Performance Losses of Existing PV Systems (ID: 1052297) | 10/14/2011 | 8/15/2012 | $68,628 |
| 68 | PI: Mr. Stephen Barkaszi; CoPI(s): Mr. Joseph Walters | UCF/FSEC | Sandia National Laboratories | Regional Test Center (ID: 1053850) | 4/25/2012 | 10/1/2012 | $42,628 |
| 69 | PI: Mr. Stephen Barkaszi; CoPI(s): Mr. Joseph Walters | UCF/FSEC | Sandia National Laboratories | Task 3 Long-Term System Test Facility Development (FI# 12ZN4003 to project 20126103 ) (ID: 1054074) | 8/9/2011 | 10/1/2012 | $65,000 |

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| 70 | PI: Mr. Stephen Barkaszi; CoPI(s): Mr. Joseph Walters | UCF/FSEC | US DOE | Task 3 Long-Term System Test Facility Development (ID: 1053205) | 8/9/2011 | 10/1/2012 | $102,875 |
| 71 | PI: Mrs. Janet McIlvaine; CoPI(s): Mr. David Chasar, Mr. John Sherwin | UCF/FSEC | US DOE | ARRA-Partnership for High Performance Homes (ID: 1051444) | 10/1/2010 | 2/29/2012 | $39,938 |
| 72 | PI: Mrs. Susan Schleith; CoPI(s): Mr. David Click, Ms. Mary Huggins, Colleen Kettles | UCF/FSEC | Progress Energy | SunSmart Schools E-Shelter Plus-UP (Utility Program) AKA SunSense Plus UP (ID: 1052872) | 8/31/2011 | 2/28/2013 | $1,153,276 |
| 73 | PI: Mrs. Susan Schleith; CoPI(s): Mr. David Click, Ms. Mary Huggins, Mr. William Young | UCF/FSEC | TECO Energy | SunSmart School E-Shelter Plus-UP (Utility Program) TECO Plus UP (ID: 1052905) | 9/30/2011 | 2/28/2012 | $126,187 |
| 74 | PI: Mrs. Susan Schleith; CoPI(s): Mr. William Young | UCF/FSEC | Florida Power and Light | RF: FPL SunSmart Schools DAS program (ID: 1049174) | 5/1/2009 | 6/30/2012 | $4,454 |
| 75 | PI: Ujjwala Magdum; CoPI(s): Mr. Safvat Kalaghchy | UCF/FSEC | Solar Rating & Certification Corporation | SRCC Portal Development (ID: 1051806) | 4/20/2011 | 8/31/2012 | $60,000 |
| 76 | PI: Ujjwala Magdum; CoPI(s): Mr. Safvat Kalaghchy | UCF/FSEC | Solar Rating & Certification Corporation | SRCC Portal Development (ID: 1054404) | 7/1/2012 | 12/31/2012 | $17,413 |
| 77 | ACOSTA D E | UF | US DOE | US CMS M&O Trigger Subsystem | 4/30/2012 | 9/30/2013 | $37,620 |
| 78 | ACOSTA D E | UF | US DOE | US CMS M&O Trigger Subsystem | 4/30/2012 | 9/30/2013 | $79,380 |
| 79 | ACOSTA D E | UF | US DOE | CMS Level 1 Trigger | 5/29/2012 | 12/31/2012 | $36,454 |
| 80 | ACOSTA D E | UF | US DOE | US CMS Trigger Upgrade At Fermilab | 6/11/2012 | 12/31/2012 | $53,770 |
| 81 | ACOSTA D E | UF | US DOE | US CMS Trigger Upgrade At Fermilab | 6/11/2012 | 12/31/2012 | $97,020 |
| 82 | ADAMS C M | UF | US DEPT OF COMMERCE | Economics Of Harmful Algae Bloom Literature Review | 4/24/2012 | 10/15/2012 | $9,993 |
| 83 | ALTPETER F | UF | US DOE | Engineering Hydrocarbon Biosynthesis And Storage Together With Increased Photosynthetic Efficency Into Saccharinae | 2/29/2012 | 2/14/2013 | $371,715 |
| 84 | ANDERSON T J | UF | US DOE | SEP Collaborative: Routes to Earth Abundant Kesterite Based Thin Film PV Materials | 9/6/2012 | | $1,900,000 |
| 85 | ANDERSON T J | UF | US DOE | Information-Driven Semiconducting Materials Discovery | 10/6/2011 | 9/21/2012 | $48,000 |
| 86 | ANDERSON T J | UF | US DOE | Advanced Precursor Reaction Processing For Cu(Inga)(Ses)2 Solar Cells | 1/26/2012 | 2/28/2013 | $162,747 |
| 87 | ANDERSON T J | UF | US DOE | Routes To Rapid Synthesis Of Cugaxin1 Xse2 Absorbers | 9/12/2012 | 9/30/2013 | $206,091 |
| 88 | ANDREW J | UF | EMCORE INC | Improved Contacts For Solar Cells | 3/13/2012 | 4/30/2013 | $5,000 |

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| 89 | APONICK A | UF | NSF | Self-Assembled Catalysts For Asymmetric Ring Opening Reactions | 12/21/2011 | 1/31/2013 | $120,000 |
| 90 | AVERY P R | UF | NSF | Sustaining And Extending The Open Science Grid: Science Inn Ovation On A Petascale Nationwide Facility | 10/11/2011 | 3/31/2012 | $35,000 |
| 91 | AVERY P R | UF | US DOE | High Energy Experimental And Theoretical Research | 2/7/2012 | 6/30/2011 | $166 |
| 92 | AVERY P R | UF | US DOE | Task Q: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $136,970 |
| 93 | BANEY R H | UF | US DOE | Microporous Materials For Getters Is Pressurized Water Reactor (PWR) Nuclear Fuels | 12/8/2011 | 9/30/2012 | $6,462 |
| 94 | BARTLETT R J | UF | US DOE | Super Instruction Architecture For Scalable Parallel Computations | 10/4/2011 | 8/31/2013 | $95,534 |
| 95 | BOHN K K | UF | US DEPT OF AG | Woody Biomass Harvesting In Northwest Florida | 8/8/2012 | 9/30/2013 | $50,038 |
| 96 | BORKHATARI A R R | UF | NORMANDEAU ASSOCIATES | Preconstruction Study Of Wood Storks & Other Wading Birds In The Palm Beach Wind Energy Study Area | 12/8/2011 | 7/31/2013 | $110,000 |
| 97 | BOWERS C R | UF | | Application Of Parahydrogen Enhanced NMR To Heterogeneous Hydrogenation On Supported Metal Catalysts | 8/16/2012 | 8/31/2014 | $55,000 |
| 98 | BUSCHBACHE R R J | UF | MOORE, GORDON & BETTY FOU | Amazon Conservation Leadership Initiative | 4/9/2012 | 12/3/2013 | $215,734 |
| 99 | CATTAFESTA III L N | UF | GULFSTREAM AEROSPACE CORP | Anechoic Wind Tunnel Experiments Of Landing Gear Noise | 12/15/2011 | 8/31/2011 | $30,942 |
| 100 | CHASE C D | UF | HIGHLANDS ETHANOL | Dna Fingerprinting Of Pennisetum Purpureum Biomass Cultivars | 3/29/2012 | 3/11/2013 | $74,685 |
| 101 | CHEN Y | UF | US DOE | Prediction Of Thermal Transport Properties Of Materials With Microstructural Complexity | 5/21/2012 | 7/14/2013 | $150,000 |
| 102 | CHENG H P | UF | US DOE | A Computational Approach To Complex Junctions And Interfaces | 2/2/2012 | 11/30/2012 | $180,000 |
| 103 | CHENG H P | UF | NSF | Understanding And Reducing Thermal Noise Via Atomistic Simulations | 6/25/2012 | 8/31/2014 | $105,000 |
| 104 | Chung Jacob | UF | NASA | Cryogenic Storage And Transfer Line Thermal And Fluid Physics In Low To Zero Gravity (Student: Charles Cook) | 10/6/2011 | 8/14/2012 | $30,000 |
| 105 | Chung Jacob | UF | NASA | Cryogenic Storage And Transfer Line Thermal And Fluid Physics In Low To Zero Gravity (Student: Charles Cook) | 8/14/2012 | 8/14/2013 | $30,000 |
| 106 | Chung Jacob | UF | UF FOU | Hines/Progress Energy Eminent Scholar Chair | 8/28/2012 | 8/31/2017 | $31,500 |
| 107 | Chung Jacob | UF | Hinkley Center for Solid Waste Research | A Continued Research of High-Temperature Steam Gasification ofAgricultural and Municipal Solid Waste | 9/1/2011 | 2/28/2013 | $45,000 |
| 108 | Erickson John, Lynn Sollenberger, Maria Silveira, and Lonnie Ingram | UF | USDA-AFRI Sustainable Bioenergy Research – Land Use Change | Direct Effects of Converting Conventional Agroecosystems to Bioenergy Cropping Systems on Carbon,Water, and Nutrient Cycling in the Southeastern U.S.A. | 7/1/2012 | 6/30/2016 | $499,842 |

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| 109 | FIELD R D | UF | US DOE | Task T2: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $123,264 |
| 110 | FLETCHER R J | UF | US DEPT OF AG | Evaluating The Sustainability Of Bioenergy Production In Thesoutheast On The Basis Of Wildlife And Pollinator Responses | 9/21/2012 | 8/31/2016 | $496,996 |
| 111 | FORTES J A | UF | NSF | Futuregrid: An Experimental High Performance Grid Test-Bed | 7/20/2012 | 9/30/2013 | $153,388 |
| 112 | FOSSUM J G | UF | US DOE | Simulation-Based Engineering & Design Of Heterojunction Solar Cells On Thin Som Substrates | 6/29/2012 | 8/31/2012 | $28,871 |
| 113 | Franky So | UF | Wintek | Bipolar transistors driven OLED Displays | 5/1/2012 | 4/30/13 | $1,537,666 |
| 114 | FUCHS G E | UF | US DOE | Comparison Of The Single-Crystal Ni-Base Superalloys For Multi-Component IGT Vane Applications | 2/29/2012 | 9/15/2012 | $25,000 |
| 115 | FUCHS G E | UF | US DOE | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 6/26/2012 | 9/15/2012 | $85,905 |
| 116 | FUCHS G E | UF | US DOE | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 8/22/2012 | 9/15/2013 | $90,759 |
| 117 | FURIC I K | UF | US DOE | Task J: Research In High Energy Phsyics (Experimental And Theoretical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $122,000 |
| 118 | GILBERT R A | UF | US DOE | Bio-Diesel Cellulosic Ethanol Research Project | 5/29/2012 | 2/28/2013 | $8,000 |
| 119 | GILBERT R A | UF | US DOE | Bio-Diesel Cellulosic Ethanol Research Project | 7/2/2012 | 2/28/2013 | $2,080 |
| 120 | GILBERT R A | UF | US DOE | Discovering The Desirable Alleles To The Lignocellulosic Biomass Traits In Saccharum Germplasm Collections For . . . | 9/25/2012 | 9/14/2013 | $78,201 |
| 121 | GOLUOGLU S | UF | US NUCLEAR REG. COM | UF NRC-10 Faculty Development | 6/5/2012 | 4/30/2013 | $240,480 |
| 122 | GUAN Y | UF | US DOE | Models And Methods For Power System Under Uncertainty | 1/17/2012 | 9/30/2012 | $97,792 |
| 123 | GUAN Y | UF | US DOE | Multi-Stage Stochastic Integer Programming For Power Grid Systems | 6/6/2012 | 9/30/2013 | $36,000 |
| 124 | GURLEY K R | UF | NSF | Hurricane Wind Load Monitoring For Coastal Infrastructure | 9/5/2012 | 8/31/2013 | $125,044 |
| 125 | HAGELIN-WEAVER H E | UF | US DOE | New Mea Materials For Improved DMFC Performance, Durability And Cost | 1/5/2012 | 6/30/2012 | $60,312 |
| 126 | HAGELIN-WEAVER H E | UF | US DOE | Solar Thermochemical Fuel Production Via A Novel Low Pressure, Magnetically Stabilized, Non-Volatile Iron Oxide... | 4/4/2012 | 12/18/2014 | $63,635 |
| 127 | HAGELIN-WEAVER H E | UF | AMER CHEMICAL SOC | Optimizing Heterogeneous Hydrogenation Catalysts For Parahydrogen Enhanced Nuclear Magnetic Resonance | 8/16/2012 | 8/31/2014 | $45,000 |
| 128 | HAHN D W | UF | UF FOU | Hines/Progress Energy Eminent Scholar Chair | 11/1/2011 | 8/31/2012 | $15,800 |
| 129 | HAHN D W | UF | US DOE | Solar Thermochemical Fuel Production Via A Novel Low Pressure, Magnetically Stabilized, Non-Volatile Iron Oxide Looping | 1/18/2012 | 12/18/2012 | $124,107 |

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| 130 | HAHN D W | UF | UF FOU | Hines/Progress Energy Eminent Scholar Chair | 4/4/2012 | 8/31/2012 | $31,800 |
| 131 | HIRSCHFELD P J | UF | US DOE | Theory Of Novel Superconductors | 10/19/2011 | 8/31/2012 | $105,000 |
| 132 | HOCTOR T S | UF | KRESGE FOUNDATION | Adaption To Sea Level Rise In Florida: Biological Conservation Priorities | 10/17/2011 | 6/30/2014 | $140,236 |
| 133 | INGLEY III H A | UF | US EPA | High-Temperature Steam Gasification Of Agriculture And Municipal Solid Waste And Conversion To Energy System | 10/17/2011 | 9/30/2012 | $45,000 |
| 134 | ISSA R R | UF | DEPT OF BUSINESS & PROF REGUL | Energy Conservation Features Of New Homes In Florida 2012-2013 | 8/9/2012 | 6/30/2013 | $21,542 |
| 135 | James F. Preston | UF | USDA | Next generation sweet sorghums: sustainable production of feed stocks for fuels, chemicals and value-added products | 5/1/2011 | 4/30/2015 | $653,752 |
| 136 | JAMISON M A | UF | FL PUBLIC SERVICE COMMISSION | Florida Ebergy Efficiency and Conservaion Act | 7/30/2012 | 1/9/2013 | $146,265 |
| 137 | Jenshan Lin | UF | SRI | Novel Humidity Independent Wireless Hydrogen Sensors Based on Carbon Nanotube Aerogels | 8/1/2012 | 7/31/2013 | $45,000 |
| 138 | JONES J L | UF | US DOE | Enabling Self-Powered Ferroelectric Nano-Sensors: Fundamental science Of Interfacial Effects Under Extreme Conditions | 10/25/2011 | 9/14/2012 | $62,000 |
| 139 | JONES J L | UF | ADVANCED GREEN INNOVATIONS | Advanced Dielectrics For Energy Applications | 2/2/2012 | 12/31/2013 | $229,220 |
| 140 | JONES J L | UF | US DOE | Development Of Stroboscopic Techniques And Application To Phase Switching In Ferroelectrics | 2/16/2012 | 5/31/2012 | $6,000 |
| 141 | JONES P H | UF | FL PUBLIC SERVICE COMM. | Florida Energy Efficiency And Conservation Act | 7/30/2012 | 1/9/2013 | $54,440 |
| 142 | Jones P. and PURC | UF | Florida Public Service Commission | Independent Program Review of FEECA | 6/12/2012 | 1/13/2012 | $200,706 |
| 143 | JORDAN K A | UF | US DOE | Bil3 Crystals For High Energy Resolution Gamma-Ray Spectroscopy | 10/10/2011 | 6/30/2013 | $70,710 |
| 144 | JORDAN K A | UF | US DOE | Travel Cost For Educational Trip To ORNL | 3/5/2012 | 8/30/2012 | $9,000 |
| 145 | JORDAN K A | UF | US DOE | Argon-41 Monitoring Equipment For Relicensing Support At The UFTR | 8/27/2012 | 7/23/2013 | $167,412 |
| 146 | KATRITZKY A R | UF | US NAVY | Novel Energy-Rich Linear Triazenes, Nitrogen Yields And Heterocyclic N-Oxides | 5/11/2012 | 6/30/2017 | $50,000 |
| 147 | KATRITZKY A R | UF | US NAVY | Novel Energy-Rich Linear Triazenes, Nitrogen Yields and Heterocyclic N-Oxides | 5/25/2012 | 6/30/2017 | $150,000 |
| 148 | KHARGONEKA R P P | UF | US DOE | IPA Agreement For Dr. Pramod Khargonekar | 9/4/2012 | 9/3/2013 | $258,300 |
| 149 | KHARGONEKA R P P | UF | NSF | Collaborative Research: Integrating Random Energy Into the Smart Grid | | | $273,000 |
| 150 | KHARGONEKA R P P | UF | NSF | CPS: Synergy: Collaborative Research: Coordinated Resource Management of Cyber-Physical-Social Power Systems | | | $280,000 |

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| 151 | KLAUSNER J F | UF | US DOE | Solar Thermochemical Fuel Production Via A Novel Low Pressure, Magnetically Stabilized, Non-Volatile Iron Oxide... | 1/5/2012 | 12/18/2014 | $1,980,728 |
| 152 | KLAUSNER J F | UF | US DOE | Solar Thermochemical Fuel Production Via A Novel Low Pressure, Magnetically Stabilized, Non-Volatile Iron Oxide Looping | 9/12/2012 | 12/18/2014 | $181,150 |
| 153 | Klausner James , D. Hahn, R. Mei, J. Petrasch | UF | DOE ARPA-E | Solar thermochemical fuel production via a novel low pressure, magnetically stabilized iron looping process | 12/19/2011 | 12/18/2014 | $2,975,920 |
| 154 | KLEIMAN V D | UF | NSF | Coherent And Incoherent Energy Transfer In Conjugated Molecules | 10/4/2011 | 9/30/2012 | $250,000 |
| 155 | KLEIMAN V D | UF | US DOE | Conjugated Polyelectrolytes: Disrupted Interactions, Self- Assembled Structures And Hybrid Polymer Solar Photcopy | 2/20/2012 | 3/14/2013 | $83,026 |
| 156 | KLEIMAN V D | UF | NSF | Coherent And Incoherent Energy Transfer In Conjugated Molecules | 8/31/2012 | 9/30/2014 | $200,000 |
| 157 | LAWSON J R | UF | PROGRESS ENERGY FL | Sunsense Schools Post Secondary Program For 100 Kw Solar Array | 8/6/2012 | 11/30/2012 | $549,693 |
| 158 | LEAR JR W E | UF | US DOE | New MEA Materials For Improved DMFC Performance, Durability And Cost | 1/5/2012 | 6/30/2012 | $60,970 |
| 159 | LEAR JR W E | UF | US DOE | New MEA Materials For Improved DMFC Performance, Durability And Cost | 4/23/2012 | 6/30/2012 | $61,199 |
| 160 | LI J G | UF | SUN NUCLEAR CORP | SNC 3d Scanner | 7/13/2012 | 7/11/2013 | $60,000 |
| 161 | LI Y | UF | US DOE | Bio-Diesel Cellulosic Ethanol Research Project | 7/2/2012 | 2/28/2013 | $12,348 |
| 162 | MARTIN C R | UF | US DOE | Nanophase Extractor Development | 8/20/2012 | 9/30/2012 | $20,000 |
| 163 | MARTIN C R | UF | US DOE | Science Of Precision Multifunctional Nanostructures For Electrical Energy Storage | 8/31/2012 | 7/31/2013 | $150,000 |
| 164 | MASLOV D | UF | NSF | Materials World Network: Control Of The Electron Nuclear Interaction In Nanoelectronic Devices | 6/15/2012 | 7/31/2013 | $85,000 |
| 165 | MASTERS F J | UF | US DEPT OF HOMELAND SECURITY | Residential Roof Covering Investigation Of Wind Resistance Of Wind Resistance Of Asphalt Shingles | 6/28/2012 | 9/30/2012 | $37,250 |
| 166 | MAUPIN J A | UF | US DOE | Identification Of Proteasome Substrates Of The Haloarchaeon Halferax Volcanii | 11/7/2011 | 7/14/2013 | $282,000 |
| 167 | MEI R | UF | US DOE | Solar Thermochemical Fuel Production Via A Novel Low Pressure, Magnetically Stabilized, Non-Volatile Iron Oxide Looping | 1/18/2012 | 12/18/2012 | $104,076 |
| 168 | MERCIER D J | UF | US DOE | Sandia Natl Labs Renovation Of Nuclear Science Building | 6/15/2012 | 11/25/2015 | $461,705 |
| 169 | MIDDELKOOP T | UF | NEW HOPE POWER CO. | Proposal For An Energy Audit Of Florida Crystals Co-Gen FACII | 10/18/2011 | 4/30/2012 | $270 |
| 170 | MITSELMAKH ER G | UF | US DOE | LPC Fellowships In Physics | 12/20/2011 | 1/31/2013 | $20,000 |
| 171 | MITSELMAKH ER G | UF | US DOE | LPC Fellowships In Physics | 3/29/2012 | 12/31/2012 | $60,135 |
| 172 | MITSELMAKH ER G | UF | US DOE | US CMS EMU At Fermilab | 5/10/2012 | 9/30/2013 | $37,630 |
| 173 | MITSELMAKH ER G | UF | US DOE | US CMS EMU At Fermilab | 5/10/2012 | 9/30/2013 | $117,370 |

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| 174 | MITSELMAKHER G | UF | US DOE | Task P: Research In High Energy Physics (Experimental And Theoretical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $1,192,265 |
| 175 | MOGHADDAM S | UF | US DOE | Absorption Water Heater Development Project | 9/1/2012 | 8/19/2014 | $90,000 |
| 176 | MOHSENI K | UF | NSF | Digitized Heat Transfer: A New Paradigm For Thermal Management Of Compact Micro Systems | 12/20/2011 | 1/31/2013 | $65,056 |
| 177 | MORGAN K T | UF | FL DEPT OF AG AND CONSUMER SER | Enhanced Agricultural Irrigation Water Conservation Tools For Use With Mobile Communication Devices | 6/13/2012 | 6/30/2012 | $35,000 |
| 178 | OBONYO E A | UF | NSF | Collaborative Research: Resilient And Sustainable Engineered fiber-Reinforced Earthen Masonry For High Wind Regions | 10/10/2011 | 8/31/2014 | $85,000 |
| 179 | ORAZEM M E | UF | US DOE | Impedance Investigation Of Lithium Batteries | 1/18/2012 | 9/30/2012 | $45,000 |
| 180 | PEIR J | UF | INTEL CORP | Memory Hierarchy Studies On Many-Core CMPS With Large On- Die Storage | 6/7/2012 | 5/31/2013 | $70,000 |
| 181 | Peter Gary | UF | DOE | Commercial Production of Terpene Biofuels in Pine | 1/11/2012 | 1/10/2015 | $2,612,707 |
| 182 | Peter Gary, Matias Kirst | UF | USDA | Advanced Pine Breeding through Association Genetics and Biotechnology | 10/1/2009 | 9/30/2013 | $150,000 |
| 183 | Peter Gary, Matias Kirst | UF | USDA/DOE | Mechanism of Carbon Partitioning Regulation by cpg13 in the Bioenergy Woody Crop Populus | 10/1/2009 | 9/30/2012 | $200,000 |
| 184 | Peter Gary, Tim Martin | UF | USDA | Integrating Research, Education and Extension for Enhancing Southern Pine Climate Change | 3/1/2011 | 3/10/2016 | $4,000,000 |
| 185 | Peter Gary, Tim Martin | UF | NSF | Center for Advanced Forest Systems | 8/15/2011 | 8/14/2016 | $50,000 |
| 186 | PHILLPOT S R | UF | US DOE | The Consortium For Advanced Simulation Of Light-Water Reactors (CASL) | 10/6/2011 | 3/31/2012 | $16,576 |
| 187 | PHILLPOT S R | UF | US NUCLEAR REG. COM | UF NRC-10 Faculty Development | 2/29/2012 | 4/30/2013 | $62,689 |
| 188 | PHILLPOT S R | UF | US NUCLEAR REG. COM | NRC Fellowship Program | 3/26/2012 | 7/31/2013 | $187,801 |
| 189 | PHILLPOT S R | UF | US NUCLEAR REG. COM | UF NRC-10 Faculty Development | 6/12/2012 | 4/30/2013 | $2,438 |
| 190 | PHILLPOT S R | UF | US NUCLEAR REG. COM | UF NRC Faculty Development Program | 7/11/2012 | 8/15/2012 | $15,861 |
| 191 | PHILLPOT S R | UF | US DOE | The Consortium For Advanced Simulation Of Light-Water Reactors (CASL) | 9/19/2012 | 9/30/2013 | $110,000 |
| 192 | POWERS K W | UF | US DOE | Microporous Materials For Getters Is Pressurized Water Reactor (PWR) Nuclear Feuls | 12/8/2011 | 9/30/2012 | $6,913 |
| 193 | POWERS K W | UF | G4 SYNERGETICS CORP. | Powder Characterization And Beneficiation For Nickel Metal Hydride Battery Manufacturing | 5/4/2012 | 2/28/2013 | $28,000 |
| 194 | PREVATT D O | UF | US DEPT OF HOMELAND SECURITY | Measurement And Modeling Of Wind Field And Wind Loads On Residential Housing Planning Project | 11/2/2011 | 6/30/2012 | $46,233 |

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| 195 | RAMOND P | UF | US DOE | Task T1: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $215,000 |
| 196 | RANKA S | UF | NSF | CSR: Medium: Collaborative Research: Gridpac: A Resource Management System For Energy And Performance Optimization .. | 8/1/2012 | 8/31/2013 | $84,975 |
| 197 | RAY H | UF | US DOE | Task P3: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $150,000 |
| 198 | RICHARD J P | UF | CSX TRANS. | Optimization-Based Decision Support System For Coal/Bulk Monthly Reservations Planning | 2/6/2012 | 12/31/2012 | $48,000 |
| 199 | ROCKWOOD D L | UF | FL FORESTRY ASSOC. | Demonstration Of Fast Growing Trees Bioenergy Farms In Florida For Mosiac - Phase 3 | 3/29/2012 | 12/21/2012 | $17,200 |
| 200 | SANKAR B V | UF | NASA | Structurally Integrated Thermal Protection Systems For Space Vehicles | 10/6/2011 | 12/31/2012 | $25,000 |
| 201 | SANSALONE J J | UF | CITY OF GAINESVILLE | Demonstration Of Hydrologic Thermal And Physical-Chemical Modification By An Infrastructure-Contrained "Biodetention"… | 10/25/2011 | 10/9/2012 | $85,837 |
| 202 | SCHANZE K S | UF | US DOE | Conjugated Polyelectrolytes: Disrupted Interactions, Self- Assembled Structures And Hybrid Polymer Solar Photcopy | 2/14/2012 | 3/14/2012 | $44,494 |
| 203 | SCHANZE K S | UF | US DOE | Conjugated Polyelectrolytes: Disrupted Interactions, Self- Assembled Structures And Hybrid Polymer Solar Photcopy | 2/20/2012 | 3/14/2013 | $266,974 |
| 204 | SCHANZE K S | UF | US DOE | Solar Fuels And Next Generation Photovoltaics - EFRC | 8/8/2012 | 10/31/2012 | |
| 205 | SCHANZE K S | UF | US DOE | Solar Fuels And Next Generation Photovoltaics - EFRC | 8/8/2012 | 10/31/2012 | |
| 206 | SCHUBRING D | UF | US DOE | DOE Fellowships/Scholarships 2012 - Paul Johns Scholarship | 6/21/2012 | 6/7/2013 | $5,000 |
| 207 | SCHUBRING D | UF | US DOE | DOE Fellowships/Scholarships 2012 - Aaron Holzaepfel Scholarship | 6/21/2012 | 6/7/2013 | $5,000 |
| 208 | SCHUBRING D | UF | US DOE | DOE Fellowships/Scholarships 2012 - Kyle Ramey Scholarship | 6/21/2012 | 6/7/2013 | $5,000 |
| 209 | SCHUUR T | UF | US DOE | From Community Structure To Functions: Metagenomics-Enabled Predictive Understanding Of Temperature Sensitivity Of Soil | 6/18/2012 | 7/14/2013 | $140,056 |
| 210 | SCHUUR T | UF | US DOE | Effects Of Warming The Deep Soil And Permafrost On Ecosystem Carbon Balance In Alaskan Tundra: A Coupled Measurement And | 9/25/2012 | 9/14/2013 | $236,006 |
| 211 | SCHUUR T | UF | US DOE | Effects Of Warming The Deep Soil And Permafrost On Ecosystem Carbon Balance In Alaskan Tundra: A Coupled Measurement And | 9/25/2012 | 9/14/2013 | $98,882 |

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| 212 | SHERIF S A | UF | US DOE | Reducing Industrial Energy Intensity In The Southeast | 6/6/2012 | 4/30/2013 | $165,000 |
| 213 | SHI J J | UF | US DOE | Energy Efficient Housing Research Partnerships - Field Data Supporting Retrolift Analytical Research | 8/21/2012 | 8/31/2012 | $259,180 |
| 214 | SHUKLA S | UF | WATER MGMT DISTRICTS | Water Use Of Two Biofuel Crops In Southwest Florida | 10/6/2011 | 9/30/2012 | $60,000 |
| 215 | SHUKLA S | UF | WATER MGMT DISTRICTS | Evaluation Of Bed Geometry For Water Conservation On Drip Irrigated Tomatoes In Southwest Florida | 5/17/2012 | 6/30/2016 | $200,000 |
| 216 | SINGH R K | UF | US DOE | Defect Free, Ultra-Rapid Thinning/Polishing Of Diamond Crystal Radiator Targets (20 Micro-M) For Highly Linearly Polariz | 2/29/2012 | 9/18/2012 | $50,012 |
| 217 | SINGH R K | UF | US DOE | Low Cost, Scalable Manufacturing Of Microlens Engineered Substrates (Miles) For Enhanced Light Extraction In OLED | 2/29/2012 | 8/14/2012 | $50,012 |
| 218 | SINGH R K | UF | US DOE | Device | 8/10/2012 | 8/14/2013 | $50,012 |
| 219 | SINGH R K | UF | US DOE | Defect Free, Ultra-Rapid Thinning/Polishing Of Diamond Crystal Radiator Targets (20 Micro-M) For Highly Linearly Polariz | 8/14/2012 | 8/14/2013 | $50,012 |
| 220 | SINNOTT S B | UF | US DOE | Low Cost, Scalable Manufacturing Of Microlens Engineered Substrates (Miles) For Enhanced Light Extraction In OLED Device | 10/13/2011 | 10/1/2013 | $50,000 |
| 221 | SINNOTT S B | UF | US DOE | Computational Study Of Fission Product Clustering In Nuclear Fuels | 8/21/2012 | 7/31/2013 | $86,191 |
| 222 | SKVARCH E A | UF | US DEPT OF AG | Computational Catalysis And Atomic-Level Synthesis Of Materials: Building Effective Catalysts From First Principles | 8/6/2012 | 9/30/2014 | $50,861 |
| 223 | So Franky | UF | US DOE | Adoption Of 'Solid Tarp' Soil Solarization By Cut-Flower Growers | 2/15/2012 | 12/31/2012 | $260,000 |
| 224 | So Franky | UF | US DOE | High Efficiency Organic Light Emitting Devices For Lighting | 3/15/2012 | 5/31/2013 | $160,000 |
| 225 | So Franky | UF | SESTAR TECH. | Luminescence In Conjugated Molecular Materials Under Sub-Bandgap Excitations | 3/27/2012 | 3/14/2013 | $112,217 |
| 226 | So Franky | UF | US DOE | High Efficiency Black Polymer Solar Cells | 8/14/2012 | 8/14/2013 | $75,014 |
| 227 | STEWART G R | UF | US DOE | Low Cost, Scalable Manufacturing Of Microlens Engineered Substrates (Miles) For Enhanced Light Extraction In OLED Device | 12/5/2011 | 11/30/2012 | $150,000 |

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| 228 | SUBHASH G | UF | US DOE | Fe Pnictide And F-Electron Novel Materials: Magnetism, Superconductivity, And Quantum Criticality | 8/16/2012 | 8/15/2015 | $393,061 |
| 229 | TANNER D B | UF | US DOE | Development Of Innovative Accident Tolerant High Thermal Conductivity Uo2-Diamond Composite Fuel Pellets | 6/5/2012 | 5/14/2013 | $43,793 |
| 230 | TANNER D B | UF | US DOE | Time-Resolved Far-Infrared Experiments: Implications For Nanotechnology | 7/23/2012 | 6/30/2013 | $83,449 |
| 231 | TANNER D B | UF | US DOE | Task N: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 7/23/2012 | 6/30/2013 | $11,550 |
| 232 | THORON A C | UF | US DOE | Task N: Research In High Energy Phsyics (Experimental And Therotical) Together With Quarknet Educational Outreach | 2/10/2012 | 2/28/2013 | $94,938 |
| 233 | TULENKO J S | UF | US DOE | Bio-Diesel Cellulosic Ethanol Research Project | 12/8/2011 | 9/30/2012 | $11,625 |
| 234 | TULENKO J S | UF | US DOE | Microporous Materials For Getters Is Pressurized Water Reactor (PWR) Nuclear Fuels. | 6/26/2012 | 9/15/2012 | $46,452 |
| 235 | TULENKO J S | UF | US DOE | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 8/16/2012 | 8/15/2015 | $406,939 |
| 236 | TULENKO J S | UF | US DOE | Development Of Innovative Accident Tolerant High Thermal Conductivity Uo2-Diamond Composite Fuel Pellets | 8/22/2012 | 9/15/2013 | $48,049 |
| 237 | VEIGE A S | UF | NSF | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 6/4/2012 | 3/31/2013 | $12,396 |
| 238 | VERMERRIS W | UF | US DEPT OF AG | New Group Vi Catalysts For Nitrile-Akalyne Cross Metathesis (NACM): Design, Synth And Appl Of Trianionic Pincer Ligands | 10/3/2011 | 7/5/2012 | $19,583 |
| 239 | VERMERRIS W | UF | US DEPT OF AG | Improved Bioenergy Sorghums For The Southeastern US | 1/10/2012 | 4/30/2015 | $320,650 |
| 240 | VERMERRIS W | UF | US DEPT OF AG | Next-Generation Sweet Sorghums - Sustainable Production Of Feedstocks For Fuels, Chemicals And Value-Added Products | 5/7/2012 | 4/30/2015 | $90,123 |
| 241 | VERMERRIS W | UF | US DEPT OF AG | Next-Generation Sweet Sorghums - Sustainable Production Of Feedstocks For Fuels, Chemicals And Value-Added Products | 8/22/2012 | 8/31/2013 | $80,397 |
| 242 | VERMERRIS W | UF | US DEPT OF AG | Improved Bioenergy Sorghums For The Southeastern Us | 8/23/2012 | 4/30/2015 | $1,357,484 |
| 243 | WANG J | UF | US DOE | Next-Generation Sweet Sorghums - Sustainable Production Of Feedstocks For Fuels, Chemicals And Value-Added Products | 9/25/2012 | 9/14/2013 | $233,033 |

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| 244 | WEAVER J F | UF | US DOE | Discovering The Desirable Alleles To The Lignocellulosic Biomass Traits In Saccharum Germplasm Collections For . . . | 9/1/2012 | 8/31/2013 | $200,000 |
| 245 | WONG T F | UF | NSF | Growth And Reactivity Of Oxide Phases On Crystaline Pd And Pt Surfaces | 8/31/2012 | 6/30/2013 | $45,000 |
| 246 | YANG Y | UF | US DOE | STTR:Phase I:Enhanced Spectral Efficiency Through Adaptive Utilization Of Fragmented Spectrum | 2/10/2012 | 9/30/2014 | $20,000 |
| 247 | YANG Y | UF | US DOE | Microstructural Analysis Of Stainless Steels And Nickel Alloys For LWR Applications | 6/26/2012 | 9/15/2012 | $97,643 |
| 248 | YANG Y | UF | US DOE | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 8/22/2012 | 9/15/2013 | $101,192 |
| 249 | YANG Y | UF | US DOE | Fuel Aging In Storage And Transportation: Accelerated Characterization And Performance Assessment Of The Used Nuclear... | 9/18/2012 | 9/30/2014 | $25,000 |
| 250 | YOST R A | UF | US DOE | Microstructural Analysis Of Stainless Steels And Nickel Alloys For LWR Applications | 7/26/2012 | 8/31/2012 | $30,000 |
| 251 | ZIEGLER K J | UF | US AIR FORCE | Integrated Nondestructive Spatial And Chemical Analysis Of Lignocellulosic Materials During Pretreatment And Bioconv... | 10/28/2011 | 6/14/2012 | $33,500 |
| 252 | ZIEGLER K J | UF | NSF | Ultra-High Surface Area Architectures For Thermal Energy Storage | 7/17/2012 | 7/31/2013 | $3,125 |
| 253 | ZIEGLER K J | UF | NSF | Modeling The Charge Transport Of Nanowire-Based Dye-Sensitizing Solar Cells | 7/17/2012 | 7/31/2013 | $1,500 |
| 254 | ZIEGLER K J | UF | NSF | Modeling The Charge Transport Of Nanowire-Based Dye-Sensitizing Solar Cells | 9/6/2012 | 7/31/2013 | $106,152 |
| 255 | ZWICK P D | UF | KRESGE FOUNDATION | Modeling The Charge Transport Of Nanowire-Based Dye-Sensitizing Solar Cells | 6/29/2012 | 2/15/2014 | $27,500 |
| 256 | ZWICK P D | UF | KRESGE FOUNDATION | Adaption To Sea Level Rise In Florida: Biological Conservation Priorities | 7/18/2012 | 2/15/2014 | $5,500 |
| 257 | Jamison Mark | UF/PURC | NSF | SEP Collaborative: Routes to Earth Abundant Kesterite Based Thin Film PV Materials | 9/6/2012 | | $500,000 |
| 258 | Jamison Mark, Ted Kury | UF/PURC | FPSC | Energy Issues and Fuels Training for the Staff of the Florida Public Service Commission | 1/31/2012 | 6/30/2012 | $25,000 |
| 259 | Don Morel | USF | NSF | Developing the Path Toward Realizing the Full Potential of II-VI Based Photovoltaic Materials | 8/1/2010 | 7/3/2013 | $209,373 |
| 260 | Don Morel/F. Christos S | USF | US DOE | Development of High Electronic Quality of DcTe Fls for 1 Volt VOC DcTe Cells | 9/1/2011 | 2/28/2013 | $415,618 |
| 261 | Elias Stefanakos | USF | US DOE | Development and Demonstration of an Innovative Thermal Energy Storage System for Baseload Power Generation | 8/1/2010 | 7/31/2014 | $769,286 |

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| 262 | Elias Stefanakos/Yogi Goswami | USF | UCF | Design and Development of an Advanced Hydrogen Storage System using Novel materials | 12/1/2010 | 12/31/2012 | $248,000 |
| 263 | Kuhn,John Norbert | USF | US DOE | Advanced Catalyst Characterization and Mechanisms During | 9/21/2010 | 9/20/2013 | $14,994 |
| 264 | Sarina Ergas | USF | NSF | PIRE: Context Sensitive Implementation of Synergistic Water-Energy Systems, | | | $3,912,276 |
| 265 | Sarina Ergas | USF | NSF | REU Site: Tampa Environmental Interdisciplinary Research | | | $392,000 |
| 266 | Sarina Ergas | USF | European Commission | BioWET—Advanced Biological Waste-to-Energy Technologies, | | | $330,000 |
| 267 | Sarina Ergas | USF | NASA | Green Aviation Fuels from Microalgae, Collaboration (with NASA Glenn Research Center.) | | | $121,500 |
| 268 | Sarina Ergas | USF | Fulbright Fellowship | Examining the Use of Algal Photobioreactor Production Systems for the Dual Purpose of Bioremediation and Biofuel Production under Different Climatic Conditions (for 1-year study at the Life Sciences University, Oslo Norway. ) | | | |
| 269 | Yogi Goswami | USF | ISES | Solar Energy Journal Management and Editing | 1/1/2012 | 12/31/2012 | $46,463 |
| 270 | Yogi Goswami | USF | Florida Aquaculture Review Council | Removal of Off-Flavor Compounds in Aquaculture Food Products: Optimizing New Techniques for Sustainable Aquaculture Systems | 7/1/2012 | 6/30/2012 | $114,714 |
| 271 | Yogi Goswami/ Elias Stefanakos | USF | E-ON International | Innovative Latent Thermal Energy Storage System for Concentrating Solar Power Plants | 1/1/2011 | 12/31/2013 | $429,467 |
| 272 | Yogi Goswami/Elias Stefanakos | USF | US DOE | Development of a Low Cost Thermal Energy Storage System Using Phase Change Materials with Enhanced Radiation Heat Transfer (Adv. Research Proj. Agcy-Energy) | 12/5/2011 | 12/4/2014 | $782,379 |
| 273 | Zhixin Miao | USF | Progress Energy Florida, Inc. | Smart Grid Functionality of PV Battery Systems | 12/7/2011 | 3/30/2013 | $81,000 |
| 274 | Franky So, John Reynolds and Frederick Krebs | | Office of Naval Research | Materials and Devices compatible with high volume roll-to-roll manufacturing of polymer solar cells | Jan, 2011 | Dec, 2013 | $750,000 |

## 3. Publications by FESC Faculty

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

**Total # of Publications:** 242

| # | University | Publications |
|---|---|---|
| 1 | FAU | Mark Bowren; The Software Framework for Prognostic Health Monitoring of Turbine System in Ocean Based Energy Generation;Master's Thesis, Florida Atlantic University; Graduation August 2012 |
| 2 | FAU | Reena Ursula Friedel ; "Asset Identification Using Image Descriptors"; Masters Thesis, Florida Atlantic University; Graduation August 2012 |
| 3 | FAU | Renee Christina Lippert, "Numerical Models to Simulate Underwater Turbine Noise Levels"; Master's Thesis, Florida Atlantic University; Graduation August 2012 |
| 4 | FAMU | A. K. F. Haque, M. A. Uddin, M. Shahjahan, M. R Talukder, A. K. Basak and B. C. Saha, "Electron impact inner-shell ionization of atoms", in *Advances in Quantum Chemistry,* Vol. 61, 309-373 (2011). |
| 5 | FAMU | A. K. F. Haque, M. R. Talukder, M. Shahjahan, M. A. Uddin, A. K. Basak and B. C. Saha, "An extended empirical formula for inner-shell ionization of atoms", J. Phys. B**43**, 115201 (2011). |
| 6 | FAMU | B. C. Saha and L. B. Zhao, " H and He atoms in strong magnetic fields", Abst. XXVII ICPEAC, Belfast,July, 27 –Aug2,.(2011). |
| 7 | FAMU | B. C. Saha, "Inner shell ionization of atoms (Z=6 to 92) by electrons, 42$^{nd}$ DAMOP, Atlanta, June134-17, 2011. |
| 8 | FAMU | Bidhan C. Saha, "Collisions of fully and partially stripped ions with $H_2$ al low energies", in *Atomic Structure and Collision processes* (edt. Man Mohan) Narosa Pub. House (2011). |
| 9 | FAMU | C. Weatherford, Kalayu Belay, Gennady Gutsev, "Theoretical and Experimental Studies of Fullerite Modified by Oxidation, Intercalation, and Radiation," 2011 Florida Energy Systems Consortium Summit, University of Florida Reitz Union, Gainesville, Florida, September 28, 2011. |
| 10 | FAMU | D. C. Joseph and B. C. Saha, "Electron capture cross sections by $O^+$ from atomic He", Abst XXVI IEPEAC, Kalamazoo, MI, July 22, 2009. |
| 11 | FAMU | D. C. Joseph and B. C. Saha, "State-selective charge exchange in slow collisions of $Si^{3+}$ ions with H atoms: A molecular state close coupling treatment", Abst. XXVII ICPEAC, Belfast, July22 –Aug 2, (2011). |
| 12 | FAMU | D. C. Joseph, E. Quashie and B. C. Saha, "Charge exchange cross sections in slow collisions of $Si^{3+}$ with Hydrogen atom", 42 nd DAMOP, Atlanta, June 13-17, 2011. |
| 13 | FAMU | D. C. Joseph, J. P. Gu and B. C. Saha, "State selective charge-transfer in slow collisions of $Si^{3+}$ with H", Phys. Rev. A (under consideration) (2011). |

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| 14 | FAMU | Daniel Gebremedhin and Charles A. Weatherford, "Two-Range Addition Theorem for Coulomb Sturmians", Progress in Theoretical Chemistry and Physics B22, 71-81, P. E. Hoggan, E.J. Brändas, J. Maruani, P. Piecuch, and G. Delgado-Barrio, editors, Springer, Dordretch (2011). |
| 15 | FAMU | G. L. Gutsev, K. G. Belay, C. A. Weatherford, V. N. Vasilets, E. M. Anokhin, A. V. Maksimychev, O. V. Val'ba, V. M. Martynenko, S. A. Baskakov, E. S. Leskova, and Y. M. Shulga "Dimerization of Defect Fullerenes and the Orientational Phase Transition in Oxidized $C_{60}$ Fullerite," Journal of Nanoscience and Nanotechnology **11**, 1887-1896 (2011). |
| 16 | FAMU | G.L. Gutsev, C.A. Weatherford, K. Pradhan, and P. Jena, "Density Functional Study of Neutral and Anionic $AlO_n$ and $ScO_n$ with High Oxygen Content," Journal of Computational Chemistry, **32**, 2974-2982 (2011). |
| 17 | FAMU | J.L. Abot, A. Song, M.J. Schulz, V.N. Shanov, K. Belay, Y. Abere, B. Place, and C. Weatherford, "On the Development of Integrated Strain Sensors for Polymers and Composite Materials", Proceedings of the 2nd Joint US-Canada Conference on Composites, September 26-28, 2011, Montreal, Quebec, Canada. |
| 18 | FAMU | K. Pradhan, G. L. Gutsev, C. A. Weatherford, P. Jena, "A systematic study of neutral and charged 3d-metal trioxides and tetraoxides", Journal of Chemical Physics 134, 144305-1-10 (2011). |
| 19 | FAMU | L. B. Zhao, B. C. Saha and M. Du, "Circular Rydberg states of atomic hydrogen in an arbitrary magnetic field", 42nd DAMOP , Atlanta, June13-17 (2011). |
| 20 | FAMU | M. A. R. Potoary, M. Alfaz Uddin, A. K. F. Haque, M. Shahjahan, A. K. Basak and B. C. Saha, "Electron impact ionization in K-, L- , and M- shell of atomic targets", Int. J. Qu. Chem, **111,** 923 (2011). |
| 21 | FAMU | Nicolais. L. Guevera and Bidhan. C. Saha, "Collisions of $C^{6+}$ with atomic and molecular hydrogen", Phys. Rev. A (under consideration) (2011). |
| 22 | FAMU | P. Karamanis, C. Pouchan, C.A. Weatherford, G.L. Gutsev, "Evolution of Properties in Prolate (GaAs)n Clusters", Journal of Physical Chemistry C, **115**, 97-107 (2011). |
| 23 | FAU | A. Agarwal, M. Browen, I. Cardei, B. Alhalabi, T. Khoshgoftaar, P. Beaujean, G. Alsenas, H.P. Hanson;"Software System Acrchitecture for Prognostic Health Monitoring of Ocean Based Power Generation" ; Proceedings, The 13th IEEE International High Assurance Systems Engineering Symposium, Boca Raton, FL ; 11/18/2011 |
| 24 | FAU | A.E.S. Duerr, M.R. Dhanak, and J.H. Van Zwieten;"Utilizing the Hybrid Coordinate Ocean Model Data for the Assessment of Florida Current's Hydrokinetic Renewable Energy Resource"; Marine Technology Society Journal, in Press, Accepted September 12, 2012; Sep 2012 |
| 25 | FAU | Alana Smentek-Duerr;A Hydrokinetic Resource Assessment of the Florida Current.; Ph.D. Thesis, Florida Atlantic University; Graduation August 2012 |
| 26 | FAU | H.P. Hanson (Contributing Author);Offshore Resource Assessment and Design Conditions: A Data Requirements and Gaps Analysis for Offshore Renewable Energy Systems; U.S. Department of Energy Wind & Water Power Program, Washington, DC; Jan 2012 |
| 27 | FAU | H.P. Hanson, A.E. Smentek-Duerr & J.H. VanZwieten, Jr.,;Variability in the Florida Current: Implications for Power Generation; Proceedings, World Renewable Energy Forum 2012, Denver, CO; 5/12/2012 |
| 28 | FAU | H.P. Hanson; Hydrokinetic energy in the Sunshine State: Challenges of Florida's unique renewable resource; Technology & Innovation -- Proceedings of the American Society of Inventors (in press); July 2012 |

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| 29 | FAU | J.H. VanZwieten, N. Vanrietvelde, and B. Hacker;"Numerical simulation of an experimental ocean current turbine"; Journal of Oceanic Engineering, in Press, Accepted September 07, 2012, no. JOE.2012.2218891; Sep 2012 |
| 30 | FAU | Lewis, A., et al. (Including H.P. Hanson);2011: Ocean Energy. In: **IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation** (O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seybroth, PI Matschoss, S. Kadner, T. ZwickelP. Eickemeier, G. Hansen, S. Schlomer, C. von Stechow (eds.)); Cambridge University Press, Cambridge, United Kingdom and New York, USA; Dec 2011 |
| 31 | FAU | M. Borghi, F. Kolawole, S. Gangadharan, A. Engblom, J. VanZwieten, G. Alsenas, W. Baxley, S. Ravenna (2012);"Design, fabrication and installation of a hydrodynamic rotor for a small-scale experimental ocean current turbine"; Proceedings of the IEEE SoutheastCon, Orlando, Florida, March 15-18, no. SECon.2012.6196973; March 2012 |
| 32 | FAU | Matthew Young ;"Design and Analysis of an Ocean Current Turbine Performance Assessment System" ; Masters Thesis, Florida Atlantic University |
| 33 | FAU | William Valentine ;Design of a Hydrodynamic Testing Facility for Gulf Stream Ocean Current Turbines.; Master's Thesis, Florida Atlantic University; Graduation August 2012 |
| 34 | FSU | Abichou, T., Mahieu, K., Chanton, J., Romdhane, M., Mansouri, I., "Scaling methane oxidation: From laboratory incubation experiments to landfill cover field conditions", Waste Management, v 31, n 5, p 978-986, May 2011 |
| 35 | FSU | Balathandayuthapani, S., Edrington, C., Henry, S., Cao, J., "Analysis and control of a photovoltaic system: Application to a high-penetration case study." IEEE Systems Journal, v 6, n 2, p 213-219, 2012 |
| 36 | FSU | Balathandayuthapani,S., Edrington, C., Henry, S., Cao, J., "Analysis and control of a photovoltaic system: Application to a high-penetration case study" v 6, n 2, p 213-219, 2012 |
| 37 | FSU | Brusco, M., "Emergent clustering methods for empirical OM research", v 30, n 6, p 454-466, September 2012 |
| 38 | FSU | Brusco, M., Steinley, D., Cradit, D., Singh, R., "Emergent clustering methods for empirical OM research", v 30, n 6, p 454-466, September 2012 |
| 39 | FSU | Chung, I., Liu, W., Cartes, D., Moon, l., "Control parameter optimization for multiple distributed generators in a microgrid using particle swarm optimization." European Transactions on Electrical Power, v 21, n 2, p 1200-1216, March 2011 |
| 40 | FSU | Hasanzadeh, A., Edrington, C., Mokhtari, H., "Optimal tuning of linear controllers for power electronics/power systems applications." Electric Power Systems Research, v 81, n 12, p 2188-2197, December 2011 |
| 41 | FSU | Johnson, A., Merilis, G., Hastings, J., Palmer, E., Fitts, J., Chidambaram, D., "Nanotechnology and microbial electrochemistry for environmental remediation." ECS Transactions, v 33, n 38, p 103-112, 2011, Nanotechnology (General) - 218th ECS Meeting |
| 42 | FSU | Kim, T., Vodyakho, O., Yang, J., "Fuel cell hybrid electric scooter**",** IEEE Industry Applications Magazine, v 17, n 2, p 25-31, 2011 |
| 43 | FSU | Liu, L., Li, H., Zhao, Y., He, X., Shen, J., "1 MHz cascaded Z-source inverters for scalable grid-interactive photovoltaic (PV) applications using GaN device.", IEEE Energy Conversion Congress and Exposition: Energy Conversion Innovation for a Clean Energy Future, ECCE 2011, Proceedings, p 2738-2745, 2011 |

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| 44 | FSU | Liu, W., Liu, L., Chung, I., Cartes, D., Zhang, W., "Modeling and detecting the stator winding fault of permanent magnet synchronous motors" Simulation Modelling Practice and Theory, v 27, p 1-16, September 2012 |
| 45 | FSU | Uzun, A., Hussaini, M., "Some issues in large-eddy simulations for chevron nozzle jet flows**",** v 28, n 2, p 246-258, March-April 2012 |
| 46 | FSU | Vodyakho, O., Steurer, M., Edrington, C., Fleming, F., "An induction machine emulator for high-power applications utilizing advanced simulation tools with graphical user interfaces", IEEE Transactions on Energy Conversion, v 27, n 1, p 160-172, March 2012 |
| 47 | UCF | C. Huang, W. Yao, A. T-Raissi, N. Muradov, "Development of efficient photoreactors for solar hydrogen production", Solar Energy, 85(1), 19-27, 2011. |
| 48 | UCF | A. Amirahmadi, H. Hu, A. Grishina, F. Chen, J. Shen and I. Batarseh, "Hybrid control of bcm soft-switching three phase micro-inverter, " in Energy Conversion Congress and Exposition (ECCE), 2012 IEEE, 2012, pp. 4690-4695. |
| 49 | UCF | A. Grishina, H. Hu, D. Zhang, A. Amirahmadi, J. Shen and I. Batarseh, "A new quasi resonant DC link for single phase micro inverter, " in Energy Conversion Congress and Exposition (ECCE), 2012 IEEE, 2012, pp. 4690-4695. |
| 50 | UCF | A. Gujar, J. Baik, N. Garceau, N. Muradov, A. T-Raissi, "A process for the production of liquid hydrocarbons from pinewood charcoal", Submitted to Energy & Fuels, 2012. |
| 51 | UCF | A. Gujar, J. Baik, N. Garceau, N. Muradov, A. T-Raissi, "Oxygen-blown gasification of pine charcoal in a top-lit downdraft moving-hearth gasifier", Submitted to Fuel, 2012. |
| 52 | UCF | B. Fidalgo, N. Muradov, J. Menéndez, "Effect of $H_2S$ on carbon-catalyzed methane decomposition and $CO_2$ reforming", submitted to Intern. J. of Hydrogen Energy, 2012 |
| 53 | UCF | D. Beal, J. McIlvaine, K. Fonorow, and E. Martin, Building America Measure Guideline: Summary of Interior Ducts in New Construction, Including an Efficient, Affordable Method to Install Fur-Down Interior Ducts, U.S. Department of Energy, Office of Scientific and Technical Information, Oakridge, TN, November 2011. Peer reviewed publication. |
| 54 | UCF | F. Xiang, H. Haibing, Z. J. Shen and I. Batarseh, "Operation Mode Analysis and Peak Gain Approximation of the LLC Resonant Converter," Power Electronics, IEEE Transactions on, vol. 27, pp. 1985-1995, 2012. |
| 55 | UCF | H. Hu, X. Fang, Q. Zhang, Z. J. Shen, and Issa Batarseh, "Optimal Design Considerations for a Modified LLC Converter with Wide Input Voltage Range Capability Suitable for PV Applications," in Proc. of the 3rd IEEE Energy Conversion Congress and Expo ECCE2011), pp. 3096-3103, September 2011, Phoenix, Arizona, USA. |
| 56 | UCF | J. Cummings, C. Withers, Jr., "Envelope Thermal Failures Due to Wind Washing in Two-Story Homes", Peer reviewed paper for Building Enclosure Science and Technology (BEST) 3, Conference Atlanta, GA. April 2-4, 2012. |
| 57 | UCF | K. Zhang, S. Luo, J. Breen, S. Lin, T. Wu, Z. J. Shen, and Issa Batarseh, "Analysis and Design of Dynamic Voltage Regulation in Multiphase Buck Converter," in Proc. of the 27th Annual IEEE Applied Power Electronics Conference (APEC), Feb 2012, Orlando, Florida. |

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| 58 | UCF | L. Gu, “Advancement of Energyplus and Its Coupling with Champs-Whole Building,” Proceedings of CHAMPS 2011: The 8th International Forum and Workshop on Combined Heat, Air, Moisture and Pollutant Simulations March 20-22, 2011 Nanjing, China, 2011. |
| 59 | UCF | l. Gu, L, R. Raustad, “Investigate peak demand reduction strategies in a large office building using EnergyPlus”, The 7th International Symposium on Heating, Ventilating and Air Conditioning, Shanghai, China, Nov. 7-9, 2011. |
| 60 | UCF | L. Gu, R. Raustad, “Short-Term Curtailment of HVAC Loads”, ASHRAE Transactions, SA-12-(RP-1390), 2012. |
| 61 | UCF | L. Mao, A. T-Raissi, C. Huang, N. Muradov, “Thermal decomposition of $(NH_4)_2SO_4$ in presence of $Mn_3O_4$”, Intern. J. of Hydrogen Energy, 36, 5822-5827, 2011. |
| 62 | UCF | M. Oztek, M. Hampton, D. Slattery, S. Loucks, “Hydrogen storage with hetero porphyrin aggregates” International Journal of Hydrogen Energy, 36 670 – 6710, 2011. |
| 63 | UCF | M. Rodgers, C. Huang, A. Gujar, Liquid fuel from waste plastics, submitted to Progress in Energy and Combustion Science, 2011. |
| 64 | UCF | M. Rodgers, L. Bonville, D. Slattery, “Evaluation of the Durability of Polymer Electrolyte Membranes in Fuel Cells Containing Pt/C and Pt-Co/C Catalysts under Accelerated Testing”, Electrochemical Society Transactions, 41(1) 1461, 2011. |
| 65 | UCF | M. Rodgers, L. Bonville, H. Kunz, D. Slattery, J. Fenton, “Defining the correlation between membrane/MEA degradation rate from accelerated testing and lifetime”, accepted in Chemical Reviews, 2012. |
| 66 | UCF | M. Rodgers, N. Mohajeri, L. Bonville, D. Slattery, “Accelerated testing of polymer electrolyte membranes in fuel cells containing Pt/C and PtCo/C catalysts”, Journal of the Electrochemical Society, 159, B564, 2012. |
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| 68 | UCF | M. Rodgers, P. Brooker, N. Mohajeri, L. Bonville, R. Kunz, D. Slattery, J. Fenton, “Comparison of Proton Exchange Membranes Degradation Rates Between Accelerated and Performance Tests”, Journal of the Electrochemical Society, in press. |
| 69 | UCF | M. Tanniru, D. Slattery, F. Ebrahimi, “A study of phase transformations during the development of pressure-composition-isotherms for electrodeposited Mg-Al alloys” , International Journal of Hydrogen Energy, 36(1), 639-647, 2011. |
| 70 | UCF | N. Mohajeri, A. T-Raissi, J. Baik, "TG/DTA of hydrogen reduction kinetics of TiO2 supported PdO chemochromic pigments", Thermochimica Acta, ,518(1-2),119-122, 2011. |
| 71 | UCF | N. Mohajeri, A. T-Raissi, J. Baik, “Reduction Kinetics studies of $TiO_2$ supported PdO chemochromic pigment by $H_2$ gas using TG/DTA”, Thermochimica Acta, 518, 119-122, 2011. |
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| 74 | UCF | N. Muradov, “Hydrogen Fuel”, Encyclopedia of Sustainability, Vol. 4, Berkshire, MA, 2012. |
| 75 | UCF | N. Muradov, B. Fidalgo, A. Gujar, N. Garceau, A. T-Raissi, “Production and characterization of duckweed bio-char and its catalytic application for biogas reforming”, Biomass and Bioenergy, 41, 123-131, 2011. |
| 76 | UCF | N. Muradov, N. Veziroglu, “Energy options in a carbon-constrained world”, Chapter 1 in Carbon-Neutral Fuels and Energy Carriers, Muradov and Veziroglu, eds., Taylor & Francis, CRC Press, 2012. |
| 77 | UCF | P. Brooker, L. Bonville, D. Slattery, "Decreasing Membrane Degradation through Heteropolyacid Sub-layers," Journal of the Electrochemical Society, under review. |
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| 79 | UCF | P. Brooker, M. Rodgers, L. Bonville, H. Kunz, D. Slattery, J. Fenton. “Influence of Trace Oxygen in Low-Crossover Proton Exchange Membrane Fuel Cells”, Journal of Power Sources, accepted in Journal of Power Sources, 2012. |
| 80 | UCF | Q. Zhang, D. Zhang, H. Hu, X. Fang, J. Shen and I. Batarseh, "A controlled-Type ZVS technique Without Auxiliary Components for the low power DC/AC inverter," Power Electronics, IEEE Transactions on, vol. PP, pp. 1-1, 2012. |
| 81 | UCF | S. Chandra, S. Widders, R. Bartlett, J. McIlvaine, D. Chasar, D. Beal, et al, “Affordable Energy Efficient New Housing Solutions”, Pacific Northwest National Laboratory, 03/12. |
| 82 | UCF | S. Rhoden, C. Linkous, N. Mohajeri, D. Díaz, P. Brooker, D. Slattery, J. Fenton, “Low equivalent weight Friedel-Crafts cross-linked sulfonated poly (ether ketone)”, J. Membrane Science, 376 290–301, 2011. |
| 83 | UCF | W. Yao, C. Huang, N. Muradov, A., T-Raissi, “A novel Pd-$Cr_2O_3$/CdS photocatalyst for solar hydrogen production using a regenerable sacrificial donor”, International Journal of Hydrogen Energy, 36(8), 4710-4715, 2011. |
| 84 | UCF | X. Fang, H. Hu, L. Chen, A. Amirahmadi, Z. J. Shen, and Issa Batarseh, "Operation Analysis and Numerical Approximation for the LLC DC-DC Converter," in *Proc. Of the 27th Annual IEEE Applied Power Electronics Conference (APEC)*, Feb 2012, Orlando, Florida. |
| 85 | UCF | X. Fang, H. Hu, L. Chen, S. Utsav, E. Auadisian, J. Shen and I. Batarseh, "Efficiency Oriented Optimal Design of the LLC Resonant Converter Based on Peak Gain Placement," Power Electronics, IEEE Transactions on, vol. PP, pp. 1-1, 2012. |
| 86 | UCF | X. Fang, H. Hu, Z. J. Shen, and Issa Batarseh, "An Optimal Design of the LLC Resonant Converter Based on Peak Gain Estimation," in Proc. of the 27th Annual IEEE Applied Power Electronics Conference (APEC), Feb 2012, Orlando, Florida. |
| 87 | UCF | Z. Dehua, Z. Qian, A. Grishina, A. Amirahmadi, H. Haibing, J. Shen and I. Batarseh, "A comparison of soft and hard-switching losses in three phase micro-inverters," in Energy Conversion Congress and Exposition (ECCE), 2011 IEEE, 2011, pp. 1076-1082. |

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| 88 | UCF | Z. Dehua, Z. Qian, H. Haibing, A. Grishina, J. Shen and I. Batarseh, "High efficiency current mode control for three-phase micro-inverters," in Applied Power Electronics Conference and Exposition (APEC), 2012 Twenty-Seventh Annual IEEE, 2012, pp. 892-897. |
| 89 | UF | M. Amb, M.R. Craig, U. Koldemir, J. Subbiah, K. Roy Choudhury, S.A. Gevorgyan, M. Jorgensen, F.C. Krebs, F. SO and J.R. Reynolds, "Aesthetically pleasing conjugated polymer: fullerene blends for green solar cells via roll-to-roll processing", Appl. Mater. Interfaces, (2012) |
| 90 | UF | "Biocatalytic Reductions of Baylis-Hillman Adducts." A.Z. Walton, W.C. Conerly, Y.A. Pompeu, B. Sullivan and J.D. Stewart, *ACS Catalysis*, **2011**, *1*, 989-993 (cover article). |
| 91 | UF | "Library Construction and Evaluation for Site Saturation Mutagenesis." B. Sullivan, A.Z. Walton and J.D. Stewart, *Nucleic Acids Res.* **2012**, *submitted for publication.* |
| 92 | UF | "Preparation of Enantiomerically Pure Citronellal Enantiomers Using Alkene Reductases." A.Z. Walton, B.T. Sullivan and J.D. Stewart in *Practical Methods for Biocatalysis and Biotransformations*, Whitall, J. Ed., John Wiley & Sons, 2012. |
| 93 | UF | "Structural and Catalytic Characterization of *Pichia stipitis* OYE 2.6, a Useful Catalyst for Asymmetric Alkene Reductions." Y.A. Pompeu, B. Sullivan, A.Z. Walton and J.D. Stewart, *Adv. Synth. Catal.* **2012**,*354*, 1949-1960. |
| 94 | UF | A Study of Hot Carrier Effects In The Photocurrent of CIGS Solar Cells, Yige Hu, Gijs Bosman, and Tim Anderson. Poster at FESC Symposium, September 2011, Gainesville, Florida |
| 95 | UF | A. Giani, E. Bitar, M. Garcia, M. McQueen, P. P. Khargonekar, and K. Poolla, "Smart Grid Data Integrity Attacks," submitted for publication to the IEEE Transactions on Smart Grid. |
| 96 | UF | A. Subramanian, E. Bitar, P. P. Khargonekar, and K. Poolla, "Market Induced Curtailment of Wind Power," Proc. 2012 IEEE PES General Meeting, 22 - 26 July 2012, San Diego, CA, USA. |
| 97 | UF | Alnaimat, F., Klausner, J.F., "Solar Diffusion Driven Desalination for Decentralized Water Production," *Desalination*, Vol. 289, pp. 35-44, 2012. |
| 98 | UF | Alnaimat, F., Klausner, J.F., Mei, R., "Transient Dynamic Response of Solar Diffusion Driven Desalination," accepted for publication, *Applied Thermal Engineering*, 2012. |
| 99 | UF | Alnaimat, F., Klausner, J.F., Mei, R., Greek, B., "Transient Analysis of Direct Contact Evaporation and Condensation Within Packed Beds," *Int. J. Heat Mass Transfer*, Vol. 54, pp. 3381-3393, 2011. |
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| 198 | UF/PURC | Sanford V. Berg and Theodore J. Kury, "New Tools for Regulators in Addressing the Impact of Renewable Energy and Energy Efficiency Policy" University of Florida, Department of Economics, PURC Working Paper, 2012 |
| 199 | UF/PURC | Silbert, Megan E., and Maria del Pilar Useche. 2012. "Repeated Natural Disasters and Poverty in Island Nations: A Decade of Evidence from Indonesia" University of Florida, Department of Economics, PURC Working Paper. |
| 200 | UF/PURC | Theodore J. Kury, "Performance Assessment of the Florida Electric Power Network System against Hurricanes", 2011 [with Charles R. Glagola, Kurtis R. Gurley, Young Jun Park, and Sungjin Ahn] |

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| 201 | UF/PURC | Theodore J. Kury, "The Impact of Transparent Wholesale Markets on Market Participation in the U.S. Electricity Industry" University of Florida, Department of Economics, PURC Working Paper, 2012. |
| 202 | USF | Abutayeh, M., Goswami, Yogi, and Stefanakos, E.K. (2012) "Solar thermal power plant simulation," *Environmental Progress and Sustainable Energy*, American Institute of Chemical Engineers. Wiley Online Library, DOI 10.1002/ep.11636, (April 13, 2012). |
| 203 | USF | Alvi, F., Basnayaka, P., Ram, M.K., Goswz, H., Stefanakos, E., and Goswami, Y. (2012) "Graphene-polythiophene nanocomposite as novel supercapacitor electrode material," *Journal of New Materials for Eletrochemical Systems*, 089. |
| 204 | USF | Alvi, F., Ram, M.K., Basnayaka, P.A., Stefanakos, E., Goswami, Y., and Kumar, A. (2011) "Graphene-polyethylenedioxythiophene Conducting polymer nanocomposite based supercapacitor," *Electrochimica Acta*, 56 (25), pp. 9406-9412. |
| 205 | USF | C. A. Coutinho, B. D. Mankidy, and V. K. Gupta "A Simple Refraction Experiment for Probing Diffusion in Ternary Mixtures", ***Chemical Engineering Education*** 44(2), 134 (2010). |
| 206 | USF | Chen, H., Goswami, D. Yogi, Rahman, M.M., and Stefanakos, E.K. (2011) "A supercritical Rankine cycle using zeotropic mixture working fluids for the conversion of low-grade heat into power," *Energy*, vol. 36 (1), pp. 549-555. |
| 207 | USF | Chen, H., Goswami, D.Y., Rahman, M.M. and Stefanakos, E.K. (2011) "Energetic and Exergetic analysis of $CO_2$- and R32-based Transcritical Rankine Cycles for Low-Grade Heat Conversion," *Applied Energy*, 88 (8), pp. 2802-2808. |
| 208 | USF | Crane, N. B., and McKnight, P., "Impact of Self-assembly Process Errors on Thermoelectric Performance," *Journal of Electronic Packaging*, 2012, Vol 134, pg 031001-1-7. |
| 209 | USF | Crane, N. B., Tuckerman, J., and Nielson, G. N., "Self Assembly in Additive Manufacturing: Opportunities and Obstacles," *Rapid Prototyping Journal*, Vol 17, No 3, 2011, p 211-217. |
| 210 | USF | D. Mankidy, C. A. Coutinho, and V. K. Gupta*, "Probing the Interplay of Size, Shape, and Solution Environment on Macromolecular Diffusion using a Simple Refraction Experiment", ***Journal of Chemical Education*** 87(5), 515-518 (2010) |
| 211 | USF | Dalrymple, O.K., Halfhide, T., Udom, I., Gilles, B., Wolan, J., Zhang, Q., Ergas, S.J. (accepted) A preliminary estimation of the algal feedstock production potential of Tampa Bay utilizing CO2 emissions and wastewater effluent, *J. Aquatic Biosystems*. |
| 212 | USF | Dalrymple, O.K., Isaacs, W., Stefanakos, E., Trotz, M.A. and Goswami, D.Y. (2011) "Lipid Vesicles as Model Membranes in Photocatalytic Disinfection Studies," *Journal of Photochemistry and Photobiology A: Chemistry*, 221 (1), pp. 64-70. |
| 213 | USF | Demirkaya, G., Padilla, R.V., Goswwami, D.Y., Stefanakos, E., Rahman, M.M. (2011) "Analysis of a combined power and cooling cycle for low-grade heat sources," *International Journal of Energy Research*, 35 (13), pp. 1145-1157. |
| 214 | USF | Demirocak, D.E., Kuravi, S., Ram, M.K., Jotshi, C.K., Srinivasan, S., Kumar, A., Goswami, Y., and Stefanakos, E. (2012) "Investigation of polyaniline nanocomposites and cross-linked polyaniline for hydrogen storage, *Advanced Materials Research*, vol. 445, 571-576. |

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| 215 | USF | Demirocak, D.E., Ram, M.K., Srinivasan, S., Kumar, A., Goswami, Y., and Stefanakos, E. (2012) "Spillover enhancement for hydrogen storage by Pt doped hypercrosslinked polystyrene," *International Journal of Hydrogen Energy*, 37, pp. 12402-12410. |
| 216 | USF | Gómez, H., Ram, M.K., Alvi, F., Villalba, P., **Stefanakos, E.** and Kumar A. (2011) "Graphene-Conducting Polymer Nanocomposite as Novel Electrode for Supercapacitor," *J. Power Sources*, 196(8), pp. 4102-4108. |
| 217 | USF | Gómez, H., Ram, M.K., Alvi, F., Villalba, P., **Stefanakos, E.** and Kumar A. (2011) "Novel synthesis, characterization, and corrosion inhabitation properties of nanodiamond-polyaniline films," *Journal of Physical Chemistry C*, 114(44), pp. 18797-18804. |
| 218 | USF | Khodayari, M. , Carballo, J., and Crane, N. B., "A reliable low voltage anodic electrowetting material system," *Materials Letters*, Vol 69, 2012, p 96-99. |
| 219 | USF | Kumar, A., Yuan, X., Sahu, A.K., Zhang, Q., Ergas, S.J., Malcata, F. X., Van Langenhove, H. (2010) Strategies for $CO_2$ sequestration using microalgae and cyanobacteria: Recent developments and future directions, *Trends in Biotechnology*, 28(7): 371-380. |
| 220 | USF | L. Piyasinghe, and Z. Miao, "Investigate the Microgrid Operation with Pulsed Power Loads," Technology and Innovation (accepted). |
| 221 | USF | M. Celestin, S. Krishnan, E. Stefanakos, Y. Goswami, S. Bhansali, "A review of Alkanethiol Self-Assembled Monolayers for Low Cost Nano Rectenna Energy Harvesting," Progress in Energy and Combustion Science, 2012. (Under Review) |
| 222 | USF | N. Balakrishnan, V. Bhethanabotla, **B. Joseph**, "Promotional Effect of Platinum in Fischer Tropsch Synthesis Using Cobalt Catalysts: A DFT Study," Surface Science, Volume 606, Issues 5–6, March 2012, Pages 634–643. |
| 223 | USF | Ozgener, O., Ozgener, L., and Goswami, D.Y. (2011) "Experimental prediction of total thermal resistance of a closed loop EAHE for greenhouse cooling system," *International Communciations in Heat and Mass Transfer*, 38 (6), pp. 711-716. |
| 224 | USF | Padilla, R.V., Demirkaya, G., Goswami, D.Y., Stefanakos, E., and Rahman, M.M. (2011) "Heat transfer analysis of parabolic trough solar receiver," *Applied Energy*, Vol. 88, pp. 5097-5110. |
| 225 | USF | Ram, M.K., Gomez, H., Alvi, F., Stefanakos, E., Goswami, Y. and Kumar, A. (2011) "Novel nanohybrid structured regioregulator polyhexylthiophene blend films for photoelectrochemcial energy applications," *Journal of Physical Chemistry C*. 115(44), pp. 21987-21995. |
| 226 | USF | Razykov, T.M., Amin, N., Alghoul, M.A., Ergashev, B., Ferekides, C.S., Goswami, Y., Hakkulov, M.K., Kouchkarov, K.M., Sopian, K., Sulaiman, M.Y., and Ullal, H.S. (2012) "Effect of the composition on physical properties of CdTe absorber layer fabricated by chemical molecular beam deposition for use in thin film solar cells," *Journal of Applied Physics*, 112, 023517. |
| 227 | USF | Razykov, T.M., Ferekides, C.S., Morel, D., Stefanakos, E., Ullal, H.S., and Upadhyaya, H.M. (2011) "Solar photovoltaic electricity: Current status and future prospects," *Solar Energy* (invited review article for special issue "*Progress in Solar Energy*), 85 (8), pp. 1580-1608. |
| 228 | USF | Russell S.R. *Hybrid ZEH for Florida's Hot Humid Climate*, The International Journal of Design & Nature and Ecodynamics, WIT Press. |

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| 229 | USF | Syed Ali Gardezi, **Babu Joseph**, John T. Wolan. Effect of Catalyst Preparation Conditions on the Performance of Eggshell Cobalt/$SiO_2$ Catalysts for Fischer-Tropsch Synthesis. Paper accepted by Journal of Applied Catalysis, A, Sept 2012. |
| 230 | USF | Syed Ali Gardezi, Lucky Landrigan, **Babu Joseph**, and John T. Wolan, Synthesis of Tailored Eggshell Cobalt Catalysts for Fischer–Tropsch Synthesis Using Wet Chemistry Techniques, *Ind. Eng. Chem. Res.*, 2012, *51* (4), pp 1703–1712. |
| 231 | USF | Weisberg, R., et al. *Jour. Geophys. Res. – Oceans* was judged to be outside the scope of the that journal's mission. The paper was subsequenty revived and submitted to the Journal of the Marine Technology Society. The revised paper was peered reviewed and accepted for publication. |
| 232 | USF | Weisberg, R.H., Y. Liu, C.R. Merz, J.I. Virmani, and L. Zheng (2012). A critique of alternative power generation for Florida by mechanical and solar means, *J. Mar. Tech. Soc.*, Sept/Oct 2012, 46, 5, 1-12. |
| 233 | USF | Wijewardane, S., Goswami, D. Y., (2012) "A review on surface control of thermal radiation by paints and coatings for new energy applications" Renewable and Sustainable Energy Reviews, Vol. 16, 1863– 1873. |
| 234 | USF | Wijewardane, S., Goswami, D. Y., (2012), "Exergy of partially coherent thermal radiation", *Energy*, 42, pp 497-502. doi:10.1016/j.energy.2012.03.019. |
| 235 | USF | Yangyang Zhang, **Elias K. Stefanakos, and D. Yogi Goswami**, Design of an efficient photocatalytic reactor with artificial surface roughness for air purification. *Atmospheric Environment* 2012 (finished) |
| 236 | USF | Yangyang Zhang, **Elias K. Stefanakos, and D. Yogi Goswami**, Effect of photocatalytic surface roughness on reactors effectiveness for indoor air cleaning. *Atmospheric Environment* 2012 (Under review) |
| 237 | USF | Yangyang Zhang**, Elias K. Stefanakos, and D. Yogi Goswami,** Optimum photocatalytic reactor performance with surface roughness arrangement for indoor air cleaning. *Atmospheric Environment* 2012 (finished) |
| 238 | USF | Yangyang Zhang, Manoj K. Ram, **Elias K. Stefanakos, and D. Yogi Goswami**, Synthesis, Characterization, and Applications of ZnO nanowires. *Journal of Nanomaterials* 2012 |
| 239 | USF | Yuan, X., Kumar, A., Sahu, A.K., Ergas, S.J. (2011) Impact of Ammonia Concentration on *Spirulina platensis* Growth in an Airlift Photobioreactor, *Bioresource Technology*, 102(3): 3234-3239. |
| 240 | USF | Yuan, X., Wang, M., Park, C., Sahu, A.K., Ergas, S.J. (2012) Microalgae Growth Using High Strength Wastewater Followed by Anaerobic Co-digestion, *Water Environ. Research*, 84(5):396-404. |
| 241 | USF | Z. Miao, A. Domijan, and L. Fan, "Investigation of Microgrids with Both Inverter Interfaced and Direct AC Connected Distributed Energy Resources," IEEE Trans. Power Delivery, vol. 26, no. 3, pp. 1634-1642, July 2011. |
| 242 | USF | Z. Miao, A. Domijan, and L. Fan, "Negative Sequence Compensation for Unbalance in Distributed Energy Resources Interfacing Inverters," *International Journal of Power and Energy Systems*, no. 3, 2012. |

## 4. Professional Presentations Made by FESC faculty

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

**Total # of Presentations:** 202

| # | Faculty | University | Title/Event | Date |
|---|---|---|---|---|
| 1 | M. A. Uddin, T. I. Talukder, A. K. F. Haque, A.K.Basak, B. C. Saha and F. B. Malik | FAMU | "A simple model for evaluating stopping cross sections of H+, He++, Li 3+" , Phys. Letts (submitted) 2012 | 2012 |
| 2 | B. Ritchie, C. Weatherford | FAMU | "Algebra of Physical Space and the Geometric Space-Time Solution of Dirac's Equation," International Journal of Quantum Chemistry, DOI: 10.1002/qua.24156 (2012).. | 2012 |
| 3 | L. B. Zhao, B. C. Saha, and M. L. Du | FAMU | "Calculation of excited states of He atoms in a strong magnetic field", Comm. In Theo. Physics, 57,1059, (2012). | 2012 |
| 4 | D.H. Gebremedhin and C.A. Weatherford | FAMU | "Canonical Two-Range Addition Theorem for Slater-Type Orbitals," International Journal of Quantum Chemistry, DOI: 10.1002/qua.24319 (2012). | 2012 |
| 5 | Y.Shulga, S. Baskakov, V. Muradyan, D. Voilov, V. Smirnov, A. Michtchenko, J. Cabañas-Moreno, K. Belay, C. Weatherford, and G. L. Gutsev | FAMU | "Colorful Polymer Compositions With Dyed Graphene Oxide Nanosheets", International Scholarly Research Networks Optics 2012, 1-5 (2012). | 2012 |
| 6 | K.M. Williams, A.B. Alexander, M. Scott, J. Buchanan | FAMU | "Self-Organization in Hypersonic Shock Driven Plasmas", Presented at the 2011 APS Division of Plasma Physics Meeting, Salt Lake City, UT | 2011 |
| 7 | Gennady Gutsev, Charles Weatherford, Puru Jena, Elijah Johnson, Bala Ramachandran | FAMU | "Structural Patterns in Carbon Chemisorption on an Icosahedral Iron Clusters", Journal of Physical Chemistry B, 116 7050-7061 (2012). | 2012 |
| 8 | C. Weatherford, Kalayu Belay, Gennady Gutsev | FAMU | "Theoretical and Experimental Studies of Fullerite Modified by Oxidation, Intercalation, and Radiation," 2011 Florida Energy Systems Consortium Summit, University of Florida Reitz Union, Gainesville, Florida, September 28, 2011. | 2011 |
| 9 | D. Gebremedhin, E. Quashie, C. A. Weatherford and B. C. Saha | FAMU | "Photoionization of H atom in electric field: Finite Element Technique", 43rd DAMOP Meeting, Orange County, CA (2012). | 2012 |
| 10 | C. Weatherford | FAMU | "Algebra of Physical Space and the Geometric Space-Time Solution of Dirac's Equation," 52nd Sanibel Symposium, February 23, 2012, St. Simon's Island, GA. | 2012 |
| 11 | B. Ritchie, C. Weatherford | FAMU | "Algebra of Physical Space and the Geometric Space-Time Solution of Dirac's Equation," Proceedings of the 52nd Sanibel Symposium, February 23, 2012, St. Simon's Island, GA. | 2012 |

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| 12 | Nicolais. L. Guevera and Bidhan. C. Saha | FAMU | “Collisions of C6+ with atomic and molecular hydrogen”, Phys. Rev. A (under consideration) (2012). | 2012 |
| 13 | X. Zhang and C.A. Weatherford | FAMU | “Evolution Strategy for Controlling Diatomic Molecular Vibration States with the Space-Time Algorithm,” 14th International Congress on Quantum Chemistry, June 25-30, 2012 Boulder, CO. | 2012 |
| 14 | James B. Titus, Alonzo B. Alexander, Kyron Williams, Charles Weatherford, and Joseph A. Johnson III | FAMU | “FAMU Spheromak and the Turbulent Physics Experiment—STPX”, Technology and Innovation 14, 1-11, 2012. | 2012 |
| 15 | D. Gebremedhin, E. Quashie, C. A. Weatherford and B. C. Saha | FAMU | “Photoionization of H atom in electric field: Finite Element Technique”, 43rd DAMOP Meeting, Orange County, CA (2012). | 2012 |
| 16 | C.Y. Scarlett, H.C. Chen, R.J. Peteraon | FAMU | “Proton Spectrum at the Jupiter Facility of LLNL,”, arXiv 1204.3819 (2012). | 2012 |
| 17 | Charles Weatherford and Xingjun Zhang | FAMU | “Quantum Control of Diatomic Molecular Vibration States Using Space-Time Discretization”, Bulletin of the American Physical Society (2012). | 2012 |
| 18 | D. C. Joseph and B. C. Saha | FAMU | “Si3+ +H collisions: role of rotational couplings”, 43rd DAMOP Meeting, Orange County, CA (2012). | 2012 |
| 19 | D. C. Joseph, J. P. Gu and B. C. Saha | FAMU | “State selective charge-transfer in slow collisions of Si3+ with H”, Phys. Rev. A (under consideration) (2012). | 2012 |
| 20 | G.L. Gutsev, C.A. Weatherford, P. Jena, E. Johnson, and B.R. Ramachandran | FAMU | “Structure and Properties of Fe, Fe-n, Fe+n Cluster, n=7-20”, Accepted Journal of Physical Chemistry A. | 2012 |
| 21 | Gennady L. Gutsev, Charles A. Weatherford, Lewis E. Johnson, Purusottam Jena | FAMU | “Structure and Properties of the Aluminum Borates Al(BO2)n and Al(BO2)n-, (n=1-4)“, Journal of Computational Chemistry 33(4), 416-424 (2012). | 2012 |
| 22 | K.M. Williams, E.D. Mezonlin, A.B. Alexander, C.A. Weatherford, J.A. Johnson III | FAMU | “The Spheromak Turbulent Plasma Experiment: The Next Phase in Spheromak Physics”, Presented at the 2011 APS Division of Plasma Physics Meeting, Salt Lake City, UT | 2011 |
| 23 | C.A. Weatherford and G. Gutsev | FAMU | “Theoretical and Experimental Studies of Fullerite Modified by Oxidation, Intercalation, and Radiation”, Electronic Structure Theory for Strongly Correlated Systems, May 30 to June 1, 2012, Palermo, Italy. | 2012 |
| 24 | Susan H Skemp, Executive Director and P.I., SNMREC | FAU | "MHK Ocean Renewable Energy - SNMREC"; Southern Environmental Journalist Confernece, Miami Beach, FL | 10/11/2011 |
| 25 | Dr. James VanZwieten, Jr. | FAU | “Hydrokinetic Energy Extraction Potential of a Turbine Array Placed Across the Florida Current”; FAU Community Salon presentation series, Boca Raton, Florida 31st International Conference on Ocean, Offshore and Arctic Engineering, (1-6 July, 2012, Rio de Janeiro, Brazil): Contributed paper, A.E.S. Duerr and M.R. Dhanak | 3/1/2012 |

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| 26 | Dr. Howard P. Hanson (with A. Smentek-Duerr, J. Van Zwieten) | FAU | "Design Challenges of the Florida Current"; Florida Energy Summit (Poster) | 8/12/2012 |
| 27 | Dr. Howard Hanson, Scientific Director, SNMREC | FAU | "Design Considerations for Ocean Current Turbines";National Wind Technology Center, NREL, DOE Reference Model Meeting | 11/11/2011 |
| 28 | Dr. Howard P. Hanson | FAU | "Energy from the Florida Current: Toward Commercialization"; North Carolina Ocean Energy Consortium | 9/12/2012 |
| 29 | Dr. Howard Hanson, Scientific Director, SNMREC | FAU | "Green Light Considerations for MRE"; Offshore Renewable Energy Conference - Getting the Green Light to Deploy and Produce | 10/11/2011 |
| 30 | Dr. Howard P. Hanson | FAU | "Marine Renewable Energy in Florida"; U.S. Dept. of State, International Visitors' Program | 8/12/2012 |
| 31 | Dr. Howard P. Hanson | FAU | "Marine Renewable Energy: Resources and Challenges in Florida"; Palm Beach Chapter, Americal Society of Civil Engineers | 8/12/2012 |
| 32 | Dr. Howard Hanson, Scientific Director, SNMREC | FAU | "Marine Renewable Energy: HASE Challenges" ; 13th IEEE International High Assurance Systems Enginerring Symposium, Boca Raton, FL | 11/1/2011 |
| 33 | Dr. Howard P. Hanson | FAU | "Marine Renewable Energy: Resources and Challenges"; West Palm Beach Pack & Paddle Club | 7/12/2012 |
| 34 | Susan H Skemp, Executive Director and P.I., SNMREC | FAU | "MHK Ocean Renewable Energy - SNMREC" at the SNMREC Public Forum as part of the Harbor Branch Oceanographic Institute's "Ocean Sciences Leadership Seminar"; Harbor Branch Oceanographic Institute, Ft Pierce, FL | 1/1/2012 |
| 35 | Susan H Skemp, Executive Director and P.I., SNMREC | FAU | "MHK Ocean Renewable Energy - SNMREC"; Dania Beach, FL | 10/11/2011 |
| 36 | Susan H Skemp, Executive Director and P.I., SNMREC | FAU | "Ocean Energy, a Path Forward to Sustainability" ; Florida Green, Energy & Climate Conference, West Palm Beach, FL | 5/1/2012 |
| 37 | Dr. Howard Hanson, Scientific Director, SNMREC | FAU | "Power from the Florida Current: Beyond Assessment" ; Fifth Global Marine Renewable Energy Conference, Washington DC | 4/1/2012 |
| 38 | Dr. James VanZwieten, Jr. | FAU | “Marine Renewable Energy”; Presentation given at the Museum of Discovery and Science, July 26, 2012, Fort Lauderdale, Florida | 7/1/2012 |
| 39 | Dr. James VanZwieten, Jr. | FAU | “Numerical Simulation of Ocean Current Turbines”; SNMREC Brown Bag Lunch presentation Series, August 22, 2012, Boca Raton, Florida | 8/1/2012 |
| 40 | Camille Coley, Associate Director, SNMREC | FAU | Panel Presentation at the FL Energy Summit; Orlando, FL | 10/12/2011 |
| 41 | Susan H Skemp, Executive Director and P.I., SNMREC | FAU | Program Overview "MHK Ocean Renewable Energy - SNMREC"; Total of six Public Forums | April & May 2012 |
| 42 | William Baxley, Chief Engineer, SNMREC | FAU | Teledyne ADCP Conference; San Diego, CA | 10/11/2011 |
| 43 | David Cartes | FSU | 2011 IEEE Electric Ship Technologies Symposium | 1/12/2012 |

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| 44 | Yan Zhou | FSU | High Efficiency cascaded quasi-Z-source photovoltaic inverter module using eGaN FETS/ IEEE Energy Conversion Congress | 9/17/2012 |
| 45 | David Cartes | FSU | IEEE PES General Meeting | 7/22/2012 |
| 46 | Richard Feiock | FSU | Power and Energy Systems General Meeting | 7/23/2012 |
| 47 | Marilyn Barger | HCC-FLATE | Energy Education for Florida's Future Technician Workforce, 2012 Florida Energy Summit, Orlando, FL | 8/16/2012 |
| 48 | D. Parker | UCF/FSEC | Achieving Very High Efficiency and Net Zero Energy in a Hot Humid Climate in an Existing Home, FSEC, Cocoa, FL | 2/1/2012 |
| 49 | N. Muradov, N. Mohajeri, UCF/FSEC | UCF/FSEC | Chemochromic Hydrogen Leak Detectors for Safety Monitoring", DOE FHI Kick-off Meeting, Cocoa, FL | 1/5/2011 |
| 50 | K. Sutherland | UCF/FSEC | Cost-Effective, Energy Efficiency Residential Retrofit Measures for the Hot Humid Climate, IPed conference, Renewable Energy 101 for Housing and Community Development, Tampa, FL | March 4-25, 2011. |
| 51 | M. Rodgers, L.Bonville, H. Kunz, D. Slattery, J. Fenton | UCF/FSEC | Defining the correlation between membrane/MEA degradation rate from accelerated testing and lifetime, Fuel Cell Seminar, Orlando, FL | November 2011 |
| 52 | A. T-Raissi, N. Muradov, A. Gujar, J. Baik, N. Garceau, S. Fenton, D. Block, E. Hinkamp | UCF/FSEC | Development and Costing of an Integrated Biomass Gasification/Fischer-Tropsch Synthesis Process for Co-production of Transportation Fuels, Heat and Power, FESC 2011 Summit, Gainesville, FL | 9/1/2011 |
| 53 | M. Rodgers, C. Huang, C. Odetola | UCF/FSEC | Development of electrocatalysts for PEM fuel cells by electrodeposition, Electrochemical Society Meeting, Boston, MA | October 2011 |
| 54 | C. Huang, M. Rodgers (co-presented) | UCF/FSEC | Development of High Efficiency Low Cost Electrocatalysts for Hydrogen Production and PEM Fuel Cells Applications, FHI Kickoff Meeting at FSEC, Cocoa, FL | February 2011 |
| 55 | B. Pearman, N. Mohajeri, A. Karakoti, D. Diaz, D. Slattery, L. Bonville, S. Saraf, S. Seal | UCF/FSEC | Effects of Cerium Oxide Nanoparticles on Ex-situ and In-situ Degradation of 1100EW Nafion Composite Membranes, Fuel Cell Seminar, Orlando, FL | 11/3/2011 |
| 56 | J. Cummings | UCF/FSEC | Energy Savings and Peak Demand Reduction of a SEER 21 Heat Pump vs. a SEER 13 Heat Pump with Attic and Indoor Duct Systems, Building America Meeting, Denver, CO. | Aug 2011 |
| 57 | J. Cummings | UCF/FSEC | Energy Savings from Wind Washing Retrofits in Two-Story Homes, Building America Meeting, Denver, CO | Aug 2011 |
| 58 | M. Rodgers, L. Bonville, D. Slattery | UCF/FSEC | Evaluation of the Durability of Polymer Electrolyte Membrane Fuel Cells containing Pt/C and Pt-Co/C Catalysts under Accelerated Testing, 2011 Annual Joint Symposium & Exhibition of the Florida Chapter of the AVS Science and Technology Society, Orlando, FL | March 2011 |
| 59 | M. Rodgers, L. Bonville, D. Slattery | UCF/FSEC | Evaluation of the Durability of Polymer Electrolyte Membranes in Fuel Cells Containing Pt/C and Pt-Co/C Catalysts under Accelerated Testing", Electrochemical | October 2012 |

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| | | | Society Meeting, Boston, MA | |
| 60 | D. Block, A. T-Raissi, N. Muradov, N. Mohajeri | UCF/FSEC | Florida Hydrogen Initiative, project: Hydrogen Leak Detectors for Safety Monitoring", DOE Annual Merritt Review Meeting, Washington DC | May, 2011 |
| 61 | N. Mohajeri, A. T-Raissi, J. Baik, UCF/FSEC | UCF/FSEC | FSEC's Irreversible Chemochromic Hydrogen Sensor Overview, Fuel Cell Seminar, Orlando, FL | 11/3/2011 |
| 62 | M. Rodgers | UCF/FSEC | Fuel Cell Research, Women's International Research Engineering Summit (WIRES), Cocoa, FL, | 3/1/2011 |
| 63 | N. Muradov, W. Rieks, P. Brooker | UCF/FSEC | High power density generators for unmanned undersea vehicle applications", ONR – Undersea Energy and Propulsion Workshop, Alexandria, VA | March 28-29, 2012 |
| 64 | N. Muradov, W. Rieks, P. Brooker | UCF/FSEC | High-energy density seawater-based hydrogen generators for marine applications", XIX World Hydrogen Energy Conf., Toronto, Canada (accepted as an oral presentation) | June 3-7, 2012 |
| 65 | N. Mohajeri, P. Kubiak | UCF/FSEC | Improved Titania Supported Palladium Oxide Pigments for Irreversible Chemocromic Hydrogen Sensor, Fuel Cell Seminar, Orlando, FL | 11/3/2011 |
| 66 | J. Fenton, D. Slattery, H. Kunz, L. Bonville, N. Mohajeri, M. Rodgers, R. Brooker | UCF/FSEC | Lead Research and Development Activity for DOE's High Temperature, Low Relative Humidity Membrane Program, DOE Annual Merit Review Meeting, Washington, DC | 5/9/2011 |
| 67 | J. Cummings, C. Withers, E. Martin, N. Moyer | UCF/FSEC | Measure Guideline: Managing the Drivers of Air Flow and Water Vapor Transport in Existing Single-Family Homes, US Department of Energy, EERE, Building Technologies Program. Peer Reviewed | February 2012 |
| 68 | P. Brooker, D. Slattery, L. Bonville, J. Fenton | UCF/FSEC | Mechanism of Platinum-band Formation Mitigation with Heteropolyacid Electrodes, Abstract # 1208, 220th ECS Meeting, Boston, MA | 10/9-14, 2011 |
| 69 | N. Muradov, A.T-Raissi, G. Bokerman, E. Hinkamp | UCF/FSEC | Passive Chemochromic Hydrogen Leak Detectors for Safety Monitoring", XIX World Hydrogen Energy Conf., Toronto, Canada (accepted as a poster presentation) | June 3-7, 2012 |
| 70 | P. Brooker, D. Slattery, L. Bonville, J. Fenton | UCF/FSEC | Platinum Band Formation Mitigation through Heteropolyacid Sublayers, Abstract # LRD42-1, Fuel Cell Seminar, Orlando, FL | 10/31 to 11/3 2011 |
| 71 | P. Brooker, L. Bonville, D. Slattery, J. Fenton (Presented by M. Rodgers) | UCF/FSEC | Platinum Band Formation Mitigation through Heteropolyacid Sublayers, Electrochemical Society Meeting, Boston, MA | October 2011 |
| 72 | P. Brooker, D. Slattery, L. Bonville, J. Fenton | UCF/FSEC | Platinum Band Formation Mitigation through Heteropolyacid Sublayers, Oral Presentation, Abstract # LRD42-1, 2011 Fuel Cell Seminar, Orlando, FL, . | October 31-November 3, 2011 |
| 73 | A. Gujar, J. Baik, N. Garceau, E. Hinkamp, A. T-Raissi, N. Muradov | UCF/FSEC | Production of Syngas by Oxygen-blown Gasification of Biomass", XIX World Hydrogen Energy Conf., Toronto, Canada (accepted as an oral presentation) | June 3-7, 2012 |
| 74 | C. Carlos | UCF/FSEC | Side-by-Side water heating results at Building America Meeting stakeholders meeting", Austin, TX | March 2012. |
| 75 | J. McIlvaine | UCF/FSEC | Technical Solutions for High Performance Habitat Homes, 2011 Affordable Comfort Institute National Conferences, San Francisco, CA | January 2011. |

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| 76 | N. Moyerl | UCF/FSEC | Training Programs: Building and Maintaining Capacity, DOE National Weatherization Training Conference, New Orleans, LA | Dec 2011. |
| 77 | D. Danny | UCF/FSEC | User Motivation Pays Off! Evaluation of Energy Savings and Persistence from Residential Energy Demand Feedback Devices", World Sustainable Energy Days, Austria | 2/1/2012 |
| 78 | Jenshan Lin | UF | "From Far-Field Wireless Power Transmission to Near-Field Wireless Charging," presented at IEEE MTT-S Tainan Chapter in Taiwan | 6/8/2012 |
| 79 | Jon Stewart | UF | "Adventures in Alkene Reductases." Infinity Pharmaceuticals, Boston, MA | 1/31/2012 |
| 80 | J.F. Preston | UF | "Bacterial xylan-utilization regulons: Systems for coupling depolymerization of glucuronoxylans with assimilation and metabolism", DOE Joint Genome Users Meeting, Walnut Creek, CA | 3/20/2012 |
| 81 | Kelly Jordan | UF | "BiI3 Crystals for High Energy Resolution Gamma-Ray Spectroscopy " NNSA University-Industry Technical Interchange Conference Oakland, CA, USA, Dec 6-8, 2011. "An Overview of the Fukushima Nuclear Accident" Meeting of the Florida Chapter of the Health Physics Society (FCHPS) Gainesville, FL, Oct. 14, 2011. | 10/14/2011 |
| 82 | Jon Stewart | UF | "Expanding the Catalytic Repertoires of Alkene Reductases." Enzyme Engineering XXI, Vail, CO | 9/19/2011 |
| 83 | Jon Stewart | UF | "Flavoprotein Alkene Reductases for Chemical Synthesis." Society for Industrial Microbiology Annual Meeting, Washington, DC | 8/16/2012 |
| 84 | Kelly Jordan | UF | "Progress on Implementation of Digital Controls at the University of Florida Training Reactor," 2012 Annual Meeting of the National Organization of Test and Research Reactors. 2012. | 9/26/2012 |
| 85 | Lynn Sollenberger | UF | Are all elephantgrasses invasive? Characterization of natural populations and cultivated types of a bioenergy grass in Florida. In ASA/CSSA/SSSA, San Antonio, TX. | 10/24/2011 |
| 86 | E. J. Phlips | UF | Bailey Trump, E. J. Phlips, P. Pullammanappallil, and s. Svoronos. Development of a photosynthetic biorefinary employing a novel hypersaline, nitrogen fixing, hypersaline cyanobacterium. 2012 Florida Energy Summit, August 15-17, Gainesville, Florida. | 8/15-17, 2012 |
| 87 | Jeff Fedenko | UF | Biofuel potential of perennial grasses across Florida. 2012 Power Up Energy Exposition, Pensacola Beach, FL. | Spring 2012 |
| 88 | Jeff Fedenko | UF | Biofuel potential of perennial grasses across Florida. In Florida Energy Summit. Orlando, FL. | 8/15/2012 |
| 89 | John Erickson | UF | Biomass yield and mineral composition of six potential perennial grass bioenergy crops for the Southeast. In ASA/CSSA/SSSA, San Antonio, TX. | 10/22/2011 |
| 90 | Pierce Jones | UF | Characterizing Energy Efficiency Using Utility and Appraiser Data; Hillsborough County Energy Workgroup; Tampa | 10/13/2011 |

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| 91 | Gary Peter | UF | Commercial Production of Biofuels from Biomass, Florida Energy Summit, Orlando, FL, 2012 | 8/12/2012 |
| 92 | Gary Peter | UF | Commercial Production of Terpene Biofuels in Pine. BIO's 9th Annual World Congress on Industrial Biotechnology and Bioprocessing, Orlando, FL, 2012 | 4/12/2012 |
| 93 | Pierce Jones | UF | Community Design and Agricultural Urbanism; Envision Alachua; Gainesville | 1/26/2012 |
| 94 | Craig Miller | UF | Cost-Effective Weatherization in Hot, Humid Climates, National Weatherization Training Conference, New Orleans, LA | 12/15/2011 |
| 95 | Franky So | UF | Critical issues for OLED lighting, DOE Round Table Discussions, Washington DC | 11/15/2011 |
| 96 | Yolanda Lopez | UF | Cross-Taxa microsatellite primers transferability from pearl millet (Pennisetum glaucum (L.) R. Br.) to elephantgrass (Pennisetum purpureum Schumach.). Plant/Animal Genome Conf., San Diego, CA. | 1/8/2012 |
| 97 | Chaein Na | UF | Effect of harvest frequency and timing on perennial bioenergy grass yield and composition in Florida. Florida Energy Summit. Orlando, FL. | 8/15/2012 |
| 98 | Richard Stehle, Michael Bobek | UF | FESC Summitt / Steam Iron Process: Examination of Regenerative Cycling | 9/28/2011 |
| 99 | Nathan Rhodes | UF | FESC Summitt/ Kinetics investigation for solar syngas production | 8/15/2012 |
| 100 | Sabine Grunwald | UF | Grunwald S. 2012. Soil carbon variability across large landscapes. Soil and Water Science Research Forum, Gainesville, FL | 9/7/2012 |
| 101 | Sabine Grunwald | UF | Grunwald S., B. Hoover, and R. Patarasuk. 2012. Terra C and Pinemap data resources. Webinar series Pinemap project. Gainesville, FL | 7/13/2012 |
| 102 | Chaein Na | UF | Harvest frequency and timing affect perennial bioenergy grass yield and composition. In ASA/CSSA/SSSA, San Antonio, TX. | 10/24/2012 |
| 103 | Hoover B | UF | Hoover B., N.M. Knox, S. Grunwald, T.A. Martin, X. Xiong, P. Chaikaew, J. Kim, and B. Cao. 2011. Synthesis tools for carbon assessment in ecosystems. FESC Summit, University of Florida, Gainesville, FL | 9/28-29/2011 |
| 104 | Hoover B | UF | Hoover B., S. Grunwald, T.A. Martin, G.M. Vasques, N.M. Knox, J. Kim, X. Xiong, P. Chaikaew, J. Adewopo, B. Cao and C.W. Ross. 2011. The Terrestrial Carbon (Terra C) Information System to facilitate carbon synthesis across heterogeneous landscapes No. 264-10. Symposia Spatial Predictions in Soils, Crops and Agro/Forest/Urban/Wetland Ecosystems, ASA-CSSA-SSSA Int. Meeting, San Antonio, TX | 10/16-19/2011 |
| 105 | Kelly Jordan | UF | Implementation of Digital Up- grades to the UFTR Protection and Control Systems" 8th International Topical Meeting on Nuclear Plant Instrumentation, Control and Human Machine Interface Technologies (NPIC&HMIT 2012), San Diego, CA, July 22-26, 2012. | 7/23/2012 |

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| 106 | Pierce Jones | UF | Land Development &Transportation: A Case Study; UF/DCP Showcase; Gainesville | 2/24/2012 |
| 107 | Pierce Jones | UF | Land Development, Energy and Water: A Florida Case Study; 1000 Friends of Florida; Webinar | 10/19/2011 |
| 108 | Pierce Jones | UF | Land Development, Water and Energy: A Florida Case Study; Green Symposium; DeLand | 4/13/2012 |
| 109 | Pierce Jones | UF | Land Development, Water and Energy: A Florida Case Study; SJRWMD; Palatka | 1/19/2012 |
| 110 | Pierce Jones | UF | Land Development, Water and Energy: A Florida Case Study; Urban Forestry Institute; Oviedo | 3/9/2012 |
| 111 | Franky So | UF | Light extraction in OLEDs, invited seminar given at PPG Industry, | 3/22/2012 |
| 112 | Jeff Fedenko | UF | Lignin and fermentable sugars of perennial biofuel crops. In ASA/CSSA/SSSA, San Antonio, TX. | 10/22/2011 |
| 113 | Franky So | UF | OLED Displays and Lighting, invited seminar given at Taiwan Industrial Technology Research Institute | 3/7/2012 |
| 114 | Franky So | UF | OLED light extraction scheme, presentation given at the DOE workshop, Washington DC | 11/12/2011 |
| 115 | Franky So | UF | OLED lighting, invited seminar given at Taiwan National Tsinghua University, | 3/8/2012 |
| 116 | Gary Peter | UF | Past, Present and Future of Breeding for Rust Resistance in Slash Pine. IEG 40 Workshop – Integrating Fusiform Rust Research, Screening and Breeding, Asheville, NC, 2012 | 6/12/2012 |
| 117 | Kelly Jordan | UF | Reactor Licensing Basis Optimization for Extensive Modifications," 2012 Annual Meeting of the National Organization of Test and Research Reactors. 2012. | 9/26/2012 |
| 118 | Franky So | UF | Recent Progress in Organic Solar Cells, University of Florida Energy Colloquium | 12/12/2012 |
| 119 | Franky So | UF | Recent progress in polymer solar cells, invited seminar given at Arizona State University | 4/13/2012 |
| 120 | Gary Peter | UF | Regulation of Genetically Engineered Forest Trees. 12th International Symposium on Biosafety of Genetically Modified Organisms, St. Louis, MO, 2012 | 9/12/2012 |
| 121 | Chaein Na | UF | Seasonal changes in growth and morphological characteristics of bioenergy grasses in the USA Gulf Coast Region. In ASA/CSSA/SSSA, San Antonio, TX. | 10/23/2012 |
| 122 | Maria Silveira | UF | Short-term effects of grazing intensity and nitrogen fertilization on soil organic carbon under grazed pastures in the southeastern USA. In ASA/CSSA/SSSA, San Antonio, TX. | 10/23/2012 |
| 123 | Xiong X | UF | Xiong X., S. Grunwald, D.B. Myers, W.G. Harris, A. Stoppe and N.B. Comerford. 2011. Are soil carbon models transferable across distinct regions or scales in Florida? No. 262-8. Symposia Spatial Predictions in Soils, Crops and Agro/Forest/Urban/Wetland | 10/16-19/2011 |

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| | | | Ecosystems, ASA-CSSA-SSSA Int. Meeting, San Antonio, TX | |
| 124 | Ted Kury | UF/PURC | "Evidence-Driven Utility Policy with Regard to Storm Hardening Activities". Presented at National Regulatory Research Institute Teleseminar, August 27, 2012. | 8/12/2012 |
| 125 | Ted Kury | UF/PURC | "Execution and Leadership: Fulfilling Conflicting Responsibilities in Utility Regulation" Presented at the South African Regulators Conference, August 2012, Johannesburg, South Africa | 8/12/2012 |
| 126 | Ted Kury | UF/PURC | "Florida's Storm Response Initiatives". Presented to the Pennsylvania Energy Office, March, 2012. | 3/12/2012 |
| 127 | Ted Kury | UF/PURC | "New Tools for Regulators in Addressing the Impact of Renewable Energy and Energy Efficiency Policy" Presented at the South African Regulators Conference, August 2012, Johannesburg, South Africa | 8/12/2012 |
| 128 | Ted Kury | UF/PURC | "Price Effects of Independent System Operators in the United States Electricity Market." Presented at the Annual Meeting of the Allied Social Science Associations (AEA Section), January 2012, Chicago, Illinois. | 1/12/2012 |
| 129 | Ted Kury | UF/PURC | "Price Effects of Independent System Operators in the United States Electricity Market." Presented at the Florence School of Regulation Workshop on Performance in Network Industries, October 2011, Florence, Italy. | 10/11/2012 |
| 130 | Ted Kury | UF/PURC | "Status of Federal and State Energy Policy". Presented at the Energy in North Florida: Policy and Resiliency Workshop, August 13, 2012, Gainesville, Florida. | 8/12/2012 |
| 131 | Ted Kury | UF/PURC | "Status of U.S. Energy Policy and Outlook for the Future". Presented to the North American Energy Markets Association Annual Meeting, April, 2012, Ponte Vedra Beach, Florida. | 4/12/2012 |
| 132 | Ted Kury | UF/PURC | "The Impact of Transparent Wholesale Markets on Market Participation in the U.S. Electricity Industry" Presented at Pressing Issues in World Energy Policy, March 2012, Gainesville, Florida. | 3/12/2012 |
| 133 | Mark Jamison | UF/PURC | "The Regulator and Interconnection Standards: Four Rules for Renewables." Presented at Energy Security: Real or Imaginary?, CARILEC Renewable Energy Forum 2012, September 2012, Bermuda. | 9/12/2012 |
| 134 | Ted Kury | UF/PURC | "The Role of Renewable Energy Resources in Island Electric Systems." Presented at the 9th OOCUR Annual Conference, November 2011, Rockley, Christ Church, Barbados. | 11/11/2012 |
| 135 | Ted Kury | UF/PURC | "Washington's Energy Policy 'Leadership' and its Implications for Utilities and Customers." Presented at the Annual Meeting of the Southern Minnesota Municipal Power Agency, October 2011, Minneapolis, Minnesota. | 10/11/2012 |
| 136 | D. Dutta, C. Yang, B. Joseph, V. Bhethanabotla | USF | "Ag-Cu Bimetallic Nanoparticles for Metal Enhanced Luminescence (MEL)", AIChE Annual Meeting, Minneapolis, MN, Nov 2011. | 11/1/2011 |

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| 137 | Chen, H., M.M. Rahman, D.Y. Goswami, E.K. Stefanakos | USF | "Optimizing energy conversion using organic Rankine cycles and supercritical Rankine cycles," in the Proceedings of the Proceedings of the ASME ESFuelCell 2011 Conference, Washington, D.C., August. | 2011 |
| 138 | Vasquez Padilla, R., Ramos, A.A., Demirkaya, G., Besarati, S., Goswami, D.Y., Rahman, M.M. and Stefanakos, E.K. | USF | "Performance Analysis of a Rankine-Goswami Combined Cycle," Proceedings of the ASME 2011 "ESFuelCell 2011" (5th International Conference on Energy Sustainability and 9th Fuel Cell Science Engineering and Conference), Washington, DC, August. | 2011 |
| 139 | Syed Ali Zeeshan Gardezi, John T Wolan, Babu Joseph | USF | Fischer Tropsch Synthesis via Bioderived Syngas, ACS Florida Annual Meeting and Exposition, Tampa, Florida, May 2012 | 5/1/2012 |
| 140 | Sarina ErgasUdom, I., Halfhide, T., Gillie, B., Dalrymple, O., Zaribaf, B. H., Zhang, Q., Ergas, S.J. | USF | Harvesting algae grown on wastewater, Proc. 85th Annual Meeting of the Water Environment Federation (WEFTEC 12), Sept. 29-Oct. 3., New Orleans, LA. | 9/1/2012 |
| 141 | Nianthrini Balakrishnan, Babu Joseph, Venkat Bhethanabotla1 and D. Yogi Goswami | USF | The Role of Added Promoters In Reducing the Deactivation of Co Catalyst Used In Fischer Tropsch Synthesis, Paper 359f, AIChE Annual Meeting, Minneapolis, MN, Oct 2011. | 10/1/2011 |
| 142 | B. Mankidy, B. Joseph and V. Gupta | USF | "Colloidal Ag-Pt/TiO2 Nanocomposites for Photocatalysis", 2012 Annual TMS Meeting, Orlando, March 2012. | 3/1/2012 |
| 143 | Koiry, S.P., Krishnan, S., Ratnadurai, R., Goswami, D.Y., Stefanakos, E., and Bhansali, S. | USF | "Controlled ex-situ doping of electrochemically polymerized 5,10,15,20 tetrakis (4-hydroxyphenyl)-porpyrin (THPP) for hybrid switching circuits," in the Proceedings of the 220th ECS Meeting. | 2011 |
| 144 | D. L. Morel, C. S. Ferekides, K. Jayadevan and R. Anders | USF | "Effective Ga Incorporation for 2SSS CIGS Manufacturing", Proceedings of the 37th IEEE PV Specialist Conference, Seattle | 7/3/2012 |
| 145 | Alvi, F., Ram, M.K., Basayaka, P., Stefanakos, E., Goswami, Y., Hoff, A.M., and Kumar, A. | USF | "Electrochemical Supercapacitors Based on Graphene-conducting Polythiophenes Nanocomposite, ECS Symposium in the Proceedings of the MRS Fall Conference, Boston. | 2011 |
| 146 | Syed Ali Gardezi, and Babu Joseph | USF | "Experimental Investigation of Liquid Fuel Production From Derived Synthesis Gas Via Fischer-Tropsch Synthesis,", AIChE Annual Meeting, Pittsburg, PA, Nov 2012 | 11/1/2012 |
| 147 | Syed Ali Gardezi, J. W. Wolan, B. Joseph, Y. Goswami | USF | "Fischer Tropsch Synthesis Via Biomass Derived Synthesis Gas," 2011 Florida Energy Systems Consortium Annual Summit, Gainesville, FL, Sept 2011 | 11/1/2011 |
| 148 | Nianthrini Balakrishnan, Bijith Mankidy, Vinay Gupta, Babu Joseph and Venkat Bhethanabotla | USF | "Mechanistic Studies On the Size Effect of Cobalt Nanoparticles On CO Oxidation,", AIChE Annual Meeting, Pittsburg, PA, Nov 2012 | 11/1/2012 |
| 149 | Syed Ali Gardezi, and Babu Joseph | USF | "Modeling the Start-up Phase of Fischer Tropsch Synthesis in a Fixed Bed Reactor: Effect of Pore Filling and Heat Transfer Through the Catalyst Bed,", AIChE Annual Meeting, Pittsburg, PA, Nov 2012 | 11/1/2012 |

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| 150 | Demirkaya, G., Besarati, S.M., Vasquez Padilla, R., Ramos, A.A., Rahman, M.M., Goswami, D.Y., and Stefanaksos, E. | USF | "Multi-Objective Optimization of a Combined Power and Cooling Cycle for Low-Grade and Mid-Grade Heat Sources," in the Proceedings of the ASME ESFuelCell 2011 Conference, Washington, D.C., August. | 2011 |
| 151 | B. Mankidy, B. Joseph and V. Gupta | USF | "Towards Efficient Co/SiO2 FTS Catalysts: Study of Cobalt Nanoparticle Size Effects on Reaction Kinetics", 2011 Florida Energy Systems Consortium Annual Summit, Gainesville, FL, Sept 2011. | 11/1/2011 |
| 152 | Lee Stefanakos/Yogi Goswami | USF | Abutayeh, M., Goswami, D.Y., and Stefanakos, E. (2011) "Solar thermal power plant simulation, in the Proceedings of the AIChE National Meeting, Minneapolis, MN, October. | 2011 |
| 153 | Debosruti Dutta, Chi Ta Yang, Babu Joseph and Venkat R. Bhethanabotla | USF | Ag-Cu Bimetallic Nanoparticles for Metal Enhanced Luminescence (MEL), Paper 591a, AIChE Annual Meeting, Minneapolis, MN, Oct 2011. | 10/1/2011 |
| 154 | Stan R. Russell | USF | AIA Florida Annual Conference- Naples Florida- summer 2011 | 2011 |
| 155 | Stan R. Russell | USF | AIA Tampa Bay Designer's Luncheon Lecture Series- fall 2010- 2011 Solar Decathlon - FLeX House | 2011 |
| 156 | Bijith Mankidy, Babu Joseph, Vinay Gupta | USF | AIChE Annual Meeting, Pittsburg, PA, Nov 2012 Enhancing Photocatalytic Reduction of CO2 by Using Bimetallic Co-Catalyst and Plasmonic Nanoparticles | 11/1/2012 |
| 157 | Syed Ali Gardezi, Babu Joseph | USF | AIChE Annual Meeting, Pittsburg, PA, Nov 2012 ; Modeling the Start-up Phase of Fischer Tropsch Synthesis in a Fixed Bed Reactor: Effect of Pore Filling and Heat Transfer Through the Catalyst Bed | 11/1/2012 |
| 158 | Syed Ali Zeeshan Gardezi, John T Wolan, Babu Joseph | USF | An Integrated Approach to the preparation of effective Catalysts for Biomass-to-Liquid (BTL) processes, AIChE Central Florida International Conference, Clearwater, FL, June, 2012 | 6/1/2012 |
| 159 | Stan R. Russell | USF | ASME Tampa Bay Annual Meeting- FLeX House- summer 2011 | 2011 |
| 160 | Babu Joseph | USF | Bijith Mankidy, Nianthrini Balakrishnan, Babu Joseph, ; Vinay Gupta, , AIChE Annual Meeting, Pittsburg, PA, Nov 2012; Size Effect of Cobalt-Oxide Nanoparticles for CO Oxidation: An Experimental and Computational Study | 11/1/2012 |
| 161 | Babu Joseph | USF | Chi-Ta Yang, Nianthrini Balakrishnan, Babu Joseph and Venkat Bhethanabotla, AIChE Annual Meeting, Pittsburg, PA, Nov 2012 | 11/1/2012 |
| 162 | Stan R. Russell | USF | CSI Luncheon - FLeX House- spring 2011 | 2011 |
| 163 | Sarina Ergas | USF | Dalrymple, O.K., Halfhide, T., Udom, I., Gilles, B, Wolan, J., Zhang, Q., Ergas, S.J. (2011) A preliminary estimation of the algal feedstock production potential of Tampa Bay utilizing CO2 emissions and wastewater effluent, Proc. Florida Energy Systems Consortium (FESC) Summit, Sept. 26-27, 2011, Gainesville, FL. | 9/1/2011 |

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| 164 | Lee Stefanakos/Yogi Goswami | USF | Demirocak, D.E., Kuravi, S., Ram, J.K., Jotshi, C.K., Srinivasan, S., Kumar, A., Goswami, Y. and Stefanakos, E. (2011) "Investigation of polyaniline nanocomposites and cross-linked polyaniline for hydrogen storage," Proceedings of the 2011 Advances in Materials Processing Technologies (AMPT) Conference, July 2011, Istanbul, Turkey. | 2011 |
| 165 | Lee Stefanakos/Yogi Goswami | USF | Demirocak, D.E., Kuravi, S., Ram, M.K., Jotshi, C.K., Kumar, A.D., Goswami, Y., and Stefanakos, E.K. (2011) "Surfactant enriched polyaniline for hydrogen storage," in the Proceedings of the ASME 2011 5th International Conference on Energy Sustainability and 9th Fuel Cell Science, Engineering and Technology Conference (ESFuelCell 2011), Aug, 011, Washington, DC | 2011 |
| 166 | Babu Joseph | USF | Devin Walker, Syed Ali Gardezi, J. Kuhn and B. Joseph, Converting Trash to Cash : Using Landfill Gas to produce liquid fuels, AIChE Central Florida International Conference, Clearwater, FL, June 2012 | 6/1/2012 |
| 167 | Stan R. Russell | USF | Eco House Symposium- Kanagawa University, Kanagawa Japan- summer 2011 | 2011 |
| 168 | Syed Ali Gardezi, Babu Joseph, and John T. Wolan | USF | Fischer Tropsch Synthesis Via Biomass Derived Synthesis Gas, , AIChE Annual Meeting, Minneapolis, MN, Oct 2011. Paper 231c | 10/1/2011 |
| 169 | Syed Ali Zeeshan Gardezi, Babu Joseph, and John T Wolan | USF | Fischer Tropsch Synthesis via Biomass Derived Synthesis Gas, FESC Energy Summit, July 2012, Orlando. | 7/1/2012 |
| 170 | Syed Ali Gardezi and Babu Joseph | USF | Fischer-Tropsch Synthesis via Biomass derived Synthesis Gas," 2011 College of Engineering Research Day, USF, Tampa, Dec 2011. (Best Poster Award in Poster Competition) | 12/1/2011 |
| 171 | Sarina Ergas | USF | Halfhide, T., Trimmer, J., Pinilla, M., Bosshart, W., Zhang, Q., Wolan, J., Main, K., Ergas, S. J. (2011) Reducing Carbon and Nutrient Impacts of Aquaculture Using an Algal Photo-bioreactor Production System, Proc. International Water Association Leading Edge Technologies Conference, June 6-10, Amsterdam, The Netherlands. | 6/1/2011 |
| 172 | Nianthrini Balakrishnan, Babu Joseph, Venkat R. Bhethanabotla1 and D. Yogi Goswami | USF | Influence of Pt Promoter On Fischer-Tropsch Initiation Pathways Over Cobalt Catalysts, paper 487a, AIChE Annual Meeting, Minneapolis, MN, Oct 2011. | 10/1/2011 |
| 173 | Bijith Mankidy, Babu Joseph, Vinay Gupta | USF | In-Situ FTIR Spectroscopy to Study the Size Effect of Cobalt Nanoparticles On Carbon Monoxide Oxidation, Paper 108e, AIChE Annual Meeting, Minneapolis, MN, Oct 2011. | 10/1/2011 |
| 174 | Robert Weisberg | USF | Invited speaker at the CMS Eminent Scholars Lecture series in April 2011. | 4/1/2011 |
| 175 | Babu Joseph | USF | Justin Stottlemyer, and Babu Joseph, Density Functional Theory Studies of Co Catalysts and Reaction Mechanisms for Fischer-Tropsch Synthesis, 2011 College of Engineering Research Day, USF, Tampa, Dec 2011. (Best Poster Award in Poster Competition) | 12/1/2011 |

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| 176 | Lee Stefanakos/Yogi Goswami | USF | Kuravi, S., Trahan, J., Goswami, Y., Jotshi, C., Stefanakos, E., Goel, N. (2012) "Investigation of a high temperature packed bed sensible heat thermal energy storage system with large sized elements," Proceedings of the ASME 202 International Mechanical Engineering Congress and Exposition (IMECE 2012), November, 2012, Houston. | 2012 |
| 177 | Z. Miao | USF | L. Xu, Z. Miao and L. Fan, "Control of a back-to-back VSC system from grid-connected to islanded mode in microgrids," in Proc. of IEEE Energy Tech, May 2011 | 2011 |
| 178 | Z. Miao | USF | L. Xu, Z. Miao and L. Fan, "Control of a battery system to improve operation of a microgrid," IEEE PES General Meeting, 2012. | 2012 |
| 179 | Z. Miao | USF | L. Xu, Z. Miao and L. Fan, "Coordinated Control of a Solar and Battery System in a Microgrid," IEEE T&D meeting, 2012. | 2012 |
| 180 | Lee Stefanakos/Yogi Goswami | USF | Li, C., Abutayeh, M., Goswami, Y., and Stefanakos, E. (2011) "Seawater Desalination using Solar Energy, Proceedings of the Florida Section of the AWWA Regional Conference, Orlando, November. | 2011 |
| 181 | Nathan Crane | USF | Liberti, C., and Crane, N. B., "Investigation of Surface Tension Effects of a Water-Hexadecane Interface on Silicon Microparts," ASME 2011 International Mechanical Engineering Congress & Exposition November 11-18, 2011, Denver, CO | 11/1/2011 |
| 182 | Yogi Goswami | USF | M. Celestin, S. Koiry, S, Krishnan, Y. Goswami, E. Stefanakos, "Metal Thin-film Roughness Mitigation Through Thermal Annealing for Self-Assembled Monolyaer Growth" USF Research Day, 2011. | 2011 |
| 183 | Babu Joseph | USF | María J. Pinilla, Babu Joseph, Qiong Zhang , "Comparative Life Cycle Assessment of Lignocellosic Biomass Conversion into Different Energy Products, 2011 Florida Energy Systems Consortium Annual Summit, Gainesville, FL, Sept 2011 | 11/1/2011 |
| 184 | Babu Joseph | USF | María J. Pinilla, Babu Joseph, Qiong Zhang, " Comparative Life Cycle Assessment of Biofuels and Electricity Production, "2011 Florida Energy Systems Consortium Annual Summit, Gainesville, FL, Sept 2011 | 11/1/2011 |
| 185 | Babu Joseph | USF | Matt Wetherington and Babu Joseph . Cost Models for a Biomass Based Transportation Fuels Plant. Florida Energy Systems Consortium Annual Summit. University of Central Florida, Orlando, Sept 2010. | 9/1/2010 |
| 186 | Syed Ali Gardezi, Babu Joseph, and John T. Wolan | USF | Modeling the Start-up Phase of Fischer Tropsch Synthesis In a Fixed Bed Reactor: Strategizing the Optimum Operation, AIChE Annual Meeting, Minneapolis, MN, Oct 2011. Paper 312a, | 10/1/2011 |
| 187 | Babu Joseph | USF | N. Balakrishanan, B. Joseph, V. Bhethanabotla, Y. Goswami, "Influence of Pt promoter on CO activation pathway", 2011 Florida Energy Systems Consortium Annual Summit, Gainesville, FL, Sept 2011 | 9/1/2011 |
| 188 | Lee Stefanakos/Yogi Goswami | USF | Pendyala, S., Sridharan, P., Kuravi, S., Jotshi, C.K., Ram, M.K., Rahman, R., Stefanakos, E., Goswami, D.Y. (2012) "Macroencapsulation of sodium nitrate for thermal energy storage in solar thermal power," Proceedings of the ASME 2012 6th Int'l Conf. on | 7/4/2012 |

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| | | | Energy Sustainability and 10th Fuel Cell Science, Engineering and Technology Conf. (ESFuelCell 2012), July 23-26, 2012, San Diego, CA. | |
| 189 | Lee Stefanakos/Yogi Goswami | USF | Ramos, A.A., Kuravi, S., Rahman, M.M., Goswami, D.Y., Stefanakos, E.K., Gonzalez-Aguilar, J., and Romero, M. (2011) "Parametric study of a phase change thermal storage module," in the Proceedings of the ISES Solar World Congress, pp. 1699-1707, Kassel, Germany(Aug-Sept.). | 2011 |
| 190 | Stan R. Russell | USF | Reaching Zero Energy in Florida's Hot Humid Climate, ARCC 2011 CONSIDERING RESEARCH: Reflecting upon current themes in Architectural Research, Detroit MI, spring 2011, | 2011 |
| 191 | Watson, S., Halfhide, T., Trimmer, J., Zhang, Q., Wolan, J., Main, K., Ergas, S.J. | USF | Reducing the Nutrient Impacts of Aquaculture Through the Use of an Algal Photobioreactor Production System, Proc. 2011 WEF Nutrient Recovery and Management Conference, Jan. 9-12, 2011, Miami, FL. | 1/1/2011 |
| 192 | Stan R. Russell | USF | Russell S.R., Weston M., Goswami Y., Doll M. Flex House, ASME 2011 5th International Conference on Energy Sustainability & 9th Fuel Cell Science, Engineering and Technology Conference, Washington D.C. Summer 2011 | 2011 |
| 193 | Yogi Goswami | USF | Russell, S., Goswami, Y., Weston, M., and Doll, M. (2011) "Flex House," in the Proceedings of the ASME ESFuelCell 2011 Conference, Washington, D.C., August. | 2011 |
| 194 | Babu Joseph | USF | S.A. Ali, B. Joseph, J.W. Wolan, "Fisher-Tropsch Synthesis of Biomass derived syngas", AIChE Annual Meeting, Minneapolis, MN, Nov 2011. | 11/1/2011 |
| 195 | Lee Stefanakos/Yogi Goswami | USF | Stefanakos, E. K. (2012), "Solar Power Plants and Energy Storage for Global Energy Needs", IFNA World Congress - Energy, Athens, Greece, June 25-July 1, 2012 | 6/25-7/1/2012 |
| 196 | Nianthrini Balakrishnan, Babu Joseph, ; Venkat Bhethanabotla | USF | The Role of Added Promoters in Reducing the Deactivation of Co Catalyst Used in Fischer Tropsch Synthesis,, AIChE Annual Meeting, Pittsburgh, PA Nov 2012 | 11/1/2012 |
| 197 | Bijith D. Mankidy, Nianthrini Balakrishnan, Babu Joseph and Vinay K. Gupta, | USF | Towards efficient FTS catalysts: Size effect of cobalt oxide nanoparticle on reaction kinetics, FESC Energy Summit, July 2012, Orlando, Florida. | 7/1/2012 |
| 198 | Bijith Mankidy, Vinay Gupta and Babu Joseph, | USF | Towards Efficient Synthetic Hydrocarbon Fuel Production: Role of Cobalt Nanoparticle Size", Presented at the 2011 College of Engineering Research Day, USF, Tampa, Dec 2011. (Honorable Mention Award in Poster Competition) | 12/1/2011 |
| 199 | Lee Stefanakos/Yogi Goswami | USF | Trahan, J., Kuravi, S., Goswami, D.Y., Rahman, M.M., Stefanakos, E. (2012) "Thermal characterization of high temperature inorganic phase change materials for thermal energy storage applications, Proceedings of the ASME 2012 6th Int'l Conf. on Energy Sustainability and 10th Fuel Cell Science, Engineering and Technology Conf. (ESFuelCell 2012), July 23-26, 2012, San Diego, CA. | 7/23-26/2012 |

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|---|---|---|---|---|
| 200 | Sarina Ergas | USF | Udom, I., Halfhide, T., Trimmer, J., Gillie, B. Wolan, J., Ergas, S.J. (2011) Nutrient management using an algal photobioreactor production system, Proc. Association of Environmental Engineering and Science Professors (AEESP) Research and Education Conference, Tampa, FL, July 10-12, 2011. | 7/1/2011 |
| 201 | Sarina Ergas | USF | Udom, I., Wolan, Ergas, S.J. (2011) Harvesting Chlorella sp. for Biofuel Production Using Flocculants, Proc. 1st International Conference on Algal Biomass, Biofuels and Bioproducts, July 17-20, St Louis MO. | 7/1/2011 |
| 202 | Lee Stefanakos/Yogi Goswami | USF | Vidhi, R., Goswami, D.Y., Chen, H., Stefanakos, E. and Kuravi, S. (2011) "Study of supercritical carbon dioxide power cycle for low grade heat conversion," Proceedings of the Supercritical CO2 Power Cycle Symposium, Denver, Colorado, May. | 5/1/2011 |

## 5. Invention Disclosures & Patents By All SUS Faculty in Energy Area

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

**Total:** 59

| # | Faculty | University | Disclosure / Patent # | Title |
|---|---|---|---|---|
| 1 | Juan Ordonez | FSU | 12-204 | Solar Collection Enhancement by Volumetric Absorption |
| 2 | Jim Zheng | FSU | 12-206 | Metal-Air Flow Batteries Using Water Based Electrolyte |
| 3 | Anjaneyulu Krothapalli | FSU | 12-208 | Multiple Parabolic Trough Solar Collector Having a Focus-tracking Pipe Array |
| 4 | Juan Ordonez | FSU | 13-026 | Alkaline Membrane Fuel Cell (AMFC) |
| 5 | Liu and Li | FSU | 13-045 | A Single Phase Fuel Cell Power Conditioning System with Minimized DC Capacitor |
| 6 | Farrukh Alvi | FSU | | Microjet Control For Flow And Noise Reduction In Automotive Applications |
| 7 | Crook et al | FSU | | Cryogenic Heat Sink for Helium Gas Cooled Superconducting Power Devices |
| 8 | Rick Meeker | FSU | 13-065 | Distributed Resources Intelligent Voltage and Energy Regulation (DRIVER) |
| 9 | Winger | FSU | U.S. Patent No. 8,235,035 Issued 8/7/2012 | Improvements to the Inflatable Trough Type Solar Concentrator aka Solar Sausage |
| 10 | Nahid Mohajari, Paul Brooker, | UCF/FSEC | Serial No. 61/526,873 | Chemochromic Membranes for Membrane Defect Detection |
| 11 | Paul Brooker, Len Bonville | UCF/FSEC | Serial No. 61/5445,709 | Electroactive species in layer between electrode and membrane for fuel cells |
| 12 | Nazim Muradov, Frank Smith, Ali T-Raissi | UCF/FSEC | U. S. Patent 8,147,765, 4/3/12 | Apparatus for hydrogen and carbon production via carbon aerosol-catalyzed dissociation of hydrocarbons |
| 13 | Nazim Muradov | UCF/FSEC | US Patent 8,119,198; 2/21/12 | Three-dimensional carbon fibers and method and apparatus for their production |
| 14 | Nazim Muradov | UCF/FSEC | US Patent 8,003,055, 8/23/11 | Visual hydrogen detector with variable reversibility |
| 15 | Gary Bokerman, Ali T-Raissi, Nazim Muradov | UCF/FSEC | US Patent 8,048,384, 11/1/11 | Chemochromic hydrogen sensors |
| 16 | Nazim Muradov | UCF/FSEC | US Patent 8,002,854 | Thermocatalytic Process for $CO_2$-free Production of Hydrogen and Carbon from Hydrocarbons |
| 17 | Clovis A. Linkous | UCF | UCF ID# 30383, 30092 | Photo-catalytic Surface Agent |
| 18 | Edward J. Philips; Bailey Trump | UF | 14197 | Novel New Algae Species for Biofuel Production |

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|---|---|---|---|---|
| 19 | Sean W. York; Michael Todd Mullinix; James Y. Lee; Huabao Zheng; Lorraine P. Yomano; Lonnie O. Ingram; Kelnatham T. Shanmugam; Xuan Wang | UF | 14358 | Combining Genetic Traits for Furfural Tolerance |
| 20 | Wayne Nicholson; Rafael Rodrigues Oliveira | UF | 14379 | Bacterial Strain for High-Level Production of 2,3-butanediol From Biomass |
| 21 | Jiangeng Xue; Ronald Keith Castellano | UF | 13955 | A Modular Supramolecular Approach to Organic Photovoltaic Devices |
| 22 | Kevin S. Jones; Nicholas G. Rudawski | UF | 13963 | Ion Beam Mixing for Improved Li Ion Batteries |
| 23 | Parvesh Sharma; Brij M. Moudgil; Gary W. Scheiffele; Spyros A. Svoronos; Ajoy K. Saha; Kevin William Powers; Jiaqing Zhou | UF | 14105 | Process For Making Precision Core-shell Quantum Dots by Hydrothermal Flow Manufacturing |
| 24 | Wallace Gregory Sawyer; Brandon Alexander Krick; Jeffrey John Ewin; Angela A. Pitenis | UF | 14178 | Surface Patterning on Hydrodynamic Interfaces to Mitigate Break Loose Friction |
| 25 | Jiangeng Xue | UF | 14235 | Quantum-Dot Based Hybrid LED Lighting Devices |
| 26 | Sunghwan Yeo; Lihao Ge; Edward McKenna; Ronald Howard Baney; Ghatu Subhash; James S. Tulenko | UF | 14238 | Urania Based Nuclear Fuel Containing Diamond Particles with Greatly Enhanced Thermal Conductivity (combined with 14243 and 14244) |
| 27 | Ghatu Subhash; James S. Tulenko; Ronald Howard Baney | UF | 14243 | Rapid Consolidation of UO2 Powder Using Spark Plasma Sintering (combined with 14238 and 14244) |
| 28 | Ghatu Subhash; James S. Tulenko; Ronald Howard Baney | UF | 14244 | Sintering of High Density and High Thermal Conductivity UO2+SiC Composites Using SPS (combined with 14238 and 14243) |
| 29 | Saeed Moghaddam | UF | 13948 | Thin Film-based Compact Absorption Cooling System |
| 30 | Franky So | UF | Disclosed 7/5/12; US Provisional Patent Application filed 10/1/12 | IR focal plane array |
| 31 | Franky So | UF | Disclosed 8/30/12; US Provisional Patent Application filed 10/1/12 | UV photodetectors |
| 32 | Do Young Kim; Franky So | UF | 14038 | RGB Pixelated IR Driven OLED Display |
| 33 | Do Young Kim; Franky So | UF | 14039 | Infrared Sensitive OLED with Electrically Conductive Optical Reflector Between IR Sensitive Part and OLED Part (COMB W#14041) |

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| 34 | Do Young Kim; Franky So | UF | 14040 | AMLCD with a Reflective Polarizer for IR Driven OLED Display (COMB W14038) |
| 35 | Do Young Kim; Franky So | UF | 14041 | Enhancement in a Color Gamut Using Weak Cavity in IR Driven OLED Display (COMB W/14039) |
| 36 | Do Young Kim; Franky So | UF | 14042 | RGB Full Color IR Driven OLED Display Using a Non-pixelated IR Sensitive OLED (COMB W/14038) |
| 37 | Do Young Kim; Franky So | UF | 14043 | IR Sensitive OLED Fabricated Directly on AMLCD with IR Backlight and Without Color Filters for IR Driven Display (COMB W/14038) |
| 38 | Do Young Kim; Franky So | UF | 14044 | Thin Film Encapsulation for IR driven OLED Display (COMB W/14038) |
| 39 | Do Young Kim; Franky So | UF | 14046 | The Position of a Black Matrix for an Optical Design in an IR Driven OLED Display (COMB W/14038) |
| 40 | Franky So; Womhoe Koo | UF | 14276 | White Organic Light Emitting Diode |
| 41 | Franky So; Jesse Robert Manders; Do Young Kim; Jiho Ryu; Jae Woong Lee | UF | 14297 | Solution-Processed Ultraviolet Light Detector Based on P-n Junctions of Metal Oxides |
| 42 | Franky So; Wonhoe Koo | UF | 14388 | Blur-Free Light Extraction OLED |
| 43 | Tao Li; Chao Li | UF | 14053 | Solar Energy based Microprocessor Power Management (COMB W/14056) v |
| 44 | Tao Li; Chao Li | UF | 14056 | Methods/Systems for Optimizing Server Clusters on Renewable Energy Supply (COMB W/14053) |
| 45 | Saeed Moghaddam; Henry Angelo Sodano; Abhilash Paneri; Yumseon Heo | UF | 14304 | Graphene-based Proton Exchange Membrane |
| 46 | Mithcell Austin McCarthy; Andrew Garbiel Rinzler; Bo Liu | UF | 14361 | Ambipolar Carbon Nanotube Enabled Vertical Field Effect Transistors |
| 47 | Mithcell Austin McCarthy; Andrew Garbiel Rinzler; Bo Liu | UF | 14374 | Pre-Adjusted Scan Time Averaging Drive Scheme for AMOLED IR Drop Compensation |
| 48 | James F. Preston, Virginia Chow, Guang Nong, John D. Rice, Franz J. St. John | UF | Issued as US Patent No. 8,119,397 2/21/2012 | Xylan-Utilization Regulon for Efficient Bioprocessing of Hemicellulose and Uses Thereof. |
| 49 | Jenshan Lin and students | UF | US Patent 8,232,793 | Method and apparatus of load detection for a planar wireless power system, July 31, 2012. |
| 50 | Jon Stewart | UF | U.S. Provisional Patent application 61683497 filed on 15 August 2012 | Alkene Reductase With Altered Stereoselectivity and Uses Thereof |
| 51 | Babu Joseph, J. Kuhn, Ali Gardezi, T. Roberge, Devin Walker | USF | Disclosed 9/2012 | A process for converting landfill gas to liquid fuels |

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|---|---|---|---|---|
| 52 | Babu Joseph and John Kuhn | USF | Disclosed 10/2012 | A hybrid catalyst for simultaneous steam reforming of methane and Fischer Tropsch Synthesis |
| 53 | Babu Joseph et al | USF | Patent application filed no. 61/703428, Sept 20, 2012 | Systems and Methods for producing liquid fuels |
| 54 | Babu Joseph et al | USF | Disclosure filed, Sept 30, 2012 | A hybrid catalyst system for simultaneous reforming and liquefaction of methane. |
| 55 | Norma Alcantar, et al. | USF | US Patent No. 8,034,302 | Transparent conducting composites (TTCs) for creating chemically active surfaces |
| 56 | Srinivasan, Jurczyk, Goswami, Stefanakos | Tuskegee Univ., USF | US Patent No. 8,153,020 | Methods and Processes for Producing Complex Hydrides Exhibiting High Hydrogen Storage Capacity and Fast Sorption Kinetics at Moderate Temperatures |
| 57 | Stefanakos, E.K., Goswami, Y., and Bhansali, S | USF, FIU | US Patent No. 8,115,638 B1 | Rectenna Solar Energy Harvester |
| 58 | Goswami, D.Y., Lee, M.S., Kothurkar, N.K., and Stefanakos, E.K. | USF | US Patent No. 7,896,953 B1 | Practical Method of $CO_2$ Sequestration |
| 59 | Babu Joseph et al | USF | Patent application filed, 2010. | A cobalt Egg-shell catalyst for producing liquid fuels from syngas |

## 6. Technologies Licensed and Revenues Received By All SUS Faculty

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

| # | Faculty | University | Title | Revenues Received |
|---|---|---|---|---|
| 1 | | FSU | High energy super capacitors | $0 |
| 2 | | UCF | Efficient Green Production of Value Added Products | $0 |
| 3 | Richard Blair | UCF | Solid Acid Catalyzed Hydrolysis of Cellulosic Materials | $0 |
| 4 | Clovis A. Linkous | UCF | Photo-catalytic Surface Agent (Option Agreement) | $0 |
| 5 | Nazim Muradov | UCF | Thermocatalytic process for CO2-free production of hydrogen and carbon from hydrocarbon (Brokerage Agreement) | $0 |
| 6 | Keelnatham T. Shammugam; Lonnie O. Ingram; Qingzhao Wang | UF | Engineering of Thermotolerant Bacillus Coagulans for Production of D(-)-Lactic Acid | $2,500 |
| 7 | Lonnie Ingram; Xeeli Zhang; Xuan Wang; Keelnatham Shanmugam | UF | Chemical Mechanical Fabrication (CMF) for Forming Non-planar Surfaces | $2,500 |
| 8 | Arthur Teixeira; David Chynoweth; Patrick Haley; John Owens | UF | Flooded Densified Leachbed Anaerobic Digestion | $2,500 |
| 9 | Deepika Singh; Rajiv Singh; Anul Arjunan; Dibakar Das; Abhudaya Mishra; Tanjore Jayaraman | UF | Polishing of Silicon Carbide Comprising Surfaces | $8,413 |
| 10 | Eric Wachsman; Francesco Basoli; Silvia Licoccia; Enrico Traversa | UF | Fabrication of Dual Structure Ceramics by a Single Step Process For SOFCs Applications | $1,000 |
| 11 | Eric Wachasman; Bryan Blackburn | UF | Multifunctional Gas Sensor Array with Improved Selectivity | $32,500 |
| 12 | Eric Wachsman; Bryan Blackburn; Fredrick Van Assche | UF | Electric-Field Enhanced Performance in Catalysis and Solid-State Devices Involving Gases | $32,500 |
| 13 | Franky So; Wonhoe Koo | UF | Buckled Organic Light Emitting Diode for Light Extraction | $0 |
| 14 | Andrew Rinzler; Rajib Das | UF | Hydrogen Oxidation and Generation Over Single Wall Carbon Nanotube Films (COMB W/13920) | $0 |
| 15 | John Reynolds; Aubrey Dyer; Andrew Rinzler | UF | Multiply Controlled Electrochromic Device | $0 |

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| 16 | Bhabendra Pradhan; Franky So; Do Young Kim | UF | Solid State Lighting Window by Transparent One Side Emitting OLED | $0 |
| 17 | A. Dyer; J. Reynolds; A. Rinzler | UF | Infrared-modulating Electroactive Devices with Visible Region Transparency (SWNT) (COMB W/#13245) | $0 |
| 18 | A. Dyer; J. Reynolds | UF | Interdigitated Electrode Dual Electroemissive/Electrochromic Devices | $0 |
| 19 | J. Reynolds | UF | Dual Light Emitting and Electrochromic Devices for Variable Ambient Light Environments | $0 |
| 20 | F. So | UF | Microcavity OLED Devices Integrated with Phosphors for Solid State Lighting | $0 |
| 21 | F. So | UF | Microcavity OLEDs for Lighting | $0 |
| 22 | C. Amb; P. Beaujuge; J. Reynolds; F. So; J. Subbiah | UF | Interlayer for Organic Solar Cells (COMB 13069) | $0 |
| 23 | Financial Agent 1042-S Processing; P. Beaujuge; S. Ellinger; J. Reynolds | UF | Green Soluble Conjugated Polymers with High Charge Carrier Mobilities | $0 |
| 24 | Financial Agent 1042-S Processing; C. Amb; P. Beaujuge; S. Ellinger; J. Reynolds | UF | Black Soluble Conjugated Polymers with High Charge Carrier Mobilities | $0 |
| 25 | P. Beaujuge; J. Reynolds; F. So; J. Subbiah | UF | Earth-toned Photovoltaic Devices | $0 |
| | | | **Total Revenues Received** | **$81,913** |

## 7. Collaborations with Other Postsecondary Institutions By FESC Faculty

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

| # | Faculty | University | Description of Collaboration | Name of Institution |
|---|---|---|---|---|
| 1 | Dr. Howard Hanson | FAU | Current Resource Modelling/Simul. | Dr. Eric Chassignet - FSU - COAPS |
| 2 | Dr. Howard Hanson | FAU | Sea Water Hydrolysis | Dr. Ali Raisi - UCF - FSEC |
| 3 | Susan Skemp, Caitlin Slezycki | FAU | Power Systems Management | Dr. Steiner Dale, Dr. Rick Meeker - FSU - CAPS |
| 4 | Dr. Howard Hanson | FAU | NSF Proposal - Array Design/Control | Dr. Darris White - Embry Riddle Aeronautical Univ. |
| 5 | Dr. Howard Hanson | FAU | Cooperative Research and Development Agreement (CRADA) | US DOE - NREL |
| 6 | Susan Skemp | FAU | Research and Testing | Dr. David Lane - Heriot-Watt University, UK |
| 7 | Susan Skemp and Dr. Howard Hanson | FAU | Research and Testing | Dr. Henry Jeffrey - U. of Edinburgh, UK |
| 8 | Dr. Howard Hanson & Susan Skemp | FAU | Ocean Research and Standards | Dr. Robert Paasch & Dr. Meleah Ashford - Northwest National Marine Renewable Energy Center - Oregon State University |
| 9 | Dr. Jim Van Zweiten and Dr. Howard Hanson | FAU | OTEC Research and Standards | Dr. Luis Vega - Univ. of Hawaii, Nat. Marine Renewable Energy Center |
| 10 | Dr. Howard Hanson & Susan Skemp | FAU | Ocean Research and Standards | Dr. Brian Polayge - Northwest National Marine Renewable Energy Center - University of Washington |
| 11 | Susan Skemp, Gabriel Alsenas, Dr. James VanZweiten | FAU | Ocean current turbine power plant modeling/simulation. | Dr. Nikolas Xiros - Virginia Polytechnic Institute and State College |
| 12 | C. Weatherford, | FAMU | Collaborations on fusion research | West Virginia University, Auburn University, and Wisconsin University |
| 13 | David Cartes | FSU | Advanced Manufacturing Grant | TCC, FAMU |
| 14 | Marilyn Barger and Nina Stokes | HCC-FLATE | As part of the Energy Systems Technician 2 Project Team, working on creation and implementation of a new, Energy Efficiency specialization for the existing Engineering Technology Degree. | Tallahassee Community College, Florida State College at Jacksonville, Brevard Community College. |

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| 15 | Gary Peter | UF | Southern Pine Research | Auburn, Alcorn St., University of California, Berkeley, University of Georgia, University of Mississippi, North Carolina State University, Texas A & M, Oklahoma State University, Virginia State, North Carolina A & M, National Renewable Energy Lab, Virginia Polytechnical University, |
| 16 | David Hahn, James Klausner, Renwei Mei | UF | Collaborations on solar thermal fuels | University of Vorarlberg - Austria |
| 17 | David Hahn, James Klausner, Renwei Mei | UF | Collaborations on solar thermal fuels | Sandia National Laboratories |
| 18 | Franky So | UF | Collaborations on PV research | Georgia Tech |
| 19 | Franky So | UF | Collaborations on PV research | Technical University of Denmark |
| 20 | Franky So | UF | Collaborations on PV research | Hong Kong Baptist University |
| 21 | Franky So | UF | Collaborations on OLED research | Yamagata University, Japan |
| 22 | Jacob Chung | UF | Biomass gasification integrated with a ceramic membrane for hydrogen production | National United University and National Chung Hsing University in Taiwan |
| 23 | K. Ruppert | UF | Collaborations as reviewers for fact sheets | Florida State University and University of South Florida |
| 24 | Babu Joseph | USF | Solar Assisted Biomass Conversion | UF (College of Agriculture) |
| 25 | Babu Joseph | USF | Solar Assisted Biomass Conversion | US DOE - NREL |
| 26 | Babu Joseph | USF | Solar Assisted Biomass Conversion | US DOE - ORNL |
| 27 | Babu Joseph | USF | Biomass R&D Initiative | US Forest Service |
| 28 | Don Morel | USF | Partnering to submit NSF Center proposal | University of Minnesota |
| 29 | Stan Russell | USF | Zero Energy Home Learning Center | USF-School of architecture, College of Engineering, College of Mass Communications, School of Business |
| 30 | Stan Russell | USF | Zero Energy Home Learning Center | FSU-College of Engineering |
| 31 | Stan Russell | USF | Zero Energy Home Learning Center | UF- Department of Interior Design |
| 32 | Stan Russell | USF | Zero Energy Home Learning Center | UF-Rinker School of Building Construction |

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| 33 | Stan Russell | USF | Zero Energy Home Learning Center | UCF-Florida Solar Energy Center |
| 34 | Yogi Goswami | USF | Design, Construction and Operation of CSP Solar Thermal Power Plants in Florida | University of Florida |
| 35 | Yogi Goswami | USF | Design, Construction and Operation of CSP Solar Thermal Power Plants in Florida | University of Central Florida |

## 8. Existing or Potential Collaborations with Private Industry - FESC Funded Faculty

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

SUS related faculty reported 120 collaborations with industry in this reporting period.

| # | Faculty | University | Description of Collaboration | Name of Industry |
|---|---|---|---|---|
| 1 | Dr. Howard Hanson | FAU | DOE Contract Awards | Ecology & Environment |
| 2 | Dr. Howard Hanson & Dr. James VanZweiten | FAU | DOE Contract Awards | Dehlsen Associates |
| 3 | Dr. Pierre Beaujean | FAU | Global Standards | ISO/TC 108/SC 5 |
| 4 | Susan Skemp | FAU | Ocean Energy Issues & Policy | ASCE |
| 5 | Susan Skemp | FAU | Ocean Energy Issues & Policy | ASME |
| 6 | Susan Skemp | FAU | MOU - Energy Distribution & Integration | FPL |
| 7 | Susan Skemp | FAU | DOE Contract Awards | Lockheed Martin |
| 8 | Susan Skemp | FAU | MOU - Research & Testing | NaREC, UK |
| 9 | Susan Skemp | FAU | MOU & Industry Affiliates Program | OBOE |
| 10 | Susan Skemp | FAU | Ocean Energy Issues & Policy | Ocean Renewable Energy Coalition (OREC) |
| 11 | Susan Skemp | FAU | Ocean Energy Research, Testing & Policy | Over 3-dozen CDAs with global companies |
| 12 | Susan Skemp | FAU | Ocean Energy Issues & Policy | Palm Beach County Business Development Board |
| 13 | Susan Skemp | FAU | MOU & Industry Affiliates Program | Vision Energy |
| 14 | Susan Skemp, Dr. Arockiasamy, Gabe Alsenas | FAU | Global Standards | IEC US TC 114 TAG |
| 15 | Shawn R. Smith | FSU | Expanding the offshore wind industry within Florida | Greenberg Traurig PA |
| 16 | Shawn R. Smith | FSU | Background research | Mark Powell, National Oceanographic and Atmospheric Administration |
| 17 | Shawn R. Smith | FSU | Feasibility Study | Siemens Wind Power in Orlando, Florida |
| 18 | David Cartes | FSU | Advanced Manufacturing Grant | Bing Energy |
| 19 | David Cartes | FSU | Advanced Manufacturing Grant | City of Tallahassee |
| 20 | David Cartes | FSU | Industrial Advisor/Incubator | Marpan Recycling |
| 21 | David Cartes | FSU | Industrial Advisor/Incubator | Mentor Business Resources |
| 22 | David Cartes | FSU | Commercialization | Nanophotonica |
| 23 | David Cartes | FSU | Advanced Manufacturing Grant | Rocket Hub |
| 24 | David Cartes | FSU | Industrial Advisor/Incubator | Supply Management International LLC |
| 25 | Krothapalli, A | FSU | Hydro-processing the bio-oils | Energia Technologies Inc. in Oakland California |

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| 26 | Ordonez, Juan "J.C." | FSU | | Philippine National Academy |
| 27 | Paul Ruscher | FSU | Data Collection point (station) | Caribbean Solar Energy Center (Tobago) |
| 28 | Paul Ruscher | FSU | Data Collection point (station) | NOAA Global Systems Division, Earth Science Resource Laboratory (Boulder, CO) |
| 29 | Paul Ruscher | FSU | Data Collection point (station) | NOAA/National Weather Service Key West (FL) |
| 30 | Steinar Dale | FSU | System Restoration Simulation and Analysis | City of Tallahassee Electric Utility |
| 31 | Steinar Dale | FSU | Florida Grid Modeling and Simulation, Utility-University Engagement, including Collaborative Proposals | Florida Reliability Coordinating Council (FRCC) |
| 32 | Steinar Dale | FSU | Florida Grid Modeling and Simulation, Utility-University Engagement, including Collaborative Proposals | FRCC member utilities (most FL utilities, through FRCC committees) |
| 33 | David Van Winkle | FSU | Collaborative research | Sunnyland LLC |
| 34 | Marilyn Barger and Nina Stokes | HCC-FLATE | As part of the Energy Systems Technician 2 Project Team, working on creation and implementation of a new, Energy Efficiency specialization for the existing Engineering Technology Degree. | Energy Reduction Solution, Keith Zipper, President |
| 35 | David Blair | UCF | Technology licensing | Thor Energy |
| 36 | Jim Fenton | UCF/FSEC | Collaborative research and proposal | SEMATECH |
| 37 | C. Balaban | UF | Introduction of faculty for potential proposal collaboration | Algenol |
| 38 | C. Balaban | UF | Introduction of FESC | Applied Research Associates (ARA) |
| 39 | C. Balaban | UF | Introduction of FESC | Appollo Energy Systems |
| 40 | C. Balaban | UF | Introduction of FESC | Aquion |
| 41 | C. Balaban | UF | Introduction of FESC | Biofuels Digest |
| 42 | C. Balaban | UF | Introduction of FESC | BioTork |
| 43 | C. Balaban | UF | PV Solar | BlueChip Energy |
| 44 | C. Balaban | UF | Introduction of FESC | Bren-Tronics |
| 45 | C. Balaban | UF | Collaboration- economic development efforts | Canadian Consulate |
| 46 | C. Balaban | UF | Proposal support | ENSIDA |
| 47 | C. Balaban | UF | Introduction of FESC | Excellatron |
| 48 | C. Balaban | UF | Introduction of FESC | Extreme Power |
| 49 | C. Balaban | UF | Introduction of FESC | FL City Gas |
| 50 | C. Balaban | UF | Introduction of FESC | Florida Sustainables LLC |
| 51 | C. Balaban | UF | Introduction of FESC | Gaiergy |

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| 52 | C. Balaban | UF | Introduction of FESC | German American Chamber of Commerce |
| 53 | C. Balaban | UF | Introduction of FESC /potential proposal collaboration | Greenberg Traurig |
| 54 | C. Balaban | UF | Introduction of FESC to new contacts | GRU |
| 55 | C. Balaban | UF | Introduction of FESC and FESC faculty | Huber & Associates |
| 56 | C. Balaban | UF | Potential collaborative project | Hydrovolt |
| 57 | C. Balaban | UF | Introduction of FESC | INEOS |
| 58 | C. Balaban | UF | Introduction of FESC | Mesdi Systems Inc. |
| 59 | C. Balaban | UF | Introduction of FESC | NEI |
| 60 | C. Balaban | UF | Introduction of FESC | Particle Solutions LLC |
| 61 | C. Balaban | UF | Introduction of FESC | Power Tree |
| 62 | C. Balaban | UF | Introduction of FESC | Renewable Energy Strategies |
| 63 | C. Balaban | UF | Introduction of FESC | Renewable Energy Strategies |
| 64 | C. Balaban | UF | Introduction of FESC | Rush Eneterprises |
| 65 | C. Balaban | UF | Introduction of FESC | SebaiCMET, Inc |
| 66 | C. Balaban | UF | Introduction of FESC | SERF |
| 67 | C. Balaban | UF | Introduction of faculty for potential proposal collaboration | Sion Power |
| 68 | C. Balaban | UF | Introduction of FESC | SunEdison |
| 69 | C. Balaban | UF | Introduction of FESC | Trane |
| 70 | C. Balaban | UF | Introduction of FESC | Xtreme Power |
| 98 | C. Balaban | UF | Introduction of FESC and faculty | Re-Gen |
| 71 | Franky So | UF | OLED lighting | PPG |
| 72 | Franky So | UF | Organic PV | Sestar |
| 73 | Franky So | UF | OLED lighting | Sinmat |
| 74 | Franky So | UF | OLED displays | Wintek Electro Optics |
| 75 | Gary Peter | UF | Forest Productivity | F&W Consulting |
| 76 | Gary Peter | UF | Biofuels | ArborGen |
| 77 | Gary Peter | UF | Forest Tree Genetics & Improvement | ArborGen and Rayonier |
| 78 | Gary Peter | UF | Forest Tree Genetics & Improvement | Foley Timber & Land Co. |
| 79 | Gary Peter | UF | Forest Tree Genetics & Improvement | Packaging Corporation of America and PlumCreek Timber |
| 80 | Gary Peter | UF | Forest Productivity | PlumCreek Timber and Rayonier |

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| 81 | Gary Peter | UF | Forest Productivity | Resource Management Services and Weyerhaeuser |
| 82 | Gary Peter | UF | Forest Tree Genetics & Improvement | State of Florida – Florida Forest Service, |
| 83 | Gary Peter | UF | Forest Tree Genetics & Improvement | State of Georgia – Georgia Forestry Commission |
| 84 | Gary Peter | UF | Forest Tree Genetics & Improvement | Weyerhaeuser |
| 85 | Jacob Chung | UF | Biomass gasification | PlanetGreen Solutions |
| 86 | Jenshan Lin | UF | Collaborations on Wireless Power Research | ITRI, Taiwan |
| 87 | Jenshan Lin | UF | Collaborations on Wireless Power Research | NEC, Japan |
| 88 | Jenshan Lin | UF | Collaborations on Wireless Power Research | RIST, Korea |
| 89 | Kevin Jones | UF | Collaborative research | Planar Energy |
| 90 | Kirk Ziegler | UF | Collaborative research - energy storage | G4 Synergetics |
| 91 | Pratap Pullammanappallil | UF | Biofuels | Buckeye |
| 92 | Russ Bowers | UF | Collaborative project | OptiGrate |
| 93 | Sean Meyn | UF | Collaborative White Paper | SAFT |
| 94 | Spyros Svoronos | UF | Collaborative Project | JDC Inc |
| 95 | Tim Anderson | UF | PV chemicals | Arkema |
| 96 | Tim Anderson | UF | PV Solar | Clairvoyant Energy |
| 97 | Tim Anderson | UF | Collaborative research, energy storage, PV | Mainstream Engineering |
| 99 | Babu Joseph | USF | Fischer Tropsch Liquefaction process | Prado Associates |
| 100 | Babu Joseph | USF | Converting Landfill Gas to Liquid Fuels | Trash2Cash LLC |
| 101 | Don Morel | USF | Solar PV Manufacturing | Mustang Solar, a Division of Mustang Vacuum Systems |
| 102 | Nathan Crane | USF | Low Cost Solar Power through high efficiency microscale PV cells | Sandia National Laboratory |
| 103 | Sarina Ergas | USF | Sustainable Algal Biofuel Production | Mote Marine Laboratories |
| 104 | Stan Russell | USF | Zero Energy Home Learning Center | Beck Construction |
| 105 | Stan Russell | USF | Zero Energy Home Learning Center | Bosch |
| 106 | Stan Russell | USF | Zero Energy Home Learning Center | CSI |
| 107 | Stan Russell | USF | Zero Energy Home Learning Center | DuPont |
| 108 | Stan Russell | USF | Zero Energy Home Learning Center | Hees and Associates Structural Engineers |
| 109 | Stan Russell | USF | Zero Energy Home Learning Center | Kohler |
| 110 | Stan Russell | USF | Zero Energy Home Learning Center | Lithonia |
| 111 | Stan Russell | USF | Zero Energy Home Learning Center | OUC |
| 112 | Stan Russell | USF | Zero Energy Home Learning Center | Palm Harbor Homes |
| 113 | Stan Russell | USF | Zero Energy Home Learning Center | Pella, CWS |
| 114 | Stan Russell | USF | Zero Energy Home Learning Center | Progress Energy |
| 115 | Stan Russell | USF | Zero Energy Home Learning Center | Simpson Strongtie |

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| 116 | Stan Russell | USF | Zero Energy Home Learning Center | Solar World |
| 117 | Stan Russell | USF | Zero Energy Home Learning Center | Southern Cypress Manufacturers |
| 118 | Stan Russell | USF | Zero Energy Home Learning Center | TECO |
| 119 | Stan Russell | USF | Zero Energy Home Learning Center | Wells Fargo |
| 120 | George Philippidis | USF | Collaborative research - algae | Culturing solutions |

## 9. Students and Post-docs Supported By FESC Faculty

### During Oct. 1, 2009 to Sep 30, 2012 Period (Back to top)

Total # of Students and Post docs: 336
(Undergraduate: 35, Master: 104, PhD: 163, JD Law: 2, Post-docs: 32)

| # | Faculty | University | Student /Post- docName | MS/PhD/Post - Doc |
|---|---|---|---|---|
| 1 | B. Saha | FAMU | Dwayne Joseph (Physics) | Ph.D. |
| 2 | L. Johnson | FAMU | Jorge Martinez (Physics) | Ph.D. |
| 3 | M. Edington | FAMU | Mr. Jason Caldwell (Chemistry) | BS |
| 4 | M. Edington | FAMU | Ms. Mercedes Jackson (Chemistry) | BS |
| 5 | M. Edington | FAMU | Ms. Teresa Eaton (Chemistry) | BS |
| 6 | B. Saha | FAMU | Edwin Quashie (Physics) | Ph.D. |
| 7 | C. A. Weatherford | FAMU | Dr. Gennady Gutsev (Physics) | Post-Doc |
| 8 | C. A. Weatherford | FAMU | Roy Tucker (Physics) | Ph.D. |
| 9 | C.A. Weatherford | FAMU | Dr. Genzo Tanaka (Physics) | Post-Doc |
| 10 | C.A. Weatherford | FAMU | Dr. Xingjun Zhang (Physics) | Post-Doc |
| 11 | Charles A. Weatherford | FAMU | Alexander Schroeder (Physics) | BS |
| 12 | Charles A. Weatherford | FAMU | Baysha Bernales | BS |
| 13 | Charles A. Weatherford | FAMU | Dominique Berry | BS |
| 14 | Charles A. Weatherford | FAMU | Jerry Clark | BS |
| 15 | Charles A. Weatherford | FAMU | Albert Wynn III (Physics) | Ph.D. |
| 16 | Charles A. Weatherford | FAMU | Boyan Hristov | Ph.D. |
| 17 | Charles A. Weatherford | FAMU | Daniel Gebremedhin (Physics) | Ph.D. |
| 18 | Charles A. Weatherford | FAMU | Eddie Quashie | Ph.D. |
| 19 | D. Mezonlin | FAMU | James Titus (Physics) | Ph.D. |
| 20 | E. Johnson | FAMU | John Branch (Environmental Science) | Ph.D. |
| 21 | E. Treadwell | FAMU | Patrice Jackson (Physics) | Ph.D. |
| 22 | J. Johnson | FAMU | Mareena Robinson (Physics) | BS |
| 23 | J. Johnson | FAMU | Alonzo Brandon Alexander (Physics Education) | MS |

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|---|---|---|---|---|
| 24 | Joseph Johnson | FAMU | Dr. Delonia Wiggins (Physics)—received Ph.D. Spring 2010 | Post-Doc |
| 25 | K. Belay | FAMU | Mr. Kevin Jones (Physics) | BS |
| 26 | K. Belay | FAMU | Mr. Kimani Gopaul (Physics) | BS |
| 27 | K. Belay | FAMU | Yoseph Abere (Physics) | Ph.D. |
| 28 | K. Williams | FAMU | Ms. Marquita Scott (Physics) | BS |
| 29 | L. Johnson | FAMU | Staci Brown (Physics) | Ph.D. |
| 30 | L. Johnson | FAMU | Dr. Charlemagne Akpovo (Physics) | Post-Doc |
| 31 | M. Edington | FAMU | Mr. Brantly Scott (Chemistry) | BS |
| 32 | M. Edington | FAMU | Ms. Antoinette Addison (Chemistry) | BS |
| 33 | M. Edington | FAMU | Ms. Chatney Spencer (Chemistry) | BS |
| 34 | M. Encinosa | FAMU | Ms. Kalisa Villafana (Physics) | BS |
| 35 | M. Encinosa | FAMU | Johnny Williamson (Physics) | Ph.D. |
| 36 | Maurice Edington | FAMU | Dr. Dawn Lewis (Chemistry) | Post-Doc |
| 37 | Bassem Alhalabi | FAU | Abishek Duraiswamy | MS |
| 38 | Bassem Alhalabi | FAU | Joseph Anthony Gundel | MS |
| 39 | Bassem Alhalabi | FAU | Mark Bowren | MS |
| 40 | Bassem Alhalabi | FAU | Raviteja Gadipudi | MS |
| 41 | Chaoki Ghenai | FAU | Benjamin Garry Oliver | MS |
| 42 | Chi-Tay Tsai | FAU | Jorge Joaquin Perez, Jr | MS |
| 43 | Chi-Tay Tsai | FAU | Quingde Chen | PhD |
| 44 | George Frisk | FAU | Ryan Rundle | MS |
| 45 | Hari Kalva | FAU | Asif Rahman | MS |
| 46 | Hari Kalva | FAU | Rafael Giusti | MS |
| 47 | Hari Kalva | FAU | Reena Ursula Friedel | MS |
| 48 | Hari Kalva | FAU | Sagar Aghera | MS |
| 49 | Hari Kalva | FAU | Waazim Reza | MS |
| 50 | Hassan Mahfuz | FAU | Mohammad Wasim Akram | MS |
| 51 | Hassan Mahfuz | FAU | Fang Zhou | PhD |
| 52 | Ionut Cardei | FAU | Yang Qin | MS |
| 53 | Ionut Cardei | FAU | Anthony Marcus | MS |
| 54 | Ionut Cardei | FAU | Timur Tavlilov | MS |
| 55 | Isaac Elishakoff | FAU | Yohann Miglis | MS |
| 56 | Janet Wyneken | FAU | Bovery, Caitlin | MS |
| 57 | Janet Wyneken | FAU | Micah Rogers | MS |
| 58 | Janet Wyneken | FAU | Justin Perrault | PhD |
| 59 | Jeanette Wyneken | FAU | Erin McMichael | PhD |
| 60 | Jim VanZwieten | FAU | Aaron Donnelly Fisher | MS |
| 61 | Jim VanZwieten | FAU | Allison Cribbs | MS |
| 62 | Jim VanZwieten | FAU | Andrew Krupski | MS |
| 63 | Jim VanZwieten | FAU | Basil Lee Hacker, Jr | MS |
| 64 | Jim VanZwieten | FAU | Benjamin Shaul | MS |

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|---|---|---|---|---|
| 65 | Jim VanZwieten | FAU | James Lovenbury | MS |
| 66 | Jim VanZwieten | FAU | Lynn Rauchenstein | MS |
| 67 | Jim VanZwieten | FAU | Matthew Young | MS |
| 68 | Jim VanZwieten | FAU | Michael Seibert | MS |
| 69 | Jim VanZwieten | FAU | Serena Parton | MS |
| 70 | Judith Benson, Coordinator | FAU | Elizabeth Wojtisek | MS |
| 71 | Karl VonEllenrieder | FAU | William Valentine | MS |
| 72 | Madasamy Arockiasamy | FAU | Amit Janesh Singh | MS |
| 73 | Madasamy Arockiasamy | FAU | Carla Silva Almeida | MS |
| 74 | Madasamy Arockiasamy | FAU | Junior Senat | MS |
| 75 | Madasamy Arockiasamy | FAU | Shaun Hurley | MS |
| 76 | Manhar Dhanak | FAU | Dimitrios Psarrou | MS |
| 77 | Manhar Dhanak | FAU | Alana Smentek-Duerr | PhD |
| 78 | Pierre Philippe Beaujean | FAU | Nicholas Waters | MS |
| 79 | Shihong Huang | FAU | Rowan Hughes | BS |
| 80 | Shihong Huang | FAU | Stuart Ramgolam-Singh | BS |
| 81 | Stewart Glegg | FAU | Julian Guerra | MS |
| 82 | Stewart Glegg | FAU | Renee Christina Lippert | MS |
| 83 | Taghi Khoshgoftaar | FAU | Janell Duhaney | PhD |
| 84 | Taghi Khoshgoftaar | FAU | Randall Wald | PhD |
| 85 | Zhuang/Erdol | FAU | Ryan Thew | MS |
| 86 | Zhuang/Erdol | FAU | Ricardo Castellanos Jimenez | MS |
| 87 | Zhuang/Erdol | FAU | Mahdi Esfahanian | PhD |
| 88 | Zhuang/Erdol | FAU | Savaskan Bulek | PhD |
| 89 | Anjane'yulu' Krothapalli | FSU | John Dascomb | MS |
| 90 | Anjane'yulu' Krothapalli | FSU | Jonathan Pandolfini | MS |
| 91 | Anjane'yulu' Krothapalli | FSU | Justin Kramer | MS |
| 92 | Anjane'yulu' Krothapalli | FSU | Michael Gnos | MS |
| 93 | Anjane'yulu' Krothapalli | FSU | Shannon Ingersoll | MS |
| 94 | Anjane'yulu' Krothapalli | FSU | Malikarun Bhadrashetti | Ph.D. |
| 95 | Anjane'yulu' Krothapalli | FSU | Ifegwu Eziyi | PhD |
| 96 | Anjane'yulu' Krothapalli | FSU | Jon Pandolfini | PhD |
| 97 | Anjane'yulu' Krothapalli | FSU | John Dascomb | PhD |
| 98 | Chan Hilton | FSU | Gustavo Munoz | BS Civil Eng. |
| 99 | Chan Hilton | FSU | Andres Lastra | MS Civil Eng./Sc. Comp. |
| 100 | Chan Hilton | FSU | Chandra McGee | PhD Civil Eng. |
| 101 | Chan Hilton | FSU | Sandip Patil | PhD Civil Eng. |
| 102 | David Cartes | FSU | Gina Teofilak | BS |
| 103 | David Cartes | FSU | Akintunde Badaru | MS |
| 104 | David Cartes | FSU | Passinam Tatcho | MS |
| 105 | David Cartes | FSU | Siyu Leng | Ph.D. |
| 106 | David Cartes | FSU | Il Yop (David) Chung | Post-Doc |
| 107 | J.B. Ruhl | FSU | Andrew Fier | JD, Law |
| 108 | Joel Kostka | FSU | Kristina Welch | MS, Oceanography |
| 109 | Joel Kostka | FSU | Claire Smith | PhD, Oceanography |

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|---|---|---|---|---|
| 110 | Joel Kostka | FSU | Om Prakash | Post-Doc |
| 111 | Joseph Cronin | FSU | Ed Ramirez | PhD |
| 112 | Joseph Cronin | FSU | Jacqui Bybee | PhD |
| 113 | Joseph Cronin | FSU | Jeremy Wolter | PhD |
| 114 | Joseph Cronin | FSU | Mark Gleim | PhD |
| 115 | Joseph Cronin | FSU | Stephanie Lawson | PhD |
| 116 | Juan "J.C." Ordonez | FSU | Quinn Straub | MS, Mech. Eng. |
| 117 | Juan "J.C." Ordonez | FSU | Tom Tracy | MS, Mech. Eng. |
| 118 | Paul Ruscher | FSU | Timothy Sliwinski | BS, Meteorology |
| 119 | Paul Ward | FSU | Michael Marshall | BS |
| 120 | Paul Ward | FSU | Katerina Kudlockova | PhD, Ed. Psychology |
| 121 | Paul Ward | FSU | Stephanie Robertson | PhD, Ed. Psychology |
| 122 | Paul Ward | FSU | Guler Arsal | PhD, Educational Psychology |
| 123 | Paul Ward | FSU | Avner Dachoach | PhD, Psychology |
| 124 | Paul Ward | FSU | Jackie Kott | PhD, Psychology |
| 125 | Paul Ward | FSU | Jarrett Evans | PhD, Psychology |
| 126 | Paul Ward | FSU | Jason Torof | Post-Doc, Psychology |
| 127 | Philip Steinberg | FSU | Adam Keul | Ph.D. |
| 128 | R. Mark Issac | FSU | Sean Collins | PhD, Economics |
| 129 | Richard Feiock | FSU | Kristen Holder | BS |
| 130 | Richard Feiock | FSU | Steve Traylor | BS |
| 131 | Richard Feiock | FSU | Charles Andrews | MPA |
| 132 | Richard Feiock | FSU | Mary Jo Spector | MS |
| 133 | Richard Feiock | FSU | Hyunsang Ha | Ph.D. |
| 134 | Richard Feiock | FSU | Rizalino Cruz | Ph.D. |
| 135 | Richard Feiock | FSU | Sang Chul Park | Ph.D. |
| 136 | Richard Feiock | FSU | Anthony Kassekert | PhD |
| 137 | Richard Feiock | FSU | Ha | PhD |
| 138 | Richard Feiock | FSU | Hongtao Yi | PhD |
| 139 | Richard Feiock | FSU | Jongsun Park | PhD |
| 140 | Richard Feiock | FSU | Lee | PhD |
| 141 | Richard Feiock | FSU | In Won Lee | Post Doc |
| 142 | Shawn R. Smith | FSU | Cristina Collier | BS, Meteorology |
| 143 | Steinar Dale | FSU | Thamer Alquthami | MS, Mech. Eng. |
| 144 | Steinar Dale | FSU | Harsha Ravindra | MS, Mechanical Eng. |
| 145 | Svetlana Pevnitskaya | FSU | Matthew Cutillo | PhD, Economics |
| 146 | Tingting Zhao | FSU | John Sulik | Ph.D. |
| 147 | Tingting Zhao | FSU | Tim Kelleher | PhD |
| 148 | U. Meyer-Baese | FSU | Bhattacharya | PhD |
| 149 | U. Meyer-Baese | FSU | J. Xu | PhD |
| 150 | Uma Outka | FSU | Sarah Berner | JD, Law |
| 151 | J. Shen | UCF | Chris Hamilton | MS |
| 152 | J. Shen | UCF | Ala Alsaeed | Ph.D. |

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|---|---|---|---|---|
| 153 | J. Shen | UCF | H. Hu | Ph.D. |
| 154 | J. Shen | UCF | Karthik Padmanabhan | Ph.D. |
| 155 | J. Shen | UCF | Kejiu Zhang | Ph.D. |
| 156 | J. Shen | UCF | Lin Chen | Ph.D. |
| 157 | J. Shen | UCF | Ross Kerley | Ph.D. |
| 158 | J. Shen | UCF | Souhaib Harb | Ph.D. |
| 159 | J. Shen | UCF | Xiang Fang | Ph.D. |
| 160 | Zhihui Qu | UCF | Carlos Velez | MS |
| 161 | Ali T. Raissi | UCF/FSEC | Amit Gujar | Post-Doc |
| 162 | Darlene Slattery | UCF/FSEC | Benjamin Pearman | Ph.D. |
| 163 | Neelkanth Dhere | UCF/FSEC | Eric Schneller | MS |
| 164 | Neelkanth Dhere | UCF/FSEC | Ashwani Kaul | Ph.D. |
| 165 | Neelkanth Dhere | UCF/FSEC | Narendra Shiradkar | Ph.D. |
| 166 | Neelkanth Dhere | UCF/FSEC | Sagarnil Das | Ph.D. |
| 167 | Neelkanth Dhere | UCF/FSEC | Shirish Pethe | Ph.D. |
| 168 | Nicoleta Sorloaica-Hickman | UCF/FSEC | Rodica Krueger | M.S. |
| 169 | Nicoleta Sorloaica-Hickman | UCF/FSEC | Kris David | Ph.D. |
| 170 | Nicoleta Sorloaica-Hickman | UCF/FSEC | Amare Benor-Belay | Post-Doc |
| 171 | Nicoleta Sorloaica-Hickman | UCF/FSEC | K Shivitranuruk | Post-Doc |
| 172 | Nicoleta Sorloaica-Hickman | UCF/FSEC | Wei Zhou | Post-Doc |
| 173 | Robert M. Reedy | UCF/FSEC | Hubert Seigneur | Post-Doc |
| 174 | Franky So | UF | Fred Steffy | PhD |
| 175 | Franky So | UF | Jeg Subbiah | post-doc |
| 176 | Gabriel Ghita | UF | A. Holcomb | BS |
| 177 | Gabriel Ghita | UF | D. Lago (BS) | BS |
| 178 | Gabriel Ghita | UF | G. Fekete | BS |
| 179 | Gabriel Ghita | UF | S. Brown | BS |
| 180 | Gabriel Ghita | UF | J. Lewis | MS |
| 181 | Gabriel Ghita | UF | J. Musgrave | MS |
| 182 | Gabriel Ghita | UF | M. Marzano | MS |
| 183 | Gabriel Ghita | UF | G. Bickford | MS |
| 184 | Gary Peter | UF | Alejandro Riveros Walker | Ph.D. |
| 185 | Gary Peter | UF | Jianxing Zhang | Ph.D. |
| 186 | Gary Peter | UF | Patricio Munoz | Ph.D. |
| 187 | Gijs Bosman | UF | Yige Hu | PhD |
| 188 | Hahn, Klausner | UF | Kyle Allen | Ph.D. |
| 189 | Hahn, Klausner | UF | Like Li | Ph.D. |
| 190 | Hahn, Klausner | UF | Michael Bobek | Ph.D. |
| 191 | Hahn, Klausner | UF | Richard Stehle | Ph.D. |
| 192 | Helena Weaver | UF | Justin Dodson | MS |
| 193 | Jacob N. Chung | UF | Sada Sekar Gopan | M.S. |
| 194 | Jacob N. Chung | UF | Elango Balu | Ph.D. |
| 195 | James Heaney | UF | James Green | MS |
| 196 | James Heaney | UF | Ken Friedman | PhD |
| 197 | James Heaney | UF | Miguel Morales | PhD |
| 198 | James Heaney | UF | John McCary | PhD |
| 199 | James Heaney | UF | Joong Lee | Post Doc |
| 200 | James Klausner | UF | Fadi Alnaimat | Ph.D. |

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|---|---|---|---|---|
| 201 | Jenshan Lin | UF | Gabriel Reyes | MS |
| 202 | Jenshan Lin | UF | Jaime Garnica | PhD |
| 203 | Jenshan Lin | UF | Te-Yu Kao | PhD |
| 204 | Jenshan Lin | UF | Xiaogang Yu | PhD |
| 205 | Jiangeng Xue | UF | Zhifeng Li | M.S. |
| 206 | Jiangeng Xue | UF | Ying Zheng | Ph.D. |
| 207 | Jiangeng Xue | UF | Yixing Yang | Ph.D. |
| 208 | Joao Vendramini | UF | Andre Aguiar | PhD |
| 209 | John Erickson | UF | Arkorn Soikew | MS |
| 210 | John Erickson | UF | Jeffrey Fedenko | MS |
| 211 | John Erickson | UF | Kenneth Woodard | Postdoc |
| 212 | Pierce Jones | UF-PREC | Sarah Dwyer | MS |
| 213 | Pierce Jones | UF-PREC | Flavio Hazan | Ph.D. |
| 214 | Pierce Jones | UF-PREC | Hal Knowles | Ph.D. |
| 215 | Pierce Jones | UF-PREC | Nicholas Taylor | Ph.D. |
| 216 | Jon Steward | UF | Bradford Sullivan | Post Doc |
| 217 | Jon Steward | UF | Filip Boratynski | Post Doc |
| 218 | K. T. Shanmugam | UF | Brelan Moritz | Ph. D. |
| 219 | K. T. Shanmugam | UF | Yue Su | Ph. D. |
| 220 | K. T. Shanmugam | UF | Deepika Awasthi | Ph.D. |
| 221 | K. T. Shanmugam | UF | Mun Su Rhee | Post-doc |
| 222 | K. T. Shanmugam | UF | Qingzhao Wang | Post-doc |
| 223 | Kelly Jordan | UF | Raymond Fortin | MS |
| 224 | Kelly Jordan | UF | Geoffrey Bickford | Ph.D. |
| 225 | Kelly Jordan | UF | Heejun Chung | Ph.D. |
| 226 | Kelly Jordan | UF | Jason Lewis | Ph.D. |
| 227 | Kelly Jordan | UF | Ozwaldo Pelaez | Ph.D. |
| 228 | Kelly Jordan | UF | Sasmit Gokahle | Ph.D. |
| 229 | Kelly Jordan | UF | Dominik Rätz | Postdoc |
| 230 | Kevin Jones | UF | Nikolas Vito | Ph.D. |
| 231 | Lynn Sollenberger | UF | Daniel Pereira | M.S. |
| 232 | Lynn Sollenberger | UF | Nick Krueger | M.S. |
| 233 | Lynn Sollenberger | UF | Chae-In Na | Ph.D. |
| 234 | Lynn Sollenberger | UF | Kesi Liu | Ph.D. |
| 235 | Lynn Sollenberger | UF | Kim Cline | Ph.D. |
| 236 | Lynn Sollenberger | UF | Miguel Castillo | PhD |
| 237 | Lynn Sollenberger | UF | Kesi Liu | Postdoc |
| 238 | Mark Jamison | UF | Colin Knapp | Post-doc |
| 239 | Matias Kirst | UF | Juan Acosta | Ph.D. |
| 240 | Matias Kirst | UF | Marcio Resende | Ph.D. |
| 241 | P Pulammanappallil | UF | Abhay Koppar | PhD |
| 242 | Panos Pardalos | UF | Neng Fan | PhD |
| 243 | Pratap Pullammanappallil | UF | Abhishek Dhoble | MS |
| 244 | Pratap Pullammanappallil | UF | Cesar Moreira | MS |
| 245 | Pratap Pullammanappallil | UF | Douglas Renk | MS |
| 246 | Pratap Pullammanappallil | UF | Mandu Inyang | MS |
| 247 | Pratap Pullammanappallil | UF | Samriddhi Buxy | MS |
| 248 | Pratap Pullammanappallil | UF | David Palubin | PhD |

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|---|---|---|---|---|
| 249 | Pratap Pullammanappallil | UF | Diane Chaulic | PhD |
| 250 | Pratap Pullammanappallil | UF | Patrick Dube | PhD |
| 251 | Pratap Pullammanappallil | UF | Robert Diltz | PhD |
| 252 | Pratap Pullammanappallil | UF | Sachin Gadekar | PhD |
| 253 | Pratap Pullammanappallil | UF | Zhuoli Tian | PhD |
| 254 | Preston, J.F. | UF | Lei Pan | M.S. |
| 255 | Preston, J.F. | UF | Neha Sawhney | Ph.D. |
| 256 | Preston, J.F. | UF | Guang Nong | Post-Doc |
| 257 | Preston, J.F. | UF | Virginia Chow | Post-Doc |
| 258 | Robert Gilbert | UF | Pedro Korndorfer | MS |
| 259 | Robert Gilbert | UF | Jim Shine | PhD |
| 260 | Sabine Grunwald | UF | CW Ross | MS |
| 261 | Sabine Grunwald | UF | X. Xiong | PhD |
| 262 | Sabine Grunwald | UF | Gustavo Vasques | Post-Doc |
| 263 | Shirley Meng | UF | Alex Emly | BS |
| 264 | Shirley Meng | UF | Thomas McGilvray | BS |
| 265 | Shirley Meng | UF | Chris Fell | Ph.D. |
| 266 | Shriley Meng | UF | Ming-Che Yang | Ph.D. |
| 267 | Tim Anderson | UF | Albert B. Hicks | Ph.D. |
| 268 | Tim Anderson | UF | Christopher Muzzillo | Ph.D. |
| 269 | Tim Anderson | UF | David Wood | Ph.D. |
| 270 | Tim Anderson | UF | Joseph C. Revelli | Ph.D. |
| 271 | Tim Anderson | UF | Michael Hague | Ph.D. |
| 272 | Tim Anderson | UF | Rangarajan Krishnan | Ph.D. |
| 273 | Tim Anderson | UF | Seo Young Kim | Ph.D. |
| 274 | Tim Anderson | UF | Vaibhav Chaudhari | Ph.D. |
| 275 | William E. Lear Jr. | UF | Minki Kim | M.S. |
| 276 | William E. Lear Jr. | UF | Kurt Schulze | Ph.D. |
| 277 | Helena Weaver | UF | Justin Dodson | Ph.D. |
| 278 | Joel Kostka | UGA | Juergen Wiegel | Post-Doc |
| 279 | Andrew Hoff | USF | Prefers not to mention name | M.S. |
| 280 | Andrew Hoff | USF | Prefers not to mention name | Post Doc |
| 281 | Babu Joseph | USF | Alejandro Barbosa | BS |
| 282 | Babu Joseph | USF | Matt Wetherington | BS |
| 283 | Babu Joseph | USF | Justin Stottlemeyer | BS |
| 284 | Babu Joseph | USF | Maria Pinilla | MS |
| 285 | Babu Joseph | USF | Ali Gardezi | MS |
| 286 | Babu Joseph | USF | Bijith Mankidy | Ph.D. |
| 287 | Babu Joseph | USF | Chi Ta (partially) Yang | Ph.D. |
| 288 | Babu Joseph | USF | Nianthrini Balakrishnan | Ph.D. |
| 289 | Babu Joseph | USF | Ali Gardezi | PhD |
| 290 | Don Morel | USF | Manikanan Sampathkumar | M.S. |
| 291 | Don Morel | USF | Keshavanand Jayadevan | MS |
| 292 | Don Morel | USF | Sree Satya Kanth Benapudi | MS |
| 293 | Don Morel | USF | Ryan Anders | PhD |
| 294 | Don Morel | USF | Y. Wang | PhD |
| 295 | Elias Stefanakos | USF | Anthony D'Angelo | M.S. |
| 296 | Elias Stefanakos | USF | Emre Demirocak | Ph.D. |

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|---|---|---|---|---|
| 297 | Elias Stefanakos | USF | Michael Celestin | Ph.D. |
| 298 | Elias Stefanakos | USF | Rudraskandan Ratnadurai | Ph.D. |
| 299 | Elias Stefanakos | USF | Saumya Sharma | Ph.D. |
| 300 | Elias Stefanakos | USF | Zhang, Yangyang | Ph.D. |
| 301 | Jeffrey Cunningham | USF | Arlin Briley | MEVE |
| 302 | Jeffrey Cunningham | USF | Mark Thomas | MSEV |
| 303 | Jeffrey Cunningham | USF | Saeb Besarati | PhD |
| 304 | Jeffrey Cunningham | USF | Tina Roberts-Ashby | PhD |
| 305 | Jeffrey Cunningham | USF | Shadab Anwar | Post-doc |
| 306 | Robert Weisberg | USF | Yong Huang | Post Doc |
| 307 | Sarath Witanachchi | USF | Marak Merlak | Ph.D. |
| 308 | Sarina Ergas | USF | Benjamin Gillie | BS |
| 309 | Sarina Ergas | USF | Ruben Jean | BS |
| 310 | Sarina Ergas | USF | John Trimmer | M.S. |
| 311 | Sarina Ergas | USF | Maria Pinilla | M.S. |
| 312 | Sarina Ergas | USF | Sarah Watson | M.S. |
| 313 | Sarina Ergas | USF | Matthew Gaston | MS |
| 314 | Sarina Ergas | USF | Mehregan Jalalizadeh | MS |
| 315 | Sarina Ergas | USF | Angela Chapman | MS |
| 316 | Sarina Ergas | USF | Eunyoung Lee | Ph.D. |
| 317 | Sarina Ergas | USF | Innocent Udom | Ph.D. |
| 318 | Sarina Ergas | USF | Trina Halfhide | Ph.D. |
| 319 | Sarina Ergas | USF | Angela Chapman | PhD |
| 320 | Stanley Russell | USF | Jean Frederic Monod | MA |
| 321 | Stanley Russell | USF | Jon Brannon | MA |
| 322 | Stanley Russell | USF | Mario Rodriguez | MA |
| 323 | Stanley Russell | USF | Sean Smith | MA |
| 324 | Tapas Das | USF | Ehsan Salimi | Ph.D. |
| 325 | Tapas Das | USF | Patricio Rocha | Ph.D. |
| 326 | Yogi Goswami | USF | Sam Wiejewardane | Ph.D |
| 327 | Yogi Goswami | USF | Antonio Ramos Archibold | Ph.D. |
| 328 | Yogi Goswami | USF | Chen, Huijuan | Ph.D. |
| 329 | Yogi Goswami | USF | Demirkaya, Gokmen | Ph.D. |
| 330 | Yogi Goswami | USF | Li, Chennan | Ph.D. |
| 331 | Yogi Goswami | USF | O. Kofi Dalrymple | Ph.D. |
| 332 | Yogi Goswami | USF | Philip Myers | Ph.D. |
| 333 | Yogi Goswami | USF | Prashantha Sridheran | Ph.D. |
| 334 | Yogi Goswami | USF | Rachana Vidhi | Ph.D. |
| 335 | Yogi Goswami | USF | Trahan, Jamie | Ph.D. |
| 336 | Yogi Goswami | USF | Vasquez Padilla , Ricardo | Ph.D. |

## 10. Students Graduated – FESC Faculty

### During Oct. 1, 2011 to Sep 30, 2012 Period (Back to top)

Total # of Students Graduated: 39
(Undergraduate: 5, Master: 17, PhD: 17)

| # | Faculty | University | Student Name | MS/PhD/Post -Doc |
|---|---|---|---|---|
| 1 | Charles A. Weatherford | FAMU | Alexander Schroeder | BS |
| 2 | Charles A. Weatherford | FAMU | Hanna Mochena | BS |
| 3 | Charles A. Weatherford | FAMU | Olakunle Olojo | BS |
| 4 | Charles A. Weatherford | FAMU | Jeffrey Battaglia | MS |
| 5 | Charles A. Weatherford | FAMU | Dwayne Joseph | Ph.D. |
| 6 | Charles A. Weatherford | FAMU | James Titus | Ph.D. |
| 7 | Alhalabi, Bassem | FAU | Mark Bowren | MS |
| 8 | Dhanak, Manhar | FAU | Alana Smentek-Duerr | PhD |
| 9 | Glegg, Stewart | FAU | Renee Christina Lippert | MS |
| 10 | Kalva, Hari | FAU | Reena Ursula Friedel | MS |
| 11 | VonEllenrieder, Karl | FAU | William Valentine | MS |
| 12 | David Cartes | FSU | Gina Teofilak | BS |
| 13 | David Cartes | FSU | Akintunde Badaru | MS |
| 14 | David Cartes | FSU | Passinam Tatcho | MS |
| 15 | Darlene Slattery | UCF/FSEC | Benjamin Pearman | Ph.D. |
| 16 | Marianne Rodgers | UCF/FSEC | Chris Odeltola | M.S. |
| 17 | Neelkanth Dhere | UCF/FSEC | Ashwani Kaul | Ph.D. |
| 18 | Neelkanth Dhere | UCF/FSEC | Eric Schneller | Ph.D. |
| 19 | Neelkanth Dhere | UCF/FSEC | Gopal Singh | Ph.D. |
| 20 | Neelkanth Dhere | UCF/FSEC | Narendra Shiradkar | Ph.D. |
| 21 | David Hahn | UF | Julia Setlak | MS |
| 22 | Jacob Chung | UF | Tae-Seok Lee | Ph.D. |
| 23 | Jenshan Lin | UF | Gabriel Reyes | MS |
| 24 | Jenshan Lin | UF | Xiaogang Yu | PhD |
| 25 | Jenshan Lin | UF | Yan Yan | PhD |
| 26 | Kelly Jordan | UF | Jason Lewis | MS |
| 27 | Kelly Jordan | UF | Geoffrey Bickford | MS |
| 28 | Sabine Grunwald | UF | C.W. Ross | MS |
| 29 | Andrew Hoff | USF | Prefers not to mention name | M.S. |
| 30 | Babu Joseph | USF | Matthew Wetherington | BS |
| 31 | Don Morel | USF | K. Jayadevan | MS |
| 32 | Don Morel | USF | S. Bendapudi | MS |
| 33 | Elias Stefanakos | USF | Anthony D'Angelo | MS |
| 34 | Yogi Goswami | USF | Chennan Li | Ph.D. |
| 35 | Yogi Goswami | USF | Gokmen Demirkaya | Ph.D. |
| 36 | Yogi Goswami | USF | Huijuan Chen | Ph.D. |
| 37 | Yogi Goswami | USF | O. Kofi Dalrymple | Ph.D. |
| 38 | Yogi Goswami | USF | Ricardo Vasquez Padilla | Ph.D. |
| 39 | Babu Joseph | USF | Ali Gardezi | Ph.d. |

**11. Business Start-Ups in Florida for All SUS Faculty**

**During Oct. 1, 2008 to Sep 30, 2012 Period** (Back to top)

| # | University | Name of Business | Location | Start-Up Date | Specialty |
|---|---|---|---|---|---|
| 1 | FSU | Bing Energy | Tallahassee, FL | 2010 | Fuel Cells |
| 2 | FSU | High Performance Magnetics | Tallahassee, FL | | CIC components |
| 3 | FSU | SunnyLand Solar, LLC | Tallahassee, FL | 2011 | Solar Collectors |
| 4 | FSU | General Capacitor | Tallahassee, FL | 2012 | Supercapacitors |
| 5 | UCF | Almos Battery Corp.* | Orlando, FL | 2011 | Grid scale battery (Low temp Molten salt) |
| 6 | UCF | Energy Ltd, Rutherford Appleton Lab | Oxfordshire, UK | 2010 | Smart Hydrogen Sensing Tape |
| 7 | UCF | Mesdi Systems, Inc. * | Orlando, FL | 2011 | Electrospray (for Batteries, FC, etc.) |
| 8 | UCF | PV Integrated | Orlando, FL | 2011 | Thin Film PV |
| 9 | UF | Florida FGT, LLC | Gainesville, FL | 2010 | Energy Crops |
| 10 | UF | OsComp Systems Inc. | Cambridge, MA | 2010 | Next Generation Compressors |
| 11 | UF | RedOx Fuel Cells, Inc. | Maryland, FL | 2010 | Fuel Cells |
| 12 | UF | NanoPhotonica, Inc. | Longwood, FL | 2010 | Next Generation Optoelectronic Devices |
| 13 | UF | Emerald Endeavors, Inc. | Tampa, FL | 2009 | Energy Efficiency - Turbines |
| 14 | UF | Florida Sustainables | Gainesville, FL | 2010 | Chemicals from Biomass |
| 15 | UF | *Company requested confidentiality* | Gainesville, FL | 2012 | Chemicals to $H_2$ |
| 16 | UF | UB-WiSystems, Inc. | Gainesville, FL | 2011 | Low Power Wireless Transmission |
| 17 | UF | Solar Powder | Gainesville, FL | 2011 | Nanoparticle Thin Film Photovoltaics |
| 18 | UNF | Omnii Sense, LLC* | Jacksonville, FL | 2011 | Intelligent sensor network for street light efficiency |
| 19 | USF | MudPower* | Tampa, FL | 2011 | Microbial FC |
| 20 | USF | Trash 2 Cash-Energy, LLC* | Tampa, FL | 2011 | Landfill gas to liquid fuel |

**Part of MegaWatt Venture Program.*

## 12. Specialized Energy Education Training and Outreach

**During Oct. 1, 2011 to Sep 30, 2012 Period** (Back to top)

| # | University | Description (Event Name, Faculty, etc., Location, Date) |
|---|---|---|
| 1 | FAU | Seven high school teacher training workshops based on the SNMREC curriculum. *Energy from Ocean Currents: the New Renewable* is an ocean-energy curriculum developed for 11th and 12th grade students. Engaged over 200 teachers from Dade County to St Lucie County. A seventh topic is being added based on civics/social studies to incorporate policy and regulatory aspects related to energy. |
| 2 | HCC-FLATE | Hosted Summer Energy Camp for under-represented middle school students at HCC's SouthShore campus in Ruskin, FL from July 9-12. Staff: Nina Stokes |
| 3 | HCC-FLATE | Energy-related Professional Development Workshop for middle and high school teachers in partnership with the University of South Florida (USF). The workshop was held at USF from June 26-27, 2012. Staff: Nina Stokes and Dr. D. Karaiskaj (USF). |
| 4 | HCC-FLATE | FLATE took a delegation of eight students, five faculty members and two administrators from Florida's community and state colleges on a 21 day international technician training program to Spain (June, 2012). The three week program provided students with an outstanding technical and cultural learning experience. For the second year, students enrolled in the engineering technology A.S. degree program and faculty members at Hillsborough Community College, Polk State College, State College of Florida, and Brevard Community College, participated in a structured technical education and training experience at IEFPS Usurbil GLBHI—a technical college in the Basque region of Spain. |
| 5 | HCC-FLATE | Presented a poster, "**Energy Education for Florida's Future Technician Workforce",** at the 2012 Energy Summit in Orlando on August 16. Staff: Marilyn Barger |
| 6 | UCF | Installing Photovoltaic Systems, John Harrison, Tom McHaffie, and Donnie Metzger, October 3-7, 2011. 3 Brevard Workforce trained. 14 trained. |
| 7 | UCF | Installing Photovoltaic Systems, John Harrison, Tom McHaffie, and Donnie Metzger, December 5-9, 2011. 20 trained. |
| 8 | UCF | PV Technical Sales and Business Operations, Tom McHaffie, January 18-19, 2012. 10 trained. |
| 9 | UCF | Banner Center for Clean Energy Internship Training. February 16-17, 2012. 8 Brevard Workforce trained, 9 e-shelters trained. |
| 10 | UCF | Solar Water Heating and Cooling, John Harrison, Donnie Metzger, May 30-June 1, 2012. 15 trained. |
| 11 | UCF | PV Technical Sales and Business Operations, Tom McHaffie, July 10-11, 2012. 6 trained. |
| 12 | USF | Earth Day Events at the USF Botanical Gardens in 2011 by Sarina Ergas Group |
| 13 | USF | Earth Day Events at the USF Botanical Gardens in 2012 by Sarina Ergas Group |

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|---|---|---|
| 14 | USF | Middleton Magnet School for Science and Technology, an economically challenged high school in East Tampa, on a project that looks at the effect of participation in authentic science research on students understanding of science. By Sarina Ergas Group |

## APPENDIX C – FUNDING OPPORTUNITIES SENT TO FESC FACULTY

The following funding opportunities were sent to the faculty during the reporting period.

| # | Title | Call # | Agency | Funding |
|---|---|---|---|---|
| 1 | Advanced Propulsion Concepts and Cycles | BAA-12-03-PKP | AFRL | $44.5M |
| 2 | Environment & Energy Quality (E2Q) Technologies II | BAA-12-10-PKM | AFRL | $350M |
| 3 | Defense Production Act Title III. Advanced Drop-In Biofuels Production Project | SN-12-15-PKM | AFRL | $30M |
| 4 | Defense Production Act Title III Technology Marketing Research-Addressing Availability and Cost of Fuel Cell Systems | RFI-12-16-PKM | AFRL | |
| 5 | A Pilot Institute for the National Network for Manufacturing Innovation (NNMI) | BAA-12-17-PKM | AFRL | $60M |
| 6 | Defense Production Act Title III | BAA-12-03-PKM | AFRL/RX | $8.5M |
| 7 | Advanced Drop-in Bio fuels Production Project | FOA-12-15-PK | AFRL | $420M |
| 8 | Gulf of Mexico Research Initiative | BP - RFP-II | BP | $112.5M |
| 9 | FY 2012 Environmental Studies Program | M12AS00001 | Bureau of Ocean Energy Management (BOEM) | $350K |
| 10 | Safety of Oil and Gas Operations in the US Outer Continental | E12PS00004 | Department of Interior | $5M |
| 11 | Integrated Forest Products Research Program | USDA-NIFA-SRGP-003808 | DOA | $12.6M |
| 12 | Climate Program Office for FY 2013 | NOAA-OAR-CPO-2013-2003445 | DOC | $14.5M |
| 13 | Research and Education Program for Historically Black Colleges and Universities and Minority-Serving Institutions (HBCU/MI) | W911NF-12-R-0009: | DOD | $25M |
| 14 | Rapid Innovation Fund Broad Agency Announcement | HQ0034-12-BAA-RIF-0001: | DOD | $3M |
| 15 | Proposed Research on Oil Spill Response Operations BAA 2012 | E12PS00012 | DoI | |

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|---|---|---|---|---|
| 16 | The Rural Jobs and Innovation Accelerator Challenge, A Coordinated Initiative to Advance Regional Competiveness | | EDA/USDA | $750K each |
| 17 | National Clean Diesel Funding Assistance Program, FY 2012 Request for Proposals (RFP) | EPA-OAR-OTAQ-12-05 | EPA | $20M |
| 18 | Energy and Climate Partnership of the Americas/ Caribbean Region Climate Adaptation Partnership Initiative | ECPA/CRCA Partnership Initiative | HED/USAID | $770,500 |
| 19 | Building Construction Technology Extension Program (BCTEP) Pilot Projects | 2012-BCTEP-01 | NIST, DoC | $1.33M |
| 20 | U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research Announcement of Opportunity, Fiscal Years 2012 | RGR-FN-0512-RES | NRC | |
| 21 | U.S. Nuclear Regulatory Commission, Research Conference Grant and Cooperative Agreement Program, Announcement of Opportunity, Fiscal Year 2012 | CGR-FN-0512-RES | NRC | |
| 22 | NSF/US DOE Partnership in Basic Plasma Science and Engineering | NSF 09-596 | NSF | $2M |
| 23 | Sustainability Research Networks Competition (SRN) | NSF 11-574 | NSF | $8M |
| 24 | Basic Research to Enable Agriculture Development | NSF 11-579 | NSF | $12M |
| 25 | Energy for Sustainability | NSF PD 12-7644 | NSF | |
| 26 | Sustainable Energy Pathways (SEP) | NSF-11-590 | NSF | $34M |
| 27 | Academic Liaison with Industry (GOALI) | NSF12-513 | NSF | $5M |
| 28 | Research on the Science and Technology Enterprise: Statistics and Surveys R&D, U.S., S&T Competitiveness, STEM Education, S&T Workforce | NSF-12-545 | NSF | $750k |
| 29 | NSF/DOE PARTNERSHIP ON ADVANCED COMBUSTION ENGINES 2012-2015 | NSF 12-559 | NSF | $12M |
| 30 | International Collaboration in Chemistry between US Investigators and their Counterparts Abroad | NSF-12-562 | NSF | $10M |

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|---|---|---|---|---|
| 31 | United States-Israel Collaboration in Computer Science (USICCS) | NSF 12-603 | NSF | $400K |
| 32 | Small Business Innovation Research Program Phase I Solicitation FY-2013 (SBIR) | NSF-12-605 | NSF | $30M |
| 33 | Energy, Power, and Adaptive Systems (EPAS) | PD-10-1518: | NSF | |
| 34 | Sensors and Sensing Systems | PD- 12-1639 | NSF | |
| 35 | In-Water Wave Energy Conversion (WEC) Device Testing Support | DE-FOA-0000705 | US DOE | $500 |
| 36 | Sustainable Cities: Urban Energy Planning for Smart Growth in China and India | DE-FOA-0000697 | US DOE | |
| 37 | Advanced Computational and Modeling Research for the Electric Power System | DE-FOA-0000729 | US DOE | $6.6M |
| 38 | Innovative Biosynthetic Pathways to Advanced Biofuels | DE-FOA-0000719 | US DOE | $12 M |
| 39 | Light-Duty Fuel Cell Electric Vehicle validation Data | DE-FOA-0000625 | US DOE | $6M |
| 40 | Energy Innovation Hub-Critical Materials | DE-FOA-0000687 | US DOE | $120M |
| 41 | Implementation Initiatives to Advance Alternative Fuel Markets | DE-FOA-0000708 | US DOE | |
| 42 | Solar Energy Evolution And Diffusion Studies (SEEDS) | DE-FOA-0000740 | US DOE | $9M |
| 43 | Innovative Pilot and Demonstration Scale Production of Advanced Biofuels | DE-FOA-0000739 | US DOE | $20M |
| 44 | Diagnostic Systems for Magnetic Fusion Energy Sciences | DE-FOA-0000744 | US DOE | $120M |
| 45 | Terrestrial Ecosystems Science | DE-FOA-0000749 | US DOE | $3.7M |
| 46 | SunShot Price: Race to the Rooftops | | US DOE | $10M |
| 47 | DE-FOA-0000768 | DE-FOA-0000768 | US DOE | $400M |
| 48 | Hydrogen Pathway Analyses | DE-FOA-0000748 | US DOE | $1M |
| 49 | Predictive Modeling for Automotive Lightweighting Applications And Advanced Alloy Development for Automotive and Heavy-Duty Engines | DE-FOA-0000648 | US DOE | $1.2M to $6M each |
| 50 | National Geothermal Student Competition 2012 | 2012-13 NGSC | US DOE | |
| 51 | Expressions of Interest: Research Leading to Predictive Theory and Modeling for Materials and Chemical Sciences | BES-EOI-2012 | US DOE | $36M |

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|---|---|---|---|---|
| 52 | Cost-shared Industry Partnership Program for Small Modular Reactors | DE-FOA-0000371 | US DOE | $452M |
| 53 | U.S. Offshore Wind: Advanced Technology Demonstration Projects | DE-FOA-0000410 | US DOE | $180M |
| 54 | Nuclear Energy Enabling Technologies (NEET) – Reactor Materials | DE-FOA-0000426 | US DOE | $7M |
| 55 | Nuclear Energy Enabling Technologies (NEET)- Advanced Methods for Manufacturing | DE-FOA-0000427 | US DOE | $3 M |
| 56 | U.S.-India Joint Clean Energy Research and Development Center | DE-FOA-0000506 | US DOE | $125M |
| 57 | Energy Innovation Hub - Batteries and Energy Storage | DE-FOA-0000559 | US DOE | $120M |
| 58 | Multidisciplinary University Research Initiative: High Operating Temperature Fluids | DE-FOA-0000567 | US DOE | $10M |
| 59 | Electricity Delivery and Energy Reliability, Research, Development and Analysis | DE-FOA-0000579 | US DOE | $8M |
| 60 | SunShot Concentrating Solar Power Research and Development/ Support of Advanced Fossil Resource Utilization Research by Historically Black Colleges and Universities and Other Minority Institutions Grant | DE-FOA-0000595 | US DOE | $850k |
| 61 | Second Generation Dark Matter Experiments | DE-FOA-0000597 | US DOE | $6M |
| 62 | SunShot Incubator Program- Soft Cost Reduction | DE-FOA-0000607 | US DOE | |
| 63 | Stewardship Science Academic Alliances | DE-FOA-0000611 | US DOE | NA |
| 64 | Nuclear Energy University Programs- General Scientific Infrastructure Support | DE-FOA-0000613 | US DOE | $300k |
| 65 | Advancements in Sustainable Algal Production (ASAP) | DE-FOA-0000615 | US DOE | $21M Area1: $500k- $3M Area 2: $10-15M |
| 66 | Accelerating the Deployment of Energy Efficiency and Renewable Energy Technologies in Indonesia | DE-FOA-0000620 | US DOE | $1.2M each |
| 67 | Energy Savings through Improved Mechanical Systems and Building Envelope Technologies | DE-FOA-0000621 | US DOE | 1.5M each |

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|---|---|---|---|---|
| 68 | Light-Duty Fuel Cell Electric Vehicle Validation Data | DE-FOA-0000625 | US DOE | $6M |
| 69 | Validation of Hydrogen Refueling Station Performance and Advanced Refueling Components | DE-FOA-0000626 | US DOE | $400k to $1M each |
| 70 | Research and Development for Next Generation Nuclear Physics Accelerator Facilities | DE-FOA-0000632 | US DOE | $2M |
| 71 | Superior Energy Performance Program Administrator | DE-FOA-0000635 | US DOE | $3M |
| 72 | Advanced Oxy-combustion Technology Development and Scale-up for New and Existing Coal-fired Power Plants | DE-FOA-0000636 | US DOE | Phase 1: $10M Phase 2: $21M |
| 73 | Integrated Nuclear Medicine Research and Training Projects of Excellence | DE-FOA-0000646 | US DOE | $10M |
| 74 | Atmospheric System Research | DE-FOA-0000647 | US DOE | $3.5M |
| 75 | Improving the Accuracy of Solar Forecasting | DE-FOA-0000649 | US DOE | $9M |
| 76 | SunShot Incubator Program | DE-FOA-0000651 | US DOE | $12M |
| 77 | Technologies to Ensure Permanent Geologic Carbon Storage | DE-FOA-0000652 | US DOE | $800k to $1.2M each |
| 78 | Plug and Play Photovoltaics | DE-FOA-0000653 | US DOE | $25M |
| 79 | Bridging Research Interactions through Collaborative Development Grants in Energy (BRIDGE) | DE-FOA-0000654 | US DOE | $9M |
| 80 | Regional Test Centers: Validation of Photovoltaic (PV) Modules and Systems | DE-FOA-0000661 | US DOE | |
| 81 | Reduction of Tropical Cloud and Precipitation Biases in Global High Resolution Models | DE-FOA-0000664 | US DOE | $2M |
| 82 | Wireless Charging for Electric Vehicles | DE-FOA-0000667 | US DOE | $12M |
| 83 | Methane Hydrate Program | DE-FOA-0000668 | US DOE | $2M to $30M each |
| 84 | Zero Emission Cargo Transport Demonstration | DE-FOA-0000669 | US DOE | $2M to $10M each |
| 85 | ARPA-E | DE-FOA-0000670 | US DOE | $150M |
| 86 | Methane Opportunities for Vehicular Energy (MOVE) | DE-FOA-0000672 | US DOE | |

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|---|---|---|---|---|
| 87 | Advanced Management and Protection of Energy-Storage Devices (AMPED) | DE-FOA-0000675 | US DOE | $30M |
| 88 | Solid State Energy Conversion Alliance (SECA) Core | DE-FOA-0000677 | US DOE | $500K for each |
| 89 | National Laser Users' Facility (NLUF) Program | DE-FOA-0000681 | US DOE | $3.2M |
| 90 | Bio-Oil Stabilization and Commoditization | DE-FOA-0000686 | US DOE | $15M |
| 91 | Accident Tolerant Fuel (DRAFT) | DE-FOA-0000692 | US DOE | $10M |
| 92 | Office of Advanced Scientific Computing Research (ASCR) Scientific Collaborations at Extreme-Scale | DE-FOA-0000695 | US DOE | $4.7M each |
| 93 | Sustainable Cities: Urban Energy Planning for Smart Growth in China and India | DE-FOA-0000697 | US DOE | $750k each |
| 94 | 2012 Mathematical Multifaceted Integrated Capability Centers (MMICCs) | DE-FOA-0000698 | US DOE | $9M |
| 95 | Small Scale Coal-Biomass to Liquids (CBTL) Production and Feasibility Study of a Commercial Scale CBTL Facility | DE-FOA-0000703 | US DOE | $3M |
| 96 | In-Water Wave Energy Conversion (WEC) Device Testing Support | DE-FOA-0000705 | US DOE | $500k each |
| 97 | Theoretical Research in Magnetic Fusion Energy Science | DE-FOA-0000707 | US DOE | $4.5M |
| 98 | Implementation Initiatives to Advance Alternative Fuel Markets | DE-FOA-0000708 | US DOE | $1.2M |
| 99 | Technology Research, Development, and Tools for Clean Biomass Cook Stoves | DE-FOA-0000709 | US DOE | $7M |
| 100 | Development of LWR Fuels with Enhanced Accident Tolerance | DE-FOA-0000712 | US DOE | $10M |
| 101 | Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) | DE-FOA-0000715 | US DOE | $7M |
| 102 | Novel Sensing and Monitoring Technologies for Subsurface Detection of $CO_2$ | DE-FOA-0000732 | US DOE | $5M |
| 103 | EERE Postdoctoral Research Award Application | ORISE | US DOE | |

| | | | | |
|---|---|---|---|---|
| 104 | SunShot Initiative Postdoctoral Research Awards | | US DOE | |
| 105 | Proliferation Detection Research | DE-FOA-0000568 | US DOE & NNSA | $20M |
| 106 | Beginning Farmer and Rancher Development Program | USDA-NIFA-BFR-003541 | USDA | $19M |
| 107 | Biomass Research and Development Initiative | DE-FOA-0000657 | USDA and US DOE | USDA-NIFA: $25M; US DOE: $10M |

## APPENDIX D – IP CATALOG BY UNIVERSITY

### FLORIDA ATLANTIC UNIVERSITY

Technologies Available for Licensing

**ENERGY**

***Marine***

Retrofit Cathodic Protection - Software for Marine Pipelines
Software for the Design of Cathodic Protection Systems for Deep Water Risers
Synchronous Laser Line Scan Imaging

### FLORIDA INTERNATIONAL UNIVERSITY

Technologies Available for Licensing

**ENERGY**

***Algae***

Novel Library of Native Algae Species with Beneficial Health Effects

**CLEAN-TECH**

***Computer***

3-D Magnetic Memory

**FLORIDA STATE UNIVERSITY**
Technologies Available for Licensing

## ENERGY

### *Solar*
A High-Efficiency Multi-junction Photovoltaic Cell for Harvesting Solar Energy
Triple-Junction Solar Cells for Solar Energy Harvesting
Inflatable Solar Energy Collector (the "Solar Sausage")

### *Wind*
Multi Piece Wind Blades, HPMI

### *Fuel Cells*
Alkaline Membrane Fuel Cell
High Performance Fuel Cell

## CLEAN-TECH

### *Mechanical*
Solderless Joint Technology
Bidirectional Linear Nanoactuator Powered by Biomolecular Motors
Sharing Cyrogenic Cooling Systems Between Large and Auxiliary Devices

### *Materials*
Carbon Nanotube and Polymeric Thin Film Assemblies for Pressure Sensing and Mapping
Improved Fire Retardant Materials
High Efficiency Ion Exchange in Zeolites

### *Computer - Communication*
The SPOT Method for Detecting Compromised Computers in a Network
Method to Improve Processing Efficiency with Instruction Register File

**UNIVERSITY OF CENTRAL FLORIDA**

Technologies Available for Licensing

## ENERGY

### *Solar and Thermo Electric*

Improved Manufacturing of Thin Film Solar Cells With Highly Efficient Energy ConversionHybrid PV/Thermal Solar Cell with Significantly Increased Efficiency and Longevity
Shape Memory Alloy Based Thermal Conduction Switch for on Demand Heat Transfer
Compact, Lightweight and Highly effective Recuperative Heat Exchanger
Synthesis of Core/Shell/Shell Quantum Dots with Improved Luminescent and Semi-Conducting Properties For Bio Imaging and Solar Cell Applications

### *Biomass*

Solid Acid Catalyzed Hydrolysis of Cellulosic Materials

### *Energy Storage*

### *Power, Distribution, Smart Grid, Communication*

The Combination of Linear and Adaptive Non-Linear Control for Fast Transient Response in Highly Efficient Voltage Regulators and DC-DC Converters
Active Transient Voltage Compensator for Improving Fast Transient Response in DC to DC Converters
Highly Efficient DC-DC Converter with a Coupled-Inductor Current-Doubler Topology
Silicon Controlled Rectifier Layout Topology for High-Voltage Electrostatic Discharge Applications

### *Built Environment and Energy Efficiency*

High Efficiency Twisted Air Conditioner Condenser Fan Blades and Hub with Performance Enhancements
Long Lasting Anti-Mildew/Fungal Coating for Roofs, Buildings and Pools

### *Marine*

Highly Efficient Method for Generating, Transmitting and Receiving Electrical Power via any Heat Source including Hydrothermal Ocean Vents

### *Fuel Cells and Hydrogen*

Increased Efficiency in Hydrogen Production Using a Solar Metal Sulfate Based Water Splitting Cycle
Inexpensive Method for Producing High Purity Hydrogen from Water and Other Hydrogen Containing Compounds
Super Absorbent Palladium Filled Carbon Nanotubes for the Storage and Detection of Hydrogen Gas
Efficient Closed-Loop Method of Producing Hydrogen Fuel from Landfill Gas and Biomass Feedstocks

Low Energy Electromechanical Method for Removal of Carbon Monoxide from Hydrogen Streams for Fuel Cells
Reusable Visual Hydrogen Detecting Compound Capable of Attachment to Numerous Substrates (Polymers, Ceramics and even Tape)
Method For Zero Emission Liquid Hydrogen Production From Methane Sources and Landfill Gas
Process for Efficient Production of Pure Hydrogen Gas with Reduced $CO_2$ Emissions
Fast and Reliable Hydrogen Generation Utilizing a Fixable Catalyst and Borohydride Solutions
Portable Hydrogen Generator for Coupling with Currently Utilized Fuel Cell Technologies

***Water Desalination***
Microtextured Superhydrophobic Membranes for High Flux Water Desalination

**CLEAN-TECH**

***Environment***
*Air*
Use of Oxide Nanoparticles to Reduce Soot Emissions and Increase Combustion Engine Efficiency
Airborne Contamination Detection via Optical Waveform Matching
Compact and Highly Sensitive Gold Nanorod Sensor for Detecting Mercury in Both Water and Air

*Waste*
Sorption and Filtration Media Mixes and Systems For Passive, Inexpensive Removal and Treatment of Wastewater and Stormwater

*Oil Spills*
Filamentous Carbon Particles for Cleaning Oil Spills

***Sensors***
Micro Electro-mechanical Room Temperature Hydrogen Sensor
Highly Selective and Cost Efficient Hydrogen Nanosensor Utilizing a Single ZnO Nanorod
A Nano-Ceria Based Regenerative Radical Sensor
Ultra High Temperature Micro-Electro-Mechanical (MEMS)-Based Smart Sensors for Monitoring Gas Turbines and other Similar Extreme Environments
Fabrication of Nano-Scale Temperature Sensors and Heaters
Gas Permeable Matrix for Chemochromic Compounds with Enhanced Hydrogen Sensing Performance

***Lasers & Optics***
Rapid Scanning Optical Interferometer for Diagnostics and Manufacturing
Highly Reliable High-Capacity Free-space Optical Communication with Partially Coherent Beams

Nanoparticle Coated Substrates for Increasing Rates of Chemical Reactions with Laser Irradiation Eliminating the Need for Expensive Heating Elements
High Speed, Digitally Controlled and Polarization Based Optical Scanner Capable of Scanning in Three Dimensions

Signal Processing using Spectrally Phase-Encoded Optical Frequency Combs for High Speed Computing and Pattern Recognition
Effective Laser Plasma Source for Extreme Ultraviolet Lithography Using Water Droplet Target System
Highly Efficient Magnetic Foil Trap for Charged Particle Shielding
Highly Efficient Systems and Methods for Measuring Ultra-Short Light Pulses
High Intensity Mega Hertz Mode-Locked Laser
Temperature Independent Narrow Spectrum Lasers
Gain-guided Optical Fiber Laser
Inexpensive and Re-useable Liquid Crystal Power Meter for Quickly Measuring Laser Beam Intensity and Profile
Coupling of Diodes and Laser Chips to Fiber Optic Waveguides with Increased Efficiency
Composite Sol-gel Hybrid Optical Coating for Infrared (IR) Applications
Fiber Optic Photonically Controlled Ultrasonic Probe
Wavelength Independent Polarization Rotator with a Wide Field of View
Ultra-broadband Frequency Swept Lasers
Method of Producing High Quality Durable Laser Diode Arrays for Significantly Enhancing Disk Lasers
Modified Wurtzite Structure Oxide Compounds as Substrates for III-V Nitride Semiconductor Epitaxial Thin Film Light Emitting Diodes and Laser Diodes
Bulk Semiconductor Lasers at Sub-millimeter/Far Infrared Wavelengths Using a Regular Permanent Magnet
Water Laser Plasma X-Ray Target Source

***Materials***

Oxidase Activity of Polymeric Coated Cerium Oxide Nanoparticles
Novel Method for Creation of Multi-wall Carbon Nanotubes as Super Efficient Electron Field Emitters in Flat Panel Displays and Electron Microscopes
Composite Materials and Coatings Created by an Efficient Dispersion of Carbon Nanotubes in Copolymer Solutions
Ultra Strong and Ultra Conductive Carbon Nanotube Reinforced Metal Composites
Carbon Nanotube with a Graphitic Outer Layer for Use with Atomic Force Microscopy and as an Electron Emitter
Nanoparticles of Cerium Oxide Having Potent Antioxidant or Superoxide Dismutase Activity

Dispersion of Carbon Nanotubes in Polymer Matrices for Creation of Highly Conductive and Mechanically Strong Nanocomposites
Inexpensive Room Temperature Synthesis of High Quality Zirconia Powders for Materials Applications
Metal Nanoparticle Polymer Composites with Electronic, Computer and Adhesive Applications
Nanoparticle Coating that Increases the Oxidation Resistance of Stainless Steel at Extremely High Temperatures
Highly Effective Method of Predicting Optical Properties and Physical Characteristics to Formulate Optimum Coating System
Synthesis of Nanoparticles with Enhanced Thermal Stability
Debris-Less and Spark-Free Shape Memory Alloy Based Release Mechanism
Solid Propellant Burn Rate Optimization Using a Nano-Titania Additive

Method of Generating Frequency Tunable Resonant Scatterers
Low Coherence Apparatus for Non-Invasive Real-Time System Analysis and Process Control
Method and Apparatus for Three-Dimensional Carbon Fiber Production
Sol-Gel Coating Method Which Significantly Reduces Water Content and Increases the Coating's Efficiency
Inexpensive Method for Bulk Manufacture of Crack-Free Ceramics at Reduced Temperatures
Micro-Fluidic Device for the Creation of Hand-Held Portable Water Sensor
Inexpensive Method for Producing Whisker Formations on Metallic Fibers/Substrates and Strongly Adhering Catalysts for Filtration Applications
Inexpensive Synthesis of Carbon Nanotubes and Nanofilaments via Electrochemical Deposition
Pure Silicon Photonic Crystal Fiber Fabrication via Magnesiothermic Reduction for Operations in the Mid-IR Spectrum
Highly Efficient Magnetic Foil Trap for Charged Particle Shielding
Inexpensive One-Step Rapid Manufacturing of Metal and Composite Parts and Prototypes
Thin Film Deposition of Silicon Crystalline Layers on Polymer Substrates at Decreased Temperatures
Photosensitive Polymeric Material for High Density 3-D Optical Data Storage
Inexpensive and Highly Sensitive Amorphous Metal Alloy for Electronic Article Surveillance (EAS) Systems
Highly Efficient Method for Growing Diamond Thin Film on a Substrate at Low Temperatures
Highly Efficient 1.3μm Lasers Using $Nd^{3+}$ doped Apatite Crystals
Highly Efficient Microwave assisted Formation of Sulfonium Photoacid Generators (PGAs) for use in Photolithography and Coatings Applications
Ultra Compact, High Current and High Temperature Semiconductor Packaging
Magnetic Components for the Manufacture of Low Cost On-Chip Power Supplies
Dual-Polarity Electrostatic Discharge Protection for Sub-Micron, Mixed Signal, CMOS/BiCMOS Technologies
Reliable ESD Protection Device and Method for Advanced Sub-micron CMOS Technologies

Efficient Liquid Droplet System as Plasma Source for EUV, XUV, and X-Ray Wavelength Emissions
Efficient Plasma Source for EUV, XUV, and X-Ray Wavelength Emissions Produced from Liquid Metal and Nanoparticles Solutions
Highly Precise Advanced Droplet and Plasma Targeting System
Method for Increasing Thermal Conductivity of a Substrate

***Signal Processing***
Classification/Recognition of One or Multidimensional Signals Utilizing a Self-Designing Intelligent Signal Processing System Capable of Evolutional Learning
Multi-Sensor (Multi-Sensing) Surface Acoustic Wave Network Utilizing Orthogonal Frequency Coding for Increased Performance and Security
Data Compression of One or Multidimensional Signals Utilizing an Energy Based Split Vector Quantizer via Multiple Transform Domain Representations
Hybrid Photonics Modules for Variable Time Delay Signal Processing
Chromatic Dispersion Compensation for Optical Communications
Dual Opto-Electronic Precision Clocking Protocol for Optical and Electronic Systems

Improved Optical Communications with Significantly Reduced Cost using Polarization Diversity Transmission
Optical Multichannel Signal Regeneration
Regeneration of Differential Phase-Shift-Key Optical Modulated Signals
An Optimal Signal Processing Algorithm/System That Will Allow Complex Signals to Adapt to Time-Changing/Unknown Environments
Methods and Devices for Interference Cancellation in Radio Frequency Communication Systems

***Mechanical***
Miniature High Speed Compressor Having Embedded Permanent Magnet Motor

***Electrical***
Logic Device Design and Evolvable Hardware
On-Chip Structure for Protecting Integrated Circuits from Electrostatic Discharge (ESD)

***Nano/Micro Devices***
Ultra Compact Micro-Lens Imaging System for High Quality Magnification within a Compact Space
Highly Efficient Nanoparticle Seeded Short-Wavelength Discharge Source
Zinc Oxide Semiconductor Nanotubes with Paint-brush like Structures for use in Electronics and Quantum Computing
Large Scale Synthesis of Single Crystalline Ultra-long Semiconducting Nanowires for Improved Electronic and Optoelectronic Devices
A Passive Micro-Mixer for Use With Micro-Fluidic Sensors in Medical, Pharmaceutical and Chemical Applications
Highly Efficient Nanoparticles Generator
Novel Method for Creating Carbon Nanotubes Collimators

***Optical Display Devices***
Optical Aberration Correction via Aberration Generation
Energy Efficient and Reduced Temperature White Light Generation by Up-conversion of Rare-Earth Materials Utilizing an Infrared Light Source
High Resolution Full Color Integrated Semiconductor Display
Resonant Cavity to Enhance the Efficiency of IR to Visible Light Conversion for Use in High Resolution Displays
Display Design Suitable for Projection Displays with an Increased Color Gamut

## APPENDIX E – FESC USER FACILITIES

| # | User Facility | Location |
|---|---|---|
| 1 | Southeast National Marine Renewable Energy Center | Florida Atlantic University - Boca Raton |
| 3 | Wall of Wind Testing Facility (WoW) | Florida International University – Miami FL |
| 2 | Advanced Materials and Engineering Research Institute (AMERI) | Florida International University – Miami FL |
| | Plasma Spray Forming Laboratory | Florida International University – Miami FL |
| 4 | Aeropropulsion, Mechatronics and Energy Building (Coming Soon) | Florida State University, Tallahassee FL |
| 5 | Center for Advanced Power Systems (CAPS) | Florida State University, Tallahassee FL |
| 6 | Institute for Energy Systems, Economics and Sustainability (IESES) | Florida State University, Tallahassee FL |
| 7 | Future Fuels Institute (Coming Soon) | Florida State University, Tallahassee FL |
| 8 | High Magnetic Field Laboratory | Florida State University, Tallahassee FL |
| 9 | Photovoltaic – Module Testing and Certification | Florida Solar Energy Center, Cocoa FL |
| 10 | Photovoltaic Materials Laboratory | Florida Solar Energy Center, Cocoa FL |
| 11 | Solar Thermal Collection Test Laboratory | Florida Solar Energy Center, Cocoa FL |
| 12 | Solar Thermal Systems Test Laboratory | Florida Solar Energy Center, Cocoa FL |
| 13 | Advanced Energy Research Division (AERD) Labs | Florida Solar Energy Center, Cocoa FL |
| 14 | Manufactured House Laboratory | Florida Solar Energy Center, Cocoa FL |
| 15 | Building Science Laboratory | Florida Solar Energy Center, Cocoa FL |
| 16 | Flexible Roof Facility | Florida Solar Energy Center, Cocoa FL |
| 17 | Flexible Residential Test Structures | Florida Solar Energy Center, Cocoa FL |
| 18 | Climate-Controlled A/C Laboratory | Florida Solar Energy Center, Cocoa FL |
| 19 | Materials Characterization Facility | University of Central Florida, Orlando FL |
| 20 | Advanced Microfabrication Facility | University of Central Florida, Orlando FL |

| | | |
|---|---|---|
| *21* | *NanoScience Technology Center (NSTC)* | *University of Central Florida, Orlando FL* |
| *22* | *CREOL – The College of Optics and Photonics* | *University of Central Florida, Orlando FL* |
| *23* | *Florida Institute for Sustainable Energy - Energy Tech Incubator* | *University of Florida, Gainesville FL* |
| *24* | *UF Biofuel Pilot Plant* | *University of Florida, Perry FL* |
| *25* | *UF Biofuel Pilot Plant, Perry FL* | *University of Florida, Perry FL* |
| *26* | *Nanoscience Institute for Medical & Engineering Technologies and Nanoscale Research Facility* | *University of Florida, Gainesville FL* |
| *27* | *Wayne K. and Lyla L. Masur HVAC Laboratory* | *University of Florida, Gainesville FL* |
| *28* | *Major Analytical Instrumentation Center* | *University of Florida, Gainesville FL* |
| *29* | *Particle Engineering Research Center (PERC)* | *University of Florida, Gainesville FL* |
| *30* | *USF Thin Film Pilot Line (Coming Soon)* | *University of South Florida, Tampa FL* |
| *31* | *USF Nanotechnology Research and Education Center (NREC)* | *University of South Florida, Tampa FL* |
| *32* | *Oak Ridge Associated Universities (ORAU)* | *Florida Institute of Technology* |
| *33* | *Institute for Energy Systems (IES)* | *Florida Institute of Technology* |
| *34* | *Harris Institute for Assured Information (HIAI)* | *Florida Institute of Technology* |
| *35* | *Institute for Research on Global Climate Change* | *Florida Institute of Technology* |
| *36* | *Center for Remote Sensing (CRS)* | *Florida Institute of Technology* |
| *37* | *National Center for Hydrogen Research (NCHR)* | *Florida Institute of Technology* |
| *38* | *Collaborative International Research Centre for Universal Access (CIRCUA)* | *Florida Institute of Technology* |
| *39* | *Center for High Resolution Microscopy and Imaging (CHRMI)* | *Florida Institute of Technology* |
| *40* | *Center for Ferrate Excellence (COFE)* | *Florida Institute of Technology* |
| *41* | *Center for Corrosion and Biofouling Control (CCBC)* | *Florida Institute of Technology* |
| *42* | *Federal Aviation Administration Center of Excellence for Commercial Space Transportation* | *Florida Institute of Technology* |
| *43* | *Center for Entrepreneurship and New Business Development (CENBD)* | *Florida Institute of Technology* |
| *44* | *Wireless Center of Excellence (WICE)* | *Florida Institute of Technology* |

| | | |
|---|---|---|
| *45* | *Florida Center for Automotive Research (FCAR)* | *Florida Institute of Technology* |
| *46* | *College of Engineering Center for Space Commercialization* | *Florida Institute of Technology* |
| *47* | *Microelectronics Laboratory* | *Florida Institute of Technology* |
| *48* | *Laser, Optics and Instrumentation Laboratory (LOIL)* | *Florida Institute of Technology* |
| *49* | *Wind and Hurricane Impacts Research Laboratory (WHIRL)* | *Florida Institute of Technology* |
| *50* | *Dynamic Systems and Controls Laboratory (DSCL)* | *Florida Institute of Technology* |
| *51* | *Robotics and Spatial Systems Laboratory (RASSL)* | *Florida Institute of Technology* |
| *52* | *Ralph S. Evinrude Marine Operations Center* | *Florida Institute of Technology* |

## Florida Atlantic University

***Southeast National Marine Renewable Energy Center***

*Web Site Link:* *http://snmrec.fau.edu*

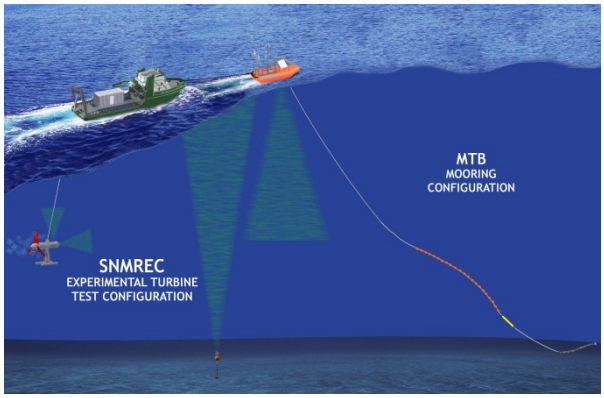
Director: Sue Skemp

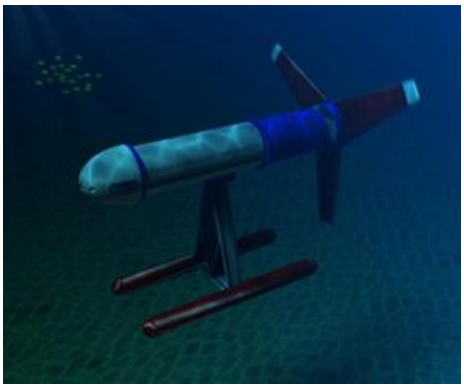
*Contact Information*
*Email: snmrec@fau.edu Phone: 561-297-0956*

*Description*
The Southeast National Marine Renewable Energy Center (SNMREC) at Florida Atlantic University is investigating the challenge of harnessing the power of the Gulf Stream for the generation of base load electricity, a unique contribution to a broadly diversified portfolio of renewable energy for the nation's future. Working in a systematic fashion toward the implementation of a full-scale, at-sea testing facility for industrial prototypes, current work includes developing testing infrastructure and protocols for components and complete generating systems and, in the process, fielding critical environmental monitoring systems so that the nature and sensitivity of the resource itself can be understood and effects of single-system deployments can be examined before commercial-scale arrays are designed. The SNMREC's strategy to accelerate commercial development of Marine & Hydrokinetic (MHK) projects includes technology R&D, testing, environmental research and measurement, policy, regulatory, and economic research, and education and outreach.

**Lab Capabilities**: In-lab technology testing is underway with scaled generator dynamometer capabilities which not only provide a platform to test offshore electrical systems before use, but also simulate offshore grids. Corrosion and bio-fouling facilities allow for investigation of new materials and coatings which will be necessary to ensure the efficacy of long term commercial device array deployments, and a recirculating flume tank is used to determine early-stage proof-of-concept and to test mooring and device dynamics before greater expense and risk is incurred testing offshore at larger scales.

**Open Water Capabilities**: An offshore scaled device test berth (approximately 12 nm offshore of Ft. Lauderdale, FL) is under construction and will be installed for up to 100kW max instantaneous power production and/or 7m rotor diameter turbine testing. This initial group of industrial devices will provide insight into individual device extraction methods, dynamics, and basic system operability. A generic 20kW experimental research turbine is also under construction which will allow for subsystem or component testing and development. In addition, it will provide methodology and support infrastructure available for commercial 1:20 scale prototype device testing.



*Fee Schedule*

Facility use is negotiated on a per-proposal basis and can include analysis and test design/planning services.

## Florida International University

***Wall of Wind Testing Facility (WoW)***

Website: http://wow.fiu.edu

*Contact Information*

Dr. Arindam Gan Chowdhury, Laboratory Director
Email: chowdhur@fiu.edu Phone: (305) 348-0518

Roy Liu-Marques, Testing Services
Email: rliumarq@fiu.edu Phone (305) 348-4392

***Description***
The 12-fan Wall of Wind (WoW) at FIU is the largest and most powerful university research facility of its kind and is capable of simulating a Category 5 hurricane – the highest rating on the Saffir-Simpson Hurricane Wind Scale. For more than a decade, FIU researchers and engineers have planned, designed and redesigned numerous concepts and models that have all contributed to the science and technology behind this state-of-the-art machine.

Due to increased demand for higher wind speed testing, FIU has taken yet another step forward with its 12-fan WoW. The new system is capable of performing controlled and repeatable to-scale testing in flows that replicate the type of CAT 5 level winds seen during Hurricane Andrew – one of the costliest storms in US history. This facility will not only fill the void where most current win-structure experiments fail, it has the potential to be as influential to wind engineering as crash testing is to the automobile industry.

FIU brings together the critical elements of wind testing to achieve comprehensive results for its clients. To do this, an expert team of wind engineers and scientific researchers integrates the unique capabilities of the Wall of Wind and the Titan America Structures Lab with the analytical tools of Computational Fluid Dynamics (CFD) simulation. At the WoW, tests can be described by three categories: 1) non-destructive (aerodynamic), 2) destructive (failure) and 3) wind-driven rain. For the non-destructive tests, a comprehensive instrument inventory is available to capture data of wind-induced forces, moments, strains, pressures, displacements, among others.

*Fee Schedule*
To be determined by the scope of work.

***Advanced Materials and Engineering Research Institute (AMERI)***

*Web Site Link: http://ameri.fiu.edu/home/About.html*

*Contact Information*

Dr. Arvind Agarwal, Director, AMERI and Professor of Materials Engineering
*Email:* agarwala@fiu.edu *Phone:* (305) 348-1701 Fax: (305) 348-1932
Mr. Neal Ricks, Manager, AMERI Email: ricksn@fiu.edu

*Description*

The Advanced Materials Engineering Research Institute (AMERI) provides an open access equipment infrastructure to support materials research and engineering over a broad range of technology and capabilities. The Institute provides analytical instrumentation, materials characterization, and process development laboratories to support faculty and industry in the development and characterization of new materials over the continuum from the nanoscale to bulk materials.

The Analytical Instrumentation Laboratory contains a field emission scanning electron microscope (FESEM), a 200 kev Transmission Electron Microscope (TEM), Atomic Force Microscope (AFM), X-ray diffraction, thermal (DSC, TGA, DMA, dilatometer flush diffusion, and mechanical testing (uniaxial/biaxial Instron, creep). Process Development laboratories for ceramic processing (sol-gel, tape casting, milling), polymer processing, metal processing, and arc melting, thermal processing (air, vacuum, hydrogen, controlled atmosphere furnaces) are available to support faculty and student researchers.

The Institute contains the Motorola Nanofabrication Research Facilities, which is supported by a class 100 clean room and nanofabrication capabilities including e-beam lithography and optical photolithography. Fabrication of nano/micro electromechanical systems (N/MENS) can be accomplished by a combination of nanolithography, reactive ion etching, and thin film deposition by a variety of techniques (e-beam, sputtering, filament evaporation, cvd).

In addition to supporting research within the graduate program in materials science within the Department of Mechanical and Materials Engineering, the Institute supports faculty across all departments (physics, chemistry, geology, biology) in materials based research.

*Fee Schedule:*
Please visit AMERI website *http://ameri.fiu.edu/*

***Plasma Spray Forming Laboratory***

*Web Site Link:* *http://web.eng.fiu.edu/agarwala/laboratories/PlasmaFormingLab.html*

*Contact Information*

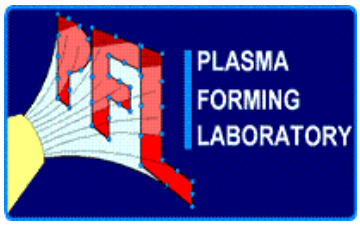
Dr. Arvind Agarwal, Department of Mechanical and Materials Engineering

*Email:* agarwala@fiu.edu *Phone:* (305) 348-1701 Fax: (305) 348-1932

*Description*

This lab makes use of plasma-based techniques to synthesize:

- Near Net Shape Structures by Rapid Prototyping
- Bulk Nanostructured Components
- Advanced Ceramic and Metallic Nanocomposites
- Multilayered Functional Coatings
- Synthesis of Nanostructured Composite Powders
  *Click Here for Demo*




Plasma Spray Forming Laboratory is a 1300 square feet facility. The equipment list is given below:

- Praxair Plasma Spray System
- Plasma Power Source Model PS-1000
- Plasma Control Console Model 3710
- Powder Feeder Model 1264
- Plasma Spray Gun Model SG-100 (internal and external powder injection capability)
- Localized inert shroud creating facility
- Plasma Spray Booth with CNC turntable
- Fanuc S 100 Robot with RF controller
- Three-axis Gantry Robot
- Thermach AT-1200 Powder Feeder, 0-15 RPM
- Accuraspray-g3 Single Head Plasma Inflight Sensor
- Raytek Optical Pyrometer (-10 to 1200C) with integrated software and PC for continuous temperature monitoring
- 4-channel B-Type (0 to 1700C) and K-Type (-200 to 1250C) Thermocouple with OM-CP-QUADTEMP Data Acquisition System and OM-CP-IFC110 Windows Software
- Grit Blaster
- Ultrasonic Cleaning Bath
- Density Measurement Kit
- ER Advanced Ceramics 755RMV Jar Mill
- Sieves and Sieve Shaker
- Work Bench with all machine tools
- Rotating Ball Mills and blenders
- Low Speed and High Speed Diamond Saws
- Positron Adhesion Tester
- Optical Microscope (upto 1600X)
- Electrostatic Spray Facility for Polymer Coating Synthesis

Computational Facilities in Plasma Forming Laboratory:

- 2 Pentium IV, 3.40 GHz, 2 GB RAM desk top computer
- 3 Pentium IV, 2.6 GHz desk top computers
- 1 Pentium IV, 2 GHz notebook computer
- 2 Pentium IV, 3.20 GHz, 3.5 GB RAM desk top computer
- Software in Plasma Forming Laboratory
- CaRIne Crystallography 4.0: For geometric visualizations of interfaces, surfaces, crystals, real lattices in 3D, reciprocal lattices in 3D and 2D and for comprehending stereographic projections and X-ray diffraction patterns.
- FactSage 6.0: A thermochemical software and database package to understand phase diagrams, feasibility of chemical reactions, compel equilibrium in multicomponent, and multiphase systems.
- Hyper Chem 7.5: Modeling software to compute thermodynamic energies based of molecular mechanics and dynamics models for various configurations and crystal geometry.
- SimDrop 3.0 software: For simulating splat formation with thermal and kinetic history as experienced in thermal spraying.

*Fee Schedule:*

Please contact Prof. Agarwal at agarwala@fiu.edu

## Florida State University

***Aeropropulsion, Mechatronics and Energy Building (COMING SOON)***

*Web Site Link:* *http://www.eng.fsu.edu/me/research/ame.html*

*Contact Information*
Dr. Chiang Shih, Chair
*Email:* shih@eng.fsu.edu *Phone:* (850)410-6321 Fax: (850)410-6337

*Description*
This 60,000-square-foot state-of-the-art facility supports advanced research in aerospace and aviation, mechatronics (robotics) and sustainable energy engineering. The Aero-Propulsion, Mechatronics and Energy Building houses laboratories, equipment, offices and other infrastructure necessary to carry out the university's research mission in several key areas seen as crucial to the economic development of the state and nation.

Among the organizations that is housed in this $23 million facility are Florida State's Energy and Sustainability Center (ESE) which features an energy material processing lab, dry room for battery assembly; Institute for Energy Systems, Economics and Sustainability (IESES); the university's Center for Intelligent Systems, Control and Robotics (CISCOR); and the Florida Center for Advanced Aero-Propulsion (FCAAP), a State University System Center of Excellence that is headquartered at FSU.

As its name indicates, the research that take place within the Aero-Propulsion, Mechatronics and Energy Building focuses on three key areas:

- **Aero-propulsion**: The discipline of aero-propulsion deals with transportation systems and other objects that move through air, influencing the design and fabrication of aircraft, spacecraft, automotive transport, and all manner of vehicles in motion. The relevant research areas cover fundamental science topics such as aerodynamics, fluid mechanics, acoustics, thermal physics and turbulence, as well as practical applications such as combustion improvement, active control of flow separation, supersonic jet noise suppression, lift/thrust enhancement and drag reduction.
- **Mechatronics**: The term mechatronics, a combination of mechanics and electronics, was first used in Japan in the 1960s. From a technical perspective, it is the synergistic integration of mechanical, electrical, control and computer systems to create functional products. Mechatronics has become the enabling technology responsible for industrial innovations in numerous economic sectors, including automobiles, alternative energy, aerospace, electronics and defense. The field of mechatronics generally covers topics such as robotics, micro-electro-mechanical-systems (MEMS), intelligent systems, automated guided vehicles and smart materials.
- **Energy**: Seeking new energy resource that are more efficient and cost-effective and that minimize effects on the environment is among the most critical issues that the world will have to grapple with in the 21st century. The Aero-Propulsion, Mechatronics and Energy Building houses research labs for organizations that are focused on exploring reliable, affordable, safe and clean energy technologies, including projects such as Florida State's Off-Grid, Zero-Emission Building; solar-thermal systems; a photo bioreactor for algae growth; and fuel-cell and advanced battery technologies.

*Fee Schedule:*
TBD

***Center for Advanced Power Systems (CAPS)***

*Web Site Link: http://www.caps.fsu.edu/*

Director: Dr. Steiner Dale

*Contact Information*
Steve McClellan
*Email: mcclellan@caps.fsu.edu Phone: (850) 645-2157 Fax: 850-644-7456*

*Description*
The 34,000 sq. ft. CAPS research, development, test and demonstration facility is located in Innovation Park in Tallahassee, Florida. CAPS is a multidisciplinary research center organized to perform basic and applied research to advance the field of power systems technology and provides a secure infrastructure and environment for all types of sensitive research. CAPS emphasis is on application to electric utility, defense, and transportation, as well as, developing an education program to train the next generation of power systems engineers. The research focuses on electric power systems modeling and simulation, power electronics and machines, control systems, thermal management, high temperature superconductor characterization and electrical insulation research. FSU also has The Energy and Sustainability Center which addresses challenging alternative energy issues through innovative solutions for consumers and industry. The Center promotes industry, government, and academia collaboration and participation in critical research activities moving beyond the stage of initial demonstration to commercialization.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Institute for Energy Systems, Economics and Sustainability***

*Web Site Link: http://www.ieses.fsu.edu/*

Director: Dr. David Cartes

*Contact Information*
*Email: sims@ieses.fsu.edu Phone: 850-645-9232*

*Description*
The *Institute* is a public resource to carry out scholarly basic research and analysis in engineering, science, infrastructure, governance and the related social dimensions all designed to further a sustainable energy economy. The *Institute* unites researchers from the disciplines of engineering, natural sciences, law, urban and regional planning, geography, and economics to address sustainability and alternative power issues in the context of global climate change. IESES offers administrative and program support to researchers, partners and collaborators.

Grant Proposal and Administration Support: Proposal development, preparation and submission; grants management; requisition and authorization of payments of purchased items; reconciling ledgers, monthly financial reports, re-budgeting and budget amendments; office space, hiring staff and managing travel.

Program Services: Public and private sector resource identification and partnership development; interdepartmental and state-university wide resource development; promotion of our research partners and collaborators in print, electronic media and through participation in statewide, national and international conferences.

*Fee Schedule:*
Negotiated on a per-proposal basis.

***Future Fuels Institute (COMING SOON)***

*Web Site Link:* *www.Research.fsu.edu/ffi*

Director: Dr. Chang Samuel Hsu

*Contact Information*
Dr. Chang Samuel Hsu
*Email:* hsu@magnet.fsu.edu *Phone:* (850) 644-9861
Address: 1800 E. Paul Dirac Dr. Tallahassee, FL 32310

*Description*
Future Fuels Institute, established at Florida State University is a global center of excellence working with renewable and difficult-to-refine oils for the production of fuels and chemicals. It is supported by sponsoring companies and collaborative entities (instrument companies, universities and research institutes) to develop advance and novel techniques for research applications and problem solving.

*Fee Schedule:*
TBD

***National High Magnetic Field Laboratory (NHMFL)***

*Web Site Link:* *http://www.magnet.fsu.edu/about/* *and* *https://users.magnet.fsu.edu/*
Director: Dr. Greg Boebinger
*Contact Information*
NHMFL has 7 user programs. The contact information for each user program is listed below.

| **Magnet Lab User Facilities** | | | |
|---|---|---|---|
| **Facility** | **Location** | **Director** | **Help With Requests** |
| Advanced MRI and Spectroscopy | Gainesville | Joanna Long | Joanna Long |
| DC Field | Tallahassee | Eric Palm | Eric Palm |
| Electron Magnetic Resonance | Tallahassee | Stephen Hill | Jurek Krzystek<br>Andrew Ozarowski |
| High B/T | Gainesville | Neil Sullivan | Neil Sullivan |
| Ion Cyclotron Resonance | Tallahassee | Alan Marshall | Amy McKenna<br>Colleen Davis |
| Nuclear Magnetic Resonance | Tallahassee | Bill Brey<br>Tim Cross | Riqiang Fu<br>Zhehong Gan<br>Ashley Blue |
| Pulsed Field | Los Alamos | Chuck Mielke, Facility Director<br>Jonathan Betts, Head of the Pulsed Field User Program, Contact person to help with requests | Chuck Mielke<br>Jonathan Betts |

*Description*

The **National High Magnetic Field Laboratory** offers the highest magnetic fields for use by the international community of scientific visitors. Many of the magnets and experimental techniques are highly specialized, yet broadly applicable to research in physics, materials science, chemistry, biochemistry, biology and even biomedicine. Every year over 1100 scientists and engineers use the National High Magnetic Field Lab facilities. Graduate students and Nobel laureates, researchers from academia and the corporate world, they travel from across the globe for a chance to work with the unique instruments and experienced staff at our three locations. First and foremost, the Mag Lab exists for these users and the cutting-edge research they conduct here as they seek to expand the boundaries of scientific knowledge. The Users Hub is dedicated to them and their needs. It is divided into two sections: User Programs and User Services.

User Programs: The Mag Lab has seven user programs located across three campuses. The lab also has a number of important in-house research programs that complement the user programs through development of new techniques and equipment.

*Fee Schedule*

Access to NHMFL magnets is open to all qualified scientists and engineers via a competitive proposal process. If a proposal is approved, facility usage is free of charge provided the researcher intends to publish the results in open literature. Proprietary research done at the Magnet Lab must enter into a cost sharing arrangement. All user facilities accept proposals throughout the year. The online system for submitting a proposal and requesting magnet time is located at https://users.magnet.fsu.edu/.

## Florida Solar Energy Center

http://www.fsec.ucf.edu/en/

***Photovoltaic – Module Testing and Certification***

*Web Site Link:* http://www.fsec.ucf.edu/en/certification-testing/PVmodules/index.htm

*Contact Information*
*Stephen Barkaszi*
*Email: barkaszi@fsec.ucf.edu or pvmodule@fsec.ucf.edu Phone: 321-638-1473*

*Description*
The Florida Solar Energy Center is required by Section 377.705 of the Florida Statutes to develop standards and certify all solar energy equipment manufactured or sold in Florida. To meet the requirements of the Florida Statutes, FSEC has developed a PV Module and PV System Certification program that protects the public interest and advances the use of renewable technologies. The objectives of the program are to:

- Provide Florida residents with reliable, safe and high quality PV system designs.
- Provide a means for consumers to obtain a summary of their certified PV system design including the installer's name, address, telephone number and Florida contractor's license number.
- Provide Florida consumers and/or agency officials with the expected power output of certified PV systems using accurate PV module performance ratings.
- Provide a PV system design approval certificate with a checklist that list the items that require compliance with National Electrical Code. The certificate and checklist can be used by local building officials for both the issuing of permits and the inspection of installed PV systems.

To satisfy these objectives, FSEC has developed a PV Module and System Certification processes. These certification processes are intended to be simple and straightforward.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Photovoltaic Materials Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/pv_mat_lab.htm

*Contact Information*
Neelkanth Dhere
*Email:* dhere@fsec.ucf.edu *Phone:* 321-638-1442

*Description*
Photovoltaic Materials Laboratory performs research in the areas of thin film solar cells for terrestrial & space application; Photoelectrochemical Water Splitting for Hydrogen Generation; High Voltage Bias Testing of Thin Film PV Modules; and Tribological coatings. The research details are given at the web site.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Solar Thermal Collection Test Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/certification-testing/STcollectors/index.htm

*Contact Information*
*Email:* thermal@fsec.ucf.edu *Phone:* 321-638-1426

*Description*
The FSEC testing program evaluates solar collectors to determine that they meet the certification standards. Testing and certification of both glazed (hot water) and unglazed (pool heating) collectors is a State of Florida-mandated activity. All collectors and systems sold or manufactured in Florida must be certified by FSEC. The details are given at the web site.

*Fee Schedule*
*Testing fee information can be found at: http://www.fsec.ucf.edu/en/publications/pdf/FSEC_Thermal_Test_Fees_2010_Final_17-May-10.pdf*

***Solar Thermal Systems Test Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/certification-testing/STsystems/index.htm

*Contact Information*
*Email:* thermal@fsec.ucf.edu *Phone:* 321-638-1426

*Description*
The FSEC testing program evaluates ICS (Batch solar water heater) and Thermosiphon systems to determine that they meet the certification standards. The Florida Solar Energy Center (FSEC) is responsible for approving all solar water heaters that are sold or manufactured in Florida. The system approval process was mandated by the Florida State Legislature as part of the Solar Energy Standards Act which required that beginning in 1980 all solar energy systems manufactured or sold in Florida meet standards established by FSEC.

The FSEC standards program has been designed to meet the intent of the legislation while also helping the Florida solar industry to develop quality products, aiding building departments in product approval, and instilling confidence in the consumer who chooses to use solar energy in their residence or business. The details are given at the web site.

*Fee Schedule*
Testing fee information can be found at: http://www.fsec.ucf.edu/en/publications/pdf/FSEC_Thermal_Test_Fees_2010_Final_17-May-10.pdf

***Advanced Energy Research Division (AERD) Labs***

*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/hydrogen_fuelcell_lab.htm

Director: Dr. Ali Raissi

*Contact Information*
Dr. Ali Raissi
*Email:* ali@fsec.ucf.edu *Phone:* 321-638-1407

*Description*

Research activities of the FSEC's Advanced Energy Research Division (AERD) are carried out within three fully equipped laboratories (Class B & C – total of 5,000 square foot), and a 1,500 square foot field facility. These laboratories are:

- Alternative Fuel Lab
- Instrumentation Lab
- Fuel Cell Lab

These laboratories and the field facility meet and/or exceed the design and safety requirements imposed by the Florida State Fire Marshall and all the state and federal codes (NFPA 45 Standard on Fire Protection for Laboratories Using Chemicals, NFPA 50A Standard for Gaseous Hydrogen Systems at Consumer Sites, and NFPA 70 National Electric Code) for handling large volumes of hazardous and flammable gases and chemicals including both gaseous and liquid hydrogen. The field facility is fitted with explosion proof electrical systems and meets NFPA 50B Code "Liquefied Hydrogen Systems at Consumer Sites."

AERD labs are equipped with the state-of-the-art analytical instruments including: a JEOL GCmate-II GC/MS-MS for determining elemental compositions, unit's special features include: linked-scan MS/MS for structure determination, high-resolution selected ion monitoring (SIM), programmable temperature heated direct insertion probe with separate ion source chambers for EI and CI operation and for analysis of volatile solid samples, and link to NIST library search routines; two SRI 8810 gas chromatographs (GC) equipped with TCD, FID & FPD; a Shimadzu GC equipped with TCD & FID; a Perkin-Elmer (PE) GC equipped with TCD & FPD; a Varian refinery GC; a Buck Scientific GC; and a Dionex DX 500 Gradient Ion Chromatograph/ HPLC with AD20 absorbance detector; an Altamira AMI 200 catalyst characterization instrument capable of TPD-MS, TPR-MS, TPO-MS, and TPRx-MS; a Perkin-Elmer Spectrum 100 FTIR with Universal ATR Accessory (UATR); an Autoclave Engineers BTRS-jr lab reactor system; a CDS Analytical pyroprobe 1000 with three modes of operation; a PE Diamond Differential Scanning Calorimeter (DSC) equipped with Hyper DSCTM technology for automated unattended operation over the temperature range of -170°C to 300°C and fast heating and cooling rates (as high as 500°C/min); a PE Diamond TG/DTA-MS system equipped with ThermoStar bench-top quadrupole MS with closed ion source for mass range of 1-300 amu and a detection limit of less than 1 ppm.

Labs also house a Shimadzu UV/VIS scanning spectrophotometer; a Hach UV/VIS; an IR spectrophotometer; a PMI BET surface area analyzer; several PEM electrolyzers, three complete, fully automated (operating from LabView environment) thermovolumetric analyzers (ranging in size from 160 mL to 2 L); a Hiden Isochema HTP1-V volumetric sorption analyzer capable of operating at 100 bar and 500$^{o}$C; a Hitachi TM3000 tabletop SEM; Ranson Digital Sonifier 450 W sonicator Model No. 450, EDP: 100-214-239; two 1 kW Newport solar simulators Model No. 91190-1000 (equipped with AM1.5 global, AM1.0 & 0.0 filters); two glove-boxes equipped with purification systems for reducing moisture and oxygen to the ppm level and vacuum systems with Schlenk glassware for handling materials under inert conditions; two Carver hot presses; a SPEX CertiPrep 8000M high-energy ball mill; and two Retsch ball mill units; two PARSTAT® 2273 potentiostats controlled by the PowerSuite software (Princeton Applied Research); complete electrochemical test equipment; assortment of computerized data acquisition and control systems; an induction furnace and a collection of ovens, autoclaves, AC and DC power supplies and assortment of pumps and balances.

The fuel cell lab is equipped with devices ranging from that needed for the MEA fabrication to complete in-situ electrochemical diagnostic systems. There are four Scribner Associates test stands, several potentiostats and frequency response analyzers, and a one of a kind MEA Durability Test System, (MEADS) that allows long term testing of eight fuel cells, simultaneously. The in-situ electrochemical diagnostics facility includes a test stand, a load box and a frequency response analyzer – constituting a complete FC test station capable of using either 5 or 25 $cm^2$ single cell hardware. AERD's field facility houses the pilot-scale biomass gasification/Fischer-Tropsch synthesis plant.

AERD's computational and modeling capabilities include: Gaussian '03, GaussView™, CAChe, AspenPlus™ CPS, FACTSage, FLUENT CFD platform and GE's GateCycle™ program.

The list of equipment in each lab is given below.

| **Alternative Fuel Lab (AERD Lab Room 101)** | **Instrumentation Lab (AERD Lab Room 103)** |
|---|---|
| SRI 8610 C GC and | Retsch Ball Mill (2) |
| SRI 8610 A GC | Shimadzu UV-VIS |
| Denton Vacuum System | PE Diamond DSC |
| Ziess Microscope | Hach UV-VIS |
| Minolta CR-10 Colorimeter | Altamira AMI 200 TPD-MS |
| Varian GC-TCD/FID | PE Diamond TG/DTA-MS |
| PE Sulfur GC-FID/FPD | PMI BET |
| Shimadzu Refinery GC-FID | Dionex DX-500 IC-HPLC |
| Buck Scientific GC | Jeol GCmate-II GC-MS/MS |
| Varian 3400 GC-TCD/FID | PE Spectrum 100 FTIR |
| Chemiluminescence Analyzer | Hiden Isochema HTP1-V Volumetric Sorption Analyzer |
| Environics Multi-Gas Calibrator | Varian GC-MS (ion selective) |
| Glove box (2) | CDS Analytical Pyro-probe 1000 |
| Spex Certi Prep Ball Mill | Autoclave Engineers BTRS-jr Lab Reactor |
| Fluent CFD Platform | Potentiostat Parstat 2273 |
| **Fuel Cell Lab (AERD Lab Room 109)** | Newport Solar Simulator (2) |
| 8-Channel FC MEA Durability Test System (MEADS) | Cryocooler & Accessories |
| Potentiostat (2) | Carver hot press (2) |
| Scribner Associates 850C Fuel Cell Test Stand (4) | Electrolyzers (3) |
| Teledyne Medusa | Ranson Digital Sonifier 450 W Model 450 |
| | MEA Prep Unit |
| | Hitachi TM3000 Tabletop SEM |

*Fee Schedule*
A mini proposal is requested from each applicant describing the service(s) needed. The fee will be determined based on the service needs. The proposal will be submitted to Dr. Ali Raissi at: ali@fsec.ucf.edu.

***Manufactured House Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/mhl.htm

Director: Rob Vieira

*Contact Information*
Rob Vieira
*Email:* robin@fsec.ucf.edu *Phone:* 321-638-1404

*Description*
The Manufactured Housing Laboratory (MH Lab) is a 1600 ft2 ENERGY STAR® manufactured home that will serve as a training center and building science laboratory.

It features two completely separate space conditioning systems, an in-the-attic duct system with a package unit heat pump, and a floor-mounted duct system with a split system heat pump. An interior duct system was also recently installed. The MH Lab is a real-world training and research center used to conduct system-level residential research and to demonstrate building problems and solutions. Researchers and students investigate topics such as airflow and pressure measurement, moisture control, methods of duct leakage testing and repair, ventilation strategies, and analysis and correction of indoor air quality source control problems.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Building Science Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/bldg_sci_lab.htm

Director: Rob Vieira

*Contact Information*
Rob Vieira
*Email:* robin@fsec.ucf.edu *Phone:* 321-638-1404

*Description*

The Building Science Lab is unique in its ability to vary the building airtightness, air leakage and thermal boundary parameters in a controlled fashion and evaluate their interactions with both conventional and advanced HVAC systems. Its purpose is to advance the understanding of building science and proper application of HVAC equipment through research and training. The design of this building is based upon recent developments in building science and has the flexibility to address a wide range of issues. It has the ability to mechanically adjust infiltration rates with custom ventilation fans and it also has a modular wall on the west façade for testing solar heat gain. The Building Science Lab is ideally suited to hands-on building science and HVAC systems training. In addition to housing the training, it serves as a live training model. Trainees see in real time the pressure and air flow response of the building as air flow rates, barriers to flow and pathways to flow are changed at the turn of a switch.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Flexible Roof Facility***
*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/frf.htm

Director: Rob Vieira
*Contact Information*
Rob Vieira
*Email:* robin@fsec.ucf.edu *Phone:* 321-638-1404

*Description*

The Flexible Roof Facility (FRF) is an FSEC Buildings Research division test facility in Cocoa, Florida designed to compare the performance of different residential roofing systems. The facility can evaluate five roofing systems at a time against a control roof with a vented attic and dark shingles. The intent of the testing is to evaluate how roofing systems impact summer residential cooling energy use and peak demand. To make these evaluations, each of the 6 separate attic "cells" is heavily instrumented with sensors measuring temperatures of the shingles, roof deck, attic space and ceiling plane. Data are collected throughout the summer each year and then analyzed. The details are given at the web site.

Reserving a Test Cell: While FSEC uses several cells each year for ongoing research, there are typically two or more cells available for use by outside companies or organizations desiring to have a roof system or product tested. For more information on reserving an FRF test cell, click here to contact Danny Parker.

*Fee Schedule*

Our standard research contract for one cell of the Flexible Roof Facility is $14,973. This price includes use of the cell, standard instrumentation and our standard report which will (at a minimum) compare the cell to a reference vented attic with a dark shingle roof and a reference vented attic with a white metal roof (see the 2003 FRF report at http://fsec.ucf.edu/en/publications/pdf/FSEC-CR-1475-04.pdf as an example). Tear off of the existing roof and installation of the new roof is not included in this price. Tear off and installation are the responsibility of the individual, organization or company reserving the test cell(s), and all roof work must be done by a licensed and insured contractor.

***Flexible Residential Test Structures***

*Web Site Link:* http://blog.floridaenergycenter.org/echronicle/tag/flexible-residential-test-facility/

Director: Rob Vieira

*Contact Information*

Rob Vieira

*Email:* robin@fsec.ucf.edu *Phone:* 321-638-1404

*Description*

Construction of the flexible residential test structures was completed in December 2011. The purpose of the two side-by-side test houses is to conduct side-by-side testing of varying residential energy efficiency strategies and/or systems and to have a base house in which to compare the measured results. A preliminary measurement of temperature during passive load conditions indicates the buildings track each other well. A number of DOE staff toured the facility when they visited the Florida Solar Energy Center in January 2011, after FSEC had been awarded a four year research contract in which the facility will play a significant role.

Completed flexible residential test structures on FSEC campus.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Climate-Controlled A/C Laboratory***

*Web Site Link:* http://www.fsec.ucf.edu/en/about/facilities/cc_ac_lab.htm

Director: Rob Vieira

*Contact Information*
Rob Vieira
*Email:* robin@fsec.ucf.edu *Phone:* 321-638-1404

*Description*
FSEC's on-site environmental facilities are capable of testing air-conditioners and heat pumps with cooling/heating capacities up to 3.5 tons. The facility *(photo right)* is made up of an indoor chamber, an outdoor chamber, and a computerized control room. The environmental chamber's indoor and outdoor conditions are maintained automatically with a laboratory grade data acquisition and control system. Full automation allows complete flexibility for parametric testing. The control room houses a data acquisition and control system and is responsible for monitoring instrumentation output, controlling psychrometric chamber temperature and humidity conditions, and controlling compressor, indoor fan, and outdoor fan speeds.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

**University of Central Florida**

***Materials Characterization Facility (MCF) - Advanced Materials Processing and Analysis Center (AMPAC)***

*Web Site Link: http://www.ampac.ucf.edu/facilities/MCF.php*
*Available equipment techniques are listed at the web site.*

Director: Dr. Sudipta Seal

*Contact Information*
*Email: ampacmcf@ucf.edu Phone: 407-882-1500 Fax: 407-882-1502*
*Address: 12443 Research Parkway, Suite 304, Orlando, FL 32826*

Description
The Materials Characterization Facility (MCF) is dedicated to providing researchers and industrial partners a place to perform characterization and analysis to advance research; classroom education and hands-on training in the use of state-of-the-art characterization equipment; user-friendly support services with expert advice and data interpretation; and to enhance competitiveness of industrial partners and boost economic development of the Central Florida region.

MCF occupies about 7,000 sq. ft. of space and is supported by 3 full-time research engineers and a full-time facilities coordinator. Collaboration with other Universities is encouraged.

AMPAC is an interdisciplinary research and education center for materials science and engineering located at the University of Central Florida (UCF). Our work intersects with research areas including biology, medicine, energy, microelectronics, and nanotechnology. Materials science and engineering (MSE) is an interdisciplinary field that impacts almost every application area. Finding or developing a material with the right properties, or with affordable fabrication costs, or appropriately characterizing the material composition and/or structure to enable development of specific material properties, is often the limiting factor and enabling technology in most applications.

AMPAC faculty, affiliated faculty, and graduate students conduct in-depth research in materials science and engineering to address the requirements of several applications including energy, microelectronics, nanotechnology, green energy, life sciences, optics, aerospace, and bioengineering with the goals of enhancing scientific understanding and promoting industrial development and economic growth. With research expenditures totaling more than $3.6M per year, the UCF materials science and engineering research efforts are supported by a number of government agencies, including national laboratories, as well as private industries. The nine AMPAC faculty and 71 students alone author over 80 refereed publications and 100 presentations per year at national and international conferences.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Advanced Microfabrication Facility - Advanced Materials Processing and Analysis Center (AMPAC)***

*Web Site Link:* http://www.ampac.ucf.edu/facilities/AMF.php
*Available equipment techniques are listed at the web site*
Director: Dr. Sudipta Seal
*Contact Information*
*Karen Glidewell*
*Email: Karen.Glidewell@ucf.edu Phone: 407-882-1500*

*Description*
The Advanced Microfabrication Facility (AMF) is a multi-user cleanroom facility dedicated to provide university researchers and industrial and government partners the capabilities to perform cutting edge research, and training and education of students in the use of the available equipment for fabrication and testing of microdevices. AMF consists of a 600 sq. ft. class 100 facility and a 2500 sq. ft. class 1000 facility.

The AMF is supported by a research associate, a graduate student assistant, and a facilities coordinator to assist all users in use of and training on the AMF equipment. Collaboration of UCF researchers with other universities, government agencies, and industrial companies is strongly encouraged.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***NanoScience Technology Center (NSTC)***

*Web Site Link:* *http://www.nanoscience.ucf.edu/index.php* and
*http://www.nanoscience.ucf.edu/equipment/*

Director: Dr. Sudipta Seal

*Contact Information*
*Email: nano@ucf.edu Phone: 407-882-1578 Fax: 407-882-2819*
*Address: 12424 Research Parkway Suite 400 Orlando, FL 32826 (Research Pavilion 4th Floor)*

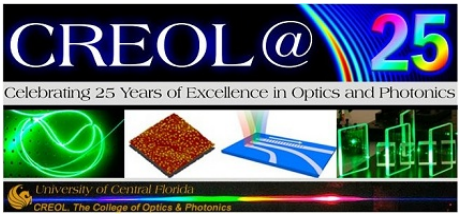
*Description*

The NanoScience Technology Center (NSTC) was formed in 2005. The NanoScience Technology Center occupies the entire 4th floor of the Research Pavilion building in UCF's Research Park. It contains over 20,000 sq. ft. of advanced chemical, materials development, and biological laboratories in support of a wide range of multidisciplinary research projects.

The common goal and purpose of this center is to strongly promote interdisciplinary research. Research opportunities in areas as diverse as Green Energy, Functional Nanomaterials, Computer/Mathematical Simulations, Assistive Robotics, Quantum Dynamics, Bioimaging, NanoElectronics & NanoPhysics, Integrated Device Development and Advanced Materials have been explored.
The equipment list is given at: *http://www.nanoscience.ucf.edu/equipment/*

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***CREOL – The College of Optics and Photonics***
*Web Site Link:* *http://www.creol.ucf.edu/Research/Facilities.aspx*
Director: Dr. Bahaa Saleh, Dean




*Contact Information*
*Dr. Bahaa Saleh, Dean*
*Email: besaleh@creol.ucf.edu Phone: 407-823-6800*

*Description*

The research activities of College of Optics and Photonics (COP) faculty span the spectrum from basic science and physics of optics, photonics, and related phenomena, to prototype development and demonstration of feasibility in applications. The faculty vigorously pursues joint research projects with industry, academia, and government laboratories. The main facilities of the COP are housed in a state-of-the-art 96,000 sq. ft. building dedicated to optics and photonics research and education. The list of laboratories in this facility is given at the web site.

*Fee Schedule:*

Facility use is negotiated on a per-proposal basis.

## University of Florida

***Florida Institute for Sustainable Energy - Energy Tech Incubator***

*Web Site Link:* *http://www.energy.ufl.edu/index.php?src=technology_incubator*

*Contact Information*
Dr. Luisa **Amelia** Dempere, *Director*
Major Analytical Instrumentation Center (MAIC) & FISE Technology Incubator
Associate Engineer, Research Service Centers, College of Engineering, University of Florida
*Email:* *ademp@mse.ufl.edu* *Phone:* (352) 392-6985 *Fax: (352) 392-0390*

*Description*
Florida Institute for Sustainable Energy (FISE) at UF brings together the broad research capabilities of UF under one umbrella to develop energy efficient technologies, sustainable practices, policy analyses, and provide energy education to assist the government, utility and energy companies. FISE Energy Technology Incubator is the commercialization arm of the institute. It is established with $4.5 million Center of Excellence award from the State of Florida. This energy technology incubator is used to transition energy research to commercial products and processes. The FISE Energy Technology Incubator includes a Prototype Development & Demonstration Laboratory and Biofuel Pilot Plant.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***UF Biofuel Pilot Plant, Gainesville FL***
*Web Site Link:* *http://fcrc.ifas.ufl.edu/pilotplant/*

*Contact Information*
*Dr. Shelia Gomez*
*Email:* *spgomez@ufl.edu* *Phone: (352) 392-0237 Fax: (352)392-5922*
*Address: Bldg. 981 Museum Road, Gainesville FL, 32611-0700*

*Description*
The Biofuel Pilot Plant serves as a platform to accelerate successful commercialization of bioethanol. The pilot plant is used to develop and improve production processes, test production feasibility from various plant substrates and residues available in Florida, and demonstrate all unit operations needed for commercialization. It is a 4,000 sqft facility with state of the art equipment including biomass processing equipment, biomass reactor, fermenters, centrifuge, distillation column, testing equipment.

The pilot plant is a testimony of the more than two decades of research efforts done at the Florida Center for Renewable Chemicals and Fuels to convert biomass such as bagasse, forestry and wood wastes, and other organic materials to ethanol. The technology used in the conversion process uses genetically engineered E. coli bacteria that target the sugars in the cellulosic component of the biomass materials.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***UF Biofuel Pilot Plant, Perry FL (COMING SOON)***

*Web Site Link: Coming Soon*

*Contact Information*
*Dr. Shelia Gomez*
*Email: spgomez@ufl.edu Phone: (352) 392-0237 Fax: (352)392-5922*

State funded ($20M) Research/Demonstration pilot plant to provide a platform for research and improvements and for design engineering to construct full scale plants of 20-50 million gallons of ethanol per year is in construction phase in Perry FL. Energy crops, agricultural residues and forestry residues, and municipal green waste could support over 200 such plants in Florida, creating employment, improving the environment, and ensuring that Florida is doing its part to promote energy independence.

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Nanoscience Institute for Medical & Engineering Technologies (NIMET) and Nanoscale Research Facility (NRF)***

*Web Site Link: http://nimet.ufl.edu/ and http://nrf.aux.eng.ufl.edu/*

*Contact Information*

*NIMET: David Arnold (darnold@ufl.edu) Phone: (352) 392-4931*

*NRF: Brent Gila (bgila@ufl.edu) Phone: (352) 273 2245*

*Address: UF-NIMET 100 Center Drive, Gainesville, FL 32611*

*Description*

Nanoscience Institute for Medical and Engineering Technologies (NIMET) and the Nanoscale Research Facility (NRF) at UF provide support for major research center initiatives in the areas of nano-and-micro-scale science and technology (NMS&T). Facility is open to all faculty, staff, and collaborators. It provides state-of-the-art equipment for research, education, nanofabrication, and prototype development of nano-materials, MEMS and NEMS devices, and sensors in NMS&T.

NIMET was created to focus and coordinate research and educational activities at the University of Florida in the fields of nanoscale science and nanotechnology (NS&T). Research in nanoscience and related fields at UF has developed in several colleges and now involves the research of over eighty faculty and staff in physics, chemistry, biology, medicine, engineering, and materials science.

The NRF is a two story building with seven functional areas:

- A Class 100-1000 cleanroom facility for nanofabrication and bio processing
- Advanced electron, optical, and surface imaging laboratories
- Core research laboratories for synthesis, processing, characterization, assembly, and testing of nanoscale materials, devices and sensors
- General laboratory space for interdisciplinary research collaborations
- Offices for faculty, staff and users
- Interactive spaces for conferences, informal gatherings, user administration, and surroundings conducive to multidisciplinary interactions
- Building support and utility handling areas.

The NRF resource and equipment list is given at : https://nrf.aux.eng.ufl.edu/resources/default.asp

*Fee Schedule:*
Facility use is negotiated on a per-proposal basis.

***Wayne K. and Lyla L. Masur HVAC Laboratory***

*Web Site Link: http://plaza.ufl.edu/sasherif/HVACLaboratory.htm*

*Contact Information*
*Email: sasherif@ufl.edu Phone: (352) 392-7821 Fax (352) 392-1071*
Dr. S.A. Sherif, Professor of Mechanical and Aerospace Engineering,
Founding Director Wayne K. and Lyla L. Masur HVAC Laboratory,
Director Industrial Assessment Center,
Co-Director Southeastern Center for Industrial Energy Intensity Reduction (SECIEIR)
Department of Mechanical and Aerospace Engineering,
University of Florida,
232 MAE Bldg. B, P.O. Box 116300,
Gainesville, Florida 32611-6300, U.S.A.
*http://www.mae.ufl.edu/facultylist/ShowData.php?ID=57*

*Description*

The Wayne K. and Lyla L. Masur HVAC Laboratory was inaugurated in February 1995 in a ceremony attended by dignitaries from the University of Florida and the local, regional, and national American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) community. The Laboratory was founded by Dr. S.A.Sherif, Professor of Mechanical and Aerospace Engineering, employing a significant cash donation from the Masur family. Wayne Masur is a successful alumnus of the Mechanical Engineering Department at UF. The Laboratory serves both an instructional and a research mission. Among its research capabilities is a unique experimental facility designed to study frost and ice formation on industrial freezer coils under ice foggy conditions. The Laboratory also includes an air-conditioning demonstration facility, a cooling tower simulator, an air-water heat pump system, and a chilled-water system with an artificial load simulator. Currently there is an effort to install a system with multi-air handling units and variable flow control capability for air conditioning applications. Most recently, experimental research was completed for the US Air Force to develop deployable heat pump units employing rotary vane expanders. Over 50 different investigations have been conducted in the Laboratory and hundreds of students have taken part in different instructional and research activities since its creation in 1995. The Laboratory is housed in Room 110 of the Mechanical and Aerospace Engineering Building B on Gayle Lemerand Drive. For laboratory tours contact Dr. Sherif at (352) 392-7821.

*Fee Schedule:*
Negotiated on a case-by-case basis (project based).

***Major Analytical Instrumentation Center***

*Web Site Link:* *https://maic.aux.eng.ufl.edu/about.asp*

*Contact Information*
Dr. Luisa **Amelia** Dempere, *Director*
Major Analytical Instrumentation Center (MAIC) & FISE Technology Incubator
Associate Engineer, Research Service Centers, College of Engineering, University of Florida

*Email:* *ademp@mse.ufl.edu* *Phone:* (352) 392-6985 *Fax: (352) 392-0390*

*Description*
The Major Analytical Instrumentation Center (MAIC) is a materials characterization and analysis facility established to provide analytical support for Florida's scientific and engineering community in meeting the challenge of technology development. MAIC is a user oriented facility that provides service to the university system and the industrial & commercial community.

The equipment list includes Scanning Electron Microscope, Auger Spectroscopy, Electron Probe Microanalysis, Direct Write (nScrypt), Electron Probe Microanalysis, ESCA/XPS, Focused Ion Beam, Mass Spectrometer, X-Ray Diffraction, Screen Printer, Spin Coater, Surface Metrology, Tape Caster, furnaces, wire bonder, viscometer, and Potentiostat & FRA. The complete list is given at https://maic.aux.eng.ufl.edu/resources/default.asp.

MAIC offers Membership Program that is intended to provide a more complete and efficient service to industrial and commercial users of the facilities at the MAIC. This program allows companies and industry to obtain preferred use-rates, priority in use of MAIC facilities, data analysis and interpretation, priority/lower rates or free registration for MAIC short courses and workshops, instrumentation appointments through the internet, access to remote operation of MAIC electron microscopes, current information regarding MAIC activities, new services, instrumentation and techniques, the MAIC Newsletter, and recognition as a MAIC affiliate in MAIC publications, brochures, and presentations.

*Fee Schedule:*
The facility user rates are posted at https://maic.aux.eng.ufl.edu/exsetup.asp

***Particle Engineering Research Center (PERC)***

*Web Site Link: http://perc.ufl.edu/sc/about.asp*

*Contact Information*
Gary Scheiffele *at 352-846-1733*
*Kevin Powers at 352-846-3554*
*Email: percsc@perc.ufl.edu*
*Reach PERC by filling out the Inquiry Form at: https://perc.ufl.edu/ccb/sc/inquiry.asp?id=new*

*Description*
PERC at UF is an integral part of the Particle Engineering Research Center at the University of Florida. It includes state-of-the-art instrumentation for particle characterization and analysis. The 17,000 square foot space includes six analytical laboratories, two processing labs, and a 5000 square foot testbed with a high bay area, a two-ton crane, a loading dock, compressed air, and other necessities required to conduct pilot scale experiments. The testbed and laboratories house equipment for assisting research groups with routine measurements as well as validation and demonstration of process and product ideas developed by research teams and the PERC's Industrial Partners. The Research & Development Facility creates the centerpiece of a world-class operation in particle science and technology.

*Fee Schedule*
Inquiry form is requested from each applicant describing the service(s) needed. The fee will be determined based on the service needs.

## University of South Florida

***USF Thin Film Pilot Line (COMING SOON)***

*Web Site Link: Not available yet*

*Contact Information*
*Email: TBD* *Phone: TBD*

*Description*

Thin Film Pilot Line at the University of South Florida, Tampa, is a $2M state funded 2500 ft2 facility. It is adjacent to the USF Incubator Building to foster the genesis of university/industry partnerships. The facility will enable the complete fabrication and evaluation of thin film solar modules.

*Fee Schedule*
TBD

**USF Nanotechnology Research and Education Center (NREC)**

*Web Site Link: http://www.nrec.usf.edu/*

*Director: Ashok Kumar*

*Contact Information*
*Robert Warner, Assistant Director*
*Email: tufts@usf.edu* *Phone: 813.974.5274*

*Description*
The Nanotechnology Research and Education Center (NREC) housed in the 15,000 square foot Nanotech I building at the University of South Florida has five laboratories available for user access. A Class 1000, 1800 square foot Cleanroom, Thin Film Lab, Metrology Suite, Electrical Test/Packing Lab, and Wet Chemistry Lab. In addition, there are 4 full-time technical staff and one office staff to run the Nanotech1facility.

**Thin Film Laboratory**

The laboratory contains an aluminum thermal evaporator, a four pocket Ebeam evaporator, a rapid thermal anneal tool, and a multi-chambered sputter tool. Various metals are available in either pellet or sputter target form.

**Metrology Suite**
This suite of rooms contains a FEI TF20 Transmission Electron Microscope with STEM, EDS and Gatan digital imaging options, a Digital Instruments Atomic Force Microscope, a Panalytical XPert Pro Materials Research Diffractometer, a Field Emission Hitachi S800 Scanning Electron Microscope with EDS capabilities, a Hitachi SU-70 Ultra High Resolution Scanning Electron Microscope Schottky FE-SEM with nanolithography capabilities, EDS and Gas Injection, and a FEI Quanta 3D Dual Beam Focused Ion Beam.

Various optical microscopes and material preparation table top tools are also available to support the sample preparation aspect of the major equipment.

**Electrical Test/Package Laboratory**
This laboratory contains Models 6200/6000 Micromanipulator probe stations, a HP 4280A 1 MHz C Meter & C-V Plotter, a HP4145B Semiconductor Parameter Analyzer, a HP 4284A Precision LCR Meter, a HP 4294A Precision Impedance Analyzer a Dektak Profilometer, and a K&S 4123 Wire Bond station.

**Wet Chemistry Laboratory**
This laboratory contains a solvent and an acid/base wet bench to support chemical processes such as nickel and gold electroplating. The lab also contains a MA 1006 Micro Automation wafer dicing saw, a tape mounter, a Buehler saw, wire saw, and polisher for material preparations.

**Device Fabrication Laboratory/Cleanroom**
This laboratory contains equipment to support optical contact lithography, wet chemical cleaning/etching, film thickness/profile measurement, furnace oxide growth, doping, contact anneals, low pressure chemical vapor deposition, plasma dry etching, deep reactive ion etching, plasma enhanced chemical vapor deposition and other more specific research techniques and processes. Photomask fabrication is also available for most designs with features larger than 2 microns.

**Cleanroom Process/Equipment Capability Detail**

- Three Wet benches – Chemically clean samples and substrates; chemically etch films and substrates, general chemical processes. Services: Exhausted bench with deionized water guns and dump rinsers, nitrogen blow guns, process timers, and plenum flush.
- Develop & Spinner Hoods – Develop photoresists, photoresist stripping, general solvent cleaning. Services: Deionized water gun and dump rinser, nitrogen blow guns, and process timers.
- Soft/Hard bake ovens and hot plates
- Karl Suss Masker Aligner – Align mask sets for patterning waters. Capable of handling 2, 3, and 4" wafers. Supports down to 1 micron technology.
- Quintel Mask Aligner
- Two Photoresist Spinners – Laurel Technologies Spinner – capable of spinning fragment samples up to 8" wafers. Integrated Technologies Spinner - Capable of spinning fragment samples up to 6" wafers. For photoresists, spin on dopants, spin on glasses and polymers.
- Mititoyo Ultraplan FS-110 microscope – Long working distance microscope with video still picture capture and onscreen critical dimension measurement capability. Contains bright and dark field, polarized light, Nomarski, and reflected and transmitted illumination capabilities together with extra-long working distance objectives and fraction of a micron resolution.
- Rudolph Ellipsometer – Capable of measuring film thickness and index of refraction on many different types of films.
- Nanospec 210 film thickness tool for patterned structures.
- Veeco Dektak 150 State of the art profilometer with film stress option.
- Sopra Spectroscopic Ellipsometer
- Veeco Wyco D9100 Optical Profilometer
- Alphastep Profilometer – Capable of measuring film or substrate surface features with nanometer resolution.
- BTI Furnaces (Two banks, 8 Tubes) – Four inch wafer capable tubes. Each tube has three heating zones. Computer controlled recipe storage and process controller. Spin on and solid source dopants n and p types, contact anneal, dry and pyrogenic oxidations. LPCVD undoped polysilicon films.

- Plasma Therm 700 – PECVD and Plasma Etcher – Plasma etcher used for ashing, nitride etching, SiC etching. PECVD α-Silicon, $SiO_2$, and $Si_xN_y$ films.
- Four point probe station for measurement of sheet resistivity.
- AMS 100 Deep Reactive Ion Etcher – Capable of high aspect ratio etching of glass, quartz, silicon dioxide, silicon and silicon carbide films and substrates.
- GCA 3600F Pattern Generator capable of producing 5x5 inch chrome on glass photo masks or reticules
- GCA 3696 Photorepeater
- Denton Gold & Chrome thermal evaporator

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

# Florida Institute of Technology

## *Oak Ridge Associated Universities (ORAU)*

*Web Site Link:* *http://www.orau.org/*

*Contact Information*
T. Dwayne McCay, Florida Tech Executive Vice President and Chief Operating Officer, ORAU Councilor at (321) 674-8889
or Monnie E. Champion, ORAU Corporate Secretary, at (865) 576-3306 or (865) 576-3306
or online at www.orau.org.

*Description*

Since 1989, students and faculty of Florida Tech have benefited from its membership in Oak Ridge Associated Universities (ORAU). ORAU is a consortium of 98 colleges and universities, and a contractor for the U.S. Department of Energy (DOE) located in Oak Ridge, Tennessee. ORAU works with its member institutions to help their students and faculty gain access to federal research facilities throughout the country; to keep its members informed about opportunities for fellowship, scholarship and research appointments; and to organize research alliances among its members. Through the Oak Ridge Institute for Science and Education (ORISE), the DOE facility that ORAU operates, undergraduates, graduates and postgraduates, as well as faculty enjoy access to a multitude of opportunities for study and research. Students can participate in programs covering a wide variety of disciplines including business, earth sciences, epidemiology, engineering, physics, geological sciences, pharmacology, ocean sciences, biomedical sciences, nuclear chemistry and mathematics.

Appointment and program length range from one month to four years. A comprehensive listing of these programs and other opportunities, their disciplines and details on locations and benefits, can be found in the ORISE Catalog of Education and Training Programs, which is available at www.orau.gov/orise/educ.htm or by calling either of the contacts below. ORAU's Office of Partnership Development seeks opportunities for partnerships and alliances among ORAU's members, private industry and major federal facilities. Activities include faculty development programs such as the Ralph E. Powe Junior Faculty Enhancement Awards, the Visiting Industrial Scholars Program, consortium research funding initiatives, faculty research and support programs and services to chief research officers.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

## *Institute for Materials Science and Nanotechnology (IMSN)*

*Director: Gordon L. Nelson, Ph.D., Vice President for Academic Affairs and Professor, Chemistry, Interim Director.*

*Contact Information*
*Email:* *nelson@fit.edu* *Phone: (321)674-8480*

*Description*
The IMSN mission is to enhance and expand materials research and outreach at Florida Tech and advance nanotechnology research and outreach by promoting joint multi-investigator research, encouraging interdisciplinary and trans-disciplinary research, coordinating shared faculty infrastructure, recruiting

scholars and students, coordinating presentation of materials- and nanotechnology related activities to external governmental and non-governmental agencies, foundations and industry, and promoting collegiality and cohesiveness within the university in the area of materials and nanotechnology. The 21-institute faculty come from diverse engineering and science disciplines. Current research funding of participating faculty is approximately $4 million, including research, instrumentation and participation in multi-investigator projects.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Institute for Energy Systems (IES)***

*Director: Y.I. Sharaf-Eldeen, Ph.D., P.E., Associate Professor, Mechanical and Aerospace Engineering, and Stephane Bucaille, Ph.D., Assistant Professor, Electrical Engineering, Co-Directors.*

*Contact Information*
*Email: eldeen@fit.edu or sbucaille@fit.edu* *Phone: (321)674-8124 or (321)674-8425*

*Description*
The mission of the IES is to provide an intellectually stimulating environment for faculty and students to conduct funded research in areas of national need. National energy policy identifies these needs to be: (1) increasing domestic energy supplies; (2) increasing America's use of renewable and alternative energy; (3) increasing energy conservation and efficiency; (4) developing a comprehensive delivery system; (5) enhancing national energy security and international relationships; and (6) sustaining the nation's health and environment.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Harris Institute for Assured Information (HIAI)***

*Director: Richard A. Ford, Ph.D., Harris Professor for Computer Science in Assured Information, Director.*

*Contact Information*
*Email: rford@cs.fit.edu* *Phone: (321)674-8590*

*Description*
The mission of the Harris Institute for Assured Information is to promote interdisciplinary approaches to computer security and trustworthy computing through education, research and outreach by providing a single point of contact for students, faculty, funding agencies and businesses, and by crossing traditional academic disciplines to promote innovation. Information assurance is the discipline dedicated to providing users with trustworthy data. As such, the institute focuses on new technologies for protecting people and organizations from vulnerabilities that can lead to theft of information, malicious code infection or data destruction.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Institute for Research on Global Climate Change***

*Director: Robert Van Woesik, Ph.D., Professor, Biological Sciences*

*Contact Information*
*Email: rvw@fit.edu* *Phone: (321)674-7475*

*Description*
Over the next century, the Earth's average surface temperature is predicted to rise above temperatures that have not been experienced for over 400,000 years. Such a change in climate will consequently increase the risk of drought, erratic weather, sea-level rise, ocean warming and wildlife diseases. The mission of the institute is to: (1) foster climate-change research that will lead to improved decision-making, from local to international levels; (2) provide world-class research opportunities for undergraduate and graduate researchers; and (3) promote interdisciplinary collaborations leading to new understandings of climate change and adaptation. Since the end of 2009 when the institute was initiated, researchers have published over 60 scholarly articles on climate change in international journals.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Center for Remote Sensing (CRS)***

*Director: Charles R. Bostater Jr., Ph.D., Associate Professor, Environmental Sciences and Physical Oceanography*

*Contact Information*
*Email: bostater@fit.edu* *Phone: (321)674-7113 or (321)674-7278*

*Description*
The center's purpose is to encourage excellence in the development and application of remote sensing science and technology. It is organized as a collaborative center among and between faculty within the College of Engineering, College of Science and College of Aeronautics. Under the authority of the Space Grant Act of 1988, Florida Tech is a member of the Southeastern Space Consortium and the Florida Space Grant Colleges Consortium. The center has consulted and provided services to defense contractors, NASA centers and contractors, the Department of Energy and its subcontractors, state of Florida water management agencies, the Department of State and U.S. Department of Education, and is affiliated with foreign institutions and organizations. Facilities for remote sensing teaching and research include the ERDAS Image Analysis System, Evans Library, the Geographical Information Systems Laboratory, the Marine and Environmental Optics Laboratory and the Synoptic Meteorological Laboratory. Various laboratories and facilities in academic and research computing; computer science; aerospace, computer, electrical and mechanical engineering; physics and space sciences; and space systems are also available. Field studies can be conducted through the College of Aeronautics' fleet of aircraft. The university operates several small boats and charters a well-equipped vessel for offshore, estuarine and river work. Center faculty offer a wide variety of courses at the graduate and undergraduate level, including environmental satellite systems and data, hydroacoustics, digital image processing, and environmental optics for remote sensing.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***National Center for Hydrogen Research (NCHR)***

*Web Site Link:* *http://research.fit.edu/nhc/*

Director: *Mary H. McCay, Ph.D., Research Professor, Mechanical and Aerospace Engineering*

*Contact Information*
*Email:* *mmccay@fit.edu* *Phone:* 321- 674-8803

*Description*
The NCHR was established with funding from NASA to perform research and development concerning the application of hydrogen as a fuel for airborne platforms. It is currently pursuing the development of an interdisciplinary hydrogen and fuel cell technology academic program under the sponsorship of Department of Energy (DOE). The objectives of this program are to develop undergraduate modules, enquiry-based laboratory experiments and a graduate area of specialization academic program that will enable the growth of research and development in the arena of hydrogen and fuel cell technology. Faculty associated with the center are currently conducting research in computational modeling of fuel cells, fiber-optic sensors suitable for safety applications and systems monitoring, hydrogen storage mediums, the interaction of hydrogen with materials and hydrogen purification techniques.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Collaborative International Research Centre for Universal Access (CIRCUA)***

*Web Site Link:* *http://circua.fit.edu/*

*Director: Gisela Susanne Bahr, Ph.D., Associate Professor, Industrial/ Organizational Psychology, Executive Head*

*Contact Information*
*Email:* *gbahr@fit.edu* *Phone: (321)674-7613*

*Description*
The Collaborative International Research Centre for Universal Access (CIRCUA) is an international research center with worldwide membership that promotes universal access and e-inclusion. CIRCUA's motto calls for removing barriers to modern technology in the information society. CIRCUA's objectives are: (1) advancing research and development for an inclusive information society; (2) leading the systematic growth of interaction science by drawing on expertise in cognitive and computer sciences; (3) creating global partnerships that result in international collaborations and products; and (4) networking and fusing multidisciplinary expertise globally. CIRCUA's international center head is Florida Tech's Dr. Bahr. CIRCUA's European center head is Dr. Ray Adams, University of Middlesex, London, and Churchill College, Cambridge, both in England.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Center for High Resolution Microscopy and Imaging (CHRMI)***

Director: *Michael Grace, Ph.D., Associate Dean, College of Science and Associate Professor, Biological Sciences, Director.*

*Contact Information*
*Email: mgrace@fit.edu* *Phone: (321)674-8194*

*Description*
The Center for High Resolution Microscopy and Imaging is a multidisciplinary laboratory providing state-of-the art light and fluorescence microscopy, transmission electron microscopy, scanning electron microscopy, scanning probe microscopy and x-ray microanalysis of natural and artificial materials. The CHRMI contains necessary equipment and expertise to prepare almost any kind of sample for microscopic evaluation, to image sample surfaces and cross-sections at very high resolutions and to analyze elemental compositions of materials. Support staff maintains instrumentation and trains users in sample preparation and analyses of microstructure and microchemistry. Image collection is both film-based and digital. Support platforms provide detailed image analysis capabilities.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Center for Ferrate Excellence (COFE)***

*Web Site Link: http://research.fit.edu/cofe/*

Director: *Virender K. Sharma, Ph.D., Professor, Chemistry*

*Contact Information*
*Email: vsharma@fit.edu* *Phone: (321)674-7310*

*Description*
In recent years, the higher oxidation states of iron (ferrates) have become of interest because they can safely and efficiently clean polluted water without harmful byproducts. The ferrate compound may be used as an oxidant, disinfectant, coagulant and for industrial green purposes. Ferrate has thus become advantageous over other commonly used chemicals in the wastewater industry. Applications of ferrate include treatment of common pollutants and emerging contaminants such as arsenic, estrogens and pharmaceuticals. The ferrate compound has also attracted interest for applications in green chemistry because the byproducts of its use, iron oxides, are environmentally friendly. Recently, the technology developed at Florida Tech has made a breakthrough in synthesizing liquid ferrate, which, unlike competing products, is stable for at least two weeks. This liquid product will open new opportunities for novel applications of ferrate. The intellectual property on the ferrate technology is being developed for licensing to bring it to the marketplace. This center offers technology, production and application as well as on-site engineering, testing and analysis.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Center for Corrosion and Biofouling Control (CCBC)***

*Web Site Link: http://research.fit.edu/ccbc/*

*Director: Geoffrey W.J. Swain, Ph.D., Professor, Oceanography and Ocean Engineering*

*Contact Information*
*Email: swain@fit.edu* *Phone: (321)674-7129*

*Description*
The mission of the center is to understand the processes of biofouling and corrosion, and to develop and apply innovative solutions for control and prevention. Its objectives are to advance the state-of-the-art in corrosion and biofouling control; to establish mutually beneficial collaborative relationships with local, national and international university, government and industrial partners; and to provide graduate and undergraduate students a world-class research and educational experience that prepares them for both academic and industrial professional opportunities. Current research activities include testing and evaluation of antifouling systems; investigation of hydrodynamic performance of ship hull coatings; the development of autonomous underwater hull cleaning systems; investigating the mechanisms of adhesion and release of fouling to novel biocide-free coating systems; and monitoring the performance of antifouling coatings through dry dock inspections.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Federal Aviation Administration Center of Excellence for Commercial Space Transportation***

*Director: Samuel T. Durrance, Ph.D. Professor, Physics and Space Sciences, and Daniel R. Kirk, Ph.D., Associate Professor, Mechanical and Aerospace Engineering, Co-Directors*

*Contact Information*
*Email: sdurranc@fit.edu* *Phone: (321)674-7313*

*Description*
The center is a partnership of academia, government and private industry addressing the current and future challenges for commercial space transportation. The center encompasses four primary research areas: (1) space traffic management and operations; (2) space transportation operations, technologies and payloads; (3) human spaceflight; and (4) space transportation industry promotion.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Center for Entrepreneurship and New Business Development (CENBD)***

*Director: S. Ann Becker, Ph.D., Dean, Nathan M. Bisk College of Business*

*Contact Information*
*Email: abecker@fit.edu* *Phone: (321)674-7327*

*Description*
The Center for Entrepreneurship and New Business Development integrates entrepreneurial education, training and research in pursuit of enterprise creation, sustainability and growth. The center fosters partnerships among students, faculty, community members and entrepreneurs. These partnerships support

an educational environment bridging theory and practice in pursuit of early-stage innovation, business leadership and new business ventures. The center encompasses the Women's Business Center (WBC) and the Entrepreneurial Training Services (ETS) program. The WBC is funded by a cooperative agreement with the U.S. Small Business Administration, offering technical assistance for nascent entrepreneurs and small businesses. The ETS program offers entrepreneurs intensive training on business development, supported by business faculty, community leaders and business area experts.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Wireless Center of Excellence (WICE)***

*Web Site Link: http://research.fit.edu/wice/*

*Director: Ivica Kostanic, Ph.D., Associate Professor, Electrical and Computer Engineering*

*Contact Information*
*Email: kostanic@fit.edu* *Phone: (321)674-7189*

*Description*
WICE is devoted to creating a new generation of wireless engineering professionals through education and research. Driven by its academic program, WICE considers wireless to be any system or device that relies on electromagnetic-wave propagation to perform one or more of its functions. This context includes such diverse applications as radar, global positioning, location and sensing, as well as the broader class of communications systems such as satellites, point-to-point/multipoint, WLAN and wireless WAN. In partnership with industry, WICE offers the opportunity for faculty, and undergraduate and graduate students to engage in research and to study wireless concepts in a variety of courses. Research areas include propagation modeling, wireless systems engineering, personal communications systems, wireless sensors and multimedia communications, while also supporting simulation, fabrication and measurement of wireless communications and other systems and components. Laboratory test equipment includes Grayson's Spectrum Tracker, and spectrum and vector network analyzers, oscilloscopes, microwave amplifiers, oscillators and mixers, signal generators and associated active and passive RF devices. The laboratory performs experimental investigation using the anechoic chamber and screen room facilities. WICE is supported by significant laboratory facilities as described under "Electrical Engineering" in the Degree Programs section.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Florida Center for Automotive Research (FCAR)***

Director: *Pei-feng Hsu, Ph.D. Professor and Head, Mechanical and Aerospace Engineering, Interim Director*

*Contact Information*
*Email: phsu@fit.edu* *Phone: (321)674-8092*

*Description*
The mission of the Florida Center for Automotive Research is to develop an automotive engineering program with both research and educational components in order to leverage its engineering research capability in the development of highly fuel-efficient hybrid or conventional vehicles. The center will provide the academic research capability to support hybrid vehicle production. The center will also provide

solutions to challenging technical problems encountered in design and manufacturing, enhance Florida's reputation for automotive research and attract automotive supplier/original equipment manufacturer (OEM) operations to Florida.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***College of Engineering Center for Space Commercialization***

*Director: Daniel R. Kirk, Ph.D., Associate Professor, Mechanical and Aerospace Engineering, Interim Director*

*Contact Information*
*Email: dkirk@fit.edu* *Phone: (321)674-7622*

*Description*
The mission of the College of Engineering Center for Space Commercialization is to identify, promote and support the use of space to provide goods or services of commercial value, and to support U.S. aerospace industries and NASA needs toward a profitable commercialization of space. The center seeks to foster multidisciplinary collaboration among researchers from highly diversified scientific, engineering and business communities including universities, businesses and government entities.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Vero Beach Marine Laboratory (VBML)***

*Web Site Link: http://research.fit.edu/vbml/*

*Director: Junda Lin, Ph.D., Professor, Biological Sciences*

*Contact Information*
*Email: jlin@fit.edu* *Phone: (321)674-7587*

*Description*
VBML is located on four acres of oceanfront property in nearby Vero Beach. This facility serves as a field station for the university in support of research and teaching in the marine sciences. The beachfront location of VBML provides ready access to field study sites for work on the biology of coastal organisms and for studies of physical and geological processes of the coastal zone. Major research efforts at the laboratory are related to mariculture and marine biology/ecology. A two-story building, equipped with seawater tables and a flow-through system, supports research on mariculture and ecology of marine organisms. Several greenhouses and large tank systems are available for studying aquaculture, behavior and ecology of marine animals. Classrooms, offices and dry laboratory facilities are provided in the main laboratory building.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Microelectronics Laboratory***

*Director: Susan K. Earles, Associate Professor, Electrical and Computer Engineering*

*Contact Information*
*Email: earles@fit.edu* *Phone: (321)394-2171*

*Description*

This microelectronics facility is designed to be a teaching laboratory as well as an advanced research laboratory. A microelectronics fabrication course is taught to graduate and undergraduate students. In this course, students complete, fabricate and test a variety of electronic devices such as photovoltaic devices and hydrogen sensors. Research conducted in the facility includes polymer-based and silicon-based electronic and optoelectronic devices. The 3,800-sq.-ft. facility has all support services needed for modern semiconductor research including a 3,000-sq.-ft. clean room and areas dedicated to circuit testing and equipment maintenance. Equipment in the laboratory includes ultraviolet photolithography, diffusion furnaces, a thin-film evaporator, wet chemistry benches, and measurement and inspection equipment. The advanced research laboratory presently features a scanning probe microscope, plasma enhanced deposition and lasers for teaching and research.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Laser, Optics and Instrumentation Laboratory (LOIL)***

*Web Site Link: http://research.fit.edu/loil/*

*Director: Kunal Mitra, Ph.D., Professor, Mechanical Engineering and Chelakara Subramanian, Ph.D., P.Eng (UK), Professor, Aerospace Engineering, Co-Directors.*

*Contact Information*
*Email: kmitra@fit.edu* *Phone: (321)674-7131*

*Description*
LOIL exploits current technologies in continuous wave and short-pulse lasers and optics to develop new techniques for measuring and characterizing material properties. Faculty and graduate students are involved in analyzing the interaction of these lasers with different materials for various applications. Biomedical applications focus on detecting and irradiating cancer/tumors and in homogeneities in tissues. Material characterization/processing applications involve detection of defects in materials such as debonding of thermal protection tile systems and thermal response of materials subjected to high-energy radiation. Remote sensing applications focus on lightning detection in cloud media and landmines in shallow waters. The challenge of integrating laser sources, system optics, instrumentation, measurement schemes and data acquisition provides students with new learning experiences in these areas. Major equipment currently in use includes mode-locked short-pulse laser, Q-switched pulsed laser, short pulse diode laser, high-power continuous wave lasers, ultrafast photodetectors, sampling head oscilloscope, streak camera, miscellaneous optics and optical accessories, thermal camera and an image processing system.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Wind and Hurricane Impacts Research Laboratory (WHIRL)***

*Web Site Link: http://research.fit.edu/whirl/*

*Director: Jean-Paul Pinelli, Ph.D., P.E., Professor, Civil Engineering*

*Contact Information*
*Email: pinelli@fit.edu* *Phone: (321)674-8085*

*Description*
WHIRL is dedicated to the study of the effects and impacts of windstorms including hurricanes, tornadoes and thunderstorms, and other related meteorological hazards (e.g., flooding and tidal surges) on the natural environment and manmade structures. The laboratory involves a multidisciplinary team of engineers, scientists and business experts. It takes advantage of a geographic location in the heart of Florida's Space Coast to serve the needs of industry, government and the public in wind hazard mitigation. The laboratory's activities include research on mitigation of losses of life, property and the environment; education of the public through dissemination of information; and the development of a multidisciplinary program of study focused on wind engineering and wind-related socioeconomic studies and analyses. Research topics in the laboratory include action of strong winds and storm surges on structures; evaluation of codes, standards and retrofitting techniques for buildings and infrastructure systems; risk assessment for existing structures, coastal erosion, sediment transport and environmental damage due to storm surges and floods; development of remote sensing tools for assessing and monitoring hurricane damage, wind speed and flood levels; fundamental wind and meteorological research; wind tunnel modeling and testing; and statistical studies, analysis of economic impacts and development of potential damage maps for hurricane hazards in Florida.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Dynamic Systems and Controls Laboratory (DSCL)***

*Web Site Link: http://coe.fit.edu/mae/labs/sys.php*

*Director: Hector Gutierrez, Ph.D., P.E., Associate Professor, Mechanical Engineering and Y.I. Sharaf-Eldeen, Ph.D., P.E., Associate Professor, Mechanical Engineering, Co-Directors*

*Contact Information*
*Email: hgutier@fit.edu* *Phone: (321)674-7321*

*Description*
DSCL supports a variety of research activities in dynamic systems for mechanical and aerospace applications: (1) real-time monitoring and control of the flexible dynamics in launch vehicles including design, characterization and system integration of distributed actuators such as cold gas thrusters; (2) use of Fiber Bragg grating arrays to monitor and control in real-time multi-modal vibrations in aerospace structures; (3) in electrical machinery, the design, analysis, characterization and testing of novel machine topologies such as dual armature generators; (4) characterization of the liquid slosh dynamics in upper stage propellant tanks; and (5) magnetic suspension technology, computer-based instrumentation and mechatronics. Current and past research activities include: (1) realtime control of structural vibrations based on magneto-rheological (MR) dampers; (2) magnetic suspension systems for high-precision positioning applications; (3) characterization of surface tension and contact angle in novel propellants; (4) rotating machinery monitoring and fault diagnosis, online vibration and angular motion measurements; (5)analyses to develop condition monitoring; (6) maintenance information systems for power generation, transmission systems and components in rotating machinery.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Robotics and Spatial Systems Laboratory (RASSL)***

*Web Site Link: http://research.fit.edu/rassl/*

*Director: Pierre M. Larochelle, Ph.D., Assistant Dean, College of Engineering and Professor, Mechanical Engineering*

*Contact Information*
*Email: pierrel@fit.edu* *Phone: (321)674-7274*

*Description*
RASSL is dedicated to the development of robotic mechanical systems that generate spatial (i.e., 3-dimensional) motion and force transmission. RASSL seeks to advance the design methodologies for these challenging systems as well as techniques for their use in industrial and consumer applications. Equipment includes a Motoman SV3 XRC robot, an Adept/Mobile Robotics PowerBOT and several systems developed by RASSL.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.

***Ralph S. Evinrude Marine Operations Center***

*Director: Captain Timothy Fletcher, Manager*

*Contact Information*
*Email: tfletcher@fit.edu* *Phone: (321)727-7930*

*Description*

The center houses small outboard-powered craft and medium-sized workboats. These vessels are available to graduate students and faculty for teaching and research use in the tributaries and the Indian River Lagoon (IRL). The facility has a variety of other resources available and is located on Crane Creek in Melbourne, approx. 1.5 mile from the main campus. The IRL is a national estuary and is the most biodiverse estuary system in North America. The Florida Tech national champion crew team, champion concrete canoe team, Sailing Club and scientific diving program safety office are also housed at the center.

*Fee Schedule*
Facility use is negotiated on a per-proposal basis.