2006/07
External Matching Grant Projects

Summary
During the 2006/07 fiscal year, the USF External Matching Grant Program awarded 14 projects with 12 companies. The program awarded $905,854 and received $960,191 cash match and $1,201,918 in-kind match for a total investment of $3,067,963 in the program.

Arslan, Huseyin, “Development of Advanced Transceivers for Wireless OFDM and OFDMA Based Broadband”
Department: Electrical Engineering
Partner: Logus Broadband Wireless Solutions (USA) Inc.
Award: $33,500 Cash Match: $33,500 In-Kind Match: $33,500
Total Project Cost: $100,500
Abstract: This project addresses the need to research and develop unique baseband transceiver algorithms for both wireless fixed and mobile broadband communications. In this project, the researchers will focus on research and development of certain aspects of MAC, physical, and radio layers fore IEEE 802.16-2004 and IEEE 802.163-2005 standards. The proposed project consists of research and development in the physical layer, above referenced MAC processes and radios. USF will contribute in all these areas for developing a complete product that will have uniqueness for market acceptance.

Turos, Edward, “Antibacterially Active Nanoparticles”
Department: Chemistry
Partner: Nanopharma Technologies, Inc.
Award: $104,096 Cash Match: $104,909 In-Kind Match: $104,909
Total Project Cost: $313,914
Abstract: This study is to develop the commercial viability of antibacterially-active nanoparticle delivery systems for treatment of bacterial infections.

Domijan, Alex, “Renewable Distributed Generation and Storage System with Demand Side Management”
Department: Electrical Engineering
Partner: Progress Energy Florida, Inc.
Award: $100,000 Cash Match: $100,000 In-Kind Match: $100,000
Total Project Cost: $300,000
Abstract: Renewable energy technologies are seen as the only sustainable energy source for the future. But, since many forms of renewable energy are intermittent in nature, an energy storage medium or energy carrier will be needed to effectively use this energy. Many renewable technologies, such as solar, wind, etc. are available over large areas, so installations of equipment to harvest this energy will likely be distributed at various locations on the power system. Also, efficient operation of the power system will require that power and energy to supply the power system peak demand must be available when needed.
Saddow, Stephen, “Advanced Non-Linear Modeling of Power Amplifier Devices”  
Department: Electrical Engineering  
Partner: Modelithics, Inc.  
Award: $35,890  
Cash Match: $50,000  
In-Kind Match: $50,000  
Total Project Cost: $135,890  
Abstract: The PI, and co-PI, of the Department of Electrical Engineering at the University of South Florida, will administer student assistants for collaborative research and development tasks in the area of microwave modeling and related measurements. R&D tasks may include development and application of S-parameter (on-wafer and coaxial), load/source-pull, AC/DC transistor characterization, vector signal analyzer, test structure layout, spectrum analysis, impedance (LCR) and DC measurements.

Ding, Xiaoling, “Atmospheric Deposition of Materials Using Guided Particle Technology”  
Department: Marine Science  
Partner: Guided Particle, LLC.  
Award: $10,000  
Cash Match: $10,000  
In-Kind Match: $10,000  
Total Project Cost: $30,000  
Abstract: This project seeks to better understand the science behind a novel technology that allows a variety of materials to be printed at atmospheric pressure. The goal will be to deposit and evaluate characteristics of ultra thin materials using this technology.

Djeu, Nick, “Sapphire Fiber Chemical Sensor, Phase II”  
Department: Physics  
Partner: MicroMaterials, Inc.  
Award: $75,000  
Cash Match: $114,000  
In-Kind Match: $250,000  
Total Project Cost: $439,000  
Abstract: USF will continue to investigate the potential of sapphire fiber as chemical sensors through evanescent wave absorption. The scope will be extended to cover the near IR as well as the mid-IR. Emphasis will be on determining any limit on the concentration of chemical species that can be measured, i.e., any deviation from linearity of the dependence of absorbance on concentration. A second area of focus will be the dependence of absorption on the radius of the fiber coil. Other relevant issues such as the effect of the refractive index of the liquid being probed and the susceptibility of the sapphire fiber to absorption will also be examined.

Heller, Richard, “Exploratory study on DNA immunization regimen using electroporation in different target issues”  
Department: Molecular Medicine  
Partner: RMR Technologies, Inc.  
Award: $25,000  
Cash Match: $25,000  
In-Kind Match: $33,000
Total Project Cost: $83,000
Abstract: The rational in this experiment is to immunize skin and thereby efficiently activate APCs. Subsequent studies will evaluate the combination of the two tissues which might give a more long lasting expression of antigens which again might improve the duration of the immune response. As controls, a backbone (empty) plasmid will be used for both skin and muscle. The coding plasmids will be injected without electroporation.

Patten, James, “THz Focal Array Imaging”
Department: Marine Science
Partner: Zyberwear, Inc.
Award: $119,000  Cash Match: $119,080  In-Kind Match: $136,800
Total Project Cost: $374,880
Abstract: The overall objective of this project is to develop a new class of ultra-sensitive bolometric radiation sensing focal plane arrays (FPA), for terahertz (THz) imaging. Such an imaging system has applications in the areas of security, industrial monitoring, pharmaceuticals, medical diagnosis, and so on.

Department: Clean Energy Research Center
Partner: Windermere/Essex Co.
Award: $49,659  Cash Match: $49,993  In-Kind Match: $130,000
Total Project Cost: $229,652
Abstract: The purpose of this research project is the development and production of high efficiency, low cost photovoltaic system technology that is smaller and lighter than current technology. A specific deliverable requires the development of PV technology that can be camouflaged so that it is indistinguishable from other objects in specific environments. The team in the Clean Energy Research Center at the University of South Florida has considerable expertise in solar technology.

Kyle, Dennis, “Marine Microorganisms as sources of Antimalarial Agents”
Department: Global Health
Partner: Magellan BioScience Group, Inc.
Award: $84,000  Cash Match: $84,000  In-Kind Match: $84,000
Total Project Cost: $252,000
Abstract: As the search continues for more effective therapeutic agents, marine microorganisms and invertebrates have emerged as a promising new resource yielding unusual chemical structures with potent biological activities. The vast diversity and relatively unexplored nature of these unique sources of chemical diversity suggests they will continue to be an important source of new drugs. The broad goal is to discover marine natural product leads from marine microorganisms.

Mohapatra, Shyam, “Early Diagnosis of Ovarian Cancer”
Department: Internal Medicine
Partner: Transgenex Nanobiotech, Inc.
Award: $119,709  Cash Match: $119,709  In-Kind Match: $119,709
Total Project Cost: $359,127
Abstract: The proposal focused on developing a microfluidic gold nanowire-based platform technology which is envisioned to bridge the gap between fundamental progress in cancer biomarkers and translation of this scientific progress for the realization of rapid point-of-care disease assessment and biofunctional devices with higher-order behavior. A rapid and low-cost method to detect cancer early would usher in a revolution of medicine.

Sunol, Aydin, “Design and Development of Products that has Self Sustained Temperature Modulation Feature”
Department: Chemical Engineering
Partner: TempTroll, Inc.
Award: $50,000  Cash Match: $50,000  In-Kind Match: $50,000
Total Project Cost: $150,000
Abstract: The objective is to design and develop products that involve self heating and cooling chemical systems through the design and development of prototype self heating and self cooling products, to develop and implement experimental protocols/systems for modulated heating and/or cooling chemical systems of interest, the characterization and analysis of products and modeling.

Department: Chemical Engineering
Partner: TempTroll, Inc.
Award: $50,000  Cash Match: $50,000  In-Kind Match: $50,000
Total Project Cost: $150,000
Abstract: The objective is to design, develop, utilize experimental systems that will enable determination of heat evolution rates, heat transfer characteristics, and mass transfer rates for reacting and phase change systems that involve self heating and cooling chemical systems. The developed systems will be used for determining fundamental data as well as comparable information for such product prototypes. The characterization of the components of the reacting and phase change systems before and after use is also within the scope of the project.

Sunol, Aydin, “Design and Development of Self Cooling Products that Utilize Evaporative Technologies”
Department: Chemical Engineering
Partner: TempTroll, Inc.
Award: $50,000  Cash Match: $50,000  In-Kind Match: $50,000
Total Project Cost: $150,000
Abstract: The objective of this project is to design and develop products that involve evaporative self cooling technology. The project will include the design and development of prototype self cooling products, the development and implementation of experimental protocols/systems for cooling systems of interest, characterization and analysis of products and modeling.