



USF CONNECT

2007/08

Awarded External Matching Grant Projects

Summary

During the 2007/2008 fiscal year, the USF External Matching Grant Program approved 20 projects with 13 companies. The awards total \$1,155,098 and include \$1,718,491 in cash match and \$1,829,055 in-kind match for a total investment of \$4,702,644 in the program. The average total project value was \$235,132 and the average award was \$57,755. 71 students and 30 faculty have been supported by these funds.

Projects funded are in the sectors of: Life Sciences (3), Microelectronics/Nanotechnology (5), Sustainable Energy (4), Optics & Photonics (2), Aviation & Aerospace (4) and are located in the College of Engineering (14), College of Arts & Sciences (3), College of Medicine (2) and College of Marine Science (1).

Bhethanabotla, Venkat, *"Development of a Nanoscale Sensor for Quantitative Heat and Mass Measurements in Liquids"*

Department: Chemical Engineering

Sector: Microelectronics/Nanotechnology

Partner: Masscal Scientific Instruments Corporation

Location: Orlando, Orange County

Award: \$67,179 Cash Match: \$67,179

In-Kind Match: \$67,600

Total Project Cost: \$201,958

Students: 7

Faculty: 1

Abstract:

A sensor that is capable of nanogram sensitivity to integrate into the Masscal G1 instrument will be developed using microfabrication techniques.

Weller, Tom, *"Low Cost Omni Antenna Design"*

Department: Electrical Engineering

Sector: Aviation & Aerospace

Partner: Raytheon, Inc.

Location: St. Petersburg, Pinellas County

Award: \$19,999 Cash Match: \$40,000

In-Kind Match: \$20,000

Total Project Cost: \$79,999

Students: 3

Faculty: 1

Abstract:

This research effort proposes to create a light weight, omni-directional antenna

Turos, Edward, *"Antibacterially Active Nanoparticles – Phase II"*

Department: Chemistry

Sector: Life Sciences

Partner: Nanopharma Technologies, Inc.

Location: Tampa, Hillsborough County

Award: \$145,091 Cash Match: \$145,091

In-Kind Match: \$145,091

Total Project Cost: \$435,273

Students: 8

Faculty: 1

Abstract:

This study is to develop the commercial viability of antibacterially-active nanoparticle delivery systems for treatment of bacterial infections.

Weller, Tom, *"Test Chamber for Wireless Sensor Nodes on Aircraft"*

Department: Electrical Engineering

Sector: Aviation & Aerospace

Partner: Goodrich Lighting Systems

Location: Oldsmar, Pinellas County

Award: \$35,813 Cash Match: \$71,626

Total Project Cost: \$107,439

Students: 3

Faculty: 1

Abstract:

The objective of this work is to continue the research, simulation and performance evaluations on antenna design for 2.4 GHz wireless sensor nodes on aircraft. The outcome will be design verification for antenna designs, already completed or in process, suitable for on aircraft use and flight testing.

Kumar, Ashok, *"Thin Film Diamond for Thermal Management of High Power Devices"*

Department: Mechanical Engineering

Sector: Microelectronics/Nanotechnology

Partner: Raytheon, Inc.

Location: St. Petersburg, Pinellas County

Award: \$15,000 Cash Match: \$30,000

In-Kind Match: \$30,000

Total Project Cost: \$75,000

Students: 2

Faculty: 1

Abstract:

This project intends to characterize diamond coatings for thermal management applications

Tan, Jun, *"HUCBC modulation of Alzheimer-like pathology and behavioral changes"*

Department: Psychiatry

Sector: Life Sciences

Partner: Saneron-CCEL Therapeutics, Inc.

Location: Tampa, Hillsborough County

Award: \$64,756 Cash Match: \$64,756

In-Kind Match: \$75,627

Total Project Cost: \$205,139

Students: 4

Faculty: 1

Abstract:

The goal of this project is to establish a strong, well-integrated research program based on recently established roles of Th1/Th2 immunity, HUCBC transplantation, and Alzheimers pathogenesis. This knowledge is used to rationalize U-CORD-CELL as a potentially safe and effective immunomodulatory therapy for Alzheimers.

Sankar, Ravi, *“Optimal Data Distribution and Routing Algorithms for Large MANET Networks”*

Department: Electrical Engineering

Sector: Aviation & Aerospace

Partner: Raytheon, Inc.

Location: St. Petersburg, Pinellas County

Award: \$20,000 Cash Match: \$40,000

In-Kind Match: \$40,000

Total Project Cost: \$100,000

Students: 3

Faculty: 1

Abstract:

The focus of this effort is to research and evaluate optimal routing algorithms for large MANET networks

Mohapatra, Shyam, *“Phase II: Early Diagnosis of Ovarian Cancer”*

Department: Internal Medicine

Sector: Life Sciences

Partner: Transgenex Nanobiotech, Inc.

Location: Tampa, Hillsborough County

Award: \$150,000 Cash Match: \$282,638

In-Kind Match: \$282,638

Total Project Cost: \$715,276

Students: 11

Faculty: 3

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.

Djeu, Nicholas, *"Evanescent Wave Fiber Optic Chemical Sensor"*

Department: Physics

Sector: Optics & Photonics

Partner: MicroMaterials, Inc.

Location: Tampa, Hillsborough County

Award: \$51,000 Cash Match: \$102,000 In-Kind Match: \$353,100

Total Project Cost: \$506,100

Students: 2

Faculty: 1

Abstract:

Exploration of the feasibility of an evanescent wave emission sensor. The prospect of combining both absorption and emission spectroscopic capabilities into a single fiber optic probe should make possible powerful new chemical analysis strategies

Dunleavy, Larry, *"Measurement and Modeling of Phase Noise Conversion in Amplifiers and Frequency Multipliers"*

Department: Electrical Engineering

Sector: Microelectronics/Nanotechnology

Partner: Trak Microwave Corporation

Location: Tampa, Hillsborough County

Award: \$6,000 Cash Match: \$12,000 In-Kind Match:
\$12,000

Total Project Cost: \$30,000

Students: 4

Faculty: 2

Abstract:

Techniques will be established and advanced for measuring residual phase noise in amplifiers and frequency multipliers and correlating to 1/f noise modeling for the constituent transistors

Killinger, Dennis, *“Software Simulation Development and Laser Enhancement of LIBS and Raman Lidar for Explosives Detection”*

Department: Physics

Sector: Optics & Photonics

Partner: Alakai, Inc.

Location: Largo, Pinellas County

Award: \$40,768 Cash Match: \$40,783

In-Kind Match: \$207,904

Total Project Cost: \$289,455

Students: 2

Faculty: 1

Abstract:

Development of a software program to predict the detection range of selected laser sensors for remote sensing of trace explosives.

Sankar, Ravi, *“Voice Over IP (VoIP) Quality of Service (QoS) Monitoring”*

Department: Electrical Engineering

Sector: Information Technology

Partner: Planet Reach

Location: Tampa, Hillsborough County

Award: \$12,495 Cash Match: \$12,495

In-Kind Match: \$15,000

Total Project Cost: \$39,990

Students: 1

Faculty: 1

Abstract:

This project deals with the monitoring of the quality of service of voice over IP

Domijan, Alexander, *“Renewable Distributed Generation and Storage System with Demand Side Management”*

Department: Electrical Engineering

Sector: Sustainable Energy

Partner: Progress Energy Florida

Location: Lake Mary, Seminole County

Award: \$43,978 Cash Match: \$43,978 In-Kind Match: \$44,000

Total Project Cost: \$131,956

Students: 4

Faculty: 2

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.

Baylis, Charles, *“Characterization & Modeling for Improved Amplifier Design”*

Department: Electrical Engineering

Sector: Microelectronics/Nanotechnology

Partner: Modelithics, Inc.

Location: Tampa, Hillsborough County

Award: \$25,000 Cash Match: \$25,000 In-Kind Match: \$25,000

Total Project Cost: \$75,000

Students: 5

Faculty: 4

Abstract:

In this project, research and training will be performed in the areas of active and passive component modeling and characterization. The goal of the work is to develop more accurate measurement techniques and models that will be used to improve amplifier design capabilities.

Gupta, Vinay, *"Surface Modification to Control Liquid Drops For A Novel Nanobalance/Microcalorimeter"*

Department: Chemical Engineering

Sector: Microelectronics/Nanotechnology

Masscal Scientific Instruments Corporation

Location: Orlando, Orange County

Award: \$5,000

Cash Match: \$5,000

In-Kind Match: \$5,000

Total Project Cost: \$15,000

Students: 2

Faculty: 1

Abstract:

The aim of the research project is to implement surface modification schemes for controlling the wetting behavior of gold substrates and to exploit the results in controlled placement of single and multiple drops of volatile liquids on quartz crystal microbalance electrodes. The overall objective is to facilitate the development of a novel QCM based nanobalance/microcalorimeter by Masscal Scientific, an Orlando based company, and its collaborators.

Weller, Tom, *"Low Cost Omni Antenna Design"*

Department: Electrical Engineering

Sector: Aviation & Aerospace

Partner: Raytheon, Inc.

Location: St. Petersburg, Pinellas County

Award: \$11,850

Cash Match: \$5,924

In-Kind Match: \$35,000

Total Project Cost: \$52,774

Students: 3

Faculty: 1

Abstract:

This research effort proposes to create a light weight, omni-directional antenna.

Paul, John, *“An Assessment of the Impact of Drill Fluid Blowouts on Sediment Microbial Activity Will be Assessed”*

Department: Marine Science

Sector: Other – Marine Sciences

Partner: Continental Shelf Associates, Inc.

Location: Stuart, Martin County

Award: \$47,095 Cash Match: \$47,095 In-Kind Match: \$47,095

Total Project Cost: \$141,285

Students: 1

Faculty: 1

Abstract:

Spills of synthetic based fluids may impact the benthic ecology of sediments on a short term or long term basis. The goal of this project is to determine the impact on the microbial community in the sediments after such a spill at a distinct location in the Gulf of Mexico and the capacity of the community to recover from such an environmental insult. Technology will be developed to determine the impact on sediment microbes by focusing on the process of sulfate reduction. Specifically, methods for the detection of sulfate reduction gene expression will be developed and tested on a research cruise to a synthetic based fluid spill area in the Northern Gulf of Mexico.

Domijan, Alexander, *“Advanced Commercial Energy (ACE) Technology: For Implementation of a Commercial Price Responsive Load Management Pilot”*

Department: Electrical Engineering

Sector: Sustainable Energy

Partner: Tampa Electric Company

Location: Apollo Beach, Hillsborough County

Award: \$150,000 Cash Match: \$150,000 In-Kind Match: \$163,500

Total Project Cost: \$463,500

Students: 2

Faculty: 2

Abstract:

The proposed price responsive load management pilot is a research and development (R&D) and demonstration project for small commercial customers. The R&D project is designed to determine the magnitude of reduction of weather sensitive peak loads. The price information is designed to encourage customers to make behavioral or equipment usage changes to their energy consumption thereby achieving the desired high cost period load reduction to assist in meeting system peak.

Domijan, Alexander, *“Renewable Distributed Generation and Storage System with Demand Side Management”*

Department: Electrical Engineering

Sector: Sustainable Energy

Partner: Progress Energy Florida

Location: Lake Mary, Seminole County

Award: \$100,000 Cash Match: \$100,000 In-Kind Match: \$108,000

Total Project Cost: \$308,000

Students: 2

Faculty: 2

Abstract:

The main effort in this proposal is based on the development of a new control system in order to manage large infrastructures and facilities in commercial and industrial customers such as universities, offices, industries, hospitals, and hotel. The Power Center for Utility Explorations proposes the implementation of a Smart Grid Center in residential and commercial areas. The electric system will be renovated with the new smart grid equipment. A communication network would be established and a internet website will be developed to control the energy consumption and usage from remote location.

Domijan, Alexander, *“Advanced Peak Load Shaving Technology with Renewable Resources”*

Department: Electrical Engineering

Sector: Sustainable Energy

Partner: Tampa Electric Company

Location: Apollo Beach, Hillsborough County

Award: \$427,000 Cash Match: \$150,000 In-Kind Match: \$152,500

Total Project Cost: \$729,500

Students: 2

Faculty: 2

Abstract:

The University of South Florida (USF), in partnership with Tampa Electric Company (TECO) and the Lowry Park Zoo, seeks to develop methodologies to analyze and optimize the technical, economic and environmental benefits of a renewable grid connected photovoltaic system for electric power production by development of an advance peak load shaving technology.