

Florida High Tech Corridor

2001 - 2002 USF "External Matching Grant" Project Awards

Investigator, Proposal Title and Description

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**Bhansali, Shekhar. "Microfabricated MEMS sensors for defense applications."** Grant amount: \$46,450. Partner companies: Concurrent Technologies.

Layman's Abstract: The project focuses on the development of microfabricated sensors that enable in-situ health monitoring of defense equipment and facilitate application-specific detection.

**Dunleavy, Lawrence. "Precision characterization for wireless and millimeter-wave design (continuation)."** Grant amount: \$100,000. Partner companies: Raytheon Systems, Intersil, Trak Communications, Anritsu, M/A-Com, Karl Suss America, Maury Microwave, GGB Industries.

Layman's Abstract: The new program will fund six graduate students in the area of enhanced wireless and microwave/millimeter-wave circuit design and precision experimental characterization. The State matching funding will provide enabling instrumentation capabilities, and including a temperature dependent and pulsed bias probing system.

**Harmon, Julie. "Radiation effects on polymeric systems used in space environments."** Grant amount: \$25,000. Partner companies: Honeywell.

Layman's Abstract: This proposal addresses the problem of testing polymers used for navigational systems in spacecrafts. Exposure to space environments requires that the polymers retain critical physical properties upon exposure to temperature extremes and harsh radiation conditions.

**Henning, Rudolf. "Better satellite communications forecasting (continuation)."** Grant amount: \$47,000. Partner companies: Custom Manufacturing Engineering.

Layman's Abstract: Broadband satellite communication channels encounter rapidly-fluctuating signal losses due to random, weather-induced changes within their very narrow BEAM. To forecast signal loss onset requires knowledge of the movement of a weather CELL which has the potential for such signal behavior, but that CELL's movement cannot be discerned from the much larger and more rapid signal fluctuation behavior in the BEAM. The proposed program will verify/demonstrate that this forecasting can be done using co-located microwave-radiometric scanning of the atmosphere near the signal's BEAM by detecting the CELL, providing information on its movement and thus whether and when a CELL-BEAM "collision" will occur.

**Jain, Vijay. "Ultra high speed OWSS wireless networks."** Grant Amount: \$15,000. Partner companies: Intersil.

Layman's Abstract: This project will develop a next-generation technique for wireless networks. It will triple the data rate over today's industry standard and, equally importantly, will also provide for full-speed time-sharing by multiple users.

**Kumar, Ashok. "A smart composite for microelectronics thermal management applications."** Grant Amount: \$50,000. Partner companies: Honeywell.

Layman's Abstract: The main aim of this proposal is to synthesize and consolidate a smart composite material, copper-zirconium tungstate with high thermal conductivity and low thermal expansion for electronic thermal management applications.

**Kumar, Ashok. "Evaluation of mechanical and tribological properties of PVD hard coatings for multifunctional applications."** Grant Amount: \$24,000. Partner companies: Semplastics.

Layman's Abstract: The main objective of this proposal is to understand the mechanical and tribological properties of plasma treated chemical mechanical planarization pads for semiconductor manufacturing applications.

**Morel, Don. "Development of thin-film HgI<sub>2</sub> for medical radiography (continuation)."** Grant Amount: \$65,002. Partner companies: Constellation.

Layman's Abstract: The primary objective of this project is to develop thin-film HgI<sub>2</sub> x-ray detectors. Achievement of this objective would enable significant improvements in the resolution of x-ray imaging that would lead to earlier detection and treatment of cancer, particularly breast cancer.

**Moreno, Wilfrido. "Fault-tolerant FPGA design verification using laser fault injection."** Grant Amount: \$67,372. Partner companies: Honeywell.

Layman's Abstract: The purpose of this test effort is to determine the feasibility of using laser fault injection techniques in verifying fault tolerant designs implemented in an Field Programmable Gate Array (FPGA).

**Moreno, Wilfrido. "Development, implementation and validation of a rapid system prototyping process using Motorola's DSP development platforms."** Grant Amount: \$96,703. Partner companies: Motorola.

Layman's Abstract: The proposed project can be described as an initiative for the Development, Implementation and Validation of a Rapid System Prototyping Process using Motorola's DSP development platforms.

**Ostapenko, Sergei. "Development of testing facility for high-efficient light-emitting diodes."** Grant Amount: \$30,000. Partner companies: SANTECH Inc.

Layman's Abstract: The program is directed to development and design of the automatic testing system for light-emitting diode (LED) devices. The system offers state-of-the-art computer controlled electrical and optical metrological tool for high-brightness LED's and multi-LED systems, including but not limited to obstruction light sources, traffic lamps, and luminescence flat-panels displays.

**Ranganathan, N. "Techniques and tools for mapping applications to networked heterogenous computing clusters."** Grant Amount: \$34,000. Partner companies: Honeywell.

Layman's Abstract: The design of techniques and software tools for mapping, applications to networked heterogenous computing clusters with dynamic scheduling and load balancing and introduce cluster computing with the tools suite into a high performance computing course at USF.

**Sanchez-Ramos, Juan. "Neural stem cells from umbilical cord blood."** Grant Amount: \$100,000. Partner companies: CCEL Bio-Therapies.

Layman's Abstract: This project describes the process by which stem cells in cord blood may be expanded and differentiated into neural cells. These cells will be tested in the neonate and in a rodent model of stroke. In collaboration with CCEL, these neural precursors will be developed into a therapeutic product for treatment of many brain disorders and injuries.

**Sankar, Ravi. "ASIC implementation of real-time adaptive noise cancellation in space-based RLG systems."** Grant Amount: \$16,500. Partner companies: Honeywell.

Layman's Abstract: Applications of ring laser gyro (RLG) based systems for navigation and guidance range from commercial satellite to advanced military interceptor technology. The proposal targets the implementation of real-time adaptive noise canceling algorithm FPGAs and ASICs for use in reduction of correlated noise levels in RLG based systems.

**Wang, Hong-Gang. "A model system for cancer pharmacogenomics."** Grant Amount: \$99,000. Partner companies: DNAPrint Genomics.

Layman's Abstract: DNA print genomics is enabling the medical application of human population genomics to help prevent, define and diagnose disease. With the University of South Florida will develop a cell based model system to determine the variable response to two widely used anti-cancer compounds. The resulting product will constitute a powerful tool for developing genomics-based pharmaco-predictive tolls that will form the foundation of the emerging personalized medical market.

**Weller, Thomas. "Miniaturized Ka-band redundant low noise amplifier module for space applications."** Grant Amount: \$20,000. Partner companies: Raytheon.

Layman's Abstract: The proposed work targets the development of miniaturized receiver modules for space applications in the 27.5-30 GHz band. The project combines RF MEM switch technology, Raytheon's advanced transistors and novel design techniques to produce new architectures for redundancy-switched low noise amplifier packages.

**Weller, Thomas. "Baluns & transformers for wireless applications using an advanced direct-write mesotool capability."** Grant Amount: \$29,684. Partner companies: Raytheon / CMS.

Layman's Abstract: The goal of the project is to develop design and modeling solutions for baluns and transformers aimed at 1-4 GHz wireless applications. These components are needed for successful adaptation of an advanced direct-write (mesotool) capability into a wide range of Raytheon's antenna programs.

**Weller, Thomas. "Low-cost 60Ghz proximity sensor for automotive applications."** Grant Amount: \$26,200. Partner companies: Wolff Controls.

Layman's Abstract: The goal of this work is to demonstrate a low-cost, mm-wave (60 GHz) proximity sensor that is intended for a variety of automotive applications. The applications include, but are not limited to, anti-lock braking, fuel injection and safe back-up systems.

**Willing, Alison. "Sertoli cell co-transplants to treat Parkinson's disease."** Grant Amount: \$46,000. Partner companies: Saneron Therapeutics.

Layman's Abstract: This project will compare the ability of two animal sources of Sertoli cells to enhance the survival of neural transplants of dopamine cells in treating Parkinson's disease either through trophic support or localized immunosuppression.

**Wolan, John. "Preparation, growth and characterization of MOCVD GaN/nanoporous SiC."** Grant Amount: \$62,500. Partner companies: Uniroyal Optoelectronics / Sterling Semiconductor.

Layman's Abstract: The project is targeting the process optimization of advanced light-emitting materials based on III-V compounds. GaN will be deposited on both nanoporous and standard SiC & Sapphire substrates via MOCVD utilizing existing state-of-the-art reactors located at UOE in Tampa. Various material characterization techniques including x-ray, ultraviolet photoelectron spectroscopy and photoluminescence spectroscopy will be applied to evaluate material and device quality. Student education and training are an integral part of this effort.