Robert Benson: Development of Manganese Products for Pollution Control and Electronic Devices (I-4 Award: $49,000)
Industry Partner: Charles Wynn Associates (Private Match: $50K Cash, $50K In-Kind, $75K Equipment, $175K Total)

This project is concerned with development of a method using manganese in an ore to scrub the oxides of nitrogen and sulfur from flue gases. Recovered salts will be converted into both high and low purity manganese products. Part of this effort will evaluate manganese oxides for pollution control products.

Kenneth Buckle: Small Engine Portable Analyzer Test Development Project Continuation (I-4 Award: $12,628)
Industry Partner: MSE Inc. (Private Match: $32.5K In-Kind, $32.5K Total)

Design and build a prototype of a portable tester.

Yun-Leei Chiou: Characterization of Thin Gate Oxides (I-4 Award: $37,500)
Industry Partner: Bell Laboratories (Private Match: $20,480 In-Kind, $75,000 Equipment, $95,480 Total)

The continual reduction of the device dimension needs a gate oxide (SiO2) thinner than 100Å for the MOS field effect transistor (MOSFET). It becomes increasingly difficult to maintain and improve the reliability for the new generation of integrated circuits due to the lack of understanding the effect of the quantum behavior of the thin gate oxide to the device characteristics of the MOSFET. In this project, gate oxides with thicknesses ranging from 4nm to 15nm will be investigated. The model for predicting oxide reliability will be developed.

Nicholas Djeu: Crystal Fiber Temperature Sensor (I-4 Award: $49,826)
Industry Partner: MicroMaterials Inc. (Private Match: $10K Cash, $70K In-Kind, $80K Total)

Crystalline fiber optic temperature sensor based on fluorescence decay signal will be investigated.
L. P. Dunleavy: On-Wafer Metrology for 100Ghz Microelectronics (I-4 Award: $100,000)

This project represents an innovative teaming of USF faculty and students with six industrial contributors (including two Florida companies). The project will set up an otherwise cost-prohibitive measurement capability and utilize it to research and develop methods and improvements to 100GHz wafer probing. The work has two thrusts involving 1) development of approximate screening tests for 100GHz microelectronic chips, and 2) development of accurate calibration methods for 1GHz to 100GHz on-wafer metrology. This program will provide a significant leap in technology for USF. Specific technology transfer is planned with the two primary company sponsors (Alliant Defense Systems and Anritsu).

L. Garcia-Rubio: (I-4 Award: $23,083)
Industry Partners: Coulter Corporation (Private Match: $70K Total)

Rudolf Henning: Improved Telecommunication Performance of Existing Satellite Dish Systems (I-4 Award: $100,000)
Industry Partner: Custom Manufacturing and Engineering (Private Match: $206,912 In-Kind, $206,912 Total)

To prevent "premature" outdating of telecommunications equipment caused by more demanding performance specifications through such techniques as a) use of multiple existing antennas in array arrangements, b) upgrading critical systems components, or c) changing the system's configuration through re-arrangement of existing parts and adding a few judiciously placed new parts. Goal: results that will lead to cost- and schedule-effective retro-fit and dual-use applications.

Don Hilbelink: Quantitative Human Anatomy (I-4 Award: $50,000)
Industry Partner: Gold Standard Multimedia (Private Match: $50K Cash, $50K In-Kind, $100K Total)

Volumetric data files of anatomical structures of the neck region of an adult human (Visible Human Male) will be converted to provide compatibility with a range of commercially available computer aided design (CAD) software currently being used by engineers in the aerospace and automotive industries. These CAD programs will be used to obtain specific mathematical information for each anatomical structure and to develop a finite element analysis module which can be used to study physical and dynamic properties of the cervical spine.
V. K. Jain: Wavelet-Based Orthogonal Multipulse Signaling for Advanced Wireless Networks (I-4 Award: $10,000)
Industry Partner: Harris Corporation (Private Match: $20K Cash, $20K Total)

The proposed research pertains to the development of a new method of signaling in advanced wireless communication networks. This wavelet-based technique holds promise for improved performance and lower cost in future wireless networks.

V. K. Jain: Efficient Hardware for IF to BasebandSample Rate Conversion with Incommensurate Clocks (I-4 Award: $10,000)
Industry Partner: Harris Corporation (Private Match: $20K Cash, $20K Total)

(Nonlinear Processor Hardware Implementation). The proposed research pertains to the development of high performance dedicated nonlinear processors. It builds on the recent research conducted for Harris Corporation, and is expected to find applications in wireless communication, and high-performance DSP processors.

Dennis Killinger: Product Development of a Diode Laser-Doppler Vibrometer (I-4 Award: $50,000)
Industry Partner: Litton Laser Corp. (Private Match: $50K Cash, $50K In-Kind, $100K Total)

Develop an advanced prototype of a high-power, laser-doppler vibrometer that will be used to measure the vibration modes of a bridge in order to determine if the bridge has a structural defect or crack.

Daniel Lim: Real Time Identification of Food-Borne Pathogens by an Innovative Biosensor (I-4 Award: $44,800)
Industry Partner: Lykes Meat Group, and Research International (Private Match: $89.6K In-Kind, $89.6K Total)

The objective of this project is to form an interdisciplinary academic / corporate / government partnership of scientists and engineers along the I-4 Corridor to develop an innovative fiber optic biosensor assay to rapidly detect food-borne microbial pathogens.

Wilfrido Moreno: Voice Algorithm Development for IP Applications (I-4 Award: $21,587)
Industry Partner: IPAXS Corporation (Private Match: $14K Cash, $25K In-Kind, $5K Equipment, $44K Total)

Proposal submitted to IPAXS proprietary communication software for PCI bus. Student will design, implement and test telecommunication software drivers for IPAXS PCI based hardware cards for Unix and Windows NT? TAPI Compliant.
Wilfrido Moreno: **Design of Configurable Large Memory Blocks Using a Laser Programmable MCM Substrate** (I-4 Award: $16,228)

Industry Partner: Honeywell Inc. (Private Match: $12.5K Cash, $20K In-Kind, $32.5K Total)

This proposal is based on applying USFís laser-created vertical interconnect technology to design a 4 Megabyte memory PMCM on a high density programmable MCM substrate.

Paul Sanberg: **Double Blind Placebo Controlled Trial of Inversine in Tourette Syndrome** (I-4 Award: $250,000)

Industry Partner: Layton Bioscience (Private Match: $620K In-Kind, $620K Total)

The goals of this project are to develop novel therapies for neurodegenerative diseases and Tourette's Syndrome.

Elias Stefanakos: **Development of the Rivolta Isigo Electric Vehicle** (I-4 Award: $45,950)

Industry Partner: Rivolta Group (Private Match: $10K Cash, $56,880 In-Kind, $25K Equipment, $91,880 Total)

It is the purpose of this project to combine the expertise of Rivolta Engineering and Marketing with that of researchers at USF to produce the Rivolta Isigo Electric Car. The Isigo is presently being produced in Europe by Rivolta Engineering. The vehicle will be manufactured in Sarasota/ Bradenton and will create 40 jobs the first year of operation. Marketing research has shown great potential for this vehicle.

Aydin Sunol: **Modeling and Development of Supercritical Sorption Processes** (I-4 Award: $50,000)

Industry Partner: Advanced Separation Technologies (Private Match: $20K Cash, $10K In-Kind, $70K Equipment, $100K Total)

This project involves further development of continuous sorption technology of ASTI Inc. which is a division of Calgon Carbon. The project includes software testing, development training, and adaptation of technology to high pressure applications in biomedical, pharmaceutical, food and beverages, environmental, microelectronics, and materials processing.

Thomas Weller: **A Mm-Wave Proximity Sensor** (I-4 Award: $30,000)

Industry Partner: Wolff Controls (Private Match: $30K Cash, $30K In-Kind, $60K Total)

This project concerns the development of a proximity sensor for automotive applications.

Thomas Weller: **A MEMS Based Voltage-Controlled Microwave Oscillator** (I-4 Award: $20,000)

Industry Partner: Raytheon Corporation (Private Match: $20K Cash, $20K In-Kind, $40K Total)

The objective of this work is to develop a voltage controlled oscillator using a tuning element that is electro-statically controlled.