

UWF faculty, scientists and researchers

bring a wealth of knowledge and expertise

to bear on a wide range of issues, including:

• environmental issues of social, business and

• planning for emergencies

• economic development and forecasting

• artificial intelligence

• historic preservation

• environmental health and

• bioterrorism

• civic participation in government

• marine ecology

Research & Economic Development Capabilities



University of
West Florida

Florida Small Business Development Center Network

The **Florida Small Business Development Center Network** assists in the development and education of the state's entrepreneurs and small business community, successfully linking the state's education system to the community.

Key programs and services:

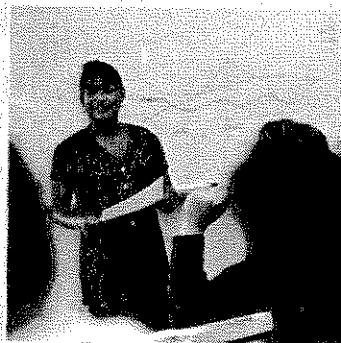
The FSBDCN is a non-profit, statewide network of college and university-based centers that link the resources of the federal, state and local governments, as well as the private sector, to provide entrepreneurs with the one-on-one counseling, management training and information needed to prosper and grow in a complex and competitive global economy.



Research strengths:

Each year, the Florida SBDCs provide:

- **one-on-one business counseling:** more than 60,000 hours to more than 11,000 entrepreneurs and small business owners
- **business training:** approximately 1,300 events for more than 19,000 participants
- **answers:** almost 70,000 responses with requested information.



Recent projects:

Return on investment of 2000-2001 FSBDCN services

Client sales impact	\$260.5 million
Existing revenues maintained	\$234.7 million
New jobs created	4,411 new jobs
Existing jobs saved	701 jobs
New Federal and state tax revenues	\$31.5 million
ROI for cost of long-term counseling	\$9.68/\$1.00
Financing leveraged by clients	\$42.7 million (\$5.19 ROI)

Independent study by Dr. James Chrisman

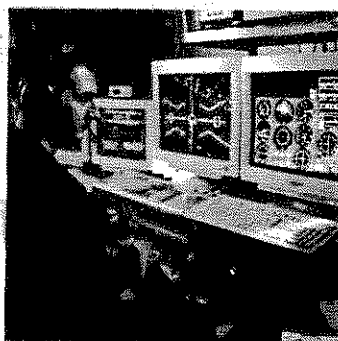
Institute for Human and Machine Cognition (IHMC)

The **Institute for Human and Machine Cognition** is one of the nation's premier research institutes with more than 115 researchers and staff members investigating cognition in both humans and machines with a particular emphasis on building computational tools to leverage and amplify human cognitive and perceptual capacities.

Key programs and services:

IHMC develops the technology to manufacture:

- multi-sensory prostheses to help humans maintain situation awareness in complex activities
- wearable robots (exoskeletons), powered prosthetics, algorithms for walking via functional electrical stimulation
- new human-computer interfaces that go beyond the traditional workstation model and become intelligent environments
- human-centered displays that enhance performance in real-time, complex tasks with many data streams and complex data interaction rules such as cockpit displays



Research strengths:

- knowledge modeling and sharing
- adjustable autonomy
- advanced interfaces and displays
- communication and collaboration
- computer-mediated learning systems
- intelligent data understanding
- software agents
- expertise studies
- work practice simulation
- knowledge representation

Recent projects:

IHMC faculty and staff collaborate extensively with industry and government and have received private and governmental funding exceeding \$21 million. IHMC research partners have included:

- | | | | |
|-------------|------------------|--------------------|--------|
| • DARPA | • U.S. Air Force | • Noikia | • SAIC |
| • NSF | • NIMA | • Sun Microsystems | • IBM |
| • NASA | • NIH | • Fujitsu | |
| • U.S. Army | • DOT | • Procter & Gamble | |
| • U.S. Navy | • IDEO | • Boeing | |



Other Research and Economic Development Capabilities

Continued from page 5

QuickScience™ 1.0, developed by the Innovative Technology Center of the UWF College of Professional Studies, is a flexible, online solution that assists teachers in increasing student performance with standards-aligned, performance-focused resources for the science classroom.

Florida-China Linkage Institute provides a broad range of services to the local community and university students, including out-of-state waivers, an annual Conference for Chinese Studies and trade show and industry information.

Florida-Japan Linkage Institute/ Jikei-American Center was created to encourage Japanese and American students to explore each other's way of life through homestay and study abroad programs and to promote the exchange of ideas in the areas of culture and education.

The Center on Aging is an interdisciplinary program staffed with faculty from the sciences, education and business to educate students, initiate research and provide outreach activities to address the growing needs of an aging population. Research includes:

- "Effects of Exercise on the Immune Response in Older Adults"
- "Successful Aging with Partnerships"
- "Seniors and Students Unite for Fitness"

The Center for Leadership Development works in partnership with the University community and area business and professional organizations to provide leadership development opportunities for UWF students.

Florida Engineering Education Delivery System (FEEDS) is a cooperative effort of the Florida colleges of engineering: Florida Atlantic University, Florida International University, The University of Central Florida, The University of Florida/University of West Florida, Florida A&M University/Florida State University and The University of South Florida. These primary centers provide graduate courses and master's degrees in engineering on campus as well as through the FEEDS network.

Office of Juvenile Studies administers a full range of research-based juvenile justice services to improve juvenile justice intervention programs and enhance both pre-service and in-service staff training and professional development.

Office of Alternative Education assists pre-service teachers, teachers, alternative educators, faculty of UWF and agencies in the community to more effectively work with students at risk and families at risk through in-service training (workshops) and graduate courses.

Office of Community Learning is a regional office that collects, analyzes, develops and disseminates learning policy data to Northwest Florida educators and citizens.

Office of Multicultural Studies assists students, staff, faculty, cultural groups, schools and community agencies in understanding concepts, attitudes and values of multicultural, inter-cultural and international interaction through workshops, seminars, guest lectures and courses of study to gain an awareness and further understanding of cultures and their impact.



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Center for Environmental Diagnostics and Bioremediation

The **Center for Environmental Diagnostics and Bioremediation (CEDB)** is a regional resource providing analytical services, scientific oversight and evaluation concerning bioremediation, environmental health, DNA chemistry and ecological surveys.

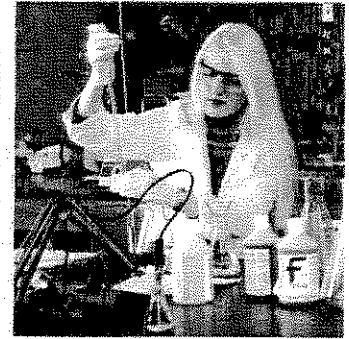
Key programs and services:

- analysis of pollution in regional waters
- new bioindicators for assessing the health of ecosystems and degrees of environmental pollution
- environmental molecular diagnostics tools
- detection and typing of indigenous biota
- investigations of environmental and ecological problems facing our coastal and estuarine areas
- educational and training opportunities for students
- technical support and expertise for local, state and federal agencies and private industries

Research strengths:

CEDB's staff of uniquely talented environmental scientists conducts basic and applied research in:

- physiology
- marine biology
- biochemistry
- coastal ecology
- microbial genetics
- environmental chemistry and toxicology
- microbial ecology
- bioremediation
- protozoology



Recent projects:

- Diagnosis and improvement of environmental health with the goal of:
- aiding in the economic development of the region and state
 - creation of technology transfer opportunities and attraction of new industries

Whitman Center for Public Service

The **Whitman Center for Public Service** seeks to improve "quality of life" in the region by assisting governmental and non-profit agencies of West Florida through training and professional development, applied research and technical assistance, administrative and staff support and civic education. Working closely with its advisory board of community representatives, the center works toward its mission of linking university resources to community needs.

Recent projects:

- Guiding the Escambia County Charter Commission's effort to provide better government in the region through:
 - visioning and strategic planning efforts
 - citizen surveys of service satisfaction
 - development of government manuals
 - research and other support
- Research on the "Quality of Life and Livability in Northwest Florida" by developing scorecards of various factors, like education and jobs
- Civic education through two regional leadership programs:
 - West Florida Leadership Academy
 - Northwest Passage Youth Leadership Summit, which attracts high school students from as far away as Miami

Research strengths:

The Whitman Center programs address urban issues in the Pensacola area, such as:

- community development education
- community organizing and revitalization
- crime prevention
- economic development and entrepreneurial activities
- fair and affordable housing.



Key programs and services

Training and professional development in:

- supervision
- management
- communication skills
- sexual harassment
- customer service
- professional/ethical behavior in the workplace

Maritime Services Center



Research strengths:

- fish physiology
- ecology and biology
- environmental biology
- bioremediation
- environmental diagnostics
- bioenergetics
- nutrient flow in the marine environment

With the resources of the **Maritime Services Center (MSC)**, UWF is uniquely positioned to effectively address prominent and critical problems affecting the world's oceans. A worldwide diminishing stock of fish for both food and sport has prompted significant private, state and federal funding activities in support of aquaculture, ecology and biology, as well as studies on the effects of pollutants and human activity on these economically and recreationally important species.

Recent projects:

- water quality research in the estuarine and bay systems in Northwest Florida
- bioenergetics and nutrient flow in regional marine environments
- studies on fish and invertebrate ecology, physiology and biology



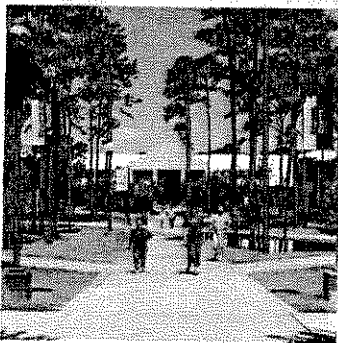
Key programs and services:

MSC's programs in dive safety, dive training and vessel navigation, maintenance and operation provide the expertise and methodology for conducting safe and effective underwater and marine research projects, such as those conducted at more distant locales (the Dry Tortugas, Indonesia and the Florida Keys) and funded by local, state and federal agencies.

Other Research and Economic Development Capabilities

Researchers at the **UWF/OWCC Fort Walton Beach** campus are conducting a multi-year research study to preempt encroachment on existing Eglin Air Force Base land that will significantly increase Eglin's military value by providing realistic test and training environments for all services and by conserving land, air and sea utilization.

The **Gulf Coast Alliance for Technology Transfer (GCATT)** is an innovative partnership of federal laboratories, state universities and community colleges in Northwest Florida and Southern Alabama. GCATT's mission is to enhance industrial and economic development through the transfer of member technology and expertise to the private sector, including:



- artificial intelligence and expert system technology
- real-time computing concepts
- neurophysical technology
- multimedia technology
- telemedicine applications
- technology applicable to controlling industrial pollutants
- natural plant restoration after environmental damage
- community strategic planning processes
- economic development activities
- business enterprise development

The **UWF Statistics Center** provides expert consultation for students, faculty and staff researchers across campus in the critical stages of their experiments and throughout the duration of their investigations.

ibinder.uwf.edu, the Internet notebook of educational standards, is an easy-to-use web site for teachers, parents and mentors. **ibinder.uwf.edu** facilitates quality instructional experiences through access to state educational standards, tools and strategies to use the standards and the support needed to make standards-based instruction work.

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Haas Center for Business Research and Economic Development



The **Haas Center** conducts studies and data analysis for economic forecasting, marketing research, business expansion, tourism and real-estate development.

Research strengths:

The Haas Center's staff unites academic expertise with professional experience, innovation and attention to detail in providing regional economic information to public and private entities. The center's research is reported in the quarterly newsletter, *Northwest Florida Economy*.

Recent projects:

- **Virtual Business Accelerator** grant (\$1 million) from the Small Business

Administration will facilitate economic development via business and technology transfer to small businesses.

- **EFI contract** (\$233,000) will assess the economic impact of Florida's 21 military bases on the state's economy and support leveraging the research, technology and economic development potential of Florida's military infrastructure, which is now the third largest industry in Florida behind tourism and agriculture.



Key programs and services:

- economic impact studies
- military studies
- tourism research
- GIS capabilities
- regional workforce development projects
- rural economic development assessments

Archaeology Institute

The **Archaeology Institute** is dedicated to enhancing the region's archaeology on land and under water. The important values of non-renewable archaeological resources are communicated by involving faculty, students, and the public and private sectors in archaeological research and development and in highly visible public archaeology projects that merge the university's missions of research, teaching and public service in West Florida.

Research strengths:

Archaeology products that educate the public about the value of archaeological resources and that promote heritage tourism in West Florida through the media and public-friendly archaeology destinations such as trails, museum exhibits and outdoor sites



Key programs and services:

The institute provides the expertise and facilities to conduct a wide variety of research including:

- evaluating archaeological impact
- developing historic and archaeological preservation plans for local communities, cities and counties
- conducting archaeological studies of colonial towns, forts and shipwrecks
- designing and installing museum exhibits
- developing outdoor public archaeological exhibits
- presenting research results to the community

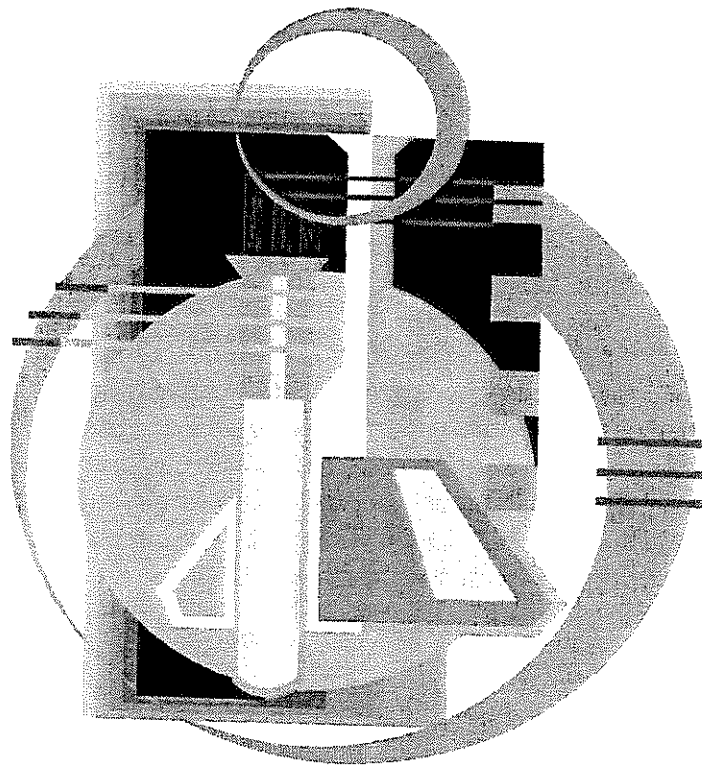
Recent projects:

- "First Spanish Pensacola" (Presidio Santa María) at NAS Pensacola; (\$300,000 local, state, federal grants and contracts) in association with Pensacola's 300th Anniversary
- Santa Rosa Island Shipwreck in Pensacola Bay: (\$300,000 state grants); 1705 Spanish shipwreck sunk while servicing Presidio Santa María
- Fort Walton Beach Landing project: (\$10,000 city contract) survey and evaluation in city park areas scheduled for development
- Pace Area Chamber of Commerce Archeological Survey and Historic Preservation Plan: (\$10,000 city and state grant and contract)
- Gulf Power "Hawkshaw" Archaeological Exhibit Update: (\$175,000 total project)



FLORIDA A&M UNIVERSITY

RESEARCH PROFILE



PHYLLIS GRAY-RAY, Ph.D.
VICE PRESIDENT FOR RESEARCH
NOVEMBER 14, 2003



About Florida A&M University

Florida Agricultural and Mechanical University was founded in 1887, thus making it one of the three oldest institutions of higher education in the State of Florida. It is a comprehensive, co-educational, residential, multi-level land-grant university offering a broad range of instruction, research, and service programs at the undergraduate, professional, and graduate levels. As the University moves through the twenty-first century, a major goal will be to enhance its statewide role as a vital and essential member of the State University System of Florida.

Florida Agricultural and Mechanical University will continue its focus on the educational needs of Blacks and other ethnic minorities, while maintaining its leadership in racial desegregation, equal access, affirmative action, and cultural diversity. At the same time, the University seeks students from all racial, ethnic, religious and national groups, without regard to age, sex, or disability, who have the potential to benefit from a sound university education. As the University grows to its optimal size, it will concentrate a greater student recruiting effort among Florida's community colleges, while maintaining a wholesome climate of receptivity for international students and all others.

As a growing state, the fourth largest in the United States, Florida is a microcosm of the consequences of growth and the accompanying racial, ethnic, religious, political and demographic diversity and the issues they present. Among the more pressing concerns are environmental degradation, racial and ethnic conflict, poverty and unemployment, the deterioration of family life, the problems of the aged, poor nutrition, an inadequate health-care system, and shortages of competent professionals in public education. As a public, land-grant institution, Florida Agricultural and Mechanical University is committed to addressing these concerns through research programs, on-campus education, the cooperative extension program, the continuing education program, and new programs created in response to these needs. The University is preeminent among the state universities for the cultural and racial diversity of its faculty. It will expand its efforts to attract faculty and staff who not only are competent in their academic areas, but able to provide instruction and learning across cultural lines, with sensitivity to carry out its mission within a climate which promotes moral and ethical values among its constituency.

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Utilizing a strong liberal arts program as its base, the University offers courses of study to educate students to meet the challenges of a rapidly-changing world through a commitment to lifelong learning, and to provide a sound foundation for advanced study. The twelve schools and colleges are committed to excellence in instruction, learning, and research, and cover a wide range of academic disciplines and related professional preparation. Of particular concern to the

University are those fields in which Blacks and other ethnic minorities are critically under-represented. In addition, the University accepts the challenge of helping to develop a truly multicultural, international society that is based upon respect and individual dignity.

Baccalaureate and master's degrees are offered in a wide range of disciplines. Doctoral degrees are offered in pharmacy, engineering, education, physics, environmental sciences, entomology, and cooperative degree in nursing. As a land-grant institution, Florida Agricultural and Mechanical University maintains an abiding commitment to adult and continuing education outreach programs, and other ways of serving the needs of non-traditional learners. Agricultural research and the Cooperative Extension program serve Florida's citizens, with a special emphasis on the needs of the rural poor and the small farmer. As these programs expand, research opportunities in agricultural experiment stations will be planned and developed.

To help ensure optimum learning, Florida Agricultural and Mechanical University will provide an environment which will allow each student the utilization of the latest technology available throughout their educational careers. In view of the impact of rapidly developing technology, the University will strengthen programs that prepare its students, particularly Blacks and other ethnic minorities, for careers in international affairs. During the last five years, the University achieved a national reputation for attracting high-achieving students. It will increase its efforts to provide attractive and stimulating student activities complementary to formal classroom instruction and academic performance. Among these will be a structured honors program, an artist and lecture series, intramural and intercollegiate athletics, and student organizations. Specific attention will be focused on the health of students and on maintaining conditions of wellness that will make for an optimal quality of life in the university community.

While maintaining its fundamental commitment to excellence in undergraduate education through existing courses of study, the University will continue to broaden its offerings at the baccalaureate level. The enhancement of the undergraduate experience through effective teaching and academic advisement will remain a hallmark of the University's dedication to study and learning.

Among the highest priorities in the development of Florida Agricultural and Mechanical University as it looks to the future will be graduate study and research. Therefore, the University will seek to offer a broader range of graduate and professional programs, especially in disciplines where there is a demonstrated need. In the planning and implementation of these new graduate degrees, interdisciplinary and innovative approaches will be major considerations. These approaches will maximize existing unit strengths, contain costs, and mitigate against dysfunctional overspecialization.

Research Mission Statement

Systematic research is a fundamental complement to advanced study, particularly at the doctoral level. The University will, therefore, provide a supportive environment for grantsmanship and scholarly inquiry at all levels, department, division, college and school, and through its centers and the Division of Research. In the pursuit of excellence in graduate studies and research, the

University will intensify its efforts to establish functional and supportive linkages with the corporate sector and private foundations.

Capabilities Overview

I. Colleges and Schools:

Allied Health Sciences

Arts & Sciences

Architecture

Business and Industry

Education

Engineering Sciences, Technology, and

Agriculture

Environmental Science Institute

FAMU-FSU College of Engineering

FAMU Law School

General Studies

Graduate Studies and Research

Journalism, Media and Graphic Arts

Nursing

Pharmacy

II. Laboratories, Centers and Programs:

Office of Academic Affairs

- ✓ Black Archives and Museum

FAMU-FSU College of Engineering

- ✓ Arsenic Laboratory
- ✓ Biomagnetic Engineering Laboratory
- ✓ Computer Security Research Lab
- ✓ Electromagnetic Research Lab
- ✓ Electronic Materials and Devices Lab
- ✓ Random Number Generation Research Lab
- ✓ High-Performance Computing and Simulation Lab
- ✓ Information Processing & Transmission Engineering Research Lab
- ✓ Design for Environmentally Conscious Mfg Research
- ✓ Affordable Composite Manufacturing
- ✓ Florida Advanced Center for Composite Technologies

- ✓ Fluid Mechanics Research Lab

Chemical Engineering Labs:

- ✓ Nuclear Magnetic Resonance Laboratory
- ✓ Pulsed Corona Laboratory
- ✓ Polymer Characterization Laboratory
- ✓ Electro-chemical Engineering Laboratory
- ✓ Process Control and Optimization Laboratory
- ✓ Fluid Dynamics and Hydrocyclone Laboratory

Biomedical Engineering Labs:

- ✓ Cellular and Tissue Engineering Laboratory
- ✓ Drug Delivery Systems Laboratory

Civil and Engineering Lab:

- ✓ Wind Hazard and Earthquake Engineering Lab (WHEEL)

Industrial Engineering Labs:

- ✓ Design for Environmentally Conscious
- ✓ Manufacturing Research
- ✓ Affordable Composite Manufacturing
- ✓ Florida Advanced Center for Composite Technologies

- ✓ Center for Civic Education and Service

The Center for Civic Education and Service engages students and faculty in community-based learning through service. The Center serves as the campus hub for linking students to service through both curricular and co-curricular experiences and for assisting faculty with strategies for connecting service to the curriculum.

- ✓ Challenger Learning Center

Exploration is the essence of learning. Challenger Center uses students' natural enthusiasm for space to create innovative learning experiences for imaginative young minds. Online or on-site, we're transforming the way teachers teach and students learn. We're creating a new generation of explorers.

✓ Cisco Network Academy Program

The FAMU-FSU College of Engineering and Cisco, Inc. have established a partnership program for high school, university, state employees and general public. The program is providing an opportunity for high school students to prepare for computer engineering career or networking career, providing additional training for university students, a career training for people seeking a career change or advancement in the networking field.

✓ Engineering Educational Outreach

The Engineering Educational Outreach (EEO) is a fun and innovative way to spark the interest of young minds into the field of engineering. The EEO is designed to involve high school and middle school students in the activities of a short-term design project with the guidance and help of FAMU-FSU College of Engineering students and faculty.

✓ Multidisciplinary Design Technology Clinic

The Multidisciplinary Design & Technology Clinic (MDTC) was established through funding provided by the National Science Foundation SUCCEED Coalition and has since worked with many industrial giants such as Ford Motor Company, Dow Chemical, Tallacom Industries Engelhard Corp, and Shaw Industries. The MDTC was created to support the College's effort to institutionalize multidisciplinary activities in all of its departments in order to expand its curriculum, and to enrich the experience of its students while meeting the needs of its corporate partners.

✓ Teachers & Guides in Forum (TGIF) Workshop

TGIF is an opportunity for guidance counselors, math, science, engineering and technology teachers and the College of Engineering to jointly work in finding ways to better guide and prepare students interested in the engineering, math and science fields.

College of Engineering Sciences, Technology, and Agriculture (CESTA)

- ✓ Center for Biological Control
- ✓ Center for Viticulture Sciences and Small Fruit Research
- ✓ Center for Water Quality
- ✓ Entomology Program
- ✓ Public Health Entomology Research & Education Center – Panama City, Florida
- ✓ National Urban Transit Institute
- ✓ GIS / Remote Sensing Laboratory

- ✓ Rural Development and Small Farms Program
- ✓ State-wide Goat Program
- ✓ International Agriculture Research
- ✓ Cooperative Institute for International Policy Research and Education (CIIPRE)

The Cooperative Institute for International Policy Research and Education (CIIPRE) is designed to affect coordinated responses to international efforts by providing technical assistance and productive involvement of member institutions from a variety of perspectives, particularly those in policy formulation to meet the economic and social needs of developing nations.

- ✓ Plant Biotechnology Laboratory

The Plant Biotechnology Laboratory conducts research on grape and peanuts, trains undergraduate and graduate students in biotechnology research, conducts workshops and seminars on biotechnology to benefit middle and high school students and the community to increase biotechnology awareness in the public, conducts community outreach activity by growing biotechnology-derived as well conventional crops in on-campus and off-campus demonstration plots, publishes reports and articles, and provides financial support for students. The laboratory is supported by the research funding from the United States Department of Agriculture, United States Agency for International Development and Florida Department of Agriculture and Consumer Services.

College of Arts and Sciences

- ✓ Center for Community Development and Research

The Center is responsible for conducting applied research which can be used by community leaders, government officials, and community members in decision-making about community problems and community development. The Center's intent is to encourage and initiate development efforts through community-based initiatives and to provide assistance to community-based organizations and limited resource families. The Center is responsible to community needs in criminal justice, poverty and welfare, social justice, mental and physical health, family organizations, and other issues as they arise and challenge community organization.

- ✓ Critical Language Institute & Translation Service

The mission of Critical Language Institute & Translation Service is to provide translation and interpretation services, training programs and materials, and develop coursework in distance learning in order to teach translation, interpretation, and less-commonly-taught language courses.

✓ Centers of Excellence in Music and Theatre

The objective of the Centers of Excellence in Music and Theatre is to provide FAMU students with enhanced educational experiences and opportunities – opportunities which prepare students for a variety of careers and provide them with a number of options for advanced study. The operation of the Centers of Excellence has served an important function in terms of community outreach and enhancement. The first rate performances offered by our jazz, choral and theatrical organizations have added a new dimension to the quality of life in the Tallahassee community.

School of General Studies

✓ Learning Development and Evaluation Center

The Center provides supportive services to learning disabled post-secondary students who attend Florida A&M University. The basic areas of service are admissions (assistance) which include a summer transition-orientation program, academic advisement and counseling, personal and career counseling, academic tutorial services, technology services, and class accommodations. The program also has an outreach program which involves community activities.

School of Graduate Studies

✓ Small Business Development Center

The Small Business Development Center (SBDC) is part of the Florida Small Business Development Center Network supported by the United States Small Business Administration (SBA), the State University System and Florida A&M University. The Center's purpose is to provide low or no-cost management/technical assistance as well as programs that are designed to assist small business owners and potential owners to make sound decisions that will contribute to the successful operation of their businesses.

College of Pharmacy and Pharmaceutical Sciences

- ✓ Center for Drug Delivery
- ✓ Florida AIDS Education & Training Center
- ✓ Minority Biomedical Research Support Program (MBRS)
- ✓ Neuroscience Research Center

School of Architecture

- ✓ Institute for Building Sciences

Single point of coordination for all research, continuing education, and public service activities of the School of Architecture (SOA) at Florida A&M University.

Environmental Science Institute

- ✓ Florida A&M Center for Environmental Equity and Justice

The purpose of the Center is to conduct and facilitate research, develop policies, engage in education, training, and community outreach activities with respect to environmental equity and justice issues.

- ✓ Center for Environmental Technology Transfer (FAMCETT)

FAMCETT is an operational unit within ESI that provides technical and research consultations to state, federal, and international agencies involved in environmental management, education, policy development and planning.

Institute on Urban Policy and Commerce

The major purposes of the Institute are to pursue basic and applied research on urban policy issues confronting the inner-city areas and neighborhoods in the state; to influence the equitable allocation and stewardship of federal, state, and local financial resources; to train a new generation of civic leaders and university students interested in approaches to community planning and design; to assist with the planning, development, and capacity building of urban area nonprofit organizations and government agencies; to develop and maintain a database relating to inner-city areas; to support the community development efforts of inner-city areas, neighborhood-based organizations, and municipal agencies; and to train a new generation of civic leaders and university students interested in approaches to community development.

Census Information Center (CIC)

The CIC Program is a cooperative agreement between Florida A&M University and the U. S. Bureau of Census and makes census data and other federal statistics available to underserved communities in Florida with an emphasis on Franklin, Gadsden, Jefferson, Leon, Liberty, Madison, Taylor and Wakulla counties.

III. Ongoing research and expertise

Communication and Signal Processing

- ✓ Advanced Digital Signal Processing Architecture
- ✓ Image Processing
- ✓ Analog, Digital and Optical Communications

Controls

- ✓ Control System Simulation
- ✓ Instrumentation
- ✓ Robotics
- ✓ Nonlinear Control Systems
- ✓ Fuzzy Logic
- ✓ Multivariable Control Systems

Digital Systems and Computer Engineering

- ✓ Parallel Computer Architecture
- ✓ Fault Tolerant Computer Architecture
- ✓ Computer Networks
- ✓ Multiprocessor Application Environment

Electromagnetics and Optoelectronics

- ✓ Laser and Sonar Signal Detection
- ✓ Microwaves

Microelectronics and Devices

- ✓ Neural Networks
- ✓ ASIC System Design
- ✓ Solid State and Photonics Devices

Affordable Composites Manufacturing

- ✓ Resin Transfer Modeling
- ✓ Integrated Product and Process Design

Precision Manufacturing

Design for Environmentally Conscious

Manufacturing

Applied Optimization

Manufacturing System Analysis

Manufacturing Processes and Design

- ✓ Computer Integrated Manufacturing
- ✓ Robotics and Robotic Applications
- ✓ Rapid Prototyping Technology
- ✓ Solar Energy Research

Combustion

- ✓ Computational Methods in Combustion
- ✓ Optical Diagnostics

Control and Robotics

- ✓ Acoustic Control
- ✓ Neural Network Control and Identification of Systems
- ✓ Sensor Fusion, Decentralized Estimation and Control
- ✓ Modular Robotics and Mechatronics

Fluid Mechanics and Aerodynamics

- ✓ Theoretical and Computational Fluid Dynamics and Mechanics
- ✓ Biomedical and Biomagnetic Fluid Mechanics
- ✓ Fluidic Thrust Vectoring

Materials Engineering

- ✓ High Temperature Superconductors
- ✓ Computational Structural Mechanics
- ✓ Composite Materials & High Temperature Composite Materials
- ✓ Superplastic Metal Forming
- ✓ Texture and Microtexture

Systems Engineering and Design

- ✓ Integrated Design Systems
- ✓ Multi-Agent Design Architecture

Advanced Materials

- ✓ Crystallization of Polymers
- ✓ Semiconductor Processing

Reaction Science and Engineering

- ✓ Electrochemical Engineering
- ✓ Chemical Thermodynamics

Bioengineering

- ✓ Applications of Nuclear Magnetic Resonance

Transport Processes

- ✓ Separation Processes in Hydrocyclones
- ✓ Multiphase transport processes

Environmental Engineering
Geotechnical Engineering

- ✓ Computer Applications in Geotechnical Engineering
- ✓ Soil Properties and Behavior

Hydraulic/Water Resources Engineering

- ✓ Water Resources Management
- ✓ Hydrology
- ✓ Hydraulic Engineering

Structural Engineering and Mechanics

- ✓ Applied Structural Mechanics
- ✓ Nondestructive Techniques
- ✓ Composite Materials
- ✓ Bridge Design and Retrofit

Plasma and Laser Science

- ✓ Laser-Plasma Interactions
- ✓ Supersonic and Hypersonic Plasma Aerodynamics
- ✓ Microwave Processes
- ✓ Turbulence and Non-equilibrium Effects
- ✓ Nonlinear Dynamics
- ✓ High Energy Density Systems
- ✓ X-Rays for Microscopy, Lithography and Diagnostics

Fiber-Based Photonics
Physics

- ✓ Astrophysics
- ✓ Atomic Molecular
- ✓ Computational
- ✓ Condensed Matter
- ✓ Fluid
- ✓ High Energy
- ✓ Laser Remote Sensing
- ✓ Accelerator Physics
- ✓ Plasma Physics

Computational Molecular Physics

- ✓ Quantum Fluid Dynamics
- ✓ Energetic Materials
- ✓ Molecular Processes through Distributed Computations
- ✓ Adaptive Algorithms

Homeland Monitoring and Security

- ✓ Laboratory Based Laser Induced Breakdown

- ✓ Spectroscopy
- ✓ Laboratory Based UV Raman Systems

Nanostructures, Superconductivity and Diamond-Like Materials

- ✓ High Strength Nanocomposites
- ✓ Sensors
- ✓ Spintronics
- ✓ Microwave Device Technology
- ✓ Magnetic Superconductors

Astrophysics and Space Science

- ✓ Cosmic Radiations
- ✓ Organic and Bio-Organic Detectors
- ✓ Simulations

AIDS Research Collaboration

- ✓ Anti-AIDS studies

Center for Drug Delivery

- ✓ Anti-Cancer drug development
- ✓ Pulsatile vaccine

Neuroscience Research Center

- ✓ Caloric Restriction Studies
- ✓ Neurodegeneration
- ✓ Stroke
- ✓ Systemic Protease
- ✓ Caphepasin
- ✓ Systemic Inhibitors

Minority Biomedical Research Support (MBRS) Program

- ✓ Drug Design
- ✓ Alzheimer's disease studies
- ✓ Opiate Studies
- ✓ Nitric Oxide studies
- ✓ Anti-Inflammatory Steroids Development
- ✓ Osteoporosis Therapy - Non-steroid anti-inflammatory studies
- ✓ Anti-cancer nucleoside development studies
- ✓ drug delivery systems

Environmental Sciences

- ✓ Risk Assessment
- ✓ Atmospheric Chemistry and Physics
- ✓ Theoretical and Computational Chemistry
- ✓ Contaminant Transport Modeling
- ✓ Environmental Restoration

- ✓ Biogeochemistry and Microbial Ecology
- ✓ Environmental Toxicology
- ✓ Environmental Policy & Risk Management
- ✓ Bioconversion of Waste
- ✓ Environmental Radiochemistry
- ✓ Marine biotechnology (bioremediation of petroleum, marine, and coastal environments)
- ✓ Biodegradation of Dry-cleaning Solvents

Viticulture Sciences and Small Farm Development

- ✓ Grape cultivation
- ✓ Pierce's Disease studies
- ✓ Pathogen identification and classification
- ✓ DNA fingerprinting
- ✓ DNA cloning
- ✓ Food Packaging

Plant Biotechnology

- ✓ Aflatoxin studies
- ✓ Protein content studies
- ✓ Transgenic peanut plant Development
- ✓ Tissue culture systems
- ✓ Plant Biotechnology

AIDS Research Collaboration

- ✓ Anti-AIDS studies

Florida AIDS Education & Training

- ✓ AIDS Workshop for Pharmacists and other health care providers
- ✓ Case conferences at County Health Department Pharmacies

Drug Delivery

- ✓ Anti-Cancer Drug Development
- ✓ Pulsatile vaccine
- ✓ Lung cancer

Diabetes Research

- ✓ Diabetes modulation of pain
- ✓ Patient Education for Diabetics
- ✓ Neuropharmacology of Diabetes

Neuroscience Research Center

Molecular Biology

- ✓ Asthmatic Airway Diseases
- ✓ Cancer Preventatives Agents

Bioterrorism

- ✓ Caloric Restriction Studies
- ✓ Neurodegeneration
- ✓ Systemic Protease
- ✓ Caphepasin
- ✓ Systemic Inhibitors
- ✓ Opiates addiction and abuse research
- ✓ Parkinson's disease research
- ✓ Development neuropharmacology research
- ✓ Alcohol abuse research
- ✓ Cocaine abuse and addiction research
- ✓ Stroke research
- ✓ Development of drugs for Alzheimer's disease

Drug Discovery Research

- ✓ Drug Design
- ✓ Alzheimer's disease studies
- ✓ Opiate Studies
- ✓ Nitric Oxide studies
- ✓ Anti-inflammatory Steroids Development
- ✓ Osteoporosis Therapy — Non-steroid anti-inflammatory studies
- ✓ Anti-cancer nucleoside development studies

Toxicology Research

- ✓ Lead Neurotoxicity
- ✓ Mercury Neurotoxicity
- ✓ Manganese Neurotoxicity
- ✓ Toxicity of petroleum products
- ✓ Pesticide toxicity

Nuclear Magnetic Resonance

- ✓ Characterization of Synthetic Compounds
- ✓ Determining the relaxation times of peptides
- ✓ Molecular Modeling

Prostate Cancer Research

- ✓ Prostate cancer education and prevention research

Cancer Research

- ✓ Chemoprevention of cancer research
- ✓ Anticancer drug discovery
- ✓ Development of metabolic inhibitors as specific anticancer agents
- ✓ Potentiation of anticancer drugs through drug delivery

- ✓ Disaster Preparedness

Public Health

- ✓ Birth Defects

Center for Research Excellence in Science and Technology

- ✓ Drug Design
- ✓ Distributed Computing
- ✓ Cultural Competence
- ✓ Health Policy Research
- ✓ Community Assessment
- ✓ Environmental Impact

Mathematics

- ✓ Process modeling of composite materials and analysis of the chemical vapor infiltration process

IV. Research Statistics

Major research partners

Award amounts from July 1, 2003-October 31, 2003.

U.S. Department of Education	\$23,314,880.00
U.S. Department of Agriculture	\$10,664,970.00
National Science Foundation	\$3,189,416.00
Florida Department of Health	\$2,645,383.00
National Aeronautics and Space Administration	\$2,511,906.00
State of Florida	\$2,224,946.00
Florida Department of Education	\$1,278,428.00
Florida Department of Transportation	\$1,000,000.00

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FLORIDA STATE UNIVERSITY RESEARCH

AN OVERVIEW OF
UNIVERSITY-WIDE SCIENCE
& TECHNOLOGY

Now approaching its 55th year as a fully fledged research university, Florida State University posted a record \$162 million in sponsored research grants and contracts in FY 2003.

The university's traditional strengths in the physical and life sciences are gaining momentum through a concerted effort by administrators and faculty to increase funding for biomedical research, molecular (or structural) biology, nuclear magnetic resonance and similar diagnostic technologies, both basic and applied materials science, and computational science with an emphasis on meteorological and oceanographic studies.

For more about Florida State University's research programs, visit www.research.fsu.edu.

HEALTH & BIOMEDICAL SCIENCE

MEDICAL SCIENCE

Now in just its second full year of operation, FSU's new College of Medicine is rapidly developing one-of-a-kind capabilities for expanding health care to Florida's elderly and rural residents.

In July 2003, the med school opened two training centers outside Tallahassee, one in Orlando and another in Pensacola. These three regional centers give third- and fourth-year medical students unique opportunities to develop clinical specialties ranging from emergency medicine to geriatrics.

Also in 2003, the school launched:

- **The FSU Department of Geriatrics:** This is the first stand-alone med school department in Florida devoted exclusively to training specialists in geriatric medicine, with special emphasis on such areas as end-of-life care, pain management and elder abuse.

- **A Doctorate Program in Biomedical Sciences:** In the fall of 2004, the first students in this program will begin training for careers as researchers with special missions aimed at tracking down the molecular basis of disease. These future scientists are being trained in an interdisciplinary environment that exposes them to the latest tools and know-how in researching the fundamental dynamics of aging and cancer.

AGING

- **The Pepper Institute on Aging and Public Policy:** A legacy of the late Claude Pepper, congressman and senator from Florida and life-long champion of issues impacting the lives of the nation's elderly, this institute—a part of the university's College of Social Sciences—serves as the coordinator for multidisciplinary work in aging at Florida State University.

Current research projects include work and retirement, pensions, inequality, long term care, assisted living, tech-



Food scientist Dr. Peggy Hsieh has patents on innovative tools for testing the safety of meat products.

nology and aging, dementia and care-giving, education and achievement, well-being, life satisfaction, the impact of Alzheimer's Disease on families and communities, intergenerational relations, Social Security and health and aging.

The Institute also sponsors an extensive outreach program for mature adults. The Academy at FSU encourages elders to return to campus to continue to learn, while participating in research projects and intergenerational education.

POPULATION HEALTH

Housed in the Department of Sociology, FSU's Center for Demography & Population Health interdisciplinary research center specializes in collecting and analyzing data on various health-related topics that impact large segments of the U.S. population. Researchers focus on such areas as HIV infection and the AIDS epidemic; infant mortality, psychiatric disorders; infant mortality; stress; alcoholism and drug dependency.

A rising program within the center is research into the

epidemiology of stress and its relationship to adult mortality and health issues among U.S. minority populations. Heavily funded by the National Institute on Drug Abuse, this team project is led by Dr. Jay Turner, an internationally acclaimed leader in the study of mental health and substance abuse problems.

FOOD & NUTRITION SCIENCE

• **The Department of Nutrition, Food & Exercise Sciences:** As part of FSU's College of Human Sciences, this department conducts numerous projects that explore the relationship between food and health. Examples of research currently under way include:

- the regulation of dietary zinc and copper and how these metals play their crucial roles in healthy brain function;
- impacts of cigarette smoking and energy balance;
- the therapeutic properties of fruit;
- jellyfish collagen as an aid in treating arthritis; and
- the relationship between obesity and hypertension.

NURSING

Within the graduate program of FSU's School of Nursing, students are offered a choice of three tracks of coursework and training that prepare them for rewarding careers in the health-care industry. For many years, Florida's health-care system has benefited from these programs that put **nurse practitioners** into primary care and clinical settings; **nurse educators** into education settings ranging from schools of nursing to local health-care facilities and highly specialized **case managers** equipped to help individuals and families understand and get access to quality health care services.

COMMUNICATION DISORDERS

A key department within the College of Communication is the **Department of Communication Disorders**, where faculty do leading research into speech therapy and profound mental disorders such as autism.

The department maintains five distinct laboratories that conduct research on almost every aspect of speech and hearing impairments. For the direct benefit of the commu-

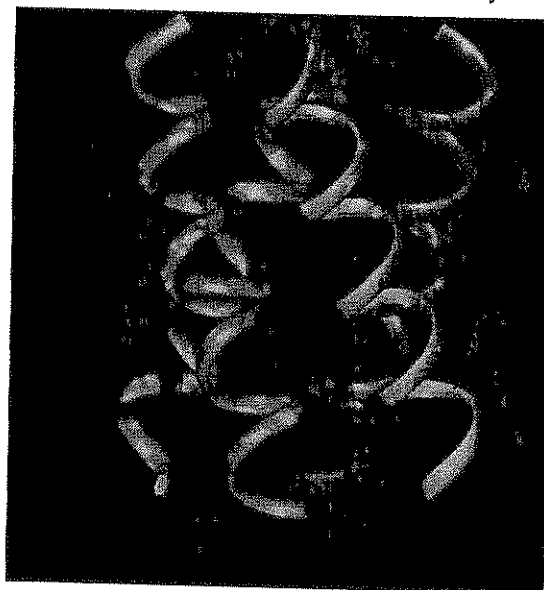
nity, the department runs the L.L. Schendel Speech and Hearing Clinic where the public can get professional assessment and treatment of communication deficiencies.

The study of autism has been a priority for the department for more than 20 years. Researchers have developed some of the most powerful techniques for detecting this incurable disorder as early as possible, even in children as young as two. As a continuing service to the state, the department is the northern headquarters for the state-funded **Center for Autism and Related Disorders**, which serves nearly 1,000 people living in 18 northwestern counties.

NEUROSCIENCE

Made up of biologists, psychologists, biochemists and biomedical scientists, FSU's Program in Neuroscience draws on interdisciplinary strengths to focus on fundamental studies of brain and neural behavior. Established programs include:

- **Sensory Research:** Scientists study the sense of smell (olfaction) and taste at the molecular level, building on work of earlier FSU specialists in the fields of taste and smell whose pioneering research is internationally recognized. A newly developing area examines the intriguing relationship between high-field magnetism (such as one might encounter in an MRI examination) and neural activity.





Taxolog, Inc., a spin-off company from Taxol research at FSU, opened a Tallahassee branch in 2003. The company's headquarters are in Fairfield, New Jersey.

- **Brain Neurotransmitter Research:** Scientists study the natural chemicals in the brain—the neurotransmitters—which allow neurons to function properly. Imbalances in these chemicals, along with imbalances of important nutrients such as zinc, often are associated with such debilitating mental disorders, including schizophrenia, Parkinson's Disease and Alzheimer's.

- **Hypertension/Obesity:** How various diets and habits impact high blood pressure and weight control in individuals is the focus of a broad line of investigation. A specialty is the study of how individuals' taste preferences for salt may be passed along hereditarily, and salt consumption's impact on pregnancy and adult health.

CANCER DRUG RESEARCH

In the 1990s, a group of organic chemists at FSU—led by Dr. Robert Holton—developed a method for synthetically manufacturing the cancer-fighting natural compound found in tiny amounts in the bark of the Pacific yew tree. Subsequently, Taxol—marketed by Bristol-Myers Squibb—has become the largest selling anti-tumor drug in the world.

Holton's Taxol Research Group today operates a round-the-clock investigation of the entire family of Taxol-like compounds known as taxanes, seeking to identify and synthesize those "cousins" of Taxol which may have even

greater cancer-killing properties than the mother molecule. The work is subsidized by grants from the National Cancer Institute and from Holton's own non-profit foundation.

COMPUTATIONAL SCIENCE

Since the 1960s, FSU has been a leader in the development and exploitation of ultra high-performance computer systems in advanced applications in science and technology.

- **The School of Computational Science and Information Technology (CSIT):** Set up as a statewide resource for scientists working anywhere within Florida's university system, this school specializes in making available leading-edge computer hardware and software across a wide scope of disciplines.

Currently, the school operates an IBM pSeries 690, among the fastest university-owned supercomputers in the world. Examples of ways researchers are using the machine include developing increasingly finer arrays of electrical components on various media and for designing better, more useful models for predicting severe weather and oceanographic anomalies such as El Niño.

- **Applied and Computational Mathematics:** A cross-disciplinary team of researchers, based in the Department of Mathematics, are heavily involved in computational research that bears on fields ranging from astrophysics to brain mapping. The Human Brain Project uses data collected by MRI brain scans and other imaging technology to help improve mathematical techniques better visualizing the functions of a living brain.

MATERIALS SCIENCE

Thanks in large part to FSU's tradition in basic research in physics, the study of novel and theoretical metals, plastics, ceramics and other materials has been a hallmark of campus research. Today, such research is integrated through the following interdepartmental programs:

- **MARTECH:** Established in 1986, the Center for Materials Research & Technology (MARTECH) promotes re-

search and education at the frontiers of materials science, helping to make Florida assume a leadership role in national materials technology. Key areas of investigations under way include: synthesis of ultra-thin films for use as insulators, semiconductors and a host of other applications; and nanomagnetism, which involves the development of nano-sized magnetic particles for use in ultra-dense memory storage devices.

• **Mechanical Engineering:** Several labs dedicated to the discovery, manufacture, processing and testing of new materials make up the research enterprise of the FAMU/FSU College of Engineering's Department of Mechanical Engineering.

Among these are The Advanced Mechanics and Materials Laboratory (AMML) which is primarily involved in the computational modeling and thermo-mechanical characterization of high performance materials. Current areas of research include:

- computational and experimental characterization of advanced materials including metal matrix composites;
- processing and characterization of polymeric composites;
- processing and modeling of superplastic materials;
- computational modeling of deformation mechanisms of superplastic materials;
- design, analysis, and characterization of superconducting magnets and materials

The Biomagnetic Engineering Laboratory (BMEL) specializes in applying high magnetic fields (of the order of 0.5 tesla and above) to biological systems in pursuit of both basic and applied research. In collaboration with the National High Magnetic Field Laboratory, headquartered adjacent to the College of Engineering, the lab's researchers have used fields of up to 20 Tesla in basic research on the behavior of biological systems including blood flow, hemoglobin spectroscopy and botanical plant growth. A leading (now patented) invention of lab re-

searchers is a method based on magnetic technology which can separate erythrocytes (red blood cells) from whole blood much faster than conventional means.

• **The National High Magnetic Field Laboratory (NHMFL):** This national lab, headquartered at FSU's Innovation Park, is one of the world's leading centers for research into exotic materials, both real and imagined. The lab's Condensed Matter Group, whose leadership includes Dr. Robert Schrieffer, a Nobel Laureate and renowned expert on the phenomenon superconductivity, conducts wide-ranging experimental and theoretical investigations into such areas as high-temperature (high-Tc) superconductivity, organic conductors, the Quantum Hall Effect, and condensed-matter nuclear magnetic resonance.

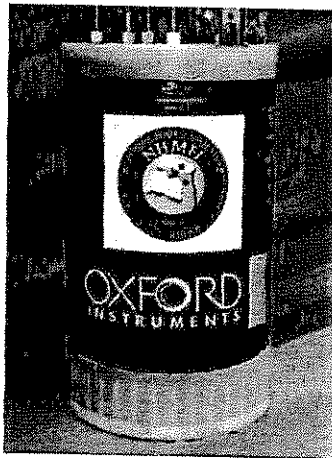
HIGH-FIELD MAGNETISM

THE NATIONAL HIGH MAGNETIC FIELD LABORATORY

Established in 1990, the National High Magnetic Field Laboratory's headquarters at FSU's Innovation Park is now the world's premiere center for the development and testing of the most powerful magnets ever made. This \$200 million center designs and builds these machines and searches for new ways to apply their ultra-high fields to

challenges ranging from the development of new power sources to a better understanding of brain function.

Though multi-faceted, the lab's Magnet Science and Technology (MS&T) Division carries the main responsibility for developing the technology for cutting-edge magnet systems. This includes building advanced magnets for the lab itself, working with industry to develop the technology to improve high-field magnet manufacturing capabilities and pushing the state of the art beyond what is currently available in high field magnet systems through materials and magnet research.



This new superconducting coil helped scientists set a new record in magnetic field strength in 2003.

Recent highlights produced by some of the division's core projects include:

- setting world records in a resistive magnet (of 33 Tesla) and a hybrid (resistive plus superconducting) magnet (of 45 Tesla)
- setting a world record (in 2003) in the strength of an NMR (nuclear magnetic resonance) spectrometer superconducting magnet at 21 Tesla.

Research into NMR, which is fundamental to advancements in medical diagnosis and biomedical research through MRI (magnetic resonance imaging) technologies, is only one of several resonance spectroscopy technologies studied at the NHMFL. The lab's Center for Interdisciplinary Magnetic Resonance (CIMAR) is a large-scale integration of resonance spectroscopy research, including NMR, MRI, EMR (electron magnetic resonance) and ICR (ion cyclotron resonance). Each of these technologies represent the most powerful tools scientists have for accurately determining the composition and characteristics of complex materials. Such tools have a vast range of applications in research and industry, from studying living tissue to refining manufacturing techniques to cleaning up pollution.

PSYCHOLOGY

Each year, FSU's diverse team of psychology faculty attract more than \$5 million in research grants for investigations in areas ranging from reading development in schoolchildren to brain function.

Strengths include the following areas of specialization:

- **Neuroscience:** The Program in Neuroscience, which began in the 1960s as a collaboration among faculty strengths in biology, physiology, biochemistry and neuropsychology, maintains a robust research enterprise that is described in some detail under the heading "Health and Biomedical Science."
- **Cognitive Studies:** Researchers focus on the dynamics of memory, the relationship between practice and expertise, and in particular, how the developing mind absorbs information. This latter vein of investigation has produced some of the most far-reaching insights into how children

learn to read. In 2001, the research led to the state's designation of FSU as the launching pad for a state and federally backed plan to overhaul reading education in Florida. As a consequence, the Florida Reading Center was created in 2002 to lead Gov. Jeb Bush's "Just Read, Florida!" initiative. Based off-campus in Tallahassee, a key part of the center's mission is to conduct applied research that will have an immediate impact on policy and practices related to K-3 literacy instruction and assessment in Florida.

ENGINEERING

Research at the FAMU/FSU College of Engineering involves more than 230 active projects under contracts exceeding \$57 million. The faculty publishes more than 250 papers annually and has received 20 patents in the last five years with another 40 pending.

Key research programs include:

- **Materials Science:** In addition to what is described under the heading "Materials Science" previously, the college is the home of the Florida Advanced Center for Composite Technologies that employs advanced material process-



ing and virtual manufacturing technologies to develop composite parts that will be used where metals were once the only option.

- **Biomedical Engineering:** Strengths focus on areas ranging from transport phenomena in tissue and drug delivery to NMR applications in biomedicine and tissue engineering. Labs include Cellular and Tissue Engineering Labora-

tory and Drug Delivery Systems Laboratory.

- **Computer Security Research:** The department maintains the latest equipment for digital signal processing, micro-processing, microelectronics fabrication, electromagnetic, communications / electro-optics, radar and other areas of research.

- **Information Processing & Transmission Engineering:** Current research project is to develop test procedures for the evaluation and certification of field traffic control devices for conformance to the National Transportation Communications for ITS Protocol Standards.

- **Fluid Mechanics Research:** The testing and diagnostic lab includes a Hot Jet Anechoic Facility, an optical diagnostic development lab and a subsonic wind tunnel. Supported by grants from the Boeing Corporation, U.S. Navy, U.S. Air Force and NASA, faculty examines a broad range of fluid dynamics problems. The main areas of research are in high-speed flows and non-intrusive diagnostics methods for the study of complex flows.

EARTH & ATMOSPHERIC SCIENCES

Florida State has been an internationally recognized leader in atmospheric and oceanographic research for more than three decades.

Key strengths are focused in the following areas:

- **Severe Weather Modeling and Prediction:** Headquartered at Innovation Park, The Center for Ocean Atmospheric Predictions Studies (COAPS) conducts research into the influence of tropical and mid-latitude oceans on the Earth's climate. COAPS, directed by meteorologist and oceanographer Dr. James J. O'Brien, is funded by several federal agencies to produce original published papers that advance understanding of the oceans and the atmosphere.

- **Hurricane Path Prediction:** A team of meteorologists led by Dr. T.N. Krishnamurti has won worldwide acclaim



Marine biologists are heavily engaged in research in the Gulf of Mexico. The work has led to the creation of two reserves aimed at protecting spawning stocks of gag grouper and other reef fishes.

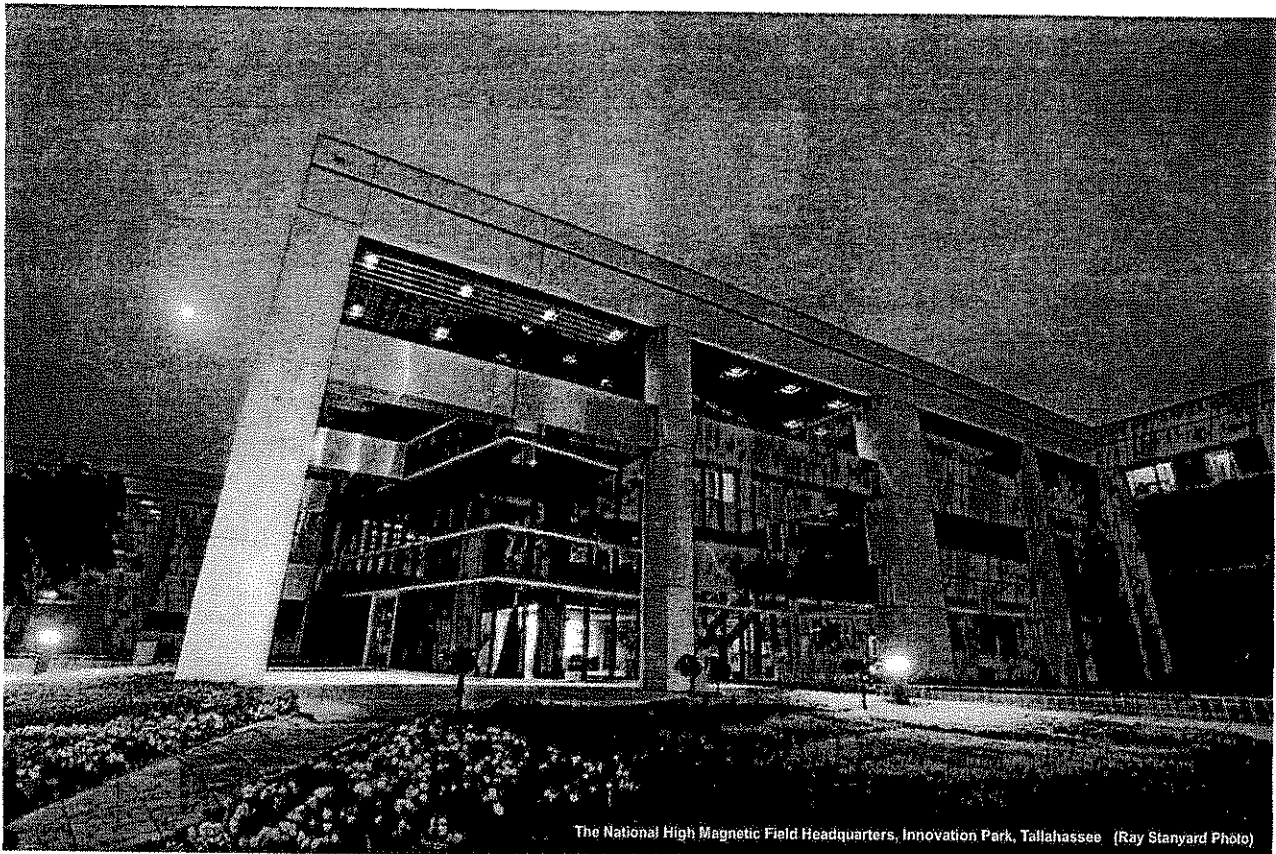


for developing computer algorithms that enable forecasters to predict the path of hurricanes and typhoons with unprecedented accuracy.

- **National Weather Service Joint Collaboration:** In 2001, FSU joined a select group of universities whose campus-based research in meteorology is physically conjoined with a regional office of the National Weather Service. This collaboration, which offers students a rare opportunity to apply classroom training to real-time weather forecasting, is manifest in a new program called The Cooperative Program for Operational Meteorology, Education and Training.

- **Geophysical Fluid Dynamics Institute:** This interdisciplinary center focus is on isolating the key mechanisms behind the movement of the atmosphere, oceans, groundwater, and molten material, and explaining these phenomena by means of analytical, numerical, and experiment models.

(continued)



The National High Magnetic Field Headquarters, Innovation Park, Tallahassee (Ray Stanyard Photo)

BIOLOGICAL & MARINE SCIENCES

Florida State's strengths in the biological sciences are renowned for their diversity and depth. Today, the Department of Biological Science is one of the fastest growing departments on campus. Primary areas emphasized currently include:

- **Ecology and Evolutionary Biology:** Research in this area includes large, well-funded investigations into such areas as:
 - dinosaur paleontology;
 - the ecosystem of the long-leaf pine forest;
 - population genetics in fishes; and
 - the ecology of fire ants.
- **Marine Biology:** Investigators focus on the following key fields:
 - the natural history and ecology of the Florida spiny lobster;
 - population dynamics of marine invertebrates, including corals and sponges; and
 - population dynamics and ecology of the gag grouper.

As a base for conducting much of the university's research in marine biology, Florida State maintains the Edward Ball Marine Laboratory on the Gulf coast an hour south of campus. This research is also supported by an interdisciplinary Academic Diving Program that provides support for many academic departments including anthropology, biology, geology, oceanography and social sciences as well as several federal and state agencies and other universities in and outside Florida.

PHYSICAL SCIENCES

From astrophysics to the subatomic realms of matter, no part of the physical universe is left uninvestigated by scientists within FSU's large (44-teaching faculty plus 22 associated Ph.D.s) Department of Physics. The department boasts particular strengths in the following key areas:

- **Nuclear and Atomic Research:** Established by Florida Gov. Leroy Collins in 1958, FSU's nuclear physics program continues to set a standard for scientific excellence. With an on-campus Superconducting Linear Accelerator, built

with NSF support, this program—unique to the Southeast—has produced 143 Ph.D. scientists who now hold key posts in industry, government labs and in graduate education nationwide.

- **Condensed Matter Research:** Campus scientists coalesce their interests in investigating the properties of new materials in the department's Center for Materials Research and Technology which is described in some details elsewhere under the heading "Materials Science."

- **High-Energy Physics:** Since it was established in the 1950s, FSU's High-Energy Physics Program now covers a diverse range of expertise ranging from detector development to the use of advanced analysis methods. FSU physicists are engaged in major programs at the Fermi National Accelerator Laboratory (Fermilab), near Chicago, and at CERN just outside Geneva, Switzerland. At Fermilab, FSU researchers use the world's highest energy (1.8 TeV) proton-antiproton collider to study the fundamental structure of matter. The team's principal research interests are the physics of quarks. In August 2003, the team helped confirm the discovery of the so-called fifth quark—an entirely

new species of matter—through work at Jefferson National Laboratory in New Jersey.

EXTRANEOUS RESEARCH STRENGTHS FOR DIRECT SERVICE TO FLORIDIANS

The Institute for Science & Public Affairs (ISPA): FSU is home to this multifaceted institute that helps government and private agencies solve problems ranging from hazardous waste disposal to conflict resolution. Specialists in a variety of fields carry out the university's public service responsibility through programs in education, training and applied research. Centers housed within the institute include:

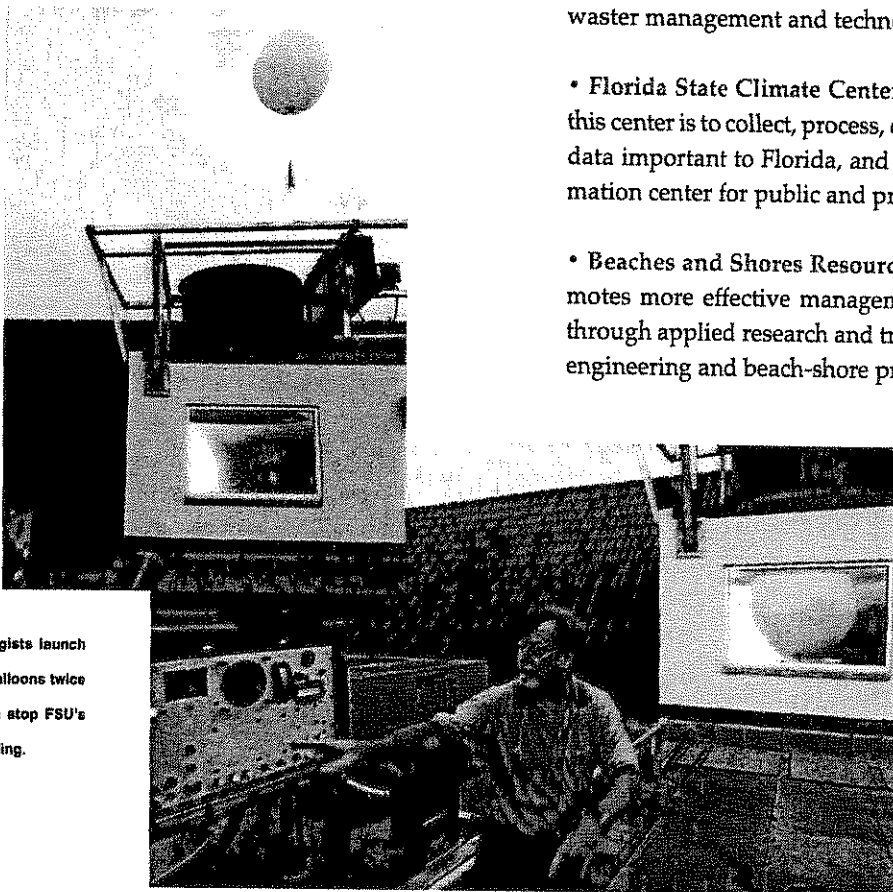
- **Florida Resources and Environmental Analysis Center:** FREAC assist state and local agencies in resource management and environmental analysis

- **Center for Biomedical and Toxicological Research:** This unit conducts a wide range of research and training for federal, state and local governments in the areas of environmental toxicology, risk assessment, solid and hazardous waster management and technology transfer.

- **Florida State Climate Center:** The primary mission of this center is to collect, process, distribute and store climatic data important to Florida, and to serve as a climate information center for public and private agencies and groups.

- **Beaches and Shores Resource Center:** This center promotes more effective management of the state's beaches through applied research and training programs in coastal engineering and beach-shore processes.

- **Center for Prevention and early Intervention Policy:** This center provides critically needed support for at-risk families by identifying and promoting practices that build strong family relationships, prevent disabilities and provide children with a healthy start. ■



Meteorologists launch weather balloons twice daily from atop FSU's Love Building.



Established: 1972

Fall 2002 Enrollment: 13,596

2002-2003 Research Dollars: \$15.4 million

Web Page: <http://www.unf.edu/>

Research:

Although the University of North Florida emphasizes quality undergraduate education and strongly supports the teaching role of faculty, it also values research as a vital component of the educational process. UNF's mission specifically identifies research as a priority by stating it will provide an environment that "maximizes the personal and professional growth of teacher/scholars by supporting teaching, scholarship and creative endeavors that include the discovery, integration and application of knowledge." With a reputation for academic excellence, the University of North Florida's 440 full time faculty members are helping our 13,000 students develop the knowledge and skills they will need for today's and tomorrow's challenges. UNF is expanding its graduate program and including both graduate and undergraduate students in its research efforts. UNF faculty have tripled external funding for research activity over the past five years. A growing number of discoveries and developments are available for commercial applications. DSRT assists researchers in protecting innovations and is UNF's negotiating and licensing agent for commercialization. DSRT administers the University's intellectual property policy and will assist with confidential disclosure and material transfer agreements, as well as patent documents, on the University's behalf.

Areas of Research Specialization:

Education

The Florida Institute of Education provides statewide leadership to improve education at all levels by working collaboratively with Florida's universities, community colleges, public schools, school readiness agencies, and communities to foster collaborative programs addressing critical educational needs by supporting innovation and engaging in problem focused research, increase access to and use of the knowledge and skills needed to improve practice and inform decision making; and enhance achievement for all students, especially those at risk. In addition, the Center for Early Literacy and Learning helps young children acquire and use the skills needed to become eager and successful readers and learners by field testing promising models; engaging in practice-based research; building expertise among early child care teachers, directors, and families; and increasing access to new information, tools, and strategies. Finally, the Center for Studies in Education strengthens and improves Florida's Pre-K-University learning system by providing a means of intellectual exchange among university and school district personnel in Northeast Florida; conducts action research projects focused on significant and critical issues in education; and forges partnerships among educational stakeholders. UNF

also conducts significant research on education for hearing impaired and other special needs students.

Drug Prevention and Health Promotion

The Center for Drug Prevention Research studies the prevention and mitigation of alcohol, tobacco, and other drug consumption and problems. Center projects include research and evaluation projects aimed at developing and testing innovative, cost-effective science-based prevention and intervention programs tailored to individual risk and protective factors of specific populations; and education and training projects aimed at developing, collecting and disseminating scientific prevention and health promotion strategies within schools, colleges, government agencies, businesses, health and social organizations, and the public. Other health-focused research includes work on cervical cancer, tick-borne diseases, and healthcare for the elderly. Mayo Clinic and other entities collaborate with UNF on health promotion research.

Ethics

The Center for Ethics, Public Policy, and the Professions fosters deliberation on ethical issues as they emerge in public and professional life. Special attention is accorded ethical dilemmas as confronted in the areas of health care, law, business, engineering, education, government, public life generally. Center activities include research, education, community outreach, and professional ethics consultation.

Public Policy

The Florida Center for Public Policy and Leadership has a four-pronged mission which includes the assessment of economic, demographic, and social trends throughout Florida; research on emerging and persistent major public policy issues; providing periodic reports and comprehensive studies to Florida's civic and political leadership, and the expansion of leadership capacity across a wide array of political, institutional, and educational sectors. Faculty in a range of disciplines perform research on a wide array of public policy issues. In addition to the work of the Florida Center, these efforts are coordinated through the Institute of Government and other entities.

Community Focused Research

The Northeast Florida Center for Community Initiatives is dedicated to providing leadership to the community by developing partnerships with local interests in assessing program development and designing program improvements; integrating research and scholarship with the classroom activities and introducing students to hands on, activity based, learning that prepares them for future work; providing support and leadership for addressing the myriad social problems we face as a community; and creating a University/Community partnership in which education, intellectual development, and community life can grow in an environment of cooperation, information, and dedication. The Center for Race and Juvenile Justice Policy conducts research exploring the sources of disproportionate minority contact (DMC) with the criminal and juvenile justice systems. The Center works in partnership with community stakeholders in both governmental and non-profit civic capacities. The Center coordinates the implementation, design, and evaluation of policies that promote social justice and enhance public safety through community-based programming.

Information Management and Processing Technology

- Information technology security is a priority at UNF, encompassing traditional cryptographic techniques such as encryption and digital signatures, which can be applied to distributed financial applications, as well as the rapidly emerging area of biometrics. Biometrics technology is devoted to the identification of individuals using biological traits, such as those based on retinal or iris scanning, fingerprints, voice, or face recognition. Utilized alone or integrated with other technologies such as smart cards, encryption keys and digital signatures, biometrics are set to pervade nearly all aspects of the economy and our daily lives.
- Research on distributed computing is an area of importance at UNF due to the rapid proliferation of Internet and web-based applications that are distributed across multiple computers and accessing remote databases. Such applications include e-commerce applications, banking and financial transactions, applications provided as web services etc. Issues such as performance, scalability, availability, and interoperability are of practical consequence for any distributed application and are not specific to any particular application domain. Research areas include middleware technologies, web specific technologies including web services, distributed object technologies, computationally intensive applications across networks of computers, and computational grids that promise to enable a wide range of emerging application concepts such as remote computing, distributed supercomputing, and data mining.

Sensors and Information Collection Technology

- Sensor Science, as a general area, is a significant part of the cutting edge research in analytical science, as applied to both physical and chemical measurements. Smaller, faster, more accurate, and rugged sensors are the primary characteristics that are the focus of ongoing detection research at UNF, with three different sensing technologies under development. Long pathlength spectrophotometry (color detection) is reliable, extremely sensitive, and suitable for inorganic ions. Photo-induced charge movement (PICM) sensors (patent pending) are a new technology for detecting mixtures of metals in aqueous environments. Screen printed electrodes for detection of biological agents (such as bacteria) are an inexpensive alternative to traditional biological assays. Each of these technologies can be incorporated into remote instruments as sensors for real-time monitoring of aqueous matrices. One or all of these can be combined with our patented Continuously Variable Volume Reactor (CVVR) technology to emulate the capabilities of a traditional analytical laboratory in a self-contained sensor. Other areas of information collection including digital imaging are also priority in our research.

Networking Typology and Communications Technology

- Wireless computing technology is an area that is rapidly evolving with today's wireless networks adding data services to voice (2.5G). This is an intermediate step towards third-generation (3G) wireless networks that will transmit audio-video and data as well as voice. This holds the promise of a wide array of mobile communications equipment including smart handsets, wireless PDAs, notebooks, and web appliances. Traditional middleware technologies do not address unique requirements of mobile applications (multiple radio network air protocols, inefficiency of TCP/IP in wireless setting, security, compression and disconnected nature of mobile sessions). These are being developed at UNF.

- Impromptu Networking, a critical technology, will initially focus on development of a reliable easy to implement Low-Rate Wireless Personal Area Network (LR-WPAN) that will comply with the emerging IEEE 802.15.4 wireless standard supporting star and mesh networking, and capable of incorporating the latest chemical sensor technology or other information collection devices. A Low-Rate (low data rate) WPAN is a simple, low-cost, power efficient communication system that allows wireless connectivity solutions to be implemented for a wide range of devices. The main objective of a LR-WPAN system is to provide for easy installation, reliable data transfer, short-range operation, extremely low-cost, and a reasonable battery life, while maintaining a simple but flexible protocol. A wide range of applications are envisioned for this technology.

Key Technology Transfer Specialties:

- Chemical sensing technologies for waterborne pollutants and toxins, including many of those which might be employed by terrorists
- An internet-based, hazardous weather early-warning system for travelers, transportation professionals, law enforcement and emergency personnel. The system integrates GPS for accurate information and can be utilized for both normal and evacuation situations. Project partners are FSU and the Florida Department of Transportation.

Web page: <http://www.unf.edu/dept/research/technology.html>

Key Contacts:



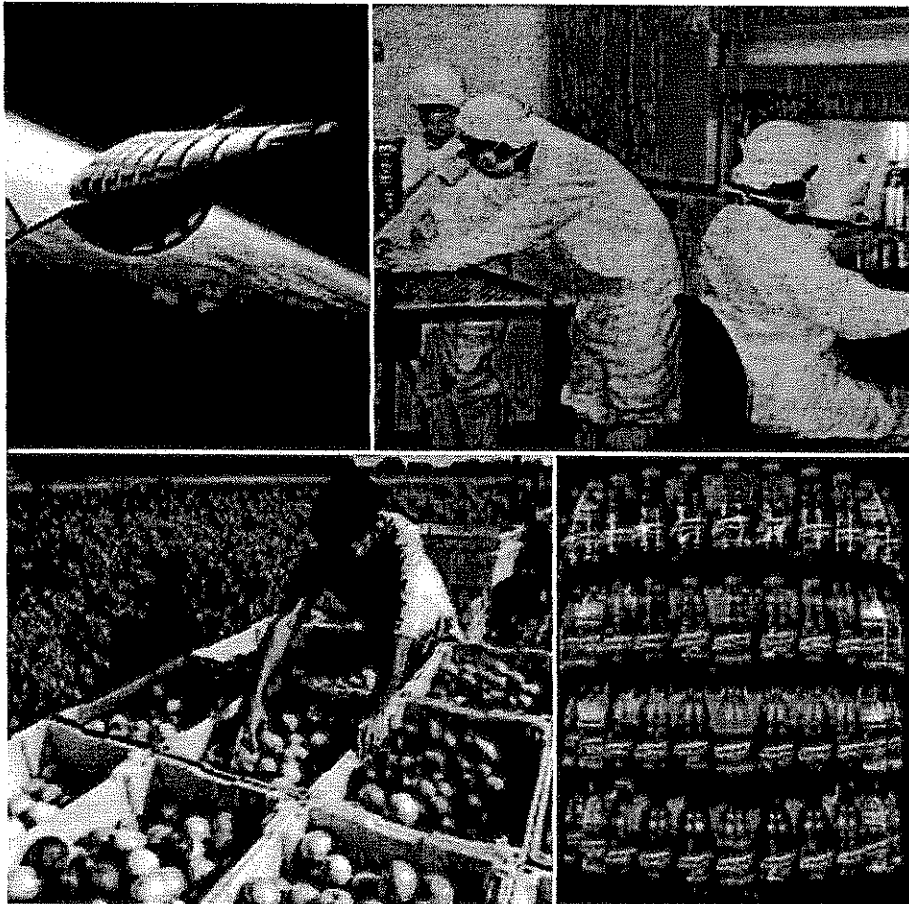
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Research and Economic Development at the University of Florida

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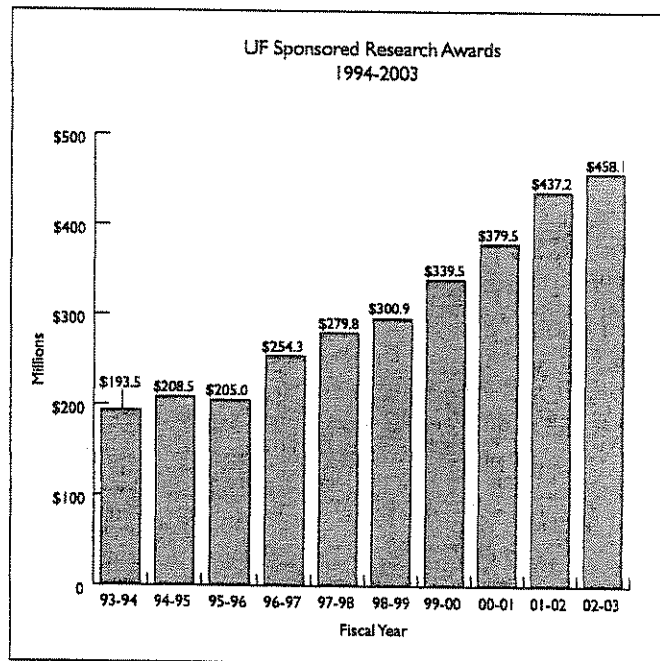


The more than \$458 million in research funding the University of Florida received during fiscal year 2002-03 will contribute to Florida's economy many times over the multi-year course of the projects it funds — supporting jobs, educating undergraduate and graduate students, building and maintaining the university's infrastructure and contributing to knowledge about things as diverse as diabetes and termites.

UF's \$458.1 million in research awards and \$411.5 million in research expenditures last year place it in the top tier of universities nationwide. UF ranked 26th in the National Science Foundation's most recent (FY01) compilation of university research expenditures.

About 55 percent of UF's awards fund biomedical research in the six colleges of the university's Health Science Center, with the other major units also generating significant awards, demonstrating the comprehensiveness that is a hallmark of the University of Florida research enterprise. The Institute of Food and Agricultural Sciences brought in \$65.3 million, the College of Engineering received \$60.9 million and the College of Liberal Arts and Sciences received \$44.3 million.

The National Institutes of Health continues to be UF's largest funding source, awarding \$104.4 million in 2002-03, followed by the National Science Foundation at \$40.7 million, the U.S. Department of Agriculture at \$26.4 million and the Department of Defense at \$24.2 million. Federal funds account for 63 percent, or \$289.3 million, of UF's total, with the rest about evenly divided between state, industry and private foundation. Funding from private foundations continues to grow as a source of research funds, reaching a record \$51.3 million in 2002-03.



Among the research strengths of the University of Florida are:

- Biomedical
- Aerospace/Astronomy
- Agriculture
- Materials Science
- Florida Issues
- Internationalization
- Economic Development

Learn more online: rgp.ufl.edu

Biomedical

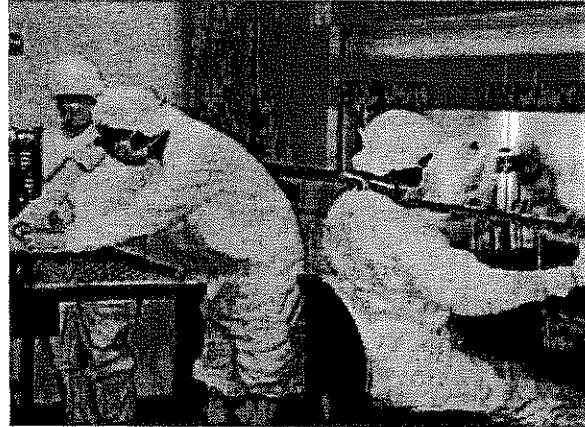
Biotechnology is booming at the University of Florida, which received more than \$250 million last year to conduct biomedical research. Basic science in areas such as adult stem cells and gene therapy now promises practical treatments for such devastating illnesses as diabetes and cystic fibrosis. The university encourages the development of new companies to move these discoveries to the marketplace, where they can help patients and contribute to Florida's burgeoning biotechnology economy.

Center of Excellence for Regenerative Health Biotechnology

Thanks to a \$10 million state grant, the UF Center of Excellence for Regenerative Health Biotechnology (CERHB) will enable researchers to more rapidly commercialize their discoveries, providing cures to benefit society and jobs to benefit Florida's economy.

The primary focus of the center is to establish a biopharmaceutical manufacturing facility that will transform potential products discovered in the research laboratory to medicines suitable for clinical trials.

The University of Florida Research Foundation recently purchased two existing buildings in the university's research park to house the CERHB manufacturing and teaching facilities. These facilities will be the centerpiece of a biotechnology cluster that will employ more than 200 people and train dozens of employees per year for the Florida biotech industry.



Learn more online: cerhb.rgp.ufl.edu

McKnight Brain Institute

UF's McKnight Brain Institute is one of the world's largest research institutes devoted to the challenges resulting from brain and nervous system disorders. The institute's research and educational programs involve more than 300 faculty from 51 academic departments and 10 colleges.

The institute provides a research and clinical environment where researchers in the neurosciences have the state-of-the-art resources and freedom to efficiently and effectively focus their own creative energies, and those of their students, on the fundamentals and on the clinical and commercial applications of brain research.

Learn more online: www.mbi.ufl.edu

Genetics Institute

The University of Florida is a national leader in the development of powerful new diagnostic tests, novel therapeutic agents, therapies for human diseases and superior plants and animals to feed the world's ever-expanding population.

The goal of the University of Florida Genetics Institute is to foster collaborative, interdisciplinary research that translates the genetic advances of today into the medical, agricultural and biological tools of tomorrow.

A state-of-the-art facility now under construction will allow researchers in such areas as medicine, chemistry, biology, engineering and agriculture to work collaboratively to translate the genetic information of today into the functional medical and biological tools of tomorrow. At 280,000 square feet and more than \$80 million, the facility is the largest construction project in UF's history. It is slated for completion in 2006.

Learn more online: www.ufgi.ufl.edu

Bioterrorism

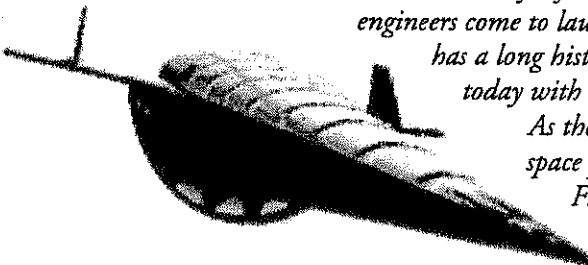
The University of Florida and five other Southeastern universities are sharing in a five-year, \$45 million federal grant to combat bioterrorism threats such as smallpox and emerging diseases such as SARS.

Scientists at the six institutions belonging to the Southeastern Regional Center of Excellence for Emerging Infections and Biodefense are collaborating to develop vaccines, diagnostic tests and treatments for potential bioterrorism agents.

UF scientists are investigating ways to create second-generation, novel smallpox vaccines to prevent the virus from entering human cells, and to develop new drugs to prevent the smallpox virus from replicating. The UF team has won international recognition for research on vaccinia, a virus that serves as the basis for the current smallpox vaccine, and on swinepox, rabbitpox and pox viruses of insects, known as entomopoxviruses.

Several other UF researchers are collaborators on a \$4 million U.S. Department of Defense grant to the University of South Florida to build a system that will prepare the state's frontline public health workers for the threat of a bioterrorist attack. A UF veterinary researcher is developing non-infectious molecular techniques to rapidly diagnose exotic animal viruses that might be introduced into Florida accidentally or deliberately. Rapid identification of a potential bioterror agent and the immediate establishment of quarantine and proper containing measures will limit the damage that might be inflicted on the state's animal industries. Other UF projects funded through the USF Center include developing air disinfection systems, predicting genetic variation of anthrax pathogens, managing infectious disease outbreaks, and containing purposeful contamination of commercially distributed food.

Aerospace/Astronomy



Since the earliest days of America's space program, Florida has been the place scientists and engineers come to launch people and experiments into space. The University of Florida has a long history of outstanding aerospace and astronomy research that continues today with numerous high-profile projects.

As the largest research university in a state so inextricably tied to the space program, UF recognizes the important role it plays in promoting Florida as America's spaceport. The university has worked closely with the state leaders and NASA to facilitate the Kennedy Space Center's evolution into a multi-faceted space research center.

Institute for Future Space Transport

NASA has awarded a UF-led consortium of seven universities \$15 million to develop the next generation of reusable launch vehicle, which would replace the current space shuttles or their successors. The new vehicle is expected to move away from a reliance on expensive, potentially dangerous conventional rocket engines. Florida researchers expect to employ dramatic advances in computers, materials, and sensors to achieve significant cost savings and safety assurances.

Learn more online: www.mae.ufl.edu/ureti

Center for Space Agriculture and Biotechnology Research and Education

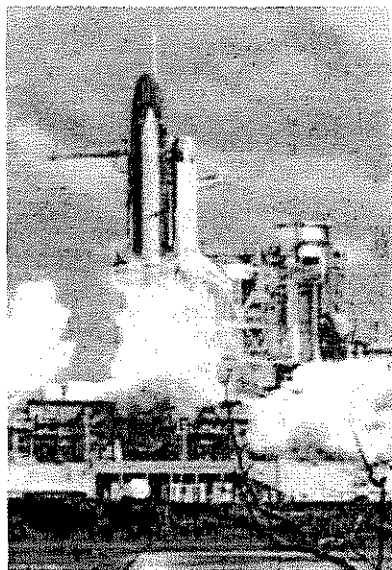
NASA has awarded the University of Florida a \$4.75 million grant to develop new technologies to help grow plants, recycle waste and create breathable air in an artificial ecosystem in space.

The grant is divided into three parts to address these challenges: human support, plant growth and commercialization.

Because of the expense and difficulty of transporting fuel, food and oxygen into outer space, scientists believe any mission longer than 18 months must rely on "bioregenerative life support" that recycles air, water and organic matter. Researchers on the human-support portion of the grant are pursuing four projects aimed at improving water reclamation technologies and creating ultra-small sensors to monitor the reclamation system for potentially unhealthy pollutants or pathogens.

The grant's commercialization component will seek to identify companies that may be willing to help fund the technologies as they are being developed for Earth-based commercial applications.

The Spaceport Research and Technology Institute



The University of Florida is leading a group of more than 20 universities in a new research institute whose aim will be to improve the safety and lower the costs of launching spacecraft.

The Spaceport Research and Technology Institute is part of a broader NASA effort to develop advanced spaceport technologies and systems. The space agency awarded a \$220 million contract to Maryland-based ASRC Aerospace Corp. to develop the systems for manned and unmanned spacecraft in conjunction with UF and its academic partners.

The institute's research activities will be based at Kennedy Space Center and will focus on developing more efficient, more economical and safer launch technologies. For the immediate future, scientists will emphasize improving shuttle and unmanned rocket launch operations at Kennedy and may work with other U.S. spaceports.

The research will focus broadly on improving components such as rocket fuel systems, creating better structures and materials, and developing better command and control systems. It also will seek to improve the safety and efficiency of launches.

Hydrogen

UF is one of several Florida universities funded by an \$8.1 million NASA grant to develop new or improved technologies to produce, store and handle hydrogen on the ground and in space. NASA is seeking safer, more efficient methods of generating the 300,000 pounds of hydrogen fuel needed for every space shuttle launch.

One goal of the research is to find better ways to transport and store hydrogen, which is difficult because it requires extremely low temperatures to be kept in liquid form. It now takes 50 tanker trucks to transport hydrogen for a single shuttle launch from a manufacturing facility near New Orleans to the Kennedy Space Center. Currently, almost a third of the hydrogen intended to fuel the shuttle or get used in space "boils off" or evaporates.

Although the research is targeted at space, the results could well have applications on Earth. Hydrogen has long been seen as an alternative to the fossil fuels that power the majority of the world's automobiles, but the costs of producing the gas and the difficulty of storing it have long proved to be significant roadblocks.

Gran Telescopio Canarias

Thanks in part to its track record in building instruments for advanced telescopes, the University of Florida is the only university partner on the world's largest telescope, now nearing completion in Spain's Canary Islands.

The Gran Telescopio Canarias will have as its "eye" 36 hexagonal ceramic glass elements joined together to form a 32.8-foot primary mirror, the largest mirror of any telescope in the world. Coupled with other technical innovations, the mirror will give the telescope superior image quality, higher reliability and greater efficiency than any other optical telescope. As a result, the GTC will be able to "see" the faintest and most distant objects in the universe, from hidden galaxies to newborn planets to distant stars.

UF astronomers also are building an infrared camera, called CANARICAM, that will be the first instrument installed on the telescope.

UF's participation in the GTC project means UF astronomy faculty and students will have exclusive use of the telescope for 12 nights annually, and they will share an additional eight nights with the Instituto de Astrofísica de Canarias.

The UF astronomy department's growing reputation for building high-quality telescope detectors has resulted in numerous contracts and significant observing time on some of the world's most advanced telescopes to pursue research interests such as the origin of stars and planets.

Learn more online: www.astro.ufl.edu/gtc.html

Agriculture

The primary mission of UF's Institute of Food and Agricultural Sciences is to help Florida realize its maximum potential for agricultural and natural resource development and to contribute to the solution of social, economic, environmental and cultural problems of concern to the people of Florida. The research function of IFAS contributes to the accomplishment of this mission through the search for new information by the application of biological, physical, economic and social sciences to the problems facing Florida's agriculture and natural resource industries.

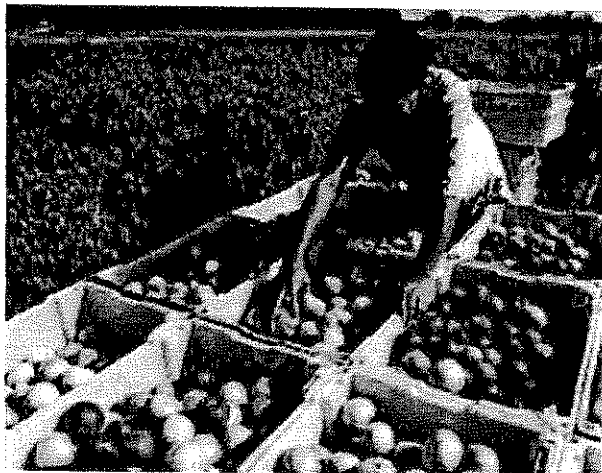
Florida Agricultural Experiment Station

Since 1888, the Florida Agricultural Experiment Station based at the University of Florida has bred hundreds of varieties of fruits, vegetables and other crops to flourish in Florida's climate and to be resistant to Florida insects and diseases. Today, agriculture is a \$50 billion business in Florida and **almost every crop variety grown in the state is a product of UF plant breeding programs.**

The FAES statewide research program is administered through 20 academic departments in Gainesville, 13 Agricultural Research and Education Centers throughout the state, eight multidisciplinary centers, the School of Forest Resources and Conservation, and the College of Veterinary Medicine.

Since its inception, FAES has concentrated on breeding varieties that are adapted to Florida's unique environment. Until recently, all of this research was done through traditional plant breeding programs, cross-breeding the best examples of plants with unique characteristics, like heat or disease tolerance, through many generations to achieve superior varieties. Today, molecular genetics also is used to speed up the process of developing new varieties and to enable the introduction of novel traits.

Learn more online: rgp.ufl.edu/publications/explore/feature02.html



Materials Science

The UF Department of Materials Science and Engineering is among the best in the nation, with current research expenditures of approximately \$10 million a year. The MSE educational and research program is interdisciplinary, focusing on all materials — biomaterials, ceramics, electronic materials, glasses, metals, minerals and polymers, among others — and their composites. An excellent working relationship has been established between the department, industry and national labs to foster technology transfer, research and development.

Learn more online: mse.ufl.edu

Particle Engineering Research Center

From toothpaste to coffee, from the air filters in our cars to the dust in our computers, particles as small as a single grain of talcum powder affect our lives in many ways every day.

At the University of Florida's Particle Engineering Research Center, scientists from many disciplines are working together to solve problems that leave our corn flakes crushed and our hard disks crashed.

Particulate systems impact a number of industries including advanced materials, environmental, chemical, mineral, energy, agricultural, pharmaceutical and food processing. Particle science and technology deals with the production, characterization, modification, handling, and utilization of a wide variety of particles, in both dry and wet conditions.

The goals of the center are to understand, monitor and modify particle behavior for efficient utilization of particles in existing and emergent industries. The primary mission is to develop cost-effective systems for processing and handling particles and to educate students and other professionals in the particle sciences.

Learn more online: www.erc.ufl.edu

Florida Issues

As Florida's oldest, largest and most comprehensive university, the University of Florida has always sought to fulfill its land-grant mission by contributing to the social and economic well-being of the state.

UF has hundreds of interdisciplinary programs that address issues as they uniquely affect Florida, including aging, education, tourism and the environment.

Aging

Older Americans represent the fastest growing segment of the population. It is estimated that by 2010, there will be 40 million people age 65 and older, with the "oldest-old" segment, adults age 85 and older, growing most rapidly. Nowhere is this truer than in Florida, which has one of the highest proportions of older adults in the U.S. More than 15 percent of Florida's residents are age 65 and older, which provides a "first look" at the social consequences of an aging society.

University of Florida faculty conduct and facilitate aging-related research, education and service through dozens of campuswide affiliations. These researchers work together as a university community to advance the health, independence and quality of life of the increasingly diverse older population and their families.



Four areas of particular excellence in aging research at UF include understanding how the aging mind is affected by the context in which an individual operates in everyday life; understanding aging in the context of social changes in society and social inequalities between individuals; increasing access to care and providing older adults with expert, holistic health care services; and providing design solutions that foster independence in housing, transportation, community involvement, and leisure activities for older adults with disabling conditions.

Tourism

The Center for Tourism Research and Development at the University of Florida focuses universitywide expertise and resources on the opportunities and challenges of Florida's largest industry. With expertise ranging from hospitality and amusement park operations to nature-based tourism development to coastal fisheries management, the center provides research in the recreation and tourism fields and offers research skills and service expertise to public and private organizations throughout the state.

The center facilitates interdisciplinary research projects focusing on a wide range of travel and tourism opportunities that provide accurate, objective and up-to-date information to serve Florida's tourism industry.

Learn more online: www2.hhp.ufl.edu/rpt/templates/CTRD_index2.htm

Education

Faculty in the UF College of Education have been pioneers in the community college movement and the middle school movement, in science education and counselor education, in teaching children with special needs and in perfecting methods of research, both qualitative and quantitative.

In a recent study comparing the college with nine other public institutions in the Association of American Universities, UF ranked first in research expenditures per faculty and second in refereed articles per faculty. Research productivity in the college has increased greatly in the past five years, despite the fact that resources have decreased.

The UF College of Education is ranked 19th among AAU public universities in *U.S. News & World Report's* rankings of Best Graduate Schools in 2003.

UF's counselor education program is ranked second nationally and faculty members are recognized as leaders in the profession. Six professors have published at least two books each in the last three years, all widely used in counselor education programs throughout the country.

The Department of Special Education is ranked tenth among public AAU institutions in the most recent U.S. News rankings. Faculty have research and development grants to study literacy, beginning teachers, teacher professional development, school improvement and teacher learning, sustaining school improvement, violence prevention through conflict resolution, and serving students and families with emotional/behavioral disorders.

Learn more online: www.coe.ufl.edu

The Everglades

The University of Florida has more than 130 researchers involved in conservation, restoration and natural resource management in South Florida, including many working on the Everglades restoration project, providing expertise on everything from alligator habitat to soil chemistry.

UF Everglades research falls into several general categories: water quality assessment, plant and animal population studies, and public policy issues.

For the past 15 years, UF researchers have sampled phosphorous levels at more than 60 sites throughout the Everglades and found that "phosphorous enriched" areas increased by more than 50 percent between 1990 and 1998.

UF alligator researchers are gathering baseline data about the reptiles to incorporate into computer programs that simulate the impact of changes to the Everglades ecosystem. They have carried out a risky campaign to capture alligators, surgically implant monitoring devices and release them.



Other UF wildlife experts are studying Everglades wading bird populations, conducting one of the most comprehensive surveys ever done for any animal living in the Everglades. Although their research shows the birds are being pushed into smaller and smaller breeding grounds by coastal development, they also report that mercury levels in the region are dropping, leading to an increase in wading bird nesting populations.

Learn more online: www.rgp.ufl.edu/publications/explore/v06n1/everglades.html

Internationalization

Today there are more than 3,850 international students representing more than 100 countries at UF. More than 1,300 international scholars are currently engaged in research and teaching on campus.

An international perspective has been included in the university's curriculum, degree programs and research programs for many years. For example, Latin American area studies and language have been a part of the curriculum since the 1890s and the Center for Latin American Studies was established in 1963. The Center for African Studies was created in 1964, and programs in Asian Studies, Soviet and East European Studies, and West European Studies were added in the 1960s and 1970s.

Study Abroad programs take about 1,200 UF students to more than 80 different countries each academic year.

It is primarily through the General Education international/diversity requirement and the more than 300 undergraduate courses with international/diversity content currently offered that our students gain a global perspective during their academic careers.

Currently one out of every five new jobs created in the U.S. is directly dependent on the international economy; this percentage is even higher in the State of Florida. Key sectors of Florida's economy, including tourism and agriculture, are significantly affected by the international environment.

Learn more online: www.ufic.ufl.edu

National Resource Centers

Last July, the U.S. Department of Education (DOE) announced that it was awarding the University of Florida more than \$4 million to create a transnational and global studies program and a European studies program, as well as to continue support for existing programs in Latin American and African studies.

With the DOE grant, UF has established a National Resource Center for Transnational and Global Studies to support new course offerings and research on problems dealing with hunger, human rights, technology, communications, terrorism, identity and diasporas that affect people around the world.

DOE also awarded funding for a new Center for European Studies. The center will support research, teaching and outreach in European Studies, building on existing strengths at UF, especially in languages and training in areas such as the European Union, Greece, France and Germany, and Jewish studies.

Two existing UF National Resource Centers received renewed funding from the department. The Center for Latin American Studies, which has been an NRC since the 1960s, received two grants totaling \$1.4 million and the Center for African Studies was awarded \$459,000 for the first year of the three-year grant.

The DOE also renewed funding last fall for the Center for International Business Education and Research for three years. This brings to five the number of NRCs on campus, placing UF among the best-supported Association of American Universities institutions.

UF Paris Research Center

UF will soon have a strong research presence in Paris, thanks to the creation of the new UF Paris Research Center, which will provide a platform for innovative and wide-ranging international research and program development. Located at Columbia University's Reid Hall building in Paris, the center offers UF scholars an international home office for communications and consultation, meeting and classroom space, and limited

office space for program directors and scholars-in-residence. The center was established with support from the Office of the Provost, the College of Liberal Arts and Sciences and the UF International Center.

Learn more online: www.clas.ufl.edu/PRC

Economic Development

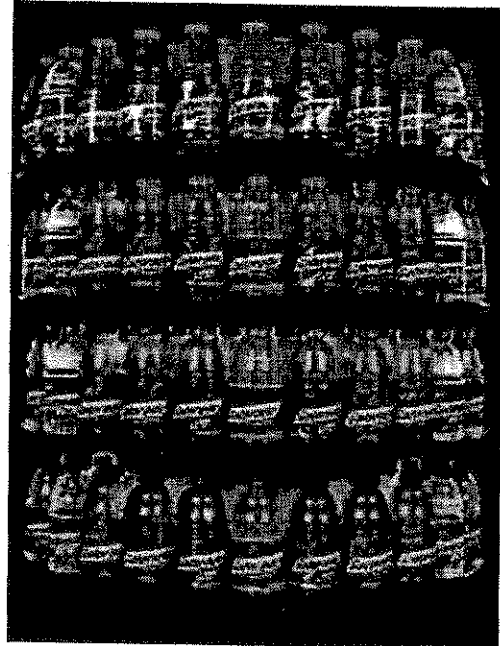
The University of Florida, through its Office of Technology Licensing (OTL), has aggressively pursued the transfer of UF technologies from the laboratory to market. The success of Gatorade is well known, but it is just one of many successful UF inventions. Others include the glaucoma drug Trusopt, the Sentricon termite elimination system, the heart-healthy SunOleic peanut, and a feline AIDS vaccine. OTL has executed 112 licenses in the last two years, more than the previous six years combined.

Royalty and licensing income reached a record \$34.1 million in 2002-03. UF ranked eighth nationally in the most recent survey of royalty income by the Association of University Technology Managers.

OTL is also actively involved in fostering the development of new companies based on UF technologies. UF has spun off more than 65 companies over the last decade, more than 80 percent of which were established in the state.

The OTL staff are also involved in state and national organizations that seek to stimulate economic development and identify funding sources.

Learn more online: rgp.ufl.edu/otl



Sid Martin Biotechnology Development Incubator (BDI)

The University of Florida's highly acclaimed Sid Martin Biotechnology Development Incubator is a resource for growing promising companies from university-based discoveries. Wet labs, office space, conference rooms, high-bandwidth Internet access, a greenhouse, pilot fermentation and small animal facilities, plus extensive scientific and business equipment combine to create an unparalleled setting for biotech startups. To date, BDI companies have raised \$40 million in equity investment and have attracted more than \$15 million in grants.

Learn more online: www.biotech.ufl.edu

Gainesville Technology Enterprise Center (GTEC)

The Gainesville Technology Enterprise Center (GTEC), Gainesville's high technology incubator offers flexible office, lab and assembly areas to serve the needs of a broad range of technology-related start-up companies. In addition, the incubator offers tenants education, networking and mentoring programs. The University of Florida played a key role in the creation of the incubator and UF staff serve as GTEC board members to channel spin-off companies into the incubator and other support programs that can enhance their success.

Learn more online: www.gtecflorida.com

Economic Development Administration's University Center

The U.S. Economic Development Administration's University Center housed at the UF Office of Technology Licensing has a mission of economic development through commercialization of Florida's university technology innovations. That mission is accomplished through facilitation of partnerships between early-stage companies, entrepreneurs and investors for purposes of starting and growing companies. More than \$16 million in additional funding was generated through private investment into UF start-ups, and nearly 70 new jobs have been created.

Gainesville Area Innovation Network (GAIN)

Gainesville Area Innovation Network (GAIN) is a group of inventors, entrepreneurs, business people, professionals, investors, professors, and service providers who share ideas, energy and talents. UF has had representation on the Board of Advisors since its inception in 1985.

Learn more online: www.gain-net.org

Emergent Growth Fund

The Emergent Growth Fund, LLC brings successful and civic-minded local investors and businesspeople together to share experiences and expertise, while investing in exciting and profitable, high-growth companies. The fund maintains close ties with UF and the Office of Technology Licensing, significantly increasing deal flow. Investors are predominantly local but the fund is open to influential UF alumni who participate in the company evaluation process.

BioFlorida

BioFlorida promotes biotechnology and related science in Florida by providing the platform for business, academia and government to work jointly to support and encourage development of existing companies in the state and to attract new business and organizations to Florida. UF has been an active supporter of this organization and serves on its Board of Advisors.

Learn more online: www.bioflorida.org

Florida Research Consortium

UF tech transfer officials are also actively involved in the Florida Research Consortium, a diverse group of high-tech industry and university leaders. The group's mission is to advise state officials on strategic policy initiatives for expanding and strengthening Florida's high-tech industries; identify specific disciplines in science and technology where Florida has the greatest potential to achieve economic and academic success; establish new and enhance existing leading-edge research programs at Florida's universities; attract leading scholars and researchers in technology-based disciplines to Florida's universities; promote technology transfer at member universities; and promote collaboration between academic and industrial researchers, scientists and engineers.

Learn more online: www.myflorida.com/myflorida.etc/frc.html



University of Central Florida Economic Development Activities

◆ UCF Vision

The University of Central Florida will be the nation's *leading metropolitan research university* recognized for its intellectual, cultural, technological, and professional contributions and renowned for its outstanding programs and partnerships. As a metropolitan university we strive to weave ourselves into the economic fabric of our region and the state.

◆ UCF Goals

- Goal 1: Offer the best undergraduate education available in Florida.
- Goal 2: Achieve international prominence in key programs of graduate study and research.
- Goal 3: Provide international focus to our curricula and research programs.
- Goal 4: Become more inclusive and diverse.
- Goal 5: Be America's leading partnership university.

Our economic development activities follow from these goals. Examples of economic development initiatives at the undergraduate level include hospitality management; digital media; engineering and computer science; the College of Business Administration (one of the largest business schools in the nation); and other undergraduate programs that provide the workforce for our industries.

The combination of Goals 2 and 5 embody our strategy for shaping our **research and graduate programs** to provide maximum impact to our regional and statewide goal of diversifying our economy by growing knowledge-based industries. That is, programs of excellence are designed around the industry sectors we wish to enhance, and we maximize and leverage our limited resources through partnership with industry, government, and public benefit non-profits. **Research and graduate programs** focused on serving existing and emerging knowledge-based industries include: optical and photonics, simulation and training, materials science, biomolucular science, computer science, nano science, and the various disciplines of engineering.

Key tech transfer specialties:

UCF has an integrated, proactive approach to research, technology transfer, and commercialization efforts. Guided by President John Hitt's goals and vision, many programs and activities focus on:

- conducting research in areas that matter to the industry sectors that we serve
- transferring technology out of the university
- providing continued technical, business, and entrepreneurial support
- incubating new technology based companies

Key tech transfer specialty areas:

School of Optics/CREOL (Center for Research and Education in Optics and Lasers)/Florida Photonics Center of Excellence (FPCE) www.creol.ucf.edu, provides half of the available licensable technology for UCF. The Center conducts a broad range of research in optics, photonics, and laser science and engineering that range from fundamental 'curiosity driven' science to practical applications, while providing comprehensive optics education at all levels. In 2003 the Florida Photonics Center of Excellence was established at the School of

Optics. The resulting \$10 Million in state funding will add a new dimension to the Center's groundbreaking research, focusing on the growing areas of nanophotonics, biophotonics, advanced imaging and 3-D displays and ultrahigh bandwidth communications.

The Florida Solar Energy Center (FSEC) www.fsec.ucf.edu is a leading research center in Hydrogen, photovoltaics, building science, and clean power sources.

Advanced Materials Processing and Applications Center (AMPAC)

<http://pegasus.cc.ucf.edu/~ampac/> supports our graduate education in materials science and engineering, partners with industry on critical materials issues, and provides a State of the Art Materials Characterization Facility for use of university faculty (UCF and others) and industry partners.

Bimolecular Science Center www.bmsc.ucf.edu conducts research at the cutting edge on molecular and genomic bases of cancer, cardiovascular diseases, infectious diseases and neurodegenerative disease. Intellectual property arising from this research yields technology and at the same time, this research provides excellent environment for the training of a skilled workforce for biotechnology industry. Its first spin-off, Chlorogen, the first biotechnology company founded on UCF research obtained six million dollars in venture capital.

Information Technology (computer science, data systems, high bandwidth, wireless, etc.), www.cs.ucf.edu, remains the key tech economy driver. New areas such as Bio and nano offer great promise for the future, however, IT underlies all sectors of our modern economy, particularly information systems, digital media, simulation, etc.)

Institute for Simulation and Training (IST) www.ist.ucf.edu supports regional defense labs and industry through research and supports the workforce for that critical tech sector through our multi-disciplinary graduate programs in simulation and training.

UCF Technology Incubator www.incubator.ucf.edu

- Created in 1999 as a university/community partnership for early stage technology companies
- Provides start-up ventures with a complete menu of services (i.e. adaptable space, clerical services, high-speed internet, legal assistance, tax/accounting services, insurance resources and access to marketing and public relations advice.
- Generated 400 new jobs and more than \$100 million in revenues from sales and research and development grants from more than 50 start-up companies
- Located in Central Florida Research Park and Downtown Orlando
- Named one of the top ten technology incubators in the US

Florida Space Institute www.fsi.ucf.edu The Institute supports Florida's space industry through university education, applied and basic research in space-related fields, and technical training.

Nanotechnology Research <http://nanotech.research.ucf.edu/> By blending together academic researchers from AMPAC, physics, chemistry, optics, biology, FSEC and engineering, UCF's nanoscience center is expanding the university's ability to participate in multi-disciplinary nanotechnology research and secure more agency funding in the area.

\$STAR Products:

The energy-efficient Hampton Bay **Gossamer Wind** ceiling fan, developed by FSEC Senior Researcher Danny Parker. Manufactured in Fort Lauderdale, the fans are sold throughout the

United States at Home Depot stores. The licensing agreement produces \$125,000 annually for UCF. Our spin-off company **Crystal Photonics** is a \$100 Million/yr company producing products for the medical imaging sector.

2003 Research Dollars: \$88.9 million

Key Contacts:

Dr. M. J. Soileau
Title: Vice President for Research
Institution: UCF
Business Address:
Orlando Tech Center/ Research
Park
12443 Research Parkway, Suite 301
Orlando, FL 32826
Business: (407) 823-5538
Business Fax: (407) 823-3299
E-mail: mj@mail.ucf.edu
Web Page:
<http://www.research.ucf.edu>

Mr. Tom O'Neal
Title: Director of Research
Institution: UCF
Business Address:
Orlando Tech Center/ Research Park
12443 Research Parkway, Suite 301
Orlando, FL 32826
Business: (407) 823-3778
Business Fax: (407) 823-3299
E-mail: oneal@mail.ucf.edu
Web Page:
http://www.research.ucf.edu/spon_research/director.htm

Significant Alliances and Economic Development Initiatives:

Florida's High Tech Corridor Council <http://www.floridahightech.com/>

- Comprised of three universities (UCF, USF, and FIT) and 20 high tech companies in partnership with 11 local community colleges and a dozen economic development organizations that work to attract, retain and grow high tech industry to Florida's High Tech Corridor.
- Located from Florida's Space Coast on the Atlantic through Metro Orlando and on to Tampa Bay on the Gulf of Mexico
- Contributed \$30 Million to more than 345 projects with more than 175 corporate and institutional partners resulting in \$60 Million in matching funds
- Generated \$3 for every tax dollar invested, according to TaxWatch

UCF Research Foundation

http://www.research.ucf.edu/spon_research/resrchfound.htm

University Direct-Support Organization that holds and licenses university intellectual property. POC: Thomas O'Neal, oneal@mail.ucf.edu

Central Florida Innovation Corporation (CFIC) www.cfic.org Nonprofit that endeavors to help build tech based companies that can secure investment capital.

National Science Foundation www.nsf.gov Partnerships for Innovation. NSF projects providing \$600,000 to help UCF more efficiently move technology from the laboratory to the commercial marketplace. Program manager cited UCF for setting a new standard for the program.

Center for Economic Competitiveness

<http://www.bus.ucf.edu/hitec/main/about.htm>

Today's metropolitan research university must be the catalyst for the economic growth of the region it serves. Education and economic development have, quite simply, become synonymous. The region that seeks high-value, high-wage, high technology employment must first prepare itself to educate the workers that will fill those jobs. Then, it must become a partner with employers in providing continuing education opportunities. Finally, it must become a research partner with high tech companies to help solve problems and to continue to generate intellectual property.

Center for Economic Education <http://www.bus.ucf.edu/cee/> The UCF Center for Economic Education was established in 1976 primarily to assist school districts in our service area in developing and implementing a kindergarten through twelfth grade program of studies in economic development.

Center for Executive Development <http://www.bus.ucf.edu/cee/> The Center for Executive Development of the College of Business Administration, established in 1974, develops and coordinates seminars, workshops, and conferences on business and management-related topics. The Center is designed to support the business community in all of its requirements for management education and training.

Small Business Development Center <http://www.bus.ucf.edu/sbdc/> located in the Disney/SBA National Entrepreneur Center in Downtown Orlando provides business seminars and *free* one-on-one counseling for small business owners.

University Office of Economic Development

http://www.unirel.ucf.edu/divisions/econ_dev.html assists in the creation, attraction and retention of high technology-based companies in Florida.

Partners for Economic Development

Orange County Government: Partner in Incubator program and other economic development activities including the establishment of an endowed chair for study of economic competitiveness, establishment of a greenhouse for Bimolecular Science center, and establishment of Venture Lab at the UCF Technology Incubator.

National Entrepreneur Center: Founding partners with UCF include Orange County, Walt Disney World, and the SBA-established. Contact: John Lewis

City of Orlando: Partner in incubation programs including the opening of a downtown incubator, Downtown Center for Entrepreneurship, and co-sponsor of many seminars and technology business events. Contact Tanja Gerhartz

Seminole County Government: UCF and Seminole County have partnered to strengthen incubation programs and workforce development programs.

Central Florida Research Park <http://www.cfrp.org/>: One of the nation's top 10 research parks with over 3.5 million square feet of office and laboratory space and 9,000 high wage jobs.

Other partners include the **Kauffman Foundation, Lemelson Foundation, Mid Florida EDC, Space Coast EDC, Enterprise Florida Inc.,** and the **Florida Research Consortium.**

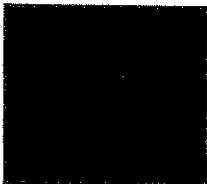
UCF At-a-Glance:

UCF first was known as Florida Technical University when Florida Governor Farris Bryant signed the bill creating the institution on June 10, 1963. The name was changed by action of the Florida Legislature in 1978. **Fall 2003 Enrollment: 42,155**

SACS:	Level 6 Institution
SREB Classification:	Four-Year II Institution
Carnegie Classification:	Doctoral/Research Universities-Intensive

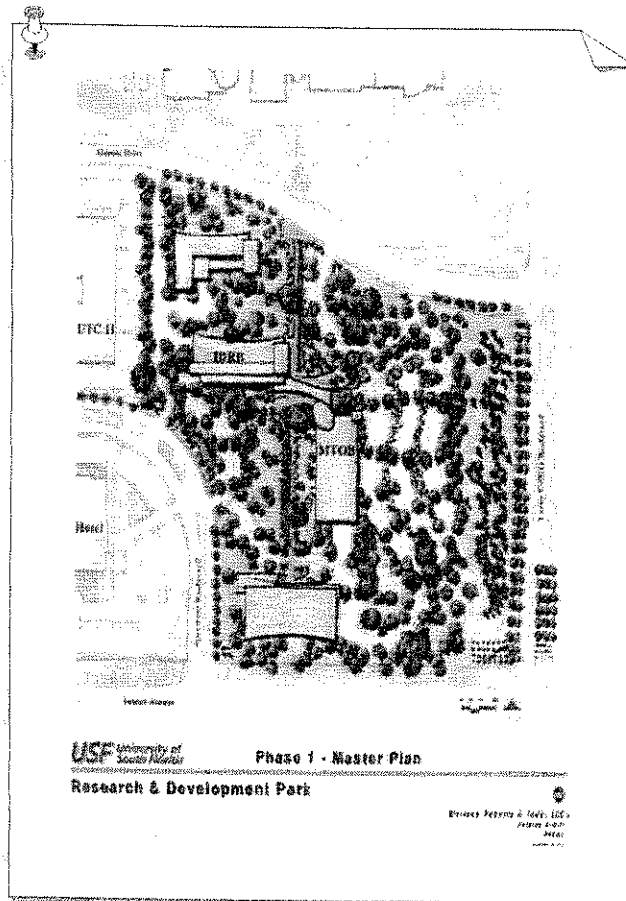
Academic Programs: (06/02)	Degrees Awarded to Date: (Fall 2003)
84 Baccalaureate Programs	Baccalaureate Degrees: 108,940
64 Master's Programs	Master's Degrees: 21,155
3 Specialist Programs	Doctoral Degrees: 1057
23 Doctoral Programs	Specialist Degrees: 343

Facilities:
UCF (Main Campus), 4000 Central Florida Blvd., P.O. Box 25000, Orlando, FL 32816-0111
UCF at Daytona Beach, UCF/DBCC Higher Education Center, 1200 International Speedway Blvd., P.O. Box 2811, Daytona Beach, FL 32120-2811
UCF Brevard Area Campus, BCC/UCF Clark Maxwell, Jr. Lifelong Learning Center, 1519 Clearlake Road, Cocoa, FL 32922
UCF Professional Development Center, 7300 Lake Ellenor Drive, Orlando, FL 32809
Central Florida Research Park, 12424 Research Parkway, Orlando, FL 32826
UCF Downtown, 36 W. Pine Street, Orlando, FL 32801
Florida Solar Energy Center (FSEC), 1679 Clearlake Road, Cocoa, FL 32922-5703



The University of South Florida is a research university that is passionate about enhancing the world around it through innovation and leadership. Our researchers pursue the challenges of their disciplines fearlessly, bringing talents and resources to assess the validity of their findings and transport its impact to the classrooms, our neighborhoods and the world. We are committed to applying our work in a practical way for the enrichment of the community and its economy through bold ideas and the power of creative scholarship.

2002/2003 Research & Economic Activity



University of South Florida
President: Judy Genshaft, Ph.D.
4202 Fowler Avenue, ADM 241, Tampa, FL 33620
Phone: (813) 974-2791
Web sites: <http://www.usf.edu>
<http://isis2.admin.usf.edu/president/index.html>

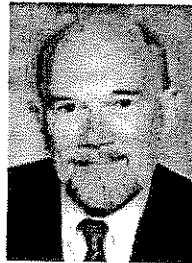


Commitment to Economic Growth

"The university will break ground by the end of the year on two buildings in the new Research Park complex. Together, they will add more than 230,000 square feet for laboratories and offices, as well as the Center for Biological Defense and an expanded 30,000-square-foot business incubator. The bottom line is that the hallmark of all successful technology clusters is the partnership between universities, industry and government."

—Judy Genshaft, Ph.D.

USF Office of Research
Vice President for Research: M. Ian Phillips, Ph.D., D.Sc.
4202 Fowler Avenue, ADM 200, Tampa, FL 33620
Email: iphillips@research.usf.edu
Phone: (813) 974-5570
Fax: (813) 974-3348
Web site: <http://www.research.usf.edu>

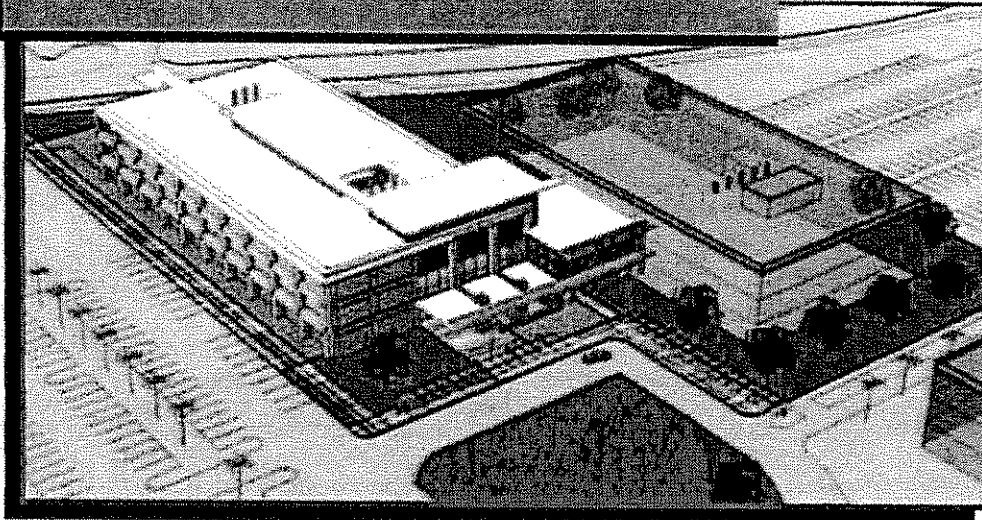


Economic Development Activity

"Strengthening and diversifying economic development in the Tampa Bay area and the State of Florida continues to be an integral part of the University of South Florida's mission. As an increasingly active and dynamic urban research institution, USF, in partnership with business, industry, and government agencies, provides opportunities to share the wealth of new knowledge and information, research, and developments being produced by faculty, staff, and students. At USF, new cooperative ventures with government and industry partners are undertaken with enthusiasm and innovation."

—M. Ian Phillips, Ph.D., D.Sc.

USF Research Park



USF CONNECT

USF CONNECT is an umbrella program tying together the various economic development activities at USF. The primary focus of USF CONNECT is to provide a single point of contact with Tampa Bay's business and entrepreneurial communities in an attempt to link area entrepreneurs with the resources they need for success: technology, money, markets, management, partners, and support services.

Strengths:

- Modeled on the successful UCSD CONNECT a widely recognized, university-based organization-fostering entrepreneurship in the San Diego region.
- Delivers targeted, high-level expertise to Tampa Bay's life sciences community by teaming up with the region's most prominent industry-specific organizations and individuals.
- Partnering with world-class USF resources such as the USF College of Medicine, College of Engineering, College of Business Administration, Center for Entrepreneurship, and the Moffitt Cancer Center and Research Institute.

Services:

- Supports entrepreneurs and business in the Florida technology and life sciences community.
- Provides talent and supports service for entrepreneurs and small businesses through the USF Center For Entrepreneurship.
- Supports networking through the partnership with the Florida Medical Manufacturers Consortium (FMMC).
- Supports the creation of new businesses through the Tampa Bay Technology Incubator.
- Will operate Tampa Bay BioCom, a forum for information sharing about research and events in the Tampa Bay area.

Tampa Bay Technology Incubator

The Tampa Bay Technology Incubator at the University of South Florida provides technology start-up companies state-of-the-art facilities and the support of world-renowned USF faculty, graduate students, business experts and entrepreneurs.

The Technology Incubator provides USF and community-based start-up businesses with enhanced entrepreneurial education, research and training by bringing together the resources of the Center for Entrepreneurship, SBDC and Tampa Bay area service providers.

Contact:

Incubator Director: Wayne Brass
Address: 4202 Fowler Ave., FAO
126, Tampa, FL , 33620
Phone: (813) 974-7815
Fax: (813) 974-8490
E-mail: wbrass@research.usf.edu
Web site:
[http://www.research.usf.edu/
incubator/incubator.htm](http://www.research.usf.edu/incubator/incubator.htm)

Strengths:

- High quality wet labs, dry labs and access to shared equipment like electron microscopes and other state-of-the-art lab equipment designed for start-up and growing companies.
- Quality office space with access to the research and resources of USF
- Support in developing market analysis, business strategies, marketing and financial plans, and other business development services.
- Access to USF researchers who generate more than \$250 million annually in research and grants, with strengths in biotech, life sciences research, nanotechnology, MEMS and rehabilitation engineering.
- Proximity to on-campus partners like Moffitt Cancer Center & Research Institute, Shriners' Children's Hospital and USF's Center for Biological Defense.
- Mentoring and advice from a network of professional service providers, community leaders and successful entrepreneurs.

Center For Entrepreneurship

The Center for Entrepreneurship is a multi-disciplinary, campus-wide center focusing on entrepreneurial education, training and research. The vision of the USF Center for Entrepreneurship is to create an internationally recognized Center of Excellence for educating and training entrepreneurial leaders using innovative, interdisciplinary approaches.

Contact:

Director: Michael W. Fountain, PhD, MBA
Address: 13101 Telecom Dr., Suite 105 Tampa,
FL 33637-0914
Phone: 813-974-7900
Fax: 813-558-1102
E-mail: ce@coba.usf.edu
Web site: <http://www.entrepreneurship.usf.edu/>

Services:

- The Center seeks to create unique learning opportunities through partnerships among students, faculty and community entrepreneurial leaders.
- These partnerships leverage the strengths of all participants to create a nationally recognized program which
- Enables students, faculty and entrepreneurial leaders to develop the critical skills necessary to identify new opportunities, accelerate the commercialization of new technologies and create and grow successful new business ventures.

Small Business Development Center

The USF Small Business Development Center provides accessible, affordable, and professional counseling, training, and resources to start-up and existing businesses, and assists them in various aspects of small business development.

Services:

- Free one-on-one business counseling
- Free entrepreneurial training workshops
- Low-cost entrepreneurial training seminars
- The Business Resource Center
- Custom corporate training

Contact:

Media Contact: Judy Silverstein Gray
1101 Channelside Drive, Suite 210, Tampa, FL
33602
Email: jsilvers@coba.usf.edu
Phone: (813) 905-5817
Fax: (813) 905-5801
Web site: <http://www.sbdc.usf.edu/index.html>

Strengths:

- Assisted more than 75,000 entrepreneurs in Southwest Florida with their businesses to
 - create/retain an average of 1,000 jobs each year, and
 - win government contracts worth over \$100 million.
- Conducts more than 200 entrepreneurial programs annually on topics and issues that are important to today's small-business owners.

Center for Biological Defense

The USF Center for Biological Defense (CBD) is a member of the National Center for Countermeasures to Biological and Chemical Threats. The CBD complements Federal Homeland Defense initiatives by coordinating multidisciplinary biodefense research and translating this research from the bench to the field.

Services:

- Develops innovative rapid clinical and environmental screening tests to allow early detection and recognition of biological agents suggestive of a bioterrorist attack.
- Provides effective and efficient dual-use surveillance of possible biological agents in non-traditional settings.
- Provides collaborative opportunities and increased outreach with other Florida universities, and with local, state and federal agencies responsible for domestic security.
- Educates and trains health professionals, emergency personnel, and government agencies in preparation for, detection of, and response to, a BT attack.

Strengths:

- The USF-based Center, co-located with the Florida Department of Health Tampa Branch Laboratory and encompassing a network of universities within the state of Florida, is the first Center of its kind to be established in Florida and among the first established nationally.

Contact:

Center Director:
Jacqueline Cattani
3602 Spectrum Blvd, Tampa, FL 33612
Email: jcattani@bt.usf.edu
Phone: (813) 974-7789
Fax: (813) 974-1479
Web site: <http://www.bt.usf.edu>

Center for Robot-Assisted Search & Rescue (CRASAR)

CRASAR serves as a crisis response and research organization that strives to direct and explore development in robotics and unmanned systems for humanitarian purposes worldwide. Murphy and her team received their first real world application at Ground Zero after the September 11 attacks.

Services:

- Deploys on order into crisis sites and hazardous areas around the globe with self-sufficient robotic systems.
- Acts as a focal point for certification and training of human-robot systems oriented on the search and rescue task domain.
- Tests and evaluates emerging robot technologies and human-robot interactions in realistic conditions to determine the readiness of the equipment.
- Promotes and directs SAR specific research regarding innovative robot design, human robot interaction.

Strengths

- Research activities cover the spectrum from providing expert advice, obtaining funding, directing applied and basic research, and forming partnerships with the international industrial and academic communities.

Contact:

Director: Professor Robin Murphy
Email: murphy@csee.usf.edu
Phone: (813) 974-1347
Fax: (813) 974-5456
Web site: <http://crasar.csee.usf.edu/>

Nanomaterials and Nanomanufacturing Research Center (NNRC)

The NNRC provides state-of-the-art facilities, support personnel and infrastructure to enable multidisciplinary research in nanomaterials and nanomanufacturing methods related to sensors, actuators, electronics, optics and integrated nanoscale systems. The Center provides design, fabrication, characterization and metrology capabilities for faculty, students and industrial organizations.

Strengths:

- NNRC is among those receiving research dollars from President Bush's National Nanotechnology Initiative.
- The Office of Naval Research has awarded USF a \$500,000 grant to study the benefits of coating nanoporous silicon carbide with gallium nitride, improving the conductivity of the silicon carbide. These new surfaces could be the basis for high-density memory and better portable fuel cell technology. If the technology lives up to its promise, which means your cell phone might run on a single charge for months at a time.
- NNRC also broke ground on a new \$4 million state-of-the-art facility which will include a clean room, metrology lab, general research laboratories and administrative space. Totalling over 14,000 sq. ft, the new facility will also provide support labs for university-wide usage.

Contact:

Director: Michael G. Kovac, Ph.D.
College of Engineering, 4202 E.
Fowler Avenue ENB 118, Tampa,
Florida, 33620
Email: mkovac@eng.usf.edu
Phone: (813) 974-5136
Fax : (813) 974-8490
Web site: <http://nnrc.eng.usf.edu/>

Clean Energy Research Center (CERC)

CERC develops, evaluates and promotes commercialization of new environmentally clean energy sources and systems such as hydrogen, fuel cells, solar energy conversion, biomass utilization, etc., that meet the needs of the electric power and the transportation sector through multi-disciplinary research, technical and infrastructure development and information transfer.

Florida has no substantial indigenous supply of fossil fuels. It must import virtually all the energy it uses. However, Florida, the Sunshine State, has good solar and biomass resources. Solar and hydrogen resources and technologies, applied both electrically and thermally, can mitigate the State's fossil fuel dependency, improve the environment and provide substantial economic growth opportunities.

Strengths:

- Received over \$8 million in contracts and grants in the past ten years.
- Developed the Nation's first 20,000 watt solar/electric charging station for electric vehicles.
- Developed the world record efficiency (15.8%) thin film cadmium telluride solar cells for low cost applications.
- Developed the Rivolta Isigo neighborhood electric vehicle.
- Developed a mobile data acquisition system for the US Department of Energy EV Site Operator program.
- Developed technologies for energy management.

Contact:

Director: Elias (Lee) Stefanakos
Address: 4202 East Fowler Avenue, ENB118,
Tampa, Florida, 33620
Phone: (813) 974-4787
Email: stefanak@eng.usf.edu
Web site: <http://cerc.eng.usf.edu/>

Center for Ocean Technology (COT)

In addition to academic research pursuits, the College of Marine Science works in conjunction with the Center for Ocean Technology (COT) to develop new sensors and technology. A leader in microtechnology research, COT provides the faculty and students the opportunity to mix pure science with applied science.

Strengths:

- Specialized laboratories for scanning and transmission electron microscopy, trace metal analysis, water quality, organic and isotope geochemistry, physical chemistry, optical oceanography, satellite imagery, sedimentology, geophysics, physical oceanography, micropaleontology, physiology, benthic ecology, microbiology, planktology, and ichthyology.
- A large flume facility and laser doppler velocimeter for interdisciplinary boundary layer studies.

Recent Projects:

- Underwater Mass Spectrometers
- MEMS
- Bottom Classification and Albedo Package, BCAP
- Bottom Stationed Ocean Profiler – BSOP
- Shadow Image Particle Profiling Evaluation Recorder, SIPPER
- Spectral Elemental Analysis System, SEAS
- Real-time Ocean Bottom Topography system, ROBOT
- Remote Operated Vehicle Explorer, ROVEX
- College of Marine Science

Contact

Director: Larry C. Langebrake, P.E.
Address: 140 7th Ave S., St. Petersburg, FL 33701
Email: llange@marine.usf.edu
Phone: (727) 553-1130
Fax: (727) 553-1189
Web site: <http://cot.marine.usf.edu/>

Health Sciences Center (HSC)

Just as the issues in health care cut across disciplines, cross-disciplinary collaboration is a focus of our colleges. USF is uniquely positioned to synthesize the skills of public health, nursing and medicine to build advanced health care for our community. This idea is at the heart of the Health Sciences Center's mission: To advance collaborative learning and discovery leading to improved health in our community.

Strengths:

- At the USF Health Sciences Center, research isn't just about laboratories and test tubes. Research is about people, and how we can translate our research findings into positive health gains for people in Florida, the nation, and the world.
- In 2002/2003, research funding for the HSC colleges and related research centers soared to more than \$119 million. Our researchers have gained recognition in areas such as biodefense, neurosciences research, aging and end-of-life studies, and children's health and wellness.

Contact:

Vice President: Phillip J. Marty, Ph.D.
HSC Associate Vice President, Research
Associate Dean for Research, COM
Address: 12901 Bruce B. Downs Blvd., MDC
61, Tampa, FL 33612
Email: pmarty@hsc.usf.edu
Phone: (813) 974-5200
Fax: (813) 974-5411
Web site: <http://www.hsc.usf.edu/research/>

USF Economic Development Outreach Activities

USF, through USF CONNECT, participates and partners with several state and community-based programs to foster a cooperative and productive environment for the advancement of technology.

Current extramural economic development activities:

- Enterprise Florida
- Florida High Tech Corridor Council
- Florida Research Consortium
- Greater Tampa Chamber of Commerce
- Tampa Bay Partnership
- Tampa Bay Technology Forum
- Gulf Coast Life Sciences Initiative

Contact:

Associate Vice President for Research:
Rod Casto, Ph.D.
4202 Fowler Avenue, FAO 126, Tampa, FL 33620
Email: rcasto@research.usf.edu
Phone: (813) 974-1082
FAX: (813) 974-8490
Web site: <http://www.research.usf.edu/otd/>



Florida Gulf Coast University
Opened to students: 1997

Key Information:

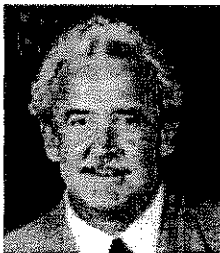
Florida Gulf Coast University is the state's newest full-service public university but has made a commitment to research activity that belies its youth. That may in part be based in the university's initial mission – to rely heavily on emerging technology to deliver higher education in new and innovative ways.

2002 Research Dollars: \$10 million

Noteworthy:

- In partnership with Lee County and private enterprise, FGCU plans to break ground in 2005 for the Florida Gulf Coast Technology and Research Park. The first park resident, Neo Genomics, a biomedical firm, will offer opportunities for student research in its laboratories.
- In April 2002 FGCU held an inaugural Research Day that was so successful became an annual event incorporated as part of the FGCU Celebration of Excellence.

Key Contacts:



Dr. William Merwin, President (above)
Florida Gulf Coast University

Mr. Thomas J. Roberts, Assistant Vice President for Research
Florida Gulf Coast University

Contact Information:

Florida Gulf Coast University
10501 FGCU Boulevard South
Ft. Myers, FL 33965-6565

239-590-1000

Web Page: <http://www.fgcu.edu/orsp/>

Fall 2002 Enrollment: 5,200

FGCU Centers and Institutes:

- Center for Leadership and Innovation
- Center for Positive Aging
- Center for Public and Social Policy
- Center for Technology Education
- Family Resource Center
- Small Business Development Center
- Florida Gulf Coast Writing Project

Florida Atlantic University
Division of Research and Graduate Studies
Research Profile

INTRODUCTION

The Florida Atlantic University Division of Research and Graduate Studies, under the direction of Vice President, Dr. Larry F. Lemanski, comprises several units whose independent activities converge to foster research activities and graduate education at Florida Atlantic University (FAU). The Division incorporates Graduate Admissions, Graduate Studies, the Offices of Pre-award and Post-award Research, Technology Transfer and the Florida Atlantic University Research Corporation.

The role of the Division of Research and Graduate Studies is to lead the way in research, scholarly and creative activities, and graduate initiatives that impact FAU and the world around us. In the past year, we have made great strides in a number of important areas of research, and this report is meant to give you a snapshot of a few of the many activities of our faculty, graduate students, post-doctorates and staff who contribute tremendously to FAU's growing reputation as a world-class research institution.

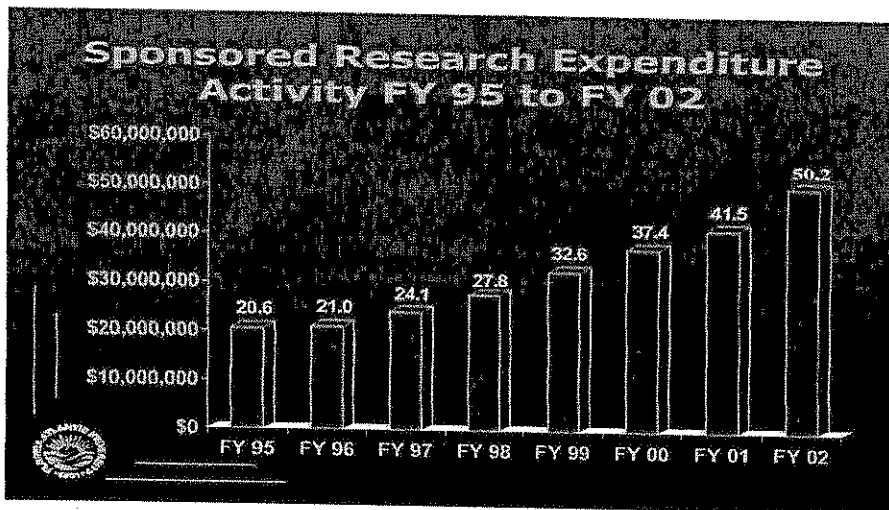
This year, FAU exceeded \$50 million in research expenditures for the first time in its history. In addition, FAU awarded 51 doctoral degrees in the 2002-2003 academic year, demonstrating our significant progress toward becoming a major, world-class, research extensive university. The new Center of Excellence for Biomedical and Marine Biotechnology was chosen by Florida's Emerging Technology Commission from 16 proposals from around the state, as one of three centers to receive \$10 million. Other major research initiatives at FAU include development of high-definition cameras for work in surveillance as well as telemedicine; adult stem cell research into cell therapies to cure diseases; computer security; autonomous underwater vehicles for our nation's defense; urban planning; classroom science and reading comprehension; and research into the treatment of Alzheimer's patients and their caregivers, to name just a few.

FAU's location as an urban university stretching 100 miles along South Florida's rapidly growing coastline area makes it uniquely situated to partner with its business and other academic institutions. Synergy between FAU and our community ensures that world-class research works to serve that community, to create new businesses and to help train a highly skilled workforce.

MISSION STATEMENT

The Division of Research and Graduate Studies is central to the University's goal of discovering and exploring truth, and understanding and improving our lives. Our mission is to:

- Promote the research enterprise for the University;
- Ensure a graduate educational experience of national and international excellence;
- Support and facilitate the research, scholarly, creative and collaborative activities of faculty and graduate students;
- Encourage national and international partnerships for the development and commercialization of research endeavors; and
- Enhance economic, human, and cultural development of an ever-changing world.



CURRENT ACTIVITIES

The Division of Research and Graduate Studies is very proud to present below a few examples of exciting new ventures, cross-disciplinary research partnerships and graduate student activities at Florida Atlantic University that have economic development potential.

- **Alzheimer's Disease Research**

The new Louis and Anne Green Alzheimer's Research Center and Care Facility on FAU's Boca Raton campus will offer expanded opportunities for interdisciplinary research and innovative practice and education in the complex problems surrounding Alzheimer's disease and related memory disorders. The groundbreaking for the first phase of this state-of-the-art facility was held in April 2003.

The Center's Memory and Wellness Center is a unique partnership of the Christine E. Lynn College of Nursing and Boca Raton Community Hospital. Dr. Ruth Tappen – Christine E. Lynn Eminent Scholar in Nursing and a widely published researcher in the field of Alzheimer's and related disorders – directs the Center and its research activities, while the hospital provides lab services and community initiatives in support of the Center.

Currently, more than four million Americans are believed to have Alzheimer's disease, and 14 million more are expected to develop it over the next 50 years. With one-quarter of Florida's population over the age of 65, the state is grappling with elder-care issues on a scale the rest of the nation will not experience for several decades. At FAU, intensive individual cognitive retraining, group cognitive stimulation programs, counseling education and stress reduction for patients and family caregivers, as well as a driver evaluation have already been developed.

- **Biomedicine and Marine Biotechnology**

Researchers at Florida Atlantic University are positioned to do what virtually no one else in the world can do: use the unique resources that are in its own backyard to develop medicines from the sea. Coupled with cutting-edge functional genomics research, academic and entrepreneurial researchers will study ocean organisms with the aim of developing drugs and therapies to combat cancer, arthritis, heart disease, neurodegenerative diseases and other illness.

The Center of Excellence for Biomedical and Marine Biotechnology was recently awarded \$10 million from the state of Florida to develop this world-class research center. The recommendation to fund the Center of Excellence was made by the state's Emerging Technology Commission (ETC), a group of leaders in the technology field appointed by Governor Jeb Bush to identify cutting-edge research initiatives in Florida with the aim of boosting economic development in the state's growing biomedical industry.

The Center will combine the scientific expertise of a group of academic institutions — FAU, Harbor Branch Oceanographic Institution and the Smithsonian Marine Station at Ft. Pierce, along with Florida International University and Nova Southeastern University — with biotechnological industries in South Florida. This unparalleled collaboration of academic scientists and engineers, high-tech researchers and private businesses is expected to expedite the discovery and commercialization of viable new drugs.

- **Complex Systems and Brain Sciences**

Dr. J. A. Scott Kelso is the Glenwood and Martha Creech Eminent Scholar in Science at Florida Atlantic University and is the founder and director of The Center for Complex Systems and Brain Sciences. Established in 1985, the Center comprises core faculty across the disciplines — physics, math and computation, cognitive psychology and neuroscience — and is an internationally recognized leader in brain research, including the pioneering application of mathematical techniques to brain function and the development of non-invasive imaging of the human brain.

- **Everglades Restoration**

Dr. John C. Volin, associate professor and Director of Environmental Sciences at FAU, is a researcher with a great deal of enthusiasm and expertise about Everglades restoration, and one of his major projects is related to the Big Cypress Seminole Indian Reservation Water Conservation Plan. He has received more than \$1.0 million in new funding in the past year alone, and was named a finalist for "Researcher of the Year" for three years running, earning that distinction as Associate Professor Researcher of the Year in 2001.

Most of Dr. Volin's research involves plant studies, the impact of environmental stresses such as air pollution or exotic and invasive plants on the physiology of a plant community. Perhaps nowhere is this impact more dramatically seen than in the Florida Everglades. Dr. Volin and his interdisciplinary team of seven full-time scientists and eight graduate students are part of a \$16 billion, 30-year project to restore this unique ecosystem.

- **Coastline Security Technology and Secure Telecommunications Networks**

In conjunction with existing efforts and expertise in coastal systems and sensor research — including the work of Dr. Stewart Glegg and colleagues at the Institute for Ocean and Systems Engineering; the Department of Computer Science and Engineering, with lead investigator Dr. Borko Furht; and the University Consortium for Intermodal Transportation, Safety and Security's Director Dr. Clifford Bragdon — new technologies are being developed to solve issues and problems related to coastal security, protection and safety.

These new technologies are necessary to enhance surveillance and inspections of marine activities in Florida's coastal zone, including major seaports, small inlets, beaches and remote coastal areas. The task is to effectively integrate sensors with underwater, surface and airborne autonomous and remotely operated platforms. Image analysis and data-mining methods must then quickly and effectively identify potential threats.

- **High-Definition Cameras**

FAU is home to one of the world's premier research centers for high-definition imaging. Under the direction of Dr. Bill Glenn, FAU's NASA Space Communications Technology Center (SCTC) is conducting leading research in telemedicine, state-of-the-art electronic cinema systems for the motion picture industry, and now enhanced surveillance systems for use in homeland security. Dr. Glenn, a distinguished research professor in electrical engineering, is an international pioneer in advance communications. He has been granted more than 115 U.S. patents for broadcast and image

technology during his 50-year research career. The FAU lab has developed the world's most advanced HDTV video camera and a personal computer-based, super-high resolution ultrasound scanner.

• HDTV camera designed by Dr. Glenn and his research team generates pictures that are three times sharper than the best standard TV cameras, and 1.4 times sharper than any other HDTV camera on the current broadcast market. High-definition TV cameras produce sharper images by generating more data on each frame to be transmitted. In order to squeeze all the data needed for HDTV into available transmission systems, Dr. Glenn's lab has developed a more advanced system of digital compression, one that is modeled on how the human eye processes information. The compression technique selectively eliminates details that would be undetected by the viewer's eye. The result is a transmitted video picture of enhanced resolution and vivid color – even better than what a DVD would produce.

• **Intermodal Transportation**

FAU's Center for Intermodal Transportation, Safety and Security proposal, headed by Dr. Clifford Bragdon, is currently earmarked for federal funding. The proposal is based on the present FAU-led Center that was created in 2000 and that was ranked number one as "the best collaborative, university-wide research proposal" in Florida in 2002. Consisting of four collaborating universities — UCF, USF, FIU and FAU — the Center is designed to address potential terrorist threats to the safety and general economic welfare of Florida's population and its transportation-based infrastructure. Applied research — including modeling and simulation technology — will be utilized to plan efficient and integrated systems of movement. The Center would assist cities, counties, businesses and other users in prevention, response, recovery and reconstruction of transportation systems in the event of an emergency.

The Scripps Research Institute

The Scripps Research Institute, one of the world's largest and best-known biomedical research organizations, will be relocating to Palm Beach County in 2004. FAU will be the host academic institution for TSRI. Scripps' presence in FAU's backyard will mean a myriad of opportunities for collaborative research, funding, and graduate and post-doctoral positions and training for FAU's students. Interactions between FAU Faculty and students will increase FAU's research activities in terms of scientific expertise and assist with building stronger graduate programs.

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Important URL's:

Division of Research and Graduate Studies (DRGS)
DRGS Annual Report 2003
Center of Excellence in Biomedical and Marine Biotech
Center for Environmental Studies
Gumbo Limbo Environmental Complex
Complex Systems
Imaging Technology Center
Memory and Wellness Center
Enterprise Development Corporation

<http://www.fau.edu/research>
<http://www.fau.edu/dsr/2003report.pdf>
<http://www.floridabiotech.org>
<http://www.ces.fau.edu>
<http://www.gumbolimbo.org>
<http://www.ccs.fau.edu>
<http://www.fau.edu/divdept/comtech/ctchome.html>
<http://www.fau.edu/memorywellnesscenter/>
<http://www.edc-tech.org>

FAU Research Corporation

The Florida Atlantic University Research Corporation (hereinafter "FAURC") is a direct-support organization of Florida Atlantic University that was established in November of 1990. The purposes of the organization are to promote and to assist the research activities of Florida Atlantic University, and to provide the means by which technology developed by at Florida Atlantic University is commercialized and otherwise made available to the public. The operations of FAURC include the administration of sponsored research grants made by private institutions and corporations, and the marketing and licensing of University technology. In certain circumstances, FAURC may also administer federal and state sponsored research grants.

FAURC is assigned University rights in inventions and copyrights by the Division of Sponsored Research. FAURC then markets this technology and enters into license agreements and other related agreements with private corporations. FAURC is used for this purpose because FAURC has greater flexibility than the University with respect to such agreements. For example, unlike the University, FAURC may receive and hold equity positions as consideration for licensed technology. A portion of the royalties received by FAURC from such licenses are distributed by FAURC to inventors according to the Florida Atlantic University Intellectual Property Policy. Remaining funds are held and used by FAURC to further the research purposes of the University.

The operations of FAURC are substantially the same as those of direct-support research foundations of the University of Florida, Florida State University and other large state universities in the state of Florida. FAURC's income and operations are substantially smaller in scope than those of the University of Florida and Florida State University. For the fiscal year ending June 2003, FAURC's income from licensed technology should be approximately \$120,000, which income is derived primarily from one license agreement. FAURC's revenue for the same year also includes approximately \$40,000 from private sponsored research grants and approximately \$1.4 million from a federal NASA grant.

FLORIDA INTERNATIONAL UNIVERSITY

Key Research and Training Activities

PROTECT THE REGION AND STATE

The **International Hurricane Research Center (IHRC)** is Florida International University's broadest-based research program. It coordinates statewide efforts to reduce damage from hurricanes. It has joined with the University of Florida in remapping Florida's coastal regions. In coastal Broward County, the Center's new map has dramatically reduced the number who must be evacuated in the event of a hurricane. The Center's research into roof damage from hurricanes showed that using ring-shanked nails increased roof strength by 130% at a cost of \$15 per house. Recently, this research led to a change in the state's building codes mandating adoption of ring-shanked roofing nails in coastal windstorm areas. The change will spare Floridians in new or re-roofed homes millions of dollars in damages. IHRC researchers are working on a public model for windstorm damage insurance that will provide Florida's insurance regulators a reasonable yardstick for hurricane insurance rates. The Center's advisory board brings together representatives of the banking, insurance, and building industries, the National Hurricane Center, and university specialists.

The **Southeast Environmental Research Center (SERC)** is the main research program monitoring water quality in the Everglades and the Florida Keys. Employing nearly 100 undergraduate and graduate students, the Center and its researchers work closely with Everglades National Park, the South Florida Water Management District, and the Florida Keys National Marine Preserve to protect the viability and attractiveness of the Southeast Florida ecosystem, home to a third of Florida's population and a magnet for millions of tourists each year. In FY2003 SERC's external support from contracts and grants totaled \$6.57 million.

The **Hemispheric Center for Environmental Technology (HCET)** works closely with the US Department of Energy to test technologies for decommissioning nuclear plants and decontaminating sites affected by nuclear radiation or other contaminants, so-called "brown fields." The Center supports and trains about seventy-five graduate and

undergraduate students each year to enter the nuclear industry's rapidly aging workforce, a matter of concern in Florida where a half dozen nuclear reactors provide energy to millions of citizens. HCET also collaborates with the University of Central Florida and the University of Florida in fuel cell research. External funding for HCET reached \$18 million in FY2003.

TRAIN THE PRESENT AND FUTURE WORKFORCE

The School of Hospitality and Tourism Management, one of the top five such programs in the United States, is a key source of intensely trained management personnel for the crucial tourism industry. University instruction is interwoven with the wide variety of internship opportunities available locally. The School's graduates are leaders in the industry and a key element in the health of the tourism business throughout the state of Florida.

The Professional Development Center (PDC) on FIU's Biscayne Bay Campus provides the Department of Children and Families with in-service management training for its supervisory employees in Southeast Florida. Extremely heavy demands on the Department for services have made the PDC's training capacity highly attractive to this important state agency. In FY03 the PDC trained 481 employees of CYF. The PDC is part of the College of Health and Urban Affairs, a major source of nurses and allied health professionals in the state's largest center for health and medical services.

The Minority Biomedical Research Support (MBRS) program is a federally supported effort to increase the number of minorities entering the biomedical research arena. The biomedical and biotechnology sectors are among the top employers in Southeast Florida and the region is the state's biomedical/biotechnology center. Miami-Dade County ranks in the top dozen nationally for employment in both sectors and a large pool of well-trained scientists and technicians is crucial to the survival and growth of these sectors. The National Institutes of Health provides over \$3 million in support for this growing program that now supports 52 undergraduate and graduate students.

The **Center for Diversity in Engineering** is the University's main effort to tackle head-on the decline in the participation of African and Hispanic-Americans in advanced science and engineering education. The decline is a cause for serious concern in an increasingly competitive global economy. FIU works not only to provide science and math teachers to school systems but also to enrich and support math, science and reading education in entire feeder patterns within the local public school system, which is predominantly Hispanic and African-American and the nation's fourth largest public school system. The **Center for Diversity in Engineering** serves more than 18,000 students through 10 programs. Its main program, **Engaging Latino Communities for Education (ENLACE)**, is a W.K.Kellogg Foundation-funded, community-based partnership that serves more than 13,000 students and is focused on the Coral Park High School and Homestead High School feeder patterns. External support for the Center totaled \$2,6 million in FY2003. The National Science Foundation has just awarded a multi-million dollar, multi-year award to a partnership of the College of Education, the Mathematics, Physics, and Chemistry Departments of the College of Arts & Sciences, and University Technology Services to adopt the Varela High School feeder system and change the way math and science are taught in both the feeder pattern and in the freshman and sophomore year program at FIU. The University is making a similar effort to link the **Marine Sciences program** at the Biscayne Bay Campus to the North Miami Beach High School feeder pattern and to the marine sciences programs in the Broward County Public School System. Given adequate external resources, the University expects to adopt five or six feeder systems.

DEVELOP THE LOCAL AND STATE ECONOMY

The **Latin American and Caribbean Center (LACC)** is more than the premier center for research on the Caribbean and one of the top ten for research on Latin America. More than 140 regional specialists associated with LACC share their expertise with undergraduate and graduate students and Miami's business community. In addition, LACC planned and operates the **Business Forum of the Americas** and its **Summit of the America's Center** has worked to support the development of trade negotiating skills in trading partners to the south and to bring the headquarters of the Free Trade Area of

the Americas to Miami, all with an eye to bolstering Miami's, and Florida's, international business.

The College of Business Administration is home to the School of Hospitality and Tourism Management, whose graduates, as noted above, strengthen the local industrial workforce and whose professors lead the field in hospitality and tourism management research. The College's federally-funded **Center for International Business Education and Research (CIBER)** adds an international dimension to the business education available to Floridians and especially import in an entrepot like Miami. The College leads the nation in graduating Hispanic-Americans as befits a business-school located in a city often described as the capital city of Latin American and the Caribbean.

Also, facilitating the rule of law that is so crucial for the continuing development of the hemisphere's economy, and thus the economies of Florida and Miami, are the federally-funded **Center for the Administration of Justice** which focuses on court reform and the **International Media Center** which trains journalists from throughout the hemisphere. The IMC offers the only master's degree program in Spanish-language journalism in the United States, particularly befitting in a city that has been a hub of the Spanish-language print and broadcast industries.

The University's **Biomedical Engineering Institute**, endowed by the Coulter Family Foundation, works closely with local hospitals and the biomedical/biotechnology community to improve devices and techniques useful to the health industry, a key sector locally. Contract and grant revenue in FY2003 was \$1.27 million.

Division of Sponsored Research & Training

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New College of Florida

Research and Economic Development Capabilities

We may be a very small liberal arts undergraduate institution – the Honors College of the State of Florida – but as the newest state “University,” New College of Florida intends to expand its role as a vital center for community engagement on many levels. We seek to involve the members of the local community, including the K-12 schools, other postsecondary institutions, neighborhoods, community-based organizations, business and industry, research facilities and local governments as active partners and collaborators in New College projects and research efforts. We believe that these community-based partnerships can provide valuable social and economic benefits to the residents of the Sarasota-Manatee region, as well as to New College students and faculty.

Jack and Rhoda Pritzker Marine Biology Research Center (PMBRC)



The Marine Biology Research center is built directly on Sarasota Bay, and incorporates state-of-the-art marine science engineering technology. Though the mission of the center is multifaceted, at its heart it seeks to provide research education experiences in aquarium and marine sciences to undergraduates, and through outreach, to students in elementary and secondary schools. Through these programs and activities, we will educate future researchers who will be prepared to address the marine environmental needs of our state in regard to preserving our ecosystems, as well as to raise community awareness of the challenges we face locally, nationally, and internationally.

The primary area of the PMBRC is the Living Ecosystem Teaching and Research Aquarium (LETRA), which has six aquaria, including a 12,000-gallon center aquarium. LETRA offers our Gulf Coast community vast opportunities for research and learning. While interdisciplinary projects and educational activities will focus on finding solutions to local environmental and natural resource issues, results of these studies may be applied to similar problems worldwide. For instance, the Tampa Bay region has one of the largest tropical fish farming industries in the United States. These farms provide animals for an increasingly large personal aquarium industry both here and abroad. However, there are problems with wastewater management, energy use, and the effects of crowding, all of which are challenges to the industry that may be explored at the PMBRC.

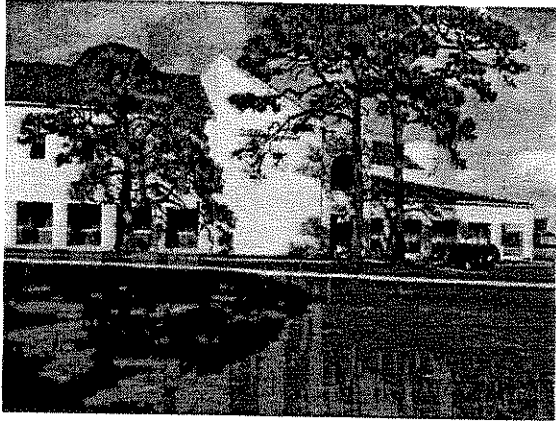
The New College Environmental Studies Program



For the past 25 years New College's Environmental Studies Program (ESP) has worked in the local community and in Southwest Florida to assist governmental and private concerns in exploring and resolving environmental issues. New College students and faculty have made numerous and substantial research contributions based on their efforts in the region. The program has involved students directly and intensely in the local community; many of those students remain in the Sarasota area as community leaders, planners, environmentalists, attorneys specializing in environmental law, and educators. The Environmental Studies program has established working partnerships with diverse groups and organizations in the Sarasota/Manatee area and throughout the region. By providing much needed data-sharing capacity to these partners and other interested

participants, New College facilitates existing community research, problem solving, and collaboration.

The Natural Sciences at New College



Biology

Research strengths:

- Training of undergraduates in high quality research methods
- Outreach and training of local high school students in research methods
- Collaborations with State and local laboratories such as Institute for Food and Agriculture Research Station in Bradenton, Mote Marine Laboratory in Sarasota and Moffitt Cancer Center in Tampa
- Providing research study abroad opportunities
- Fish Neurobiology
- Aquarium Science

Recent Projects:

- Collaboration with Gulf Coast Research and Education Center resulting in recent revision of the pesticide mode of action codes
- Examination of gravistimulation in plants at cellular and organismal levels
- Outreach grant at the Pritzker Marine Biology Research Center to connect elementary and secondary school children to research at the Center
- Completion of book project on shark olfaction
- Examination of water quality and ecology of reefs in Panama and Honduras

Chemistry/Biochemistry

Research strengths:

- Training of undergraduate students in high quality research methods
- Training of high school students in high quality research methods
- Collaborations with national laboratories
- Collaborations with research universities such as University of California, Davis

Recent projects:

- Conjugation of lipid molecules with nonlinear optical functionalities using biomimetic architecture
- Assembly of multilayer mesostructures to produce materials with large, nonlinear optical responses
- Self-assembly of novel polymers
- Wetting behavior of polyelectrolyte films
- Explorations of nanotechnology
- Department of Energy Collaborative to explore nanotribology
- Examination of multilayer systems leading to discoveries in microelectronics, surface coatings (e.g., biofilms, lubricants, surfactants, adhesives), and life sciences (e.g., biomedical sensors, membrane patterning, functional microarrays)
- Determination of the function of RNA helicase A of *Caenorhabditis elegans* (NIH AREA grant)

Physics

Research strengths:

- Training of students in research methods of physics (including introduction to astronomy)
- Collaborations with other colleges and universities (including work abroad)
- Lasers and material sciences
- Mathematical physics
- Application of Riemannian geometry to thermodynamics

Recent projects:

- Redefining Spinors in Lorentz-Violating QED
- Applying cost effective Raman Spectroscopy technique for Analysis of historic objects and objects of art
- Collaboration in Basic Science and Engineering (COBASE) grant entitled, "Laser-assisted modification of metal nanoclusters in dielectric thin films" to allow work with colleague in Bulgaria
- Applied physics problems in Spiral and Curved Periodic Crack Patterns in Sol-Gel Films

Social Sciences at New College

The faculty and students in the Social Sciences at New College are engaged in a wide array of research activities. We have internationally known archeologists on staff, who have directed significant projects in Mexico and the Middle East. Several smaller scale local projects have involved local business and governmental interests.

Two New College psychologists are internationally known marine mammal researchers, leading the way in developing new knowledge about dolphins and manatees. Other New College psychologists are involved in projects in human development at both ends of the age spectrum – one focusing on early childhood education, the other on the effects of retirement. Both topics are central to the economy of the region.



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