

Florida Space Grant Consortium
University of Central Florida
Jaydeep Mukherjee
321-452-4301
<http://www.floridaspacegrant.org>

PROGRAM DESCRIPTION

The National Space Grant College and Fellowship Program consists of 52 state-based, university-led Space Grant Consortia in each of the 50 states plus the District of Columbia and the Commonwealth of Puerto Rico. Annually, each consortium receives funds to develop and implement student fellowships and scholarships programs; interdisciplinary space-related research infrastructure, education, and public service programs; and cooperative initiatives with industry, research laboratories, and state, local, and other governments. Space Grant operates at the intersection of NASA's interest as implemented by alignment with the Mission Directorates and the state's interests. Although it is primarily a higher education program, Space Grant programs encompass the entire length of the education pipeline, including elementary/secondary and informal education. The **Florida Space Grant Consortium** is a Designated Consortium funded at a level of **\$750,000** for fiscal year 2008.

PROGRAM GOALS

(a) FSGC's Long Term Goals and Objectives:

- Fund research with strong student involvement that supports NASA's Mission Directorates (Aeronautics Research, Space Exploration, Science, and Space Operations) with an emphasis on Space Exploration and Science.
- Create public programs that support literacy in science, engineering, technology, and mathematics for the citizens of Florida.
- Increase interest and learning in the areas of science, engineering, technology, and mathematics, using the challenge of NASA's Mission Directorates
- Recruit women, underrepresented minorities, and the disabled for careers in math, science, engineering and technology.
- Encourage interdisciplinary education and training, research, and public service programs related to aerospace and encourage collaborative development programs among universities, industry, and federal, state, and local governments.
- Facilitate the post-graduate training of K-12 teachers

(b) Short Term Goals for 2008

- Increase minority awards by teaming with minority organizations like SECMEC
- Increase minority award to high school students and teachers
- Increase industry involvement in Space Grant activities by providing internships in industry
- Develop and promote Florida Space Grant opportunities for student research activities/space missions (e.g. Florida University Nanosatellite Design Competition, Hybrid Rocket Competition and Space Academy)
- Identify resources within and outside the Florida Space Grant network, share information across the network, and identify sources of financial and other support.

PROGRAM/PROJECT BENEFIT TO OUTCOME (1,2, OR 3)

My name is Charlie Groom and I was in your undergraduate educational program. Now I have an awesome job working for United Space Alliance. I would not have had this Great job if it wasn't for your program inspiring me to get involved with the (awesome!) space program. Thank you and your staff Very Much for inspiring me!!! I STRONGLY hope that Space Florida continues to inspire the minds of students for tomorrow!!!! -Thank you again for helping me get involved!!!!- (Charlie Groom, Undergraduate Workshop) - Outcome 1 and 2

Osprey Biotechnics, PGT Industries and Teleflex Electrical Systems hosted summer interns as part of NASA/Florida Space Grant Consortium/Space Florida's Science, Technology, Engineering and Math

(STEM) program. Sarasota native Frances Brilit, a pre-med student at St. Thomas University near Miami, worked in the quality-control laboratory at Sarasota-based Osprey Biotechnics, which develops biological products for environmental, industrial and agricultural uses. Scot Vensel, an aerospace engineering student at the University of Central Florida, worked at Venice-based PGT Industries, a window and door manufacturer. Teleflex Electrical Systems, based in Lakewood Ranch, hosted Paul D. Clark Jr., a mechanical engineering major at the University of South Florida. The three interns received \$4,000 stipends for the full-time internships. The Economic Development Corp. of Sarasota County worked with the Florida High Tech Corridor Council to bring the STEM program to area businesses (Article in the Sarasota Herald Tribune, Oct 13, 2008) - Outcome 1

PROGRAM ACCOMPLISHMENTS

Outcome #1 (employ and educate)

Fellowships and Scholarships

We have been successful in obtaining funds from Space Florida to place student interns at the Kennedy Space Center and various industry connected with the Florida High Tech Corridor. As a result we were able to place 23 students at KSC and 13 students in industries such as Lockheed Martin, Rockwell Collins, Osprey Biotechnics, Florida Turbine Technologies, Pall Aeropower Co, etc. Also, 4 students were also supported by FSGC to the NASA Academy program. We were successful in increasing industry participation in our scholarship program.

- 53 students significantly supported from FY08 funds
 - 50 in Fellowship & Scholarships
 - 3 in Higher Education/Research programs
- 10 students took next step in FY08 (SG participation supported from FY06-FY08 funds)
 - 4 went to graduate school in STEM disciplines
 - 1 went to work for a NASA contractor
 - 5 went to work in STEM positions for non-NASA contractors
- Funded 3 new graduate fellows (1 under-represented minority). – met our fellowship goal
- Funded 40 scholars (20 FSGC and 20 Space Florida under a joint internship program). 7 students were under-represented minorities. This fell short of our goal. We collect the applications and forward them to KSC and industry. The mentors choose the students.

Higher Education

96 students from UCF and ERAU are working on senior design projects such as the design of a sub-orbital Hybrid Rocket, balloon payload, cubesat, Moon buggy, and NASA University Student Launch Initiative (USLI). 171 students from 9 universities and 2 community colleges are working on student collaborative projects like the nano-satellite design competition, hybrid-rocket design competition and balloon launches. Details of our higher education programs are as follows:

- 65 students from the University of Central Florida from 4 different departments (electrical, mechanical, aerospace and physics) are participating in the construction of a Hybrid Rocket. This project is called Project Daedalus. FSGC is one the sponsors of the project. Project Daedalus was named 2008 SEDS National Project of the Year
- A team of 10 students from Embry-Riddle Aeronautical University, supported by FSGC, was selected to compete in the 2009 NASA University Student Launch Initiative (USLI) competition.
- A group of students from the University of Central Florida and professionals in the Central Florida area have teamed up to compete in the Google Lunar X Prize. The Google Lunar X PRIZE is a \$30 million international competition to safely land a robot on the surface of the Moon, travel 500 meters over the lunar surface, and send images and data back to the Earth. The team is led by Ruben Nunez, currently pursuing a Bachelor of Science degree in Aerospace Engineering at the University of Central Florida (UCF). The Project is called Omega Envoy. FSGC is supporting this project by sponsoring 2 senior design classes at the University of Central Florida.
- 5 students from UCF are designing a Moon Buggy to compete in the Annual NASA Great Moon Buggy Race. The competition will be held in April.

- 11 students from Embry-Riddle Aeronautical University are participating in two of ERAU Engineering Physics senior design teams: High altitude balloon project and cubesat effort. Both these projects are partially supported by FSGC.
- 54 students and 5 faculty from 5 universities (Embry-Riddle Aeronautical University, Florida Gulf Coast University, Florida International University, University of Central Florida and University of Florida) are competing in the Fifth Florida University Nano-satellite competition.
- 63 students from 3 universities (ERAU, FIT and UF) and the Tallahassee Community College are participating in the 2008-09 Hybrid Rocket Competition sponsored by FSGC, the Florida Space Institute and the North East Florida Association of Rocketry.
- 49 students from 9 universities and 2 community colleges participated in 4 undergraduate workshops conducted at the Kennedy Space Center Visitor Complex.
- PSTI Conference: 31 students from 16 universities attended the Pre-Service Teacher Institute at KSC. This workshop was organized by FSGC in collaboration with KSC. The PSTI is a two week residential workshop. The purpose of this program is to increase students' skills in teaching mathematics and science, while incorporating technology in their curriculum.

Research Infrastructure

Since our research proposals were funded only in July of 2008, we do not have the data for the number of publications and proposal submissions. We have been successful in engaging industry via our participation in a NSF funded Industry/University Cooperative Research Center. Details of our research programs are as follows:

- Seventeen proposals for conducting scientific research and development received funding in 2008 from the Florida Joint Matching Grant Program, a collaboration of the NASA Florida Space Grant Consortium and Space Florida. A total of \$375,000 was distributed to: 4Frontiers Corporation, New Port Richey, Fla., The Astronauts Memorial Foundation, Kennedy Space Center, Fla., Embry-Riddle Aeronautical University, Daytona Beach, Fla., Florida Institute of Technology, Melbourne, Fla., The University of Central Florida, Orlando, Fla. And the University of Florida, Gainesville, Fla.
- ASTREC: FSGC is an industry advisory board member for Advanced Space Technologies Research & Engineering Center (ASREC). ASTREC is an Industry/University Cooperative Research Center (I/UCRC) sponsored by the National Science Foundation program to develop a long-term partnership between academia, industry, and government. The mission of the ASTREC is to advance, develop and promote research into the principles and technology of responsive, cost efficient satellite systems through research, development, education, and technology exchange among academic, industry, and government entities.

Outcome 2 (Educate and Engage)

Pre-college programs

- UCF-College of Engineering Outreach Programs
 - **Engineer-Teacher Connection:** UCF-CECS Outreach has created a working account set-up for engineers and teachers at <http://partner.cecs.ucf.edu/ETC/>. It is being modified to include the science standards for Florida as they plan a two pronged approach. Locally, they are working with Seminole County schools to focus on a feeder system of elementary, middle and a high school.
 - **Internet Science and Technology Fair (ISTF) Teacher Training involving SECME:** This past summer, UCF-CECS coordinated with the SECME (Southeastern Consortium for Minorities in Engineering) National Office to provide ISTF teacher training. Using a conference call in system and UCF-CECS teacher training website their office developed at http://istf.ucf.edu/SECME_partnership/ISTF/Technical_Advisor_Guide/, they trained 60 teachers at remote locations
- Department of State Overseas Educators Workshop- FSGC and NASA Kennedy Space Center in conjunction with the Department of State-Assisted Overseas Schools conducted an Aerospace Institute from June 16, 2008 to June 26, 2008. Thirty elementary and secondary teachers from 23 countries participated in a program that enhanced the development of science education curricula in various American overseas schools.

- GE Foundation workshops- 90 teachers from Northeast United States visited the KSC Visitor Complex for a workshop titled “Force in Motion Inquiry Workshop GE Foundation” from July 15-18, 2008. This workshop was supported by a grant to FSGC from the GE Foundation.
- Workshops for middle school teachers and students- 74 students from Florida middle schools and 30 students from the Kansas Cosmosphere attended a number of 5-day workshops for students at the Kennedy Space Center Visitor Complex. These Workshops provide opportunities for students to be engaged in stimulating science and math activities
- Aviation Experience- As we had mentioned in our proposal, we have not been successful in attracting under-represented minorities to our internship programs. As a result we have been targeting high school students. Ms. Rader and Mr. Gannon set up the FSGC and Space Florida joint trade show display and interacted with students, teachers, members of the general public, and ambassadors from commercial and state entities. They alerted the students to the opportunities available for them with the Florida Space Grant Consortium and they established some very solid contacts with local teachers who will ultimately be of great assistance to FSGC in our search for students who are excited about STEM subjects.

Outcome 3 (Engage and Inspire)

- Orlando Science Center – Family Fun Night Programs: Through a partnership between OSC and FSGC, OSC will be revamping their Family Fun Night series by offering two new exciting and fun-filled tracks for each themed night. These energizing programs get parents and students involved in learning about a variety science and math subject areas.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking: Total awards = 84; Fellowships/Scholarship=46, Higher Education/Research Infrastructure=38; 26 of the total awards represents underrepresented minority funding. For those students that were significantly supported from FY 08 funds, one student has graduated and is pursuing an advanced STEM degree and the remaining 52 students have not yet received the degree that they were pursuing while the received their Space Grant award. For all students that were significantly supported in the period spanning FY06-FY08, 7 students graduated and are pursuing advanced STEM degrees, 1 student is working for a NASA contractor, and 5 students accepted STEM positions in industry. The remaining students have not yet received the degree that they were pursuing while the received their Space Grant award.
- Course Development: N/A
- Matching Funds: (Total \$576K) – Required Matching is \$547K. Matching Ratio is 1.05
 - \$150 from UCF; \$193.5K from Space Florida; \$127.4K from Affiliates; \$5.2K other sources; \$100K from GE Foundation
- Minority-Serving Institutions:
 - FSGC has been working closely with Florida International University (FIU) to engage its students in FSGC’s programs. Some of these students presented their work at the NASA’s 50th anniversary forum in Miami. In Fall of 2008, a group of engineering and science students from FIU entered the FSGC Student Satellite Design Competition. FSGC has also been in touch with Dr. Berrin Tansel, Associate Director, Center for Diversity in Engineering and Computing at FIU to collaborate on projects. FSGC will also be sending its representatives to the Internship Fair at FIU next month. 5 students from FIU also participated in the undergraduate workshops along with 12 students who are participating in the Florida Nano-Satellite Design Competition
 - FSGC has been in constant touch with Bethune-Cookman University and have been notifying its faculty (through BCU FSGC representative) of the various NASA programs for faculty. We have also placed a couple of their students at the Kennedy Space Center as interns. The FSGC representative from BCU participated in a faculty fellowship program at KSC.

IMPROVEMENTS MADE IN THE PAST YEAR

There have been no major adjustments last year that resulted in significant changes within the consortium. Compared to 2007, we have allocated more funding for student collaborative projects like senior design classes, NASA team competitions (USLI, Micro-gravity) etc.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Bethune-Cookman University (4-year college awarding exclusively baccalaureate degrees) is a historically Black, United Methodist Church-related college offering baccalaureate degrees.

Embry-Riddle Aeronautical University (University awarding baccalaureate and master's degrees) is a private university, teaches the science, practice, and business of the world of aviation and aerospace.

Eckerd College (4-year college awarding exclusively baccalaureate degrees) is a private, coeducational college of liberal arts and sciences.

Florida Atlantic University (University awarding degrees up through the Ph.D) is the first public university in southeast Florida and the first in America designed for upper division students only.

Brevard Community College (Community/Junior College awarding associate degrees) has four integrated campuses – in Cocoa, Melbourne, Palm Bay and Titusville – an aerospace program at the Kennedy Space Center and a Virtual campus.

Florida Gulf Coast University (4-year college awarding baccalaureate and graduate degrees) is a comprehensive university created to address the educational needs of the rapidly growing Southwest Florida population.

Florida Institute of Technology (University awarding degrees up through the Ph.D) is an independent technological university that provides quality education, furthers knowledge through basic and applied research, and serves the diverse needs of our local, state, national and international constituencies.

Florida International University (University awarding baccalaureate and master's degrees, Hispanic Serving Institute) is Miami-Dade County's first public, four-year university. FIU is ranked first in the nation among four-year colleges for awarding bachelor's and master's degrees to Hispanic students.

Florida State University (University awarding degrees up through the Ph.D) offers more than 300 undergraduate, graduate, doctoral, professional and specialist degree programs, including medicine and law, covering a vast array of disciplines critical to society today.

Florida A&M University (University awarding degrees up through the Ph.D.; Historically Black College or University) offers 108 undergraduate degrees in 64 undergraduate programs and 60 graduate degrees in 32 graduate programs (includes 1 professional and 7 doctoral degrees) within its 12 Schools and Colleges.

University of Central Florida – Lead University: (University awarding degrees up through the Ph.D) has 12 colleges. UCF offers 223 degree programs, it has become an academic and research leader in numerous fields, such as optics, modeling and simulation, engineering and computer science, business administration, education, science, hospitality management and digital media

University of Florida: (University awarding degrees up through the Ph.D) is a major, public, comprehensive, land-grant, research university.

University of Miami (University awarding degrees up through the Ph.D) is the largest, most comprehensive private research university in the southeastern United States with a reputation for academic excellence.

University of North Florida: (University awarding baccalaureate and master's degrees): The University of North Florida is a comprehensive public urban university whose mission is to educate students through a broad array of undergraduate and select graduate programs.

University of South Florida: (University awarding degrees up through the Ph.D) is one of the nation's top 63 public research universities and one of 39 community engaged public universities as designated by the Carnegie Foundation for the Advancement of Teaching.

University of West Florida: (University awarding baccalaureate and master's degrees) offers undergraduate degrees in 50 different areas with 107 specializations, master's degrees in 24 different areas with 56 specializations, two specialist degrees and a doctorate in education with seven specializations.

Astronauts Memorial Foundation (Private 501(c)(3) not-for-profit organization): Memorializes those astronauts who have sacrificed their lives for the nation and the space program by sponsoring the national Space Mirror Memorial, and by implementing innovative educational technology programs.

Kennedy Space Center (Federal Center): KSC is the NASA center of excellence for launch and payload processing systems as well as the lead center for acquisition and management of expendable launch vehicle services and payload carriers.

Orlando Science Center (Science Museum): Offers hands-on fun for all ages through engaging interactive exhibits, live programming, giant-screen films, school field trips and school-break camps.

Space Florida (State/Local Government): Space Florida is the public-private partnership responsible for promoting and developing Florida's aerospace industry.