

Florida Space Grant Consortium
University of Central Florida
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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 **\$545,000** for fiscal year 2011.

PROGRAM GOALS

FELLOWSHIPS & SCHOLARSHIPS

1. Enable students to pursue careers in the space program – whether through graduate, undergraduate, or Community College technical training.

SMART Objective – On an annual basis, at least 20 undergraduate and/or technical training awards and 3 graduate fellowships will be competitively awarded to students who wish to pursue space/aerospace/aeronautics training. At least six of these awards will be offered to minority candidates and at least 8 to female students. At least 70% of awardees will continue to the next step in their chosen STEM disciplines (academia/NASA/industry).

This goal positively impacts NASA Objectives: 5.1 and 6.1

2. Facilitate Space-Related Research Symposia for students, NASA engineers and FSGC awardees

SMART Objective – By March 2014, facilitate at least two Space-Related Research Symposia within the State of Florida that specifically target graduate student participation involving at least 12 students and 10 mentors.

This goal positively impacts NASA Objectives: 5.1 and 6.1

RESEARCH INFRASTRUCTURE

1. Support NASA related interdisciplinary research projects emphasizing work-force development with undergraduate and graduate students.
 - a. **SMART Objective** – On an annual basis, at least 12 research projects will be competitively awarded. At least three of these research project awards will be awarded to a minority serving institution and/or include minority participation. At least 12 undergraduate or graduate students will be supported by the projects, including at least 5 women and 4 under-represented minorities

This goal positively impacts NASA Objectives: 5.1, and 6.1

2. Foster collaboration among NASA engineers, Florida university faculty and industry partners.
 - a. **SMART Objective** – By March 2014, facilitate at least two Space-Related Research Symposia within the State of Florida that specifically target NASA engineers, Florida university faculty and industry partners.

This goal positively impacts NASA Objectives: 5.1. and 6.1.

HIGHER EDUCATION

1. Provide undergraduate students with opportunities for interdisciplinary hands-on experiences in team-based student launch activities and student pay-load development programs to better understand STEM concepts as they relate to space exploration.
 - a. **SMART Objective** – On an annual basis, involve at least 100 students, representing a minimum of five Florida-based higher education institutions, including at least one minority serving institution, in collaborative space-based interactive learning experiences.

This goal positively impacts NASA Objectives: 5.1, 6.1, and 6.2.

PRE-COLLEGE EDUCATION

Contribute space-related resources and training to help increase the number of K-12 teachers who:

1. Use space-related curricula resources to motivate more students to pursue advanced math and science courses.
 - a. **SMART Objective** – On an annual basis, conduct and/or facilitate space-related pre-service and in-service teacher training opportunities focused on space-related math and/or science curricula. A minimum of 50 Florida teachers per year will attend this training.

This goal positively impacts NASA Objectives: 5.1, 6.1, and 6.2

INFORMAL EDUCATION (GENERAL PUBLIC)

Contribute space-related resources to help increase the number of citizens who are aware of:

1. How the application of math and science enable or enhance common activities, NASA's contributions to our standard of living (beyond Velcro®), and NASA's mission.
 - a. **SMART Objective** – On an annual basis, collaborate with Florida museums and/or science centers to facilitate/conduct engaging space-related learning events held in public venues. A minimum of two events per year will be held. At least 200 members of the public will attend one or more of these events per year.

This goal positively impacts NASA Education Objective: 6.4

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

Outcome 1

I'm honored as a Florida Space Grant participant to continue in graduate studies. I intend to progress in a higher level of education to further extend my qualifications as a professional. The association to such a prestigious program is impressive and will elevate subsequent transcripts and resumes. This grant provided me with experimental credentials imperative to biotechnology and other science related preparations. (Jessica Cruz - 2011 Space Grant Scholarship)

Participation in the Space Grant program has greatly impacted my life and education. I now know that I want to pursue a PhD in planetary geophysics because of my experience this summer. Through the Space Grant program, my eyes were opened to all of the opportunities, and I feel as though I now have a head start in the field. (Marie McBride - 2011 NASA Internship Program, Brevard Country School District - Elementary School Tutor)

The Space Grant Program has allowed me to incorporate classroom tools in the workplace. I have been able to work in a team oriented environment and enhance my knowledge in physiology, engineering and aerospace, while gaining hands on experience on unique projects. The program has allowed me to expand my career and education opportunities as well as network with biomedical engineers and scientists in various areas of concentrations. (Patricia Santana - 2011 NASA Internship Program, Florida International University - Biological Sciences Lab Assistant)

PROGRAM ACCOMPLISHMENTS

Outcome 1 (Employ and Educate)

- 26 students took next step in FY11 (SG participation supported from FY06-FY11 funds)
 - 7 are pursuing advanced degrees in STEM disciplines
 - 1 accepted a STEM position at a NASA contractor
 - 10 accepted STEM positions in industry
 - 2 accepted positions at NASA
 - 3 accepted STEM positions in academia
 - 3 went on to positions in non-STEM disciplines

- 66 students significantly supported from FY11 funds
 - 42 in Fellowship & Scholarships
 - 24 in Higher Education/Research programs

- 221 students from 6 universities, including 1 Hispanic serving institution, are participating in Higher Education Projects

Fellowships and Scholarships

Among the students significantly supported from FY11 fellowship and scholarship

- 8 industry interns
- 4 graduate fellows
- 30 scholars

Through our fellowship program, graduate students, enrolled in a Ph.D or Masters program, are provided a year-long fellowship. Under this program, we funded 4 graduate fellows (2 women). – met our fellowship goal for gender equity but did not meet our under-representative goals.

Through the scholarship program, FSGC funded 38 scholars in industry and Florida universities. 8 of them interned at Masten Space Systems, Earthrise Enterprise, and 4Frontiers while 30 students were provided scholarships at our affiliate universities. These universities (Bethune Cookman, Florida Gulf Coast University, University of West Florida) do not have flourishing space programs and hence we try to support students at these universities. Among the scholars, 29 students were under-represented minorities and 19 were women. This was well above our goals for both under-represented minorities and gender.

SMART Objective – On an annual basis, at least 20 undergraduate and/or technical training awards and 3 graduate fellowships will be competitively awarded to students who wish to pursue space/aerospace/aeronautics training. At least six of these awards

will be offered to minority candidates and at least 8 to female students. At least 70% of awardees will continue to the next step in their chosen STEM disciplines (academia/NASA/industry).

FSGC has awarded 4 graduate fellowships, and 38 scholarships. A total of 26 students were under-represented minorities and 26 were women.

Higher Education

Students from 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). Students from universities and 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:

Senior Design and Competitions; FSGC has supported 8 senior design projects involving 59 students at the University of Miami, Florida International University, University of Central Florida and Embry-Riddle Aeronautical University. In addition, FSGC supported students in student teams from universities participating in the University Space Launch Initiative program, Moonbuggy Competition, and Lunabotics Competition .

Hybrid Rocket Competition: 83 students in 8 teams from 5 universities (University of Florida, University of Miami, Florida Institute of Technology, University of Central Florida, and Embry-Riddle Aeronautical University) took part in this competition. The objective of the competition is to build and launch a hybrid powered rocket. There are two categories in the competition. The first category consists of launching a hybrid rocket to the maximum altitude. The second category challenges the teams to fly their rocket closest to 2000 feet in altitude. The launch day was April 14, 2012 at Bunnell Florida. This program is also supported by the North East Florid Rocket Club. University of Florida won the first category and Florida Institute of Technology the 2nd category. This competition is a stepping stone for students to participate in the University Student Launch Initiative competition.

Third Annual NASA Lunabotics Competition: This is a University-level competition designed to engage and retain students in science, technology, engineering and mathematics (STEM). The challenge is for students to design and build an excavator, called a Lunabot, that can mine and deposit a minimum of 10 kilograms of lunar simulant within 10 minutes. The complexities of the challenge include the abrasive characteristics of the BP-1, the weight and size limitations of the Lunabot, and the ability to telerobotically or autonomously control the Lunabot from a remote mission control center. The competition will be held at the Kennedy Space Center Visitor Complex from May 21-26, 2012. There are 42 US teams participating in the competition and 6 are from Florida. FSGC is partially supporting 5 of the Florida teams. The teams represent Florida International University (Hispanic serving university), University of Miami, Florida State University, University of Florida, and Embry-Riddle Aeronautical University. Last year

only 2 Florida teams participated in the competition and this year we made an extra effort to involve as many Florida schools in the competition.

USLI: The NASA University Student Launch Initiative, or USLI, is a competition that challenges university-level students to design, build and launch a reusable rocket with a scientific or engineering payload to one mile above ground level, or AGL. The project engages students in scientific research and real-world engineering processes with NASA engineers. 42 US teams are participating in the competition and 5 teams are from Florida. FSGC is supporting the team from the University of Central Florida. In previous year, only a couple of Florida universities participated in the competition. However, as a result of the FSGC Hybrid Rocket competition (involving 5 universities), students who initially participate in the Hybrid Rocket Competition, take part in the USLI competition, which is a little more challenging than the Hybrid Rocket Competition. The launch date was on April 21, 2012.

Moonbuggy Race: This NASA event challenges high school, college and university students to design, build and race lightweight, human-powered rovers — “moonbuggies” — which address challenges much like those faced by NASA’s lunar rover developers in the late 1960s. Each Moonbuggy is human powered and carry two students, one female and one male, over a half-mile simulated lunar terrain course including "craters", rocks, "lava" ridges, inclines and "lunar" soil. The 19th annual NASA Great Moonbuggy Race was held on April 13-14, 2012 at the U.S. Space & Rocket Center in Huntsville, Ala. 2 colleges from Florida participated in the race, North Florida Community College and the University of Central Florida (UCF). FSGC supported the UCF team.

A Collaboration Between the School of Education and School of Science, Engineering & Mathematics at Bethune-Cookman University (ongoing)

This project involves collaboration between the School of Education (SoEd) and the School of Science, Engineering and Mathematics (SSEM), and the Volusia County School District. The project promotes awareness of science and mathematics among interested students in the School of Education. A specific group of BCU science and education majors will mentor middle and high school students in developing projects for science fairs and provide tutoring in mathematics and science courses. BCU student participants will gather and maintain data to be used to assess the impact of the project. This outreach program is designed to foster the interest of students in STEM and confirm the SoEd’s commitment to assessment-driven planning and instruction with the belief that a teacher must assess student knowledge and skills in order to teach successfully. This project began in February and is continuing through the summer and fall semester. We do not have the numbers to report at this time.

SMART Objective – On an annual basis, involve at least 100 students, representing a minimum of five Florida-based higher education institutions, including at least one minority serving institution, in collaborative space-based interactive learning experiences. *221 students from 6 universities, including 1 Hispanic serving institution, are participating in Higher Education Projects*

Research Infrastructure

Florida Space Research Program: In 2011, FSGC has funded 16 space research and education grants under the Florida Space Research Program (FSRP) totaling of \$650K (including matching of \$440K) in funding to selected recipients. The FSRP combines both Federal and State funds for projects that diversify Florida's space industry and research efforts, while also supporting aerospace workforce development statewide. The program is comprised of three categories – The Space Education & Training Program, Space Exploration & Spaceport Technical Development, and Space-Based Research and Payload Development. The State of Florida and Space Florida have been significant contributors to the Florida Space Research Program for five years. The FSRP 2011 awardees include 10 Florida universities: the University of Florida, University of Central Florida, Florida Institute of Technology, Embry Riddle Aeronautical University, Florida Atlantic University, Broward College, University of South Florida, Florida International University, Florida State University, and Florida Gulf Coast University. A total of 29 proposals were received. Each submission was independently evaluated by a team of experienced professionals from Kennedy Space Center and other universities and NASA centers. In 2011, 24 students were directly funded through 16 research grants. **11 students were under-represented minorities.**

Space Flight Payload Workshop: On March 23, 2012 Space Florida and the Florida Space Grant Consortium partnered to provide a Space Flight Payloads Workshop to suborbital flight providers, research platform developers, as well as academic, commercial and research entities. The goal of the Workshop was to stimulate market interest and demand for suborbital and microgravity flights in Florida through imaginative means. To do this, Space Florida recently introduced its flight incentive program which will provide up to one third of the published list price of a flight provider, up to a maximum of \$10,000. 132 attendees were present at this workshop. This included 30 from NASA KSC, 56 from various industry, 38 from universities and 8 from the Air Force.

Flight providers who presented on the day included - Masten Space Technologies, Starfighters, StarLab, XCORE and Zero-G. A unique feature of the Workshop was the display of space hardware. Technical expertise staffed the workshop table demonstrating their research hardware and through informal discussion, were able to relay how they could provide the required capabilities to perform high quality microgravity research. The Space Florida and NASA developed FASTRACK was on display as well as ABRS - the advanced biological research system, of which a duplicate is currently on board the International Space Station. Other attendees and presenters included commercial entities such as Innovative Health Applications and Kentucky Space. Several university staff also demonstrated their research capabilities. NASA-KSC, CASIS and QNA also provided staff, hardware and technical information to the attendees. It is envisaged that this Workshop may become an annual event and feedback is currently being requested

from all attendees as to best avail of the commercial opportunities that are being created at this jointly-sponsored (SF & FSGC) Space Flight Payloads Workshop.

SMART Objective – On an annual basis, at least 12 research projects will be competitively awarded. At least three of these research project awards will be awarded to a minority serving institution and/or include minority participation. At least 12 undergraduate or graduate students will be supported by the projects, including at least 5 women and 4 under-represented minorities.

We have supported 16 research projects involving 24 students, including 11 under-represented minorities and 11 women. 2 of the awards were to minority-serving institutions

SMART Objective – By March 2014, facilitate at least two Space-Related Research Symposia within the State of Florida that specifically target NASA engineers, Florida university faculty and industry partners.

Space Florida and FSGC partnered to provide a Space Flight Payloads Workshop to suborbital flight providers, research platform developers, as well as academic, commercial and research entities. 132 attendees were present at this workshop. This included 30 from NASA KSC, 56 from various industry, 38 from universities and 8 from the Air Force.

Outcome 2 (Educate and Engage)

Pre-college programs:

Seventh Annual Florida Engineering Education Conference: The University of Central Florida's College of Engineering and Computer Science (CECS), hosted the Seventh Annual Florida Engineering Education Conference (FEEC) on April 27, 2012 at the UCF's FAIRWINDS Alumni Center. Conference Partners included Florida Engineering Foundation, Harris Corporation, Lockheed Martin, Florida Space Grant Consortium, the Central Florida STEM Education Council and the Bureau of Curriculum and Instruction at the Florida Department of Education. This informative program provided opportunities for attendees to network and establish new engineering education contacts. There was a special emphasis this year on environmental education program with an engineering focus. There were 158 registrants for this conference and 121 actually attended the conference.

Education Scholarship Program (ESP) will be conducted by the Astronauts Memorial Foundation (AMF) in the summer of 2012. AMF will create the curriculum and provide professional development training for Florida Educators. This professional development training will deal with STEM subject matter and focus on K-12 teachers and students. Full and/or partial scholarships will be awarded to individuals, schools, and districts.

Girls in Engineering, Math and Science (GEMS): In its sixth year, Girls in Engineering, Math and Science (GEMS) was launched in 2006 to address our nation's shortage of women

professionals in the fields of math, science and engineering. The GEMS program provides 6th, 7th, and 8th grade girls from public schools the opportunity to participate in STEM related activities on the Florida Gulf Coast University (FGCU) campus. GEMS provides creative hands-on science workshops for middle school female students from Lee and Collier counties. This year Jan DeJarnette and Jo Ann Wilson, from FGCU, were awarded a grant from NASA Florida Space Grant Consortium. With this funding, GEMS served 244 girls and 9 teachers in workshops that were held on November 19, 2011, February 25 and April 21 of 2012. In addition, 13 FGCU undergraduates and 5 faculty played an active role in the success of GEMS in providing hands-on laboratory investigations for middle-school girls. The GEMS attendance demonstrated that more than 55.2% of attendees were from under-represented populations including 35% Hispanic, 15.5% African-American, and 4.6% Asian.

SMART Objective – On an annual basis, conduct and/or facilitate space-related pre-service and in-service teacher training opportunities focused on space-related math and/or science curricula. A minimum of 50 Florida teachers per year will attend this training. *We will be supporting 52 teachers, after the completion of the final workshop in June. In addition, 121 teachers and administrators attended the Seventh Annual Florida Engineering Education Conference.*

Outcome 3 (Engage and Inspire)

Orlando Science Center: OSC created a number of STEM-focused exhibit experiences that addressed the engineering design principles, problem-based learning and critical thinking skills necessary to engage students STEM Education. The following STEM-focused exhibit experiences were introduced:

Pinewood Derby- Isolate variables to create the fastest Pinewood car; Students choose wheel size, axel placement, and weight distribution in order to construct the fastest car.

Ball Wall -Engineering design challenge; Students create their own ramp design to get a ball from the top of the wall into a target cup. Students can also use challenge cards that include parameters that their design must incorporate to hit a specific target.

Wind Tubes- Creative design challenge; Students use various recycled materials to construct and test their own designs in the wind tubes. The materials change through use and provide open-ended opportunities for interaction and engagement.

Students from schools around central Florida came to OSC in the form of school field trips. These students went through a 60-minute discovery lab that involved hands-on activities and built upon the critical thinking and problem-solving principles associated with each exhibit. Students also experienced a large format film in their Dr. Phillips Cinedome Theater. An estimated 13,000 K-12 students went through these experiences. These numbers do not reflect the general attendance at the Orlando Science Center but

the numbers associated with the field trips. Lead teachers call and schedule these experiences for the respective schools.

USA Science and Engineering Fair: The Department of Astronomy at the University of Florida collaborated with the UF College of Engineering (CoE) to host a booth at the USA Science and Engineering Festival on April 28 and 29, 2012 in Washington, DC. The theme was “Engineering the Future of Biology and Astronomy”. The main goals were

- Experiencing the Gator Nation through pioneering space and biotechnology research at the University of Florida.
- Building a working telescope and see how University of Florida researchers are using some of the world's smallest and largest telescopes to explore the universe.
- Immersing oneself in the small satellite technologies and biosensor applications that are advancing the way we conduct orbital science.
- Experience the opportunity to brainstorm, submit mission concepts, and see how one might construct your own spacecraft prototype.

About 6000 people stopped by the UF booth, which was partly sponsored by FSGC. Some of the student volunteers at the UF booth were FSGC awardees.

National Science Olympiad: The University of Central Florida will be hosting the Science Olympiad National Tournament May 18-19, 2012. FSGC is one of the sponsors of this tournament. Science Olympiad is a competition for elementary, middle, and high school students. Regional and state competitions for middle and high school students and a separate elementary competition for local school districts are held at all 50 states. Teams that compete are comprised of up to 15 students, led by one teacher called a coach, who compete in 23 different events. The events are in physics, chemistry, earth space science, biology and engineering. Students engage in hands-on, interactive, inquiry-based activities that are lab-based, research-based, or prebuilt. The University of Central Florida will host 60 teams in each division (there are 2 divisions) plus a Science Olympiad Ambassador HS Team from Japan. All state directors are asked to invite their first place state winner in each division to the National Tournament. Currently there are about 48 states hosting tournaments, so approximately 12-13 states with larger membership totals by division will be asked to invite their second place team. The Master of Ceremonies is George Diller, NASA Public Affairs Information Specialist. Mr. Bob Cabana - Astronaut and Kennedy Space Center Director will provide the welcome to Science Olympiad National Tournament. The keynote speaker will be Dr. Jan Garavaglia, host of Dr. G Medical Examiner, Discovery Health Channel. The numbers will be reported later, after the completion of the tournament.

SMART Objective – On an annual basis, collaborate with Florida museums and/or science centers to facilitate/conduct engaging space-related learning events held in public venues. A minimum of two events per year will be held. At least 200 members of the public will attend one or more of these events per year.

About 19000 participants attended 2 informal science events

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking:
Required Text: Student Data and Longitudinal Tracking: Total awards = __66__; Fellowship/Scholarship = __42__, Higher Education/Research Infrastructure = __24__; __62%_ of the total award represent underrepresented minority F/S funding. During the FY11 program year 7 are pursuing advanced degrees in STEM disciplines, 1 accepted a STEM position at a NASA contractor, 2 accepted positions at NASA, 10 accepted STEM positions in industry, 3 accepted STEM positions in academia, and 3 went on to positions in non-STEM disciplines. The remaining students have not yet received the degree that they were pursuing while the received their Space Grant award.

Percentage of students whom have taken their next step and have been successfully tracked though their next step vs last year of SG support.

- 90% for 2006
 - 100% for 2007
 - 100% for 2008
 - 96% for 2009
 - 88% for 2010
 - 100% for 2011
 - 96% for 2006-2011
- Diversity:
Under the Fellowship/scholarship category, 27 of the 44 awards (61%) went to men while 26 of the 42 awards (62%) went to under-represented minorities. Under the Research category, 11 of the 24 students (46%) funded were women, while 11 of the 24 student awards (46%) went to under-represented minorities. These numbers under the research category were an improvement from last year where only 30% of the research awards went to women and 30% of the research awards went to under-represented minorities. So far FSGC awards have been provided to 15 of the affiliates including 3 minority-serving institutions.
 - Minority-Serving Institutions:
Florida has 4 minority-serving institutions, Bethune Cookman University, Florida A&M University (FAMU), Florida International University (FIU), and Broward College (Broward). FSGC has strong contacts with three of the 4 institutions (Bethune, FIU, and Broward) and has made some progress in working with faculty at FAMU, though the FSU-FAMU College of Engineering. FSGC supports the Presidential scholarship program at Bethune Cookman university by supplementing scholarships to 20 students. FSGC has supported a research project at FIU, supported a senior-design project at FIU and also supported the Lunabotics team from FIU . FSGC has also funded a research project at Broward College. We will also be

supporting one intern from FAMU and one from Bethune Cookman at the Kennedy Space Center and one from FIU at Johnson Space Center but have not included them in this report as the funds will be spent from the augmentation part of the award. In addition, we are supporting a Lunabotics team from the joint FSU-FAMU College of Engineering

- NASA Education Priorities:
 - Authentic, hands-on student experiences in science and engineering disciplines – the incorporation of active participation by students in hands-on learning or practice with experiences rooted in NASA-related, STEM-focused questions and issues; the incorporation of real-life problem-solving and needs as the context for activities. *Most of FSGC’s higher education projects involve hands-on student experiences, including the Hybrid Rocket Competition and ballooning program. In addition, FSGC supports a number of senior design projects that are relevant to NASA and also supports teams that participate in NASA competitions such as the Moonbuggy, USLI, and reduced gravity flights.*
 - Summer opportunities for secondary students on college campuses with the objective of increased enrollment in STEM disciplines or interest in STEM careers.
Through the Girls in Engineering, Math and Science (GEMS) Program at Florida Gulf Coast University, 244 middle school female students from Lee and Collier counties, participated in three creative hands-on science workshops. More than 55.2% of attendees were from under-represented populations including 35% Hispanic, 15.5% African-American, and 4.6% Asian.
 - Community Colleges – develop new relationships as well as sustain and strengthen existing institutional relationships with community colleges. *FGSC had developed relationship with 3 community colleges. However, under a new system in Florida, a number of the community colleges are changing to 4-year colleges. FSGC does work closely with Brevard Community College and is supporting research at Broward College, which became a college last year.*
 - Diversity of institutions, faculty, and student participants. *FSGC has directly supported 66 students from 10 universities, including 3 minority-serving institutions and through its higher education projects, 221 students are involved in projects from 5 universities, including one Hispanic serving institution.*
 - Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities.
Through the Florida Space Research Program, sponsored by FSGC and Space Florida, faculty at Florida institutions are provided seed funding to focus their research on NASA priorities, specially focusing on the technical requirements at KSC. This was the case with the University of South Florida where 2 researchers were supported to work on areas relevant to KSC, one of them being an early career faculty.

IMPROVEMENTS MADE IN THE PAST YEAR

One of our major improvements this year has been the increase in both women and under-represented minorities in our research projects. Under the Research category, 11 of the 24 students (46%) funded were women, while 11 of the 24 student awards (46%) went to under-represented minorities. These numbers under the research category were an improvement from last year where only 30% of the research awards went to women and 30% of the research awards went to under-represented minorities. In addition, we have added a new affiliate, Broward College, that serves the Fort Lauderdale area in South Florida. Broward College is a Hispanic Serving Institute. We have also funded a research project at Broward College which involves the building of scientific payloads to fly on sub-orbital flights. We have also been successful in attracting more teams from universities to participate in NASA competitions like the Lunabotics competition, USLI, and the Moonbuggy race. We have also started engaging collaboration between colleges of education and colleges of science and engineering. One example is the collaboration between the School of Education and School of Science, Engineering & Mathematics at Bethune-Cookman University.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Listed below are all of FSGC's affiliates. Funds are not provided directly to affiliates for implementation of programs. FSGC awards are all competitive and awards are given to the respective PI's in their institution. The affiliate institution is responsible for sending final reports and all other relevant documentation to the FSGC offices. The only roles the affiliates have is to ensure that information from the FSGC office is being sent to all interested faculty and students and to ensure timely technical and financial reports to the FSGC office. In addition, the FSGC advisory Board, comprising of representatives from all 21 affiliates meet twice a year to approve the budget and FSGC programs.

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

Broward College (4-year college Bachelor of Science degrees in addition to their 2-year degree programs) Broward College is a Hispanic serving institute. Broward College offers Associate & Bachelor degrees & certificate programs at many locations in the Greater Fort Lauderdale /Broward County community. Specialized programs include online degrees, Health Sciences and Continuing Education.

Embry-Riddle Aeronautical University (University awarding baccalaureate and master's degrees): Embry-Riddle Aeronautical University, 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): Eckerd College is a private, coeducational college of liberal arts and sciences. Eckerd College is one of only 40 schools listed in Loren Pope's *Colleges That Change Lives*. In 2003, Eckerd was named one of 13 Institutions of Excellence in the First College Year by the Policy Center on the First Year of College. Eckerd College is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award the Bachelor of Arts and Bachelor of Science degrees.

Florida Atlantic University (University awarding degrees up through the Ph.D): Florida Atlantic University is the first public university in southeast Florida and the first in America designed for upper division students only. FAU is earning a reputation as a top research institution in areas ranging from biomedicine and biotechnology to ocean engineering and coastline security.

Brevard Community College (Community/Junior College awarding associate degrees): Situated on Florida's Space Coast, BCC has four integrated campuses – in Cocoa, Melbourne, Palm Bay and Titusville – an aerospace program at the Kennedy Space Center and a Virtual campus. An accredited institution, BCC is recognized as one of America's leading community colleges for quality in instruction, organization, and its innovative and leading-edge programs. It was one of the first community colleges in the country to offer the AA degree online.

Florida Gulf Coast University (4-year college awarding baccalaureate and graduate degrees): FGCU, a member of the State University System of Florida, is a comprehensive university created to address the educational needs of the rapidly growing Southwest Florida population. Florida Gulf Coast University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools to award associate, baccalaureate, master's, and doctoral degrees. In addition, the university is actively seeking accreditation for the undergraduate engineering programs in the U.A. Whitaker School of Engineering, its Bachelor of Science in Social Work, its Bachelor of Science in Resort and Hospitality Management, and its Bachelor of Science in Clinical Laboratory Science.

Florida Institute of Technology (University awarding degrees up through the Ph.D): Florida Institute of Technology 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. FIT is the only independent, technological university in the Southeast, A Barron's Guide "Best Buy" in College Education, listed among America's best colleges in U.S. News & World Report and named one of the nation's top 13 technological institutions in the Fiske Guide to Colleges.

Florida International University (University awarding baccalaureate and master's degrees, Hispanic Serving Institute): Florida International University 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 in the 2008 survey conducted by the Hispanic Outlook in Higher Education Magazine. FIU is

the youngest university to have been awarded a chapter of Phi Beta Kappa, the nation's oldest and most distinguished academic honor society.

Florida State University (University awarding degrees up through the Ph.D): Florida State University's 16 colleges offer 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. FSU is a comprehensive, residential and coeducational institution of over 33,000 students located in Tallahassee, Florida.

Florida A&M University (University awarding degrees up through the Ph.D.; Historically Black College or University). Florida A&M 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. The doctor of philosophy is offered in the College of Pharmacy and Pharmaceutical Sciences, College of Education and FAMU/FSU College of Engineering.

University of Central Florida – Lead University: (University awarding degrees up through the Ph.D). UCF has 12 colleges, including the newly established College of Medicine, and College of Graduate Studies. More than 50,000 students attend classes on UCF's main campus and its 11 regional campuses located throughout Central Florida. 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): The University of Florida is a major, public, comprehensive, land-grant, research university. The state's oldest, largest and most comprehensive university, Florida is among the nation's most academically diverse public universities. With more than 51,000 students, Florida is now one of the five largest universities in the nation. It is one of only 17 public, land-grant universities that belongs to the Association of American Universities.

University of Miami (University awarding degrees up through the Ph.D): The University of Miami is the largest, most comprehensive private research university in the southeastern United States with a well-earned reputation for academic excellence. Nearly 15,000 undergraduate and graduate students from every state and more than 140 nations around the world call UM home during the academic semester. With more than 9,400 full- and part-time faculty and staff, UM is the second largest private employer in Miami-Dade County. The University's 12 colleges and schools, along with the Division of Continuing and International Education, offer 114 bachelor's, 104 master's, 57 doctoral and four professional areas of study.

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. UNF cultivates a learning environment that supports intellectual curiosity, academic achievement, and personal growth. This goal is supported by a strong academic curriculum comprised of 56 undergraduate, 27 masters, and 3 doctoral degree programs in the liberal arts and professional fields.

University of South Florida: (University awarding degrees up through the Ph.D): The University of South Florida is the second largest university in the southeast and among the top 20 largest in the nation. It 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. The University offers 219 degree programs at the undergraduate, graduate, specialist and doctoral levels, including the doctor of medicine.

University of West Florida: (University awarding baccalaureate and master's degrees): UWF is a member of the State University System of Florida. The university 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. Long celebrated for its caring, nurturing approach to helping

Astronauts Memorial Foundation (Private 501(c)(3) not-for-profit organization): The Astronauts Memorial Foundation honors and 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. AMF is a private, not-for-profit organization approved by NASA to build and maintain two major facilities at the John F. Kennedy Space Center's Visitor Complex.

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. Located at the Cape Canaveral Spaceport in Florida, KSC handles the checkout, launch and landing of the Space Shuttle and its payloads.

Orlando Science Center (Science Museum): Orlando Science Center offers hands-on fun for all ages through engaging interactive exhibits, live programming, giant-screen films, school field trips and school-break camps. The science Center conducts the Informal Science program for FSGC

Space Florida (State/Local Government): Space Florida is the public-private partnership responsible for promoting and developing Florida's aerospace industry. Space Florida was created by the Florida Legislature to sustain Florida's position as the global space leader. As declared in its mission statement, Space Florida drives State economic development across the global aerospace enterprise. Space Florida provides \$125K for the FSGC research program and along with FSGC sponsors the undergraduate Academy program