Georgia Space Grant Consortium
Georgia Institute of Technology

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Albany State University (HBCU), Armstrong Atlantic State University, Columbus State University, Fort Valley State University (HBCU), Georgia Southern University, Georgia State University, Kennesaw State University, Mercer University, Morehouse College (HBCU), North Georgia College and State University, Orbit Education, Inc., SpaceWorks Engineering, Inc., Savannah State University, (HBCU) Spelman College (HBCU), University of Georgia, University of West Georgia

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 Georgia Space Grant Consortium (GSGC) is a Designated Consortium funded at a level of $590,000 for fiscal year 2007.

PROGRAM RELEVANCE TO NASA
Space Grant consortia build human capital and research expertise to support NASA programs and missions, expand NASA's expertise and educational networks, and bring knowledge and awareness of space to a broad range of constituents in every state. The GSGC promotes Science, Technology, Engineering, and Mathematics (STEM) disciplines in a manner that addresses national priorities in education, research, and public service, including engaging underrepresented groups and institutions such as Historically Black Colleges and Universities (HBCUs) and female colleges and universities. By building a diverse network of colleges, universities, industrial affiliates, nonprofit organizations and government agencies, the GSGC works throughout the state of Georgia to conduct research as well as educational outreach programs in aerospace-related fields to help maintain, increase and diversify the technological workforce in the United States. The GSGC plays an integral role in increasing the technological workforce of the country, serving as the hub in Georgia, connecting researchers, the general public, educators, and students together to realize NASA's *Vision for Space Exploration*.

PROGRAM BENEFITS TO THE STATE
By establishing effective research, educational collaborations and outreach programs among its 17 institutions, the GSGC has made a significant impact on recruitment of women and minorities from underrepresented groups for Ph.D.s in STEM fields, as well as pipeline programs that have produced students seeking advanced degrees. The

expansion in students' enrollment in the Dual from the six GSGC's HBCUs as well as the Regents' Engineering Transfer Program while keeping their high retention rates, underscore the effectiveness of the GSGC collaborative programs between majority and minority serving institutions in the State. The increased participation of undergraduate and graduate student teams in microgravity competitions, NASA Means Business competitions, Exploration System Mission Directorate projects and their top placements in these competitions, promote workforce development and diversity in STEM careers for the State.

PROGRAM GOALS

The GSGC through its network of colleges, universities, industrial affiliates, nonprofit organizations, and government agencies, works throughout the State of Georgia to conduct programs of research, education, and outreach in aerospace-related fields to help maintain, increase and diversify the technological workforce in the United States. The specific goals pertaining to research, education, public out reach and scholarship/fellowship programs as well as Consortium management, are:

- To deliver a scholarship/fellowship program that stimulates STEM excellence for America's students, targeting underrepresented groups to build a diverse workforce pipeline in the STEM skills most needed by NASA and the State of Georgia
- To support customer-focused research activities that develops innovative technologies, knowledge and infrastructures to shape decisions impacting human space exploration.
- To uphold education programs, tailored to the needs of the State of Georgia, to improve STEM education for its future workforce and inspire youth to enter technology fields.
- To collaborate with informal learning institutions and private industry representatives to engage the public in NASA's *Vision for Space Exploration* through a vigorous campaign to disseminate content based on NASA's discoveries and exploration.
- To ensure full participation of Consortium affiliates via a framework of dynamic policies for fiscal management, board composition, communications, relationship building and evaluation

PROGRAM ACCOMPLISHMENTS

The GSGC has produced 45 Ph.Ds from underrepresented groups since its inception in 1990 and continues to fund a new generation of scholars. The main accomplishments for the 2007 FY include:

- Development of a 3-D Scanning and Reverse Engineering procedure which was implemented in research projects for students at Albany State University (HBCU) with the potential for dissemination to other institutions.
- Investigation of an A123 lithium nano-phospate cell type greener and low maintenance battery for composite airplanes.
- Development of software for streamlining the operation of a Mobile Solar Observatory program at Columbus State University's Mead Observatory.
- Implementation of NASA's remote sensing technology for precision farming. This includes the development of similarity analysis procedures to map soil organic Carbon as well as training on the use and application of climate forecasts in agriculture and natural resource management.
- Development of a course on digital imaging and computer applications in

agriculture.

- Expansion of the use of Georgia Southern's University Planetarium to introductory astronomy courses offered by the physics department. This expansion enabled serving nearly 1,000 students as well as offering internships.
- Established a partnership between NASA and the University of Georgia campus in Tifton to provide a library of educational materials in electronic format. This represents the 3rd NASA Electronic Educators Resource (NEER) Center in the State.
- Offered in-service and pre-service Professional Development workshops in Robotics, Aeronautics, Astronomy, Mathematics and Science for K-12 teachers in conjunction with NASA KSC using NASA curriculum and materials. The workshops included underserved schools in need of focused STEM programs averaging 50% minority teacher participation and 60% of the schools represented were Title I schools.
- Development of *Teaching STEM Initiative* using NASA Fellows to coordinate the program, creating a seamless flow of science and math learning experiences from K-16 where students can learn science and math through an organized set of activities through their application.

STUDENT ACCOMPLISHMENTS

Student accomplishments for the 2007 FY include

- Awarded 2nd and 3rd place in the Exploration System Mission Directorate (ESMD) Systems Engineering Paper team competitions.
- Presented 8 papers at national technical conferences
- Seven students participated in NASA Academies and interned in industry. Spelman College (all female HBCU) had its first student placed in a NASA Space Academy program.
    - *Andrew Panoose at Goddard and Robert Haynes at Ames both worked on projects that resulted in applications for patents*.
    - *Luvenia Hellams volunteered to serve on the Space Academy Diversity Panel. She submitted a proposal to the GSGC for travel to promote the academy to underrepresented student groups.*
- Twenty six students participated in STEM conference, a 60% increase in one year.
- Twenty handicapped/underrepresented minority student groups participated in the first Engineering workshop for the Blind.
- Forty three minority college students participated in the *Teaching STEM Initiative.*