

Georgia Space Grant Consortium  
Georgia Institute of Technology  
Stephen M. Ruffin, Ph.D.  
404 894-8200  
Stephen.ruffin@ae.gatech.edu  
URL: <http://www.gasgc.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 **Georgia Space Grant** Consortium is a Designated/Program funded at a level of **\$785,000** for fiscal year 2009.

## PROGRAM GOALS

1. Fellowships and Scholarships
  - Deliver a competitive scholarship/fellowship program that promotes STEM excellence in students and faculty.
2. Research
  - Support customer-focused research activities that develop innovative technologies, knowledge and infrastructures to advance NASA's space and aeronautics objectives.
3. Education
  - Provide opportunities for students and educators in STEM disciplines through a progression of programs that immerse them in authentic science and engineering experiences to support the NASA mission and its human capital goals.
4. Informal Education
  - Increase the general public's and students' awareness and knowledge of NASA related technologies through collaborations with informal STEM education providers, NASA, private industry, and consortium members.
5. Consortium Management
  - Promote GSGC and manage its operations in a way which results in effective and collaborative programs that maximize the impact of each affiliate in achieving the GSGC mission.

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

### Highlights

#### Outcome 1

A student funded to work on a research project at North Georgia College and State University is now pursuing a Ph.D. in solid state physics. The funding for this student to conduct research on *Confocal X-Ray Fluorescence and its Potential use on Martian Landers* convinced him to pursue graduate studies at the University of Alabama in Birmingham.

GSGC **cost sharing funds** were used to help send Ph.D. astronomy student Caballero-Nieves to the Cerro Tololo Interamerican Observatory in Chile, where she saw the new year come in while working with Blanco 4 m telescope.

As a result of a space grant funded trip to present at a conference for African Americans in Aerospace, two Georgia Tech Ph.D. students were able to meet the Space Ambassadors from the Star Trek series. One student is a former space grant funded JPL intern, and the other is a space grant fellow. Both students concluded that meeting the stars of Star Trek further motivated them to pursue careers in STEM.

The GSGC receives regular updates from a former space grant student fellow working at Northrop Grumman -

*"The mission I have been working on for the past few months, called Lunar CRater Observation and Sensing System (LCROSS), is launching today, Thursday 6/18, from Cape Canaveral, Florida at 5:12pm EDT"*

-Kyle

#### Outcome 2

There has been a tremendous response from teachers enrolling in Orbit Education programs. Fifty percent of the teachers who are in the teacher in-service programs have been in previous programs. Starting in 2009, Orbit Education added a requirement that "repeat" teachers could only return if they brought another teacher. As a result, the number of teachers in Orbit Education programs increased by 50%. Orbit Education also uses teachers who sign up each year to train other educators.

Two former high school students who participated in Bridge Building competitions sponsored by Albany State (HBCU) are now college students at Albany State. One will transfer to Georgia Tech in the spring of 2011 to pursue engineering. The second student is a presidential scholar at Albany State and will also transfer to Georgia Tech in the fall of 2011.

### Outcome 3

During 2009, West Georgia affiliate director, Dr. Ben deMayo, was the subject of three newspaper articles.

Times-Georgian

October 3, 2009

#### **Fun with Physics**

*Professor's demonstrations have been awing young and old alike since 1971*

The West Georgian

April 7, 2010

#### **Physics Demo brings studies to life**

The Times Georgian

May 12, 2010

#### **Program to Explore Wonders of Pluto**

*Professor says there's much to learn about the solar system's smallest planet*

## PROGRAM ACCOMPLISHMENTS

### Outcome 1

Title: Building Research Infrastructure in 3D Scanning and Reverse Engineering

PI: Dr. Atin Sinha, Albany State University (HBCU)

Description: Continuation of previous proposal to develop and document procedures for the 3D Scanning and reverse engineering facility for use by students and local industry. One student will work to develop projects for a sophomore level engineering course and help train student in the manufacturing technology.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3, 1.5

Metric – 1 student participant and development and documentation of procedures

Results – Metric accomplished

Title: PACER

PI: Dr. Atin Sinha, Albany State University (HBCU)

Description: Students will design, fabricate and launch a small payload from a helium filled balloon and analyze data after retrieval of the payload

NASA Education Outcome Objectives: 1.2, 1.3

Metric – 6 students participated in authentic engineering experience

Results – Metric accomplished

Title: Service Based Undergraduate Engineering Research at Armstrong Atlantic State University

PI: Cameron Coates, Armstrong Atlantic State University

Co-PI's: Wayne Johnson, Priya Goeser Description: Implementation of an undergraduate research agenda that encourages students to interact with the community, seeking engineering solutions for a broad range of current issues. This program is unique in that community service is an integral component. Students will have two options; the first involves pursuing

independent research with a faculty advisor throughout the semester while simultaneously mentoring an elementary school student from a local inner city school. The second option involves becoming a part of a team of undergraduates tasked with researching solutions to actual problems or potential modifications for the living standards of impoverished local communities.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3, 1.5

Metric – 6 students will participate in researching solutions to actual problems

Results – Exceeded number - 7 students participated

Title: NURO Observatory Consortium Membership

PI: Dr. Shawn Cruzen, Columbus State University

Description: Membership in the consortium provides the opportunity for astronomy faculty to conduct research with undergraduate student and advance their own research.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – 4 students with conduct research in astronomy

Results – Metric accomplished

Title: Research and Education in Earth and Space Science

PI: Dr. Shawn Cruzen, Columbus State University

Description: Space Grant Fellows will receive funds to participate in research and education activities with CSU faculty

NASA Education Outcome Objectives: 1.2

Metric – 4 students conduct research at the Coca Cola Space Science Center planetarium

Results – Metric accomplished

Title: GSU Student Observations

PI: Dr. Doug Gies

Description: Travel support for 2 GSU graduate students to conduct research at astronomical observatories during FY10.

NASA Education Outcome Objectives: 1.2, 1.3

Metric– 2 GSU space grant fellows conduct research at observatories

Results – surpassed – 3 students conducted research

Title: University Student Launch Initiative

PI: Tony Contrada

Description: NASA competition for students to engage in rocket development and launch.

NASA Education Outcome Objectives: 1.2, 1.3

Metric – 9 students participate in USLI team competition (authentic hands on)

Results - surpassed 11 students participated in competition

Title: NASA Space Academies

PI: various

Descriptions: Summer internships for college students at various NASA Field Centers, and Jet Propulsion Labs.

NASA Education Outcome Objectives, 1.3, 1.3

Metric – 2 students are funded to participate in Academies or other internships

Results – surpassed metric 1 student at Marshall Academy, 1 at Marshall Internship, and 1 student at JPL – 3 students total

Title: University Nanosat Program, the Rapid Reconnaissance and Response (R3)

PI: Professor David Spencer, Georgia Tech

Description: is requested for student travel to 2 University Nanosat Program events during the summer of 2009: (1) Four student will attend the SHOT-1 workshop in Boulder, Colorado (June 10-13, 2009). Students will participate in flight hardware integration and testing, and launch payloads on high-altitude balloons. (2) Eight students will attend the Preliminary Design Review for the University Nanosat-6 Program in Logan, Utah (August 13-14). The students will present the preliminary design of the R3 mission to a review board, and interact with the other student teams.

NASA Education Outcome Objectives: 1.1, 1.2., 1.3

Metric – 4 students participate in workshop

Results – Metric accomplished

Title: AIAA Atmospheric Flight Mechanics Conference

PI: Graduate Student – Jarrett LaFleur

Description: Presentation of two papers: Robustness in Planetary Entry and Angle of Attack Modulation for Mars Entry

NASA Education Outcome Objectives: 1.2, 1.3, 1.5

Metric – 1 student presentation of two papers

Results – Metric Accomplished

Title: Robotics Controls and Modeling Research

PI: Dr. Phil Oliver, Mercer University

Description: Research in robotics, controls and modeling.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3, 1.5 k

Metric – 4 students participated in robotics research

Results – 2 students conducted research (metric not achieved)

Title: Terahertz (THz) Optical Lithography for Undergraduate Research

PI: Dr. Willie Rockward, Morehouse College

Description: The Micro/Nano Optics Research & Engineering Laboratory proposed to establish and optical lithography process of micro/nano optical elements for THz imaging system.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – 1 faculty member and 2 students conduct research

Results – Metric achieved

Title: THz Undergraduate Research Assistantships

PI: Dr. Willie Rockward, Morehouse College

Description: The M.O.R.E Laboratory proposes to fund undergraduate students to participate in optical lithography research

NASA Education Outcome Objectives: 1.2, 1.3

Metric – 1 faculty member and 4 students conduct lithography research

Results – Metric achieved

Title: Terahertz (THz) Optical Lithography for Undergraduate Research at Morehouse College

PI: Dr. Willie Rockward, Morehouse College

Description: The M.O.R.E. Laboratory proposes to acquire research-related materials and supplies and work with the nanolithography facilities at Georgia Tech Microelectronics Center to assist in the design and fabrication aspects of the optical lithography process of micro/nano optical elements.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3, 1.5

Metric – Material purchased to continued fabrication

Results – Metric achieved and project ongoing

Title: Study of Confocal X-Ray Fluorescence and its potential use on Martian Landers

PI: Dr. Mark Spraker and Dr. Sarah Formica, North Georgia College and State University (NGCSU)

Description: The NGCSU SCITER (X-ray Composition, Imaging and Trace Element Research) group is using Molybdenum x-ray source, an aligned optic and the energy dispersive detector to perform x-ray fluorescence measurements.

Total Budget: NASA Education Outcome Objectives: 1.1, 1.2, 1.3

Metric –Seed funding for 2 faculty members to conduct research

Results – Metric achieved – research ongoing

Title: Development of an Educational Radio Telescope

PI: Dr. Mark Spraker, North Georgia College and State University (NGCSU)

Description: NGCSU owns a 17-foot diameter satellite dish, manufactured by Scientific Atlanta, which is located on the grounds of the North Georgia Astronomical Observatory. NGCSU proposes to take the dish and make it into an instrument suitable for undergraduate education and research.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3, 1.

Metric– Development of educational telescope for research

Results – metric achieved, research ongoing

Title: Georgia Regional Astronomers Meeting

PI: Dr. Joe Jones, Dr. Mark Spraker, Dr. Sarah Formica, (NGCSU)

Description: NGCSU will host the 2009 Georgia Regional Astronomers Meeting (GRAM) in September. Dr. Joe Jones is a founding member of GRAM and will serve, along with Drs. Mark Spraker and Sarah Formica, as hosts and organizers for the conference.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3

Metric – Sponsorship of Astronomers Meeting

Results – Metric achieved, over 75 participants in conference

Title: A Study of Confocal X-Ray Fluorescence and its potential use on Martian Landers

PI: Dr. Mark Spraker

Description: NGCSU currently has six undergraduate students doing research in the XCITER group. The requested funding would cover monies to support these and other students during the summer and throughout the year.

NASA Education Outcome Objectives: 1.1, 1.2, 1.3

Metric – 6 undergraduate students will conduct research with XCITER

Results – 5 students conducted research (metric not met) work is ongoing.

Title: Savannah State Workforce Development Programs

PI: Dr. Jonathan Lambright, Savannah State University

Description: Funds used to assist student chapters of professional societies such as Tau Alpha Pi, ASME, NSBE, ASCE that will help to increase students' interest in STEM and provide opportunities for paper presentations, collaborations, employment and training. Funds will also assist faculty who are working with students to conduct research.

NASA Education Outcome Objectives: 1.2, 1.3, 1.5

Metric – 75 students participate in workforce development programs

Results – Metric achieved

Title: Remote Sensing of Peanut Diseases

PI: Dr. J. Paz, Biological and Agricultural Engineering, University of Georgia

Description: Research will explore the use and application of remotely sensed data for peanut diseases using geospatial technologies and remote sensing.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – 3 students conduct remote sensing research

Results – Metric not achieved – faculty member left the university

Title: Exploring Remote Sensing Images to Estimate Rate Constants of Nitrogen Mineralization

PI: Dr. M. Cabrera, University of Georgia

Description: This research will investigate how the geographically variable amount and quality of crop residue affects the soil's N fertility and the N fertilizer needed.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – 1 student funded to work on research project

Results – Metric achieved, student project is in; pilot stage of testing with selected clients

Title: Use of Remote Sensing for Spatial Data Analysis of Fruit Crops

PI: Dr. G. Hoogenboom, University of Georgia

Description: Research will explore the use and application of remotely sensed data for fruit crops.

NASA Education Outcome Objectives: 1.1

Metric – 1 student funded for research and 2 publications

Results – metric partially met, no student funding and 1 publication

Title: Course - Supporting technology enhancement and curriculum development of geospatial technologies

PI: Dr. Ian Flitcroft, University of Georgia

Description: For environmental science students to be adequately prepared for the job market they need to understand remote sensing, GPS and GIS as applied to agriculture and natural resource management. Salinity mapping of turf will provide data for hands on teaching opportunities with students.

NASA Education Outcome Objectives: 1.1

Metric– Presentation of new course in geospatial technologies

Results – Metric achieved and paper presented from course.

Title: Research infrastructure and STEM student research assistant support

PI: Dr. Ben deMayo, University of West Georgia

Description: Up to 4 student lab assistants per semester to work with PI on on-going projects: optical skin cancer detection, analysis of Mars photos, low-speed wing research, ultralight aircraft electric propulsion system, Alberta oil sands, (2 patents applied for so far) and high temperature superconductors. Goals: Improve STEM workforce, research infrastructure, industry cooperation, and technology transfer. Attract and retain STEM students, build strategic partnerships with local industry.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – 4 student lab assistant conduct research

Results – Metric achieved, ongoing

Title: Space science learning community assistance

PI: Dr. Ben deMayo, University of West Georgia

Description: To assist with the UWG Space Science Learning Community by giving one lecture and conducting a model rocket launch of student-built model rockets. Assisted by above student researchers. Goals: Improve STEM workforce, attract and retain STEM students, explain NASA's missions.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – One community lecture and one model launch

Results – Metric achieved.

Title: STEM student field trips

PI: Dr. Ben deMayo, University of West Georgia

Description: 3 field trips for 15 STEM majors to GA Tech, the local Southwire factory, and KSC or MSFC. Goals: to improve STEM workforce, attract and retain STEM students, explain NASA's missions, establish collaborations.

NASA Education Outcome Objectives: 1.2, 1.3

Metric – 3 field trips for 15 STEM students

Results – Metric achieved

Title: iNASA Education Resource Center

PI: Dr. Ben deMayo, University of West Georgia

Description: Internet-based NASA resource center for teachers and education majors to be located in the College of Education. Participants will have access to a dedicated pc tailored to NASA and other space-related education resources. A CD/DVD burner and thumb-drive memory sticks will be available to reduce the amount of paper used.

NASA Education Outcome Objectives: 1.1, 1.2

Metric – Development of iNASA ERC

Results – in progress, metric is being met

Title: STEM student tracking system

PI: Dr. Ben deMayo, University of West Georgia

Description: Establish a methodology for tracking UWG STEM students. The system will be designed to be easily transportable to other Space Grant institutions

NASA Education Outcome Objectives: 1.1, 1.2



Metric –Methodology for tracking West Georgia STEM students  
Results - ongoing

## Outcome 2

Title: Professional Development Training

PI: Dr. Atin Sinha, Albany State

Description: Attending American Society of Engineering Education Conference and Workshops each year both at national and at regional level

NASA Education Outcome Objectives: 2.1, 2.2

Metric – Attendance in AASEE conference

Results – Metric achieved

Title: NASA Field Trips

PI: Dr. Atin Sinha, Albany State

Description: Field trips to NASA Kennedy Space Flight Center and/or Challenger Space Center at Columbus, GA and/or Lockheed, GA

NASA Education Outcome Objectives: 2.1, 2.2

Metric– 2 STEM field trips

Results – Metric achieved

Title: Saturday Engineering Workshop

PI: Dr. Atin, Sinha, Albany State

Description: One or two workshops for 15 high school students with hands-on training in Lego NXT robots, CNC machining, SolidWorks CAD programming and testing aircraft model in a Wind Tunnel.

NASA Education Outcome Objectives: 2.4

Metric – 1-2 workshops for 15 high school students

Results – Metric achieved

Title: Southwest Georgia Regional Bridge Building Contest

PI: Dr. Atin Sinha, Albany State

Description: Annual model bridge building contest for high school students throughout the southwest Georgia region.

NASA Education Outcome Objectives: 2.4

Metric – 18 student participate in bridge building

Results – Metric achieved

Title: Ninth Grade Mathematics, Science, and Engineering Academy (MSEA)

PI: Dr. Ike Crumbly

Description: STEM program for minority and female students with 3 components: Math skills, field trips to scientific facilities, and career opportunities in STEM disciplines.

NASA Education Outcome Objectives: 2.4

Metric – 26 students enroll in the MSEA academy

Results – Metric achieved

Title: Youth Slam – Engineering Camp

PI: n/a

Description: The GSGC will sponsor high school students to attend a summer Engineering Camp at Johns Hopkins. Students are from underrepresented groups and part of the Federation for the Blind Workforce Development Program

NASA Education Outcome Objectives: 2.4

Metric – 18 handicapped students attend Engineering camp

Results – Metric not achieved - program postponed

Title: NASA Fellows Science Enrichment Programs - Students teaching Students

PI: Dr. Army Lester, Kennesaw State University

Description: KSU proposes learning experiences for K-16 students that will enhance students understanding of STEM disciplines and their potential career paths. The events will be conducted through three sets of activities. The first component - Applied Leadership program for college students. The second component - consists of a summer camp program for pre-college students. The third component of the project - college students visit classrooms to assist schoolteachers in delivering hands-on STEM activities

NASA Education Outcome Objectives: 2.1, 2.2, 2.3, 2.4

Metric – 50 students enroll in programs

Results – Surpassed metric, 58 students participate

Title: Botball

PI: Dr. Phil Olivier, Mercer University

Description: Botball is an educational program in which teams of middle school and high school students design, build, and test an autonomous robot that competes with robots built by other teams. This

NASA Education Outcome Objectives: 2.4

Metric – 160 middle school student participate in Botball program

Results – program not conducted

Title: K12 Fellowships for UGA Young Scholars Program

PI: Dr. Ian Flitcroft

Description: This program will provide partial support to 2-3 High school students to participate in UGA's Young Scholar Program, which is successful in recruiting minority students into science tracks at USG universities.

NASA Education Outcome Objectives: 2.4

Metric – 28 high school student participate in Young Scholar Program

Results – Metric achieved

Title: K12 Science Teacher Mentoring program.

PI: Be-atrice Cunningham, University of Georgia

Description: Summer mentoring of two high school or middle school science teachers at the UGA Griffin Campus. Given the demographic makeup of counties surrounding the Griffin campus the program is likely to provide opportunities for mentoring of minority background science teachers.

NASA Education Outcome Objectives: 2.1

Metric – 2 teachers participate in mentoring

Results – Metric not achieved, one teacher participated in mentoring.

Orbit Education

PI: Anthony Docal

Description: A series of 15 hands-on workshops will be offered throughout the calendar year. Each workshop will be a 5-hour stand-alone session. Teachers participating in more than one session can accumulate hours towards Professional Learning Units (PLUs).

The workshops will be grouped by grade level, NASA Mission Directorate theme or flight project theme, and correlated to state standards in STEM.

NASA Education Outcome Objectives: 2.2, 2.3, 3.1, 3.2

Metric – 15 hands on workshops for teachers

Results – Metric surpassed, 385 teachers in 19 workshops

Title: Regional Science Auditorium and Planetarium

PI: Dr. Ben deMayo, University of West Georgia

Description: Establishment of a privately funded regional field trip destination for K-12 science lecture-demonstrations and digital video presentations

NASA Education Outcome Objectives: 2.2, 2.3, 3.1, 3.2

Metric – Make contact with Economic Development Organizations

Results – Metric ongoing

Title: NASA Nights

PI: Dr. Ben deMayo, University of West Georgia

Description: A series of 4 bi-monthly lecture-demonstrations and IMAX® type movies such as “Mars, the Search Begins,” and “Hail, Columbia” of 1.5 hours duration. Goals: to inspire and motivate K-12 students; to inform NASA/STEM career possibilities; to inform NASA missions and benefits

NASA Education Outcome Objectives: 2.2, 2.3, 3.1, 3.2

Metric – 5 physics/astronomy demos with average of 50 participants

Results – Metric achieved

Title: In-school programs: Science Night and Career Day

PI: Dr. Ben deMayo, University of West Georgia

Description: Science Night: 3 physics demonstration sessions, 50 participants each, parents and middle school students. Career Day: 3 physics demonstration sessions, 50 middle school students each, plus “science as a career” discussions. Goals: to inspire and motivate K-12 students; to inform NASA/STEM career possibilities; to inform NASA missions and benefits

NASA Education Outcome Objectives: 2.2, 2.3, 3.1, 3.2

Metric – 100 participants in school programs

Results – Metric achieved

Title: Physics Demo Night

PI: Dr. Ben deMayo, University of West Georgia

Description: student-assisted public program; 1.5 hr of physics demonstrations. Goals: to inspire and motivate K-12 students; to inform NASA/STEM career possibilities; to inform NASA missions and benefits

NASA Education Outcome Objectives: 2.1., 2.2

Metric – Outreach for 300 K-12 students

Results – Metric achieved

### Outcome 3

Title: Georgia Southern University Planetarium Operations

PI: Mark Edwards, Georgia Southern University

Description: The Georgia Southern University Planetarium fosters in interest in astronomy in particular and science in general to the southeast Georgia region (outreach) and provides laboratory (training) for Georgia Southern University students enrolled in astronomy classes throughout the academic year. In pursuit of its training mission, the Planetarium provides Georgia Southern University students with star shows and special classes for interns who learn how to operate the Planetarium.

NASA Education Outcome Objectives: 1.2, 1.3, 3.1, 3.2, 3.3

Metric – 2000 visitors circulate through planetarium

Results – Metric surpassed. Admission tracking #s – 2175visitors

Title: George Coleman Planetarium Support

PI: Dr. Mark Spraker, (NGCSU)

Description: The George Coleman, Sr. Planetarium on the North Georgia campus provides public outreach and educational opportunities. The Observatory Planetarium Public Education Nights presents public shows using NASA missions, themes and activities. Funding will be used to support personnel.

NASA Education Outcome Objectives: 3.1

Metric – 2 personnel supported for museum outreach and 4000 visitors

Results – Metric achieved

## PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking:
  - Student participants at NASA - 2
  - Student participants at Aerospace Contractors - 3
  - Students employed at universities and other educational institutions 1
  - Number of undergraduate going to graduate school - 79
  - Number of underrepresented and under-served students - 14
- Course Development: University of Georgia - Supporting technology enhancement and curriculum development of geospatial technologies course – Dr. I. Flitcroft, Crop and Soil Sciences.
- Matching Funds: All space grant program funds were equally matched (1:1).

- **Minority-Serving Institutions:** Of the active HBCUs during 2009, there were no awards to students equal to or exceeding \$5,000 and/or participation greater than 160 hours in a program.
  - Morehouse College
  - Savannah State University
  - Albany State University

Inactive during FY 2009

- Spelman College
- Fort Valley College
- Clark Atlanta University

## IMPROVEMENTS MADE IN THE PAST YEAR

**External Advisory Board** – The External Advisory Board is comprised of 10 individuals from academia, industry, and government. The development of this board has been essential in reviewing and advising on policies and procedures including:

- budget allocation (completed)
- program evaluation (ongoing)
- five strategic plan implementation (ongoing)
- collaborations with industry (2)

During 2009-2010, there were 3 meetings of the board. As a result of the meetings there is a new strategic plan, collaboration are being formed being with Lockheed and Gulfstream; the budget allocation process has been formalized and communicated to all affiliates; and program evaluation has been implemented as a requirement to receive funding.

**Executive Board** – this board was developed to make budget allocation decisions. This board is comprised of the GSGC Director, 5 affiliate co-directors, and one External Advisory Board member. The Board will meet annually to review proposals and determine allocation based on established set criteria including:

- relation to space grant goals and objectives
- merit and soundness of proposal
- reasonableness of budget
- reporting success of principal investigator

**Management** – The addition of a staff member is a top priority. Due to economic conditions in University System of Georgia, the hiring of employees at State Institutions has been curtailed, except for critical need.

**Longitudinal Tracking** – The GSGC has been working to assure accurate tracking. Fellowship students funded in 2008 were in their final year for their target degree to make tracking easier for the next five year cycle. The accuracy for tracking continues to be a priority in 2010. All newly funded students will be required to complete semiannual (academic year) tracking forms.

**Interdisciplinary/Collaborations** - There was a greater emphasis in these areas. New initiatives included:

- 4 Morehouse College (HBCU) physics students worked at the Manufacturing Research Center at Georgia for one semester to complete their research projects.
- The astronomy/physics project proposed by North Georgia College included working jointly with their school of biology for the testing of samples.

**Outcome 1**- There was a greater distribution of fellowships among affiliates than in previous years. In 2008 there were 4 affiliates participating in the fellowship program. In 2009 that number increased to 6.

The USLI team formed at Georgia Tech in 2008 participated again in 2009. As a result of increased space grant funding, the team finished in the top five. One of the students from the USLI team also participated in Marshall Space Academy and was able to gain knowledge during the internship that will help with the 2010 team competition.

**Outcome 2** – Affiliates with pre-college programs focusing on students were requested to provide direct impact data and include NASA content, or adapt their programs to become teacher focused while also using NASA content. One program has not been able to adapt their program and they were not funded for FY 2009.

**Outcome 3** – No needed improvements to report.

## PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Albany State University (HBCU). The affiliate director works with underrepresented students in underserved areas to achieve objectives for Outcome 1, 2, and 3.

Armstrong Atlantic State University – South Georgia school has an engineering transfer program with Georgia Tech. Affiliate director is a former Space Grant fellow who teams with three other former Tech students to provide research opportunities for undergraduate students.

Clark Atlanta (HBCU) Affiliate director is a former Space Grant fellow. There were no proposed programs for FY 2009.

Columbus State University – The affiliate director also manages the Coca Cola Space Science Center and is the chair of the Earth and Space Sciences Department formed in fall of 2009.

Fort Valley State University (HBCU). The Fort Valley program focuses on exposing 9<sup>th</sup> grade students to STEM through intensive summer school programs and tours of STEM facilities, and colleges throughout the state.

Georgia Southern University – This University is in an underserved area of southeast Georgia. Through their university planetary activities, both k-12 students and the general public are able to participate in astronomical observations.

Georgia State University – Space grant funding is used to fund Ph.D. students to conduct research at the Center for High Angular Resolution Astronomy (CHARA) Observatory.

Georgia Institute of Technology (lead institution). Georgia Tech is a top research university with strength in all STEM fields. Most of the undergraduate and graduate student programs/teams funded by the consortium are at the lead institution

Kennesaw State University – Affiliate director works with STEM undergraduate students in hands on research projects that are adapted for presentations and outreach for K-12 students.

Mercer University – Funds undergraduate STEM research and sponsors the statewide annual BOTBALL competitions for k-12 students.

Morehouse College (HBCU) Affiliate director is a former Space Grant fellow. Currently has a collaborative “Space Weather” research project with the University of Texas. Morehouse is part of the dual degree program with Georgia Tech to increase the number of underrepresented students in engineering.

Orbit Education (non-profit) Provides in-service and pre-service teacher training using NASA content. The affiliate director is also the co-investigator of NASA ePDN project.

Savannah State University (HBCU) Affiliate director is a former Space Grant fellow. Savannah State focuses on preparing undergraduate STEM students for research in graduate school.

Spelman College (HBCU and 100% female). Spelman is part of the dual degree engineering program with Georgia Tech to increase the number of underrepresented students in engineering. There were no proposed programs; however, they teamed with Morehouse College in a space grant mentoring program for undergraduate students.

SpaceWorks Engineering (Industry Affiliate) Provides workforce development opportunities for students enrolled in GSGC academic affiliates.

North Georgia State College and State University – Undergraduate research is the primary focus of NGSCU. Some of the research and projects are conducted at the campus planetarium which is also open to the general public.

University of West Georgia – The affiliate director has programs in Outcomes 1, 2, and 3 and focuses on underserved areas of Georgia.

University of Georgia –UGA collaborates with the state cooperative extension service in provides strong interdisciplinary research and higher education programs. UGA makes use of NASA remote sensing technology for agricultural benefits.