

Alabama Space Grant Consortium  
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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 Alabama Space Grant Consortium (ASGC) is a Designated Consortium funded at a level of \$730,000 for fiscal year 2008.

**PROGRAM GOALS**

**Outcome 1 (Employ and Educate):**

- 1.1 Student Support
  - Goal 1: The ASGC will continue its additional reporting requirement to the Scholarship Program, thus requiring awardees to conduct four researcher interviews during the scholarship year along with one final report to be turned into the ASGC Program Office at the end of the award year. Goal 2: Each ASGC affiliate will continue to match each Fellowship it receives with a second Fellowship to be administered by ASGC at the same value and will maintain the \$24,000 stipend level to remain competitive with other Federal agencies. This brings an additional \$120K of non-Federal funds into the ASGC Fellowship program. Goal 3: The ASGC will continue to support and improve our three Research Experience for Undergraduates Programs (REU) at affiliate universities (USA, UAB and UAH) targeted at STEM fields with leveraged funds from additional resources. Our recruitment goal is to have 25% minority and 40% female participants in these programs.
- 1.2 Student Involvement Higher Education and WFD
  - Goal 1: Send at least five summer interns to NASA Centers for summer research internships from at least four affiliate universities. Goal 2: The ASGC will continue to support one to two HASP payload projects at affiliate universities. Goal 3: Support one or two DC-9 NASA micro-gravity aircraft projects at JSC. Goal 4: Support student satellite building programs at three or four affiliate universities. Goal 5: Continue the University Student Launch Initiative programs at AAMU, UAH and AU. Goal 6: Continue support of the AAMU & UAH Moonbuggy projects.

- 1.3 Targeted Institution and Academic Infrastructure
  - Goal 1: The ASGC will competitively recruit and select a diverse group of academically excellent students in STEM-related fields for our Fellowship and Scholarship Programs. We shall recruit, at minimum, 25% under-represented and 40% female student applicants. Goal 2: The ASGC shall seek to re-establish a REU program at AAMU or TU. Our overall goal for this REU program will be for 25% minority and 40% female participants in this program. Goal 3: With NASA, MSFC support, continue the successful USLI Workshop “How to Build Student Launch Hardware” in Huntsville, Alabama during the summer/fall timeframe. Goal 4: Begin a Workforce Development project at TU.

**Outcome 2 (Educate and Engage):**

- 2.1 Educator Professional Development
  - Goal 1: ASGC will continue to support, with modest funding, a select set of projects and events that provide assistance to K-12 science teachers and which encourage young students to prepare for STEM careers. Our emphasis is on leveraging our funds with larger contributions from other sources. Goal 2: Increase involvement with pre-service and in-service teacher training by sending at least 20 teachers to “Space in the Classroom” workshops, which are focused on high school teachers and students to explore the world of structural biology and participate in real life science experiments in space.

**Outcome 3 (Engage and Inspire):**

- 3.1 Resources
  - Goal 1: ASGC will continue to support the activities of the Space Grant Fellow, Dr. J-M Wersinger (AU) towards the NASA and Department of Agriculture goals embodied in the 'Earth Grant' concept.
- 3.2 Professional Development for Informal Education Providers
  - Goal 1: ASGC will continue to support the Alabama Space Grant/Land Grant Geospatial Extension Specialist with the Cooperative Extension service including training of County Cooperative Extension agents in GIS and remote sensing technology.

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

**Outcome 1:** Ms. Danielle Nuding, a UAH senior majoring in physics with minors in mathematics/atmospheric science, a FY08 ASGC undergraduate scholarship awardee, was selected as a Barry M. Goldwater Scholar for the AY08. Additionally, Danielle was selected for JPL internship two years ago and after doing atmospheric ozone research, she started working with mentor Dr. Barabara Cohen at NASA MSFC analyzing data from the Spirit rover on Mars.

**Outcome 1:** Mr. Javiheir Hogan, an African-American, AAMU student majoring in mechanical engineering, entered into the STEM pipeline through his experience as a NASA intern in the Minorities In Science and Engineering Program (MISE) for three summers. He then moved to the NASA co-op program in August of 2007 at NASA MSFC, graduated in 2008, and went to *full-time employment at MSFC* in November of

2008. He currently works in the EO40 Ground Operations and Logistics Department.

**Outcome 1:** One of the more noteworthy UA (Tuscaloosa) program activities is the BAMASAT project, a student BalloonSat project that has been funded by ASGC since FY04. The BAMASAT project allows students the opportunity to design, build, fly, and track an instrumented BalloonSat as it ascends to the stratosphere. Because of the groundwork laid by students participating in the BAMASAT project, in FY08 UA was awarded a grant of over \$400,000 from NASA to study station-keeping propulsion technologies for near-space vehicles (dirigibles).

**Outcome 2:** To increase involvement with pre-service and in-service teacher training, we partnered with UAH Professor, Dr. Joseph Ng, UAB Professor and former astronaut, Dr. Larry DeLucas, and former astronaut, Dr. Owen K. Garriot to host “Classroom in Space” workshops, which are focused on high school teachers and students to explore the world of structural biology and participate in real life science experiments in space on the International Space Station (ISS) in FY08. Richard Garriott, private astronaut, carried their experiments to the ISS. We estimate the contribution of this student project by Richard Garriott, Extremozyme, Inc., and Space Adventures, Inc. to be \$3 million. Over 150 experiments were created by 13 teachers and 85 students from 26 schools from 5 different states.

## PROGRAM ACCOMPLISHMENTS

### **Outcome 1:**

- 1.1 Student Support
  - Goal 1: The ASGC achieved their goal of continuing its reporting requirement of our undergraduate scholarship awardees. The awardees have completed their four researcher interviews on aerospace related research that is being conducted on or around their campus. Goal 2: Each ASGC affiliate funded each NASA Space Grant Fellowship they received with a second matching Fellowship at the same value. Goal 3: The ASGC was able to support our three Research Experience for Undergraduates Programs (REU) at affiliate universities (USA, UAB and UAH) targeted at STEM fields with leveraged funds from additional resources in FY08. Our recruitment goal of 25% minority and 40% female participants in these programs was exceeded when it came to minorities (40%), but fell short of the female participation (32%).
- 1.2 Student Involvement Higher Education and WFD
  - Goal 1: The ASGC funded seven summer interns to attend NASA Centers (GSFC & MSFC) for summer research internships from four affiliate universities (AAMU, AU, UA, UAH) in FY08. Goal 2: We were able to continue its support of one HASP payload project at the lead institution, UAH. The graduate student who was the guiding force behind UAH’s project, Mr. Robert Hawkins, graduated in December of 2008 and has found full-time employment with a NASA MSFC contractor. Goal 3: The ASGC did not support any DC-9 NASA micro-gravity aircraft projects at JSC in FY08 due to no proposals being accepted by JSC. Goal 4: We were able to exceed our goal of supporting student satellite building programs at four affiliate

universities: AAMU (BalloonSat), AU (BalloonSat and CubeSat), UA (Airplane), UAH (BalloonSat and CanSat), and TU (CanSat). Goal 5: We accomplished our goal of continued support of the University Student Launch Initiative (USLI) programs at AAMU, UAH and AU. We also added a new USLI team at TU this year. Goal 6: The ASGC was able to continue support of the AAMU & UAH Moonbuggy projects.

- 1.3 Targeted Institution and Academic Infrastructure
  - Goal 1: We were able to recruit 48% under-represented and 38% female student awardees. We fell 2% short of our female student goal, but surpassed our 25% under-represented goal. Goal 2: The ASGC was unsuccessful in its attempts to re-establish an REU program at AAMU or TU in FY08. Goal 3: With NASA, MSFC support, the ASGC was able to support, host and run our annual USLI Workshop “How to Build Student Launch Hardware” in Huntsville, Alabama on October 10-11, 2008. We hosted 57 attendees from AL, FL, IA, LA, TN and Montreal, Canada including two HBCU’s and one Community College. With the help of the workshop, 20 student teams from colleges and universities around the country are participating in NASA’s FY08 USLI competition, a record for the program. Goal 4: We were able to begin two new programs at TU (HBCU) in FY08, a CanSat Team and a USLI rocketry Team.

**Outcome 2:**

- 2.1 Educator Professional Development
  - Goal 1: In FY08, we supported the Alabama State Science and Engineering Fair, the Regional Science Olympiad for Middle and High Schools Students, the Mobile Math Circle and Math Olympiad, and in-service teachers to attend and present at the 15<sup>th</sup> Annual Space Exploration Educators Conference at Space Center Houston. Goal 2: The ASGC hosted/supported teachers and their students with educational “Classroom in Space” workshops, which focused on exploring the world of structural biology and participating in real life science experiments in space. Richard Garriott, private astronaut, carried their experiments to the ISS. In FY08, over 150 experiments were created by 13 teachers and 85 students from 26 schools from 5 different states as a result of our workshops.

**Outcome 3:**

- 3.1 Resources
  - Goal 1: The ASGC was able to continue its support of the activities of the Space Grant Fellow, Dr. J-M Wersinger (AU) towards the NASA and Department of Agriculture goals embodied in the 'Earth Grant' concept.
- 3.2 Professional Development for Informal Education Providers
  - Goal 1: The ASGC was able to continue its support of the Alabama Space Grant/Land Grant Geospatial Extension Specialist with the Cooperative Extension service including training of County Cooperative Extension agents in GIS and remote sensing technology in FY08.

## PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Longitudinal Tracking:** The number of program student participants employed by NASA, aerospace contractors, universities, & other educational institutions is 29; The number of undergraduate students who move on to advanced education in NASA-related disciplines is 18; The number of under-represented and under-served student participating is 36.
- **Course Development:** No new courses were developed in FY08, but three new programs were started (BalloonSat at AAMU, CanSat at TU and USLI at TU). Existing courses that ASGC developed are currently running at AU, UA and UAH.
- **Matching Funds:** The ratio of funds leveraged by NASA funding support by ASGC exceeds the 1:1 requirement of matching funds.
- **Minority-Serving Institutions:** The ASGC has two HBCU's who are members of our Consortium; Alabama A&M University (AAMU) and Tuskegee University (TU). At AAMU we supported two fellowships and three scholars and at TU, five scholars were supported which is an improvement over none in the previous year. We continued our support of the AAMU moon-buggy and USLI rocketry teams and we supported one African American, female intern (MSGF) at MSFC. Travel grants were given to AAMU and TU professors and mentors to attend the USLI workshop that the ASGC supports in conjunction with NASA's MSFC.

Student Data and Longitudinal Tracking: Total awards = 85; Fellowship/Scholarship = 50, Higher Education/Research Infrastructure = 35; 36 of the total awards represents underrepresented minority F/S funding. 6 students have accepted STEM positions in an aerospace industry, while 18 have graduated and are pursuing advanced STEM degrees.

## IMPROVEMENTS MADE IN THE PAST YEAR

- To increase our awareness with industry, the ASGC in concert with the Cooperative Education Department at our lead institution, has developed a new internship experience for STEM students to co-op/intern with industry. In July 2008, the ASGC hosted a kick-off luncheon where 21 companies from across the North Alabama area were invited to learn about our new Industry Co-op Program.

## PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

The core of the program are the seven PhD-granting State Universities: Alabama A&M University (AAMU), Auburn University (AU), The University of Alabama (UA), The University of Alabama at Birmingham (UAB), The University of Alabama in Huntsville (UAH), The University of South Alabama (USA) and Tuskegee University (TU). UAH leads the Consortium. Other two- and four-year colleges, state and private institutions with a stake in developing a future aerospace workforce in Alabama also participate in our consortium such as the U.S. Space and Rocket Center, Troy University, Jacksonville State University and Calhoun Community College. A major function of all the universities in our consortium is to supply engineers and scientists to the aerospace and defense entities in Huntsville.