

## **Alabama Space Grant Consortium**

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Affiliate Members: 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 (UAHuntsville), The University of South Alabama (USA) and Tuskegee University (TU).

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 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. With their unique capabilities and interests in aeronautics, space and related fields, ASGC members work in partnership with a diverse group of affiliate members, NASA, industry, state and local governments to develop programs of Space Grant activities that promote institutional cooperation and to expand capabilities rather than to directly support technical research. All of these activities best capitalize on local strengths and resources to meet local needs of students and communities. All Space Grant programs have a strong educational emphasis, and serve Alabamians across our state. Programs are designed to complement rather than duplicate each other and are strategically integrated to leverage impacts. ASGC has strived to build upon our current successful programs while adding new components as permitted by the provisions of funds from NASA and from our other stakeholders. The result is a suite of programs that meet the objectives of the National Space Grant College and Fellowship Program Act of 1988, mirrors the broad range of program expectations defined in the NASA Space Grant Strategic Plan, and serves our universities, Alabama, NASA and the U.S. All ASGC sponsored programs are geared toward fulfilling NASA's educational goals by strengthening NASA and the future workforce, attracting and retaining students in STEM disciplines, and engaging Americans in NASA's mission.

**Program Benefits to the State:** While other states have larger aerospace engineering workforces, in few states is this industry as important in the overall economy as it is in Alabama. There is no other high-tech industry in Alabama that approaches aerospace engineering in economic and national impact. This trend of the past 40 years seems to be continuing with the

actions of BRAC (Defense Base Closure and Realignment Commission) which will bring several thousand new technical jobs to Huntsville, and the recent award of the U.S. Air Force tanker contract to Northrop Grumman, who will assemble the KC-45 aircraft in Mobile, AL. One of our main functions is to supply the next-generation of aerospace engineers and scientists to this burgeoning industry. Young engineers-to-be have several other attractive alternatives for career courses, one of the more attractive being computer science/information technology. We attract students into aerospace career lines by offering exciting hands-on programs building and flying space hardware, exploration internships at NASA Centers and getting involved in real research at universities and NASA laboratories.

**Program Goals:** The Strategic Plan and Goals of the ASGC contains the following Vision and Mission Statements. Our specific goals are aligned with the ASGC strategic plan, with NASA's Education Enterprise Strategy and Human Capital Management Plans, and with the recommendation of the President's Commission on Implementation of U.S. Space Exploration.

Our Mission is: to inspire, enable and educate a diverse group of Alabama students to take up careers in space science, aerospace technology and allied fields; to play our part in assuring U.S. leadership in space exploration and aerospace technology in the future; to inspire the next generation of space explorers; to bring increased realization of the value of space science and technology to the people of Alabama; to insure that our message and our programs reach all constituencies in the population of Alabama, especially those traditionally under-represented in the science and engineering professions.

Our Vision is: an increased level of appreciation, participation and leadership by all the people of Alabama in the national and international space exploration and aerospace engineering enterprises. The ASGC program has, over the years, selected components in each of the NASA Space Grant national emphasis areas that also fit well with Alabama interests in one, and usually both, of the following senses: 1) there is a clear existing need and interest shown by an Alabama faculty member, a teacher, a group of students, school system, university, industry, museum, etc.; and 2) there is evident willingness of an Alabama stakeholder to provide matching resources to achieve common objectives with NASA (the ASGC program shows match, or co-funding, mostly from non-federal sources of \$2 for every NASA dollar).

**Program Accomplishments:** Important emphases of ASGC are: the scholarship and fellowship programs, research programs and the work-force development programs that provide students with hands-on experience designing, building and flying space hardware. In 2007, ASGC provided fellowships/scholarships to students at their member universities, 2 of which are HBCU's – AAMU and TU. 40% of these student awards went to females and 41.25% of awards went to underrepresented minorities. In 2007, ASGC provided awards of Scholarships & Fellowships to students at 6 universities: 11 fellowship awards of \$24,000, 27 scholarships of \$1,000 and 1 teacher education scholarship of \$1,000 for a total of 39 awards totaling \$285,500. 13 awards were made to females and 16 awards were made to underrepresented minority students. 28 of these awards were to undergraduates, 4 were to master's students and 7 awards went to Ph.D. students. In 2007, ASGC sponsored Research Experiences for Undergraduates (REU) Programs. These are programs that are focused on space science/engineering research and designed to apply classroom knowledge to real-world problems. Space Grant funds provided REU stipends of \$3K for a 10-12 week, full-time experience to 18 students in 2007 from 3 universities (USA, UAB and UAHuntsville). Research experiences at a NASA center is

considered of great value to students. In 2007, ASGC supported a total of 12 student internships (5 females/7 males) from 4 universities (AAMU, AU, UA and UAHuntsville) at 4 NASA Centers (Langley, JPL, MSFC, GSFC) and APL. 42% of these interns were female and 17% were underrepresented minorities. In 2007, ASGC supported over 185 students in the Space Hardware Programs that are currently in place at 4 universities (AAMU, AU, UA and UAHuntsville) including one team from AU to participate in the KC-135/DC-9 Microgravity Flight Program at Johnson Space Center. Additionally, ASGC has continued its support of the UAHuntsville Space Hardware Student Club in which they continued their work on balloon satellites, CanSat's and payload HASP projects. ASGC supported 2 MoonBuggy Competition Teams from 2 member universities (AAMU & UAHuntsville). AAMU's entire team consisted of students from underrepresented minority groups. The ASGC supported a team of underrepresented minority students to participate in the 2007 Richard Tapia Search and Rescue Robotics Competition with a minority female as their mentor from UA and ASGC has collaborated with two former NASA astronauts, Dr. Owen K. Garriott and Dr. Larry J. DeLucas to run workshops for High School teachers and their students, many of whom come from underrepresented minority groups, to study the protein crystallization of extremophilic proteins for classroom education using the International Space Station (ISS). Over 200 teachers and students from AL, FL, MS and TX have all participated in these structural biology workshops. In October, 2007 the ASGC held a video/teleconference and workshop to help recruit teams for the University Student Launch Initiative competition (USLI). ASGC entertained various student teams from TN, WI, AR, MS, MO & AL. The team from WI is a Tribal College, the College of Menominee Nation. The purpose of the workshop, besides recruitment, was to allow teams to gain their Level I NAR (National Association of Rocketry) certification, which will help them with NASA's requirement for the competition. In 2007, ASGC continued its support of the USLI Competition Teams from three member universities (AAMU, AU & UAH) where the students are involved in designing, building and testing reusable rockets with associated scientific payloads. A total of 11 university teams competed against each other in the spring of 2008.

**Some Student Accomplishments:** A success story of note in 2007, Mr. Taoreed "Larry" Lawal, an ASGC undergraduate scholar from UAB was selected as a Barry M. Goldwater Scholar for the academic year 2008-2009. Goldwater Scholars are selected on the basis of academic merit. Only seven Alabama residents selected to receive the Goldwater scholarship this year. He is currently a junior majoring in biology and he was a first place winner in the UAB 2007 Summer Research Intern poster session and he received the Excellence in Organic Chemistry Award in 2007.

Another success story is ASGC Fellow, Dustin Wood, an aerospace engineering master's candidate at UAHuntsville. He recently won first place and \$500 in the Master's Division of the AIAA Region II Student Conference hosted by the University of Central Florida and held at Cape Canaveral. As a result, he was invited to present his paper at the 47th AIAA Aerospace Sciences Meeting being held in Orlando, Florida on March 30 – April 2, 2008.

Another highlight is the UAHuntsville USLI Team who designed and built the rocket that won NASA MSFC's 2007 USLI competition. Teams were judged on a variety of technical challenges including their websites, how close each rocket came to reaching the target altitude and how well the student-built scientific experimental payload performed. Prizes for the winning team included a cash prize from ATK Launch Systems of \$5K and a trip to Kennedy Space Center for a shuttle launch.