

Oklahoma Space Grant Consortium
Lead Institution: University of Oklahoma
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Institutional Affiliates

Cameron University
Langston University
East Central University
Southeastern Oklahoma State University
Southern Nazarene University
Southwestern Oklahoma State University
Oklahoma State University

Informal Science Education Affiliates

Oklahoma Science Museum
STARBASE Oklahoma

Academic Affiliates

Application Engineering Program
Center for Spatial Analysis

Industrial Affiliates

Frontier Electronic Systems Corporation
Science Applications International Corporation

City Government Affiliate

Norman Economic Development Coalition

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 Oklahoma Space Grant Consortium (OSGC) 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 Oklahoma Space Grant Consortium represents a state-wide partnership of universities, a cooperative extension service, State Government, City Government, industry, an informal aerospace education organization, and a major science museum. Through collaborative programs, OSGC helps attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.

At the elementary/secondary level, OSGC implements programs in concert with local districts, their schools, and their teachers to improve math and science skills through an inquiry based, hands-on approach using aerospace as the platform for the curriculum. Students are challenged through activities and experiential science curriculum to develop life goals and work as team members. Students are further challenged to consider careers in Science, Technology, Engineering, and Mathematics fields.

Oklahoma college students are drawn into NASA's Mission and are groomed to be the Science, Technology, Engineering, and Mathematics workforce of the future through OSGC internship programs with NASA Centers as well as summer internships with aerospace related industry within the State. Commenting about our highly successful programs, Chuck Gray, Vice President and CCO of Frontier Electronics Systems Corporation, Incorporated, states: *"The [Workforce Development] program has provided FES with five highly qualified engineering students . . . Each has significantly contributed to our operation while obtaining "hands-on" practical experience in a challenging real world engineering & design environment. When I put my NASA hat on & ask "What have I received for my investment in this program?" I would respond by saying--"You have earned the sincere interest of five outstanding engineering students in actively pursuing an engineering career with NASA, other Government Agencies or the industrial base supporting them."*

Program Benefits to the State: A target focus of the Oklahoma Space Grant Consortium is State economic and workforce development. Fourteen small companies have been assisted by OSGC through the pairing of a student and/or faculty member with specialties in STEM research areas needed by the industry partner. The effort with Advanced Racing Composites involved a student who introduced NASA software in the design of a racing wing modification that directly resulted in a new world speed record. The Gon-Topper project with Klutts Equipment Company is one of the most successful State economic and workforce development programs of the Oklahoma Space Grant Consortium. The Gon-Topper is a wireless, remote-controlled, self-loading/unloading machine used to load and unload railroad ties, gravel, tie plates, tie spikes and other railroad maintenance supplies from gondola cars. Several students and faculty were involved in the program, and applied NASA-related research which resulted in a new product that has been patented. The production of the Gon-Topper will result in nine immediate Oklahoma jobs, and 90 expected future jobs and an increase of \$1.5 to \$2 million in domestic revenues after the completion of a new, 10,500-sq.-ft. production facility now under construction in Muskogee.

Program Goals:

GOAL #1: Using our state consortia of scientists, engineers, and educators, enable the development of a diverse workforce of future scientists, engineers, technology professionals, and educators:

GOAL #2: Stimulate and nurture innovative programs to assure the development and transfer of practical applications in aeronautics and space-related research and education.

GOAL #3: Cultivate a statewide network of partners from universities, industry, museums, science centers, state and local agencies, to pursue state and national aeronautics and space-related research, education, and economic development goals.

GOAL #4: Provide access to the excitement, knowledge, and technology from America's Earth, Air, and Space programs.

GOAL #5: Educate students at all levels by encouraging and supporting interdisciplinary and multi-disciplinary research experiences and education programs.

GOAL #6: Serve the general public by contributing to scientific literacy

Program Accomplishments

Geospatial Summer Institute

The Geospatial Summer Institute is built around an intensive hands-on experience in Geographic Information Systems, Global Positioning Satellites, and remote sensing as well as introduction to the professional field by interaction with GIS professionals. Students from all eight OSGC affiliate universities and any academic discipline are eligible to participate and earn three credit hours and ArcGIS I certification. This year 12 students from the eight university affiliates were awarded scholarships/fellowships to attend the summer institute.

STARBASE Oklahoma Native American Summer Academies

In a cooperative effort with the Cherokee Nation, OSGC provides three-week Academies for children in grades 4-8. These programs are tailored to the learning styles of Native American children and utilize the excitement of aerospace to meet curricular objectives. Chad “Contassel” Smith, Principal Chief of the Cherokee Nation, states: *“The science, math, and technology programs these young scholars are exposed to [in the program] provide them with great hand-on learning. We are confident many of them will become interested in career paths in these fields.”*

Student Accomplishments: Below are illustrative responses from graduates who received Space Grant Fellowships when they were asked how participation in OSGC impacted their education and life:

The Space Grant was something that I was very proud to be part of. This is impacting my current job by making Science and Space an important part of the curriculum. (Stacy Kipps, 2006 Undergraduate Scholarship Program, **Vanoss Public Schools - 3rd Grade Teacher**)

Are you kidding? I get to work on the moon and mars missions! (Steve Wilson, 2005 Work Force Development Scholarship, **NASA ~ Johnson Space Center - Constellation Cost Analyst/Integrator**)

Greatly. It helped influence my success and helped fund my education. (Van Ha, 2003 Undergraduate Scholarship Program, 2004 Undergraduate Scholarship Program, 2005 Undergraduate Scholarship Program, **Intel - Industrial Engineer**)

It helped me better understand the uses of satellite imagery. (Chris Koontz, 2005 Undergraduate Scholarship Program, 2006 Work Force Development Scholarship, **Chickasaw Nation – Geographic Information Systems (GIS) Technician**)

It was a once in a life time opportunity that allowed me to fulfill the dream of being a part of the NASA team. (Jenna Root, 2005 Undergraduate Scholarship Program, **L3 Communications - Engineer 1**)

Helped assure that engineering was the correct career path for me. Allowed me to focus more time on school. Was able to make contacts with the right people. (Lindsey Cantwell, 2005 Undergraduate Scholarship Program, **Northrop Grumman - Structural Engineer**)

It gave me credible experience that allowed me to pursue other professional opportunities. (Ross Haimson, 2005 Work Force Development Scholarship, **General Dynamics SATCOM Technologies - Electrical Engineer**)

It helped me better understand the uses of satellite imagery. (Chris Koontz, 2005 Undergraduate Scholarship Program, 2005 Work Force Development Scholarship, **Benham Engineering Company - Survey Tech/ CAD Tech**)

Design of a Long-Endurance, Electric Powered Aircraft – World Record

OSGC Fellowship recipients, Dustin Gamble and Thomas Hays, set two world aviation records competing against 46 other teams from five countries around the world in the AIAA Design/Build/Fly contest. The aircraft they designed, **“Dragonfly”**, is an unmanned, entirely electric powered airplane in the F-5S category. The airplane was designed to set records for range and endurance, and uses a combination of very lightweight composite construction for state of the art propulsion systems. This team also set a record for aircraft endurance, which is continuous time aloft. The National Aeronautics Association in Washington D.C. honored these students by naming this world record *“One of the Most Memorable Events in Aviation History for 2006.”*