

Oregon Space Grant Consortium
Oregon State University
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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 Oregon Consortium is a Program Grant Consortium funded at a level of **\$535,000** for fiscal year 2008.

PROGRAM GOALS

Consortium Management goals are as follows: 1) Hosting an Annual Affiliate Meeting at Oregon State University 2) Nominating and voting for a two-year appointment of the OSGC Associate Director to represent Consortium affiliates. 3) Maintain the OSGC website with current OSGC and NASA program information, research and education opportunity announcements, resources for students and educators, and other general OSGC and NASA news and updates. 4) Keep Consortium members updated with quarterly progress reports. 5) Make annual affiliate site visits as permitted. 6) Complete NASA contract reporting using the Consortium Management Information System (CMIS) in a timely manner. 7) Author and present an annual report to the OSGC affiliates. 8) Provide contact information for OSGC student awardees for the longitudinal tracking program.

OSGC Scholarship/Fellowship Program goals include: 1) Administering the call and making 55 awards for the Undergraduate Scholarship Awards Program. 2) Awarding up to 6 graduate fellowship awards.

Research Infrastructure goals: 1) Administer the call and award for faculty research grants 2) Work with NASA center university affairs officers to disseminate information regarding NASA center internship and academy opportunities and administer eight student awards. 3) Make the call for and administer one undergraduate research award. 4) Award up to two university teams participating in the NASA Reduced Gravity Student Flights Opportunity Program. 5) Invite a NASA administrator or scientist to give an OSGC-hosted seminar open to OSGC affiliates and students. 6) Host the annual OSGC Student Symposium to highlight OSGC-supported student research projects.

OSGC Education goals include the following: 1) Make two team awards in support of the OSGC LaunchOregon Balloon Satellite Program. 2) Support one university team consisting of one faculty and two students to participate in the RockOn rocket workshop hosted by Colorado Space Grant, Virginia Space Grant, and NASA Wallops. 3) Increase science literacy of undergraduate students through development of higher education courses relating to OSGC research infrastructure.

Public Outreach Program goals are as follows: Administer the call and award for the Informal Education Award.

Oregon Space Grant's Diversity Plan goals include the following: 1) Support for 25 in-service teachers, 25 pre-service teachers, and 20 student participants through the Science and Math Investigative Learning Experience (SMILE) program. 2) Support for 6 teacher monitors through the Saturday Academy hands-on science student-mentor program.

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

Student comments gathered through longitudinal tracking are below:

Having the JPL internship made my resume standout, and cut out a lot of the competition for job applications. I believe it was the main factor in landing my job at Boeing....One of the results of having a NASA internship is definite proof of where your interests lay. I work as a structural engineer at the Boeing company. (Caleb Gritters, 2006 Undergraduate Scholarship Program, 2007 Undergraduate Scholarship, 2007 JPL Internship, 2008 Undergraduate Scholarship, Boeing - Structural Engineer)

My participation in Space Grant programs (such as a SURF at JPL) has influenced me to develop a career in research. Scholarships from the Space Grant made it possible for me to make progress toward my undergraduate degree. I feel blessed to receive such outstanding support from the OSGC. After earning my B.S.M.E. this June (2008), I will go on to graduate school at UC Berkeley in Mechanical Engineering. The NDSEG fellowship from the DoD will enable me to continue my education. (Jennifer Jones, 2004 Undergraduate Scholarship Program, 2006 Undergraduate Scholarship Program, 2007 Undergraduate Scholarship, 2007 Glenn Academy, 2008 Undergraduate Scholarship, Cascade Energy Engineering - Mechanical Engineering Intern)

PROGRAM ACCOMPLISHMENTS

- Consortium Management: OSGC successfully hosted an annual affiliate meeting at Oregon State University in September 2008. Deborah Cochrane, Director of the Portland Teachers Program, Portland Community College Cascade Campus was voted to hold a two-year term of Associate Director from September 2008 – September 2010 during which time she will be the official voice of the affiliate representatives and will attend at least one national Space Grant Directors meeting.

- Scholarship/Fellowship Program: Oregon Space Grant awarded twenty eight (28) awards in 2008. OSGC program goals included awarding fifty five (55) undergraduate scholarship awards. The number of awards and amounts vary by institution and range in amount from \$500 to \$4,000 per student as determined by the affiliate institution and the award committee. Due to this variation, the total number of awards was lower than indicated in the program goals but the total dollar amount that was awarded remained as proposed.
- OSGC program goals included awarding up to six (6) graduate fellowship awards. A total of five (5) Oregon Space Grant Graduate Fellows were funded during the reporting period.
- Research Infrastructure: Two projects are ongoing and two additional awards were made. The first ongoing award was to University of Oregon/Greg Bothun/Physics/Research and Education at the Pine Mountain Observatory. The second ongoing award was to Southern Oregon University/Peter Wu/Physics/A Balloon Launch Glider for High Altitude Experimentation. A two-year award was made to Eastern Oregon University/Anthony Tovar/Physics and Engineering for Oregon STEM Enhancement with Education and Outreach. A second two-year award was made to Oregon State University/Ken Funk/Mechanical, Industrial, and Manufacturing Engineering and University of Oregon/Robert Mauro/Psychology entitled Human Factors Issues of ADS-B and Cockpit Displays of Traffic Information.
- A total of 11 students participated in NASA Academies or summer student internships at NASA centers.
- Portland State University had two microgravity teams selected to participate in the NASA Reduced Gravity program at Johnson Space Center.
- OSGC hosted a Student Symposium designed to highlight OSGC-supported student research projects. Twenty four (24) students who received funding from Oregon Space Grant presented their research in a poster and oral presentation session to a group of their peers, faculty, and invited NASA personnel.
- Education: OSGC continued to support the efforts of the LaunchOregon High Altitude Balloon Program.
- OSGC supported one faculty and two students from Oregon Institute of Technology to attend the inaugural RockOn Workshop hosted by Virginia and Colorado Space Grants in collaboration with NASA Wallops Flight Facility.
- Both LaunchOIT and LaunchPSU developed courses based on the LaunchOregon High Altitude Balloon Program
- Public Outreach Programs: OSGC administered the award for The Museum at Warm Springs/Carol Leone/The Seeds of Discovery Program, a collaborative program between The Museum at Warm Springs tribal museum and the Jefferson County School District
- OSGC supports 25 in-service educators, 25 pre-service educators, and 20 student participants through the Science and Math Investigative Learning Experience (SMILE) program. A cohort of master's of arts in teaching (MAT) students in a project-based learning course in science and mathematics education participated as activity leaders and team mentors during a middle school engineering challenge. The MAT students' participation afforded them a meaningful

opportunity to refine their teaching skills while working with large numbers of Latino and Native American students.

Outcome #1 (employ and educate)

- 61 students significantly supported from FY08 funds
 - 33 in Fellowship & Scholarships
 - 28 in Higher Education/Research programs
- 13 students took next step in FY08 (SG participation supported from FY06-FY08 funds)
 - 6 went to graduate school in STEM disciplines
 - 2 went to work for NASA contractors
 - 1 went to work in a STEM position for non-NASA contractors
 - 2 went to work in a STEM positions at a non K-12 Academic institutions
 - 2 are seeking STEM employment

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Longitudinal Tracking: Total awards = 61 Fellowship/Scholarship = 33, Higher Education/Research Infrastructure = 28; 4 of the total awards represents underrepresented minority funding. 2 students have accepted STEM positions in an aerospace industry, while 6 have graduated and are pursuing advanced STEM degrees. 1 student has accepted a non-aerospace related STEM position, 2 are seeking STEM employment, and 2 are employed in an “other” STEM academic field.
- Course Development: The following two (2) courses were developed at OSGC affiliate institutions that target the STEM skills needed by NASA and were developed with OSGC NASA support:
 - Oregon Institute of Technology (OIT) developed ENGT 207 “Journey to the Edge of Space.” This course presents an overview of the space environment and LaunchOIT’s Balloon/Rocket program.
 - Portland State University (PSU) developed ME 406 LaunchPSU (LPSU), a Junior/Senior level design course to scheme, design, build, launch, track, and recover high altitude balloon payloads.
 - The following courses at Eastern Oregon University were reinstated as a direct result of OSGC funding for a Faculty Research Award: The pre-engineering sequence, Introduction to Engineering (ENGR 101) and the Mechanics of Solids sequence, Statistics (ENGR 211), Dynamics (ENGR 212), and Strengths of Materials (ENGR 213).
- Matching Funds: The ratio of Oregon Space Grant Consortium funds leveraged by NASA funding support, excluding scholarship/fellowship funds, is 1.06-to-1 based on CMIS data.
- Minority-Serving Institutions: Currently, there are no minority-serving institutions within the state of Oregon.

IMPROVEMENTS MADE IN THE PAST YEAR

Development of the Oregon Space Grant Faculty Research Award Program, Undergraduate Research Award Program, and Informal Education Award Program has

shifted an emphasis to research with a mentor/student approach as well as encouragement of collaborations between affiliates including formal and informal education providers.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

Higher Education Affiliate Institutions:

- Eastern Oregon University (EOU), Focus on teacher education. Affiliate representative: Chemistry.
- George Fox University (GFU), Focus on liberal arts and science education. Affiliate representative: Physics.
- Lane Community College (LCC), Affiliate representative: Aviation Academy. The Aviation Academy offers Flight Technology and Aviation Maintenance Technology programs, a pilot certification program, and an Aviation Leadership concentration in collaboration with Oregon State University.
- Oregon Institute of Technology (OIT), Focus on technical and health related fields. Affiliate representative: Computer Systems Engineering.
- Oregon State University (OSU), Lead Institution, Focus on engineering. Programs in nuclear engineering, ecology, biochemistry, oceanography, and pharmacy have been recognized nationally as top tier programs. Affiliate representative: Geosciences.
- Pacific University (PU), Affiliate representative: Science Education.
- Portland Community College Cascade Campus (PCC) Focus on adult education. Affiliate representative: Portland Teachers Program (PTP)
- Portland Community College Rock Creek Campus (PCC) Focus on adult education. Affiliate representative: Science and Technology.
- Portland Community College Sylvania Campus (PCC) Affiliate representative: Physics.
- Portland State University (PSU), Affiliate representative: Mechanical Engineering. A new engineering building in 2006 will soon be home to a PSU drop tower available for OSGC affiliated research
- Southern Oregon University (SOU), Affiliate representative: Physics. Focus on liberal arts including criminology, natural sciences, and environmental science.
- University of Oregon (UO), Affiliate representative: Physics. UO manages the Pine Mountain Observatory in Bend OR.
- Western Oregon University (WOU), Affiliate representative: Physics. Focus on science and math education.

Informal Education Affiliates:

- Evergreen Aviation & Space Museum, aviation and space museum, IMAX, and aviation education programs.
- Oregon Museum of Science and Industry (OMSI), hands-on science museum and the Oregon NASA Education Resource Center.
- ScienceWorks Hands-On Museum. Science center with educational programs for both students and educators including workshops, lectures, and science camps.
- The Museum at Warm Springs, tribal museum. The Museum partners with the local school district to offer hands-on science education utilizing expertise from within the community and around the state.

Higher Education Program Collaborations:

- Friends of Pine Mountain Observatory (PMO), UO. PMO provides access to live data for student research and public education.
- Saturday Academy, OSU, mentor/student program provides hands-on experiences for K-12 students in STEM disciplines at a crucial point in the pipeline from high school to college.
- The Science and Math Investigative Learning (SMILE) Program, OSU, encourages interest and involvement of underrepresented students in STEM disciplines

K-12 Education Program Collaborations:

- NASA Explorer School Faulconer Chapman, Sheridan OR. The Explorer School team has collaborations with OSU, OMSI, PSU, LCC, and the NASA Aerospace Education Specialist.
- NASA Explorer School Vernon, Portland OR. Vernon has partnered with PSU, PCC Cascade Campus, and the NASA Aerospace Education Specialist on community events and activities.