

## **Oregon Space Grant Consortium FY2009 Annual Performance Data (APD)**

**Oregon State University**

**Jack Higginbotham, Ph.D.**

**541-737-2414**

**URL: <http://spacegrant.oregonstate.edu>**

### **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 **\$590,000** for fiscal year 2009.

### **PROGRAM GOALS**

Consortium Management goals for FY2009: 1) Host the Fall 2009 National Space Grant Directors Meeting in Portland, Oregon October 2009; 2) Host the OSGC Annual Affiliate Meeting in conjunction with National SG Meeting; 3) Attend the Western Regional Meeting and Spring National Council of Space Grant Directors Meeting; 4) 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; 5) Make annual affiliate site visits as permitted; 6) Complete NASA contract reporting in a timely manner; 7) Provide contact information for OSGC student awardees for the longitudinal tracking program.

OSGC Scholarship/Fellowship Program goals include: 1) Redesign Scholarship Program to effectively reach and retain a more diverse pool of students in STEM related fields including STEM education; 2) Administer the call and competitively make 47 awards for the Undergraduate Scholarship Awards Program; 3) Award up to 7 graduate fellowship awards.

Research Infrastructure goals: 1) Continue to grow the OSGC Affiliated Faculty Program by adding more OSGC associated faculty and staff involved in aerospace-related research; 2) Administer the OSGC Affiliated Faculty Research Award Program call and award 6 faculty research grants; 3) Make the call for and administer 2 undergraduate research awards; 4) Host the annual OSGC Student Symposium to highlight OSGC-supported student research projects.

OSGC Education goals include the following: 1) Award up to two university teams participating in the NASA Reduced Gravity Student Flights Opportunity Program; 2) Make one team award in support of the OSGC LaunchOregon Balloon Satellite Program; 3) Provide support for five pre-

service educators who are working towards STEM teaching certification at an OSGC affiliate institution; 4) Increase science literacy of undergraduate students through development of higher education courses relating to OSGC research infrastructure. 5) Work with NASA center university affairs officers to disseminate information regarding NASA center internship and academy opportunities and administer eight student awards; 6) Support and promote Volcano World, an online volcano information resource for students and educators.

Pre-College Program goals: 1) Disseminate information and provide support for teacher professional development opportunities for in-service STEM educators including former NASA Explorer School team members.

Public Outreach Program goals are as follows: 1) Administer the call and award for the Informal Education Award; 2) Attend Oregon Science Teachers Association Conference and Expo to disseminate NASA material, resources, and professional development opportunities to approximately 250 pre-service and in-service educators; 3) Provide organizational and promotional support for NASA initiatives including NES and AESP.

Oregon Space Grant's Diversity Plan goals include the following: 1) Implement redesign of Scholarship/Fellowship program to effectively increase diversity of applicant pool and awardees; 2) Convene a more diverse selection committee for scholarship/fellowship/internship application review

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

Student comments gathered through longitudinal tracking are below:

The space grant has enabled me to pursue my interest in the aerospace industry. I am currently working on an applied research project through the Oregon Space Grant Consortium, where I have begun to lay the groundwork for a career in systems engineering. I look forward to working with the GSRP in the future and I am starting graduate school in the fall of 2010. The space grant has had a major impact on my life. Although I have not graduated yet, during the summer of 2009 I worked at Kennedy Space Center on an engineering sustainability project for the Near Earth Network System at the Merritt Island Launch Annex or MILA, which it is currently referred to. My internship through the USRP only fueled my interest in the aerospace industry and I am anxious to work for NASA in the future. (Bryant Baker - on 04/20/10, 2008 Undergraduate Scholarship, 2009 Undergraduate Scholarship, NASA - USRP Intern)

Receiving the NASA space grant has provided me with so much more than relief from the financial challenges associated with being an independent, non-traditional student. The application process and receiving this award have been experiences that have invigorated my commitment to completing my education, and have allowed me to see myself for the first time as someone with real potential to become a contributing member of the scientific community. I was overwhelmed and touched by the outpouring of congratulations and encouragement I received from my community as a result of winning the grant. That support has been the greatest gift of all. (Shelly Skolfield - on 09/09/09, 2009 Undergraduate Scholarship, PCC Sylvania Biology Lab - Lab Tech)

## PROGRAM ACCOMPLISHMENTS

- Consortium Management: 1) Contributed to national network by hosting the Fall 2009 National Space Grant Directors Meeting in Portland Oregon in October 2009; 2) Hosted annual affiliate meeting in conjunction with National SG Meeting in Portland October 2009; 3) Attended Western Regional and Spring National Council of Space Grant Directors Meeting;
- Scholarship/Fellowship Program: Oregon Space Grant implemented a redesigned program and awarded forty-seven (47) awards in 2009. Awards ranged from \$2,000 to \$5,000 per student depending on scholarship program. Increased number of awards to underrepresented minorities in excess of the state demographics of 10.1%.
- Seven (7) graduate fellowship awards were funded during the reporting period.
- Research Infrastructure: The following Faculty Research Awards were funded: 1) Oregon State University/Ken Funk/Mechanical, Industrial, and Manufacturing Engineering and University of Oregon/Robert Mauro/Psychology project entitled Human Factors Issues of ADS-B and Cockpit Displays of Traffic Information; 2) Oregon State University/David Cann/Mechanical, Industrial, and Manufacturing Engineering project “ High Temperature Piezoelectric Actuators”; 3) Portland State University/Raul Cal/Mechanical, Manufacturing, and Industrial Engineering; 4) Oregon State University/W.M. Hetherington/Physics project “OSU Radio Telescope and PicoSatellite Projects”; 5) University of Oregon/Greg Bothun/Physics project entitled “Pine Mountain Observatory K14 Outreach Program”.
- Higher Education: OSGC continued to support the efforts of the LaunchOregon High Altitude Balloon Program at GFU, OIT, PU, and PSU.
- Both LaunchOIT and LaunchPSU continued to offer courses based on the LaunchOregon High Altitude Balloon Program.
- Portland State University participated in the NASA Student Flight Opportunities Program at NASA Johnson Space Center in Houston, TX.
- Nine pre-service STEM educators participated in two workshops offered as part of the Teacher Professional Development Program with collaboration between GFU, PU, SOU, WOU and the NASA AESP representative.
- Three online Global Climate Change courses developed by Toby Dittrich, Portland Community College Rock Creek Campus funded as part of the OSGC Course Development Program.
- Both 2009 and 2010 NASA Academy and NASA center student internships are include due to a shift in the reporting period from 2009 to 2010. Nine students participated in 2009 NASA Academies or NASA Center student internships; eleven students participated in 2010 NASA Academies or NASA Center student internships.
- Public Outreach Programs: Nine in-service STEM educators participated in two workshops offered as part of the OSGC In-Service STEM Teacher Development Program with collaboration between GFU, PU, SOU, WOU and the NASA AESP representative.
- One Oregon K12 educator attended the Pathway to Mars workshop in Vernal, Utah hosted by the Rocky Mountain Space Grant Consortium.
- Two higher education faculty members attended the NASA Education Forum “Women in Engineering and Robotics” in association with the STS-131 Shuttle Launch.

- OSGC administered an 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. The award was made as part of the Informal Education Award Program.
- OSGC attended the Oregon Science Teachers Association Annual Conference and Expo.

#### Outcome #1 (employ and educate)

- 62 students significantly supported from FY09 funds
  - 54 in Fellowship & Scholarships
  - 8 in Higher Education/Research programs
- 24 students took next step in FY09 (SG participation supported from FY06-FY09 funds)
  - 10 went to graduate school in STEM disciplines
  - 8 went to work in a STEM positions for non-NASA contractors
  - 1 accepted a STEM position in K-12 academia
  - 3 accepted STEM positions in academia
  - 2 are working in non-STEM fields

#### PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking: Total awards = 62; Fellowship/Scholarship = 54, Higher Education/Research Infrastructure = 8; 12 of the total awards represent underrepresented minority F/S funding. During the FY09 program year 10 went to graduate school in STEM disciplines, 8 went to work in a STEM positions for non-NASA contractors, 1 accepted a STEM position in K-12 academia, 3 accepted STEM positions in academia, 2 are working in non-STEM fields.
- For all students who were significantly supported in the period spanning FY06-FY09, 18 went to graduate school in STEM disciplines, 2 accepted positions with NASA contractors, 9 went to work in a STEM positions for non-NASA contractors, 1 accepted a STEM position in K-12 academia, 5 accepted STEM positions in academia, 2 are working in non-STEM fields. The remaining students have not yet received the degree that they were pursuing while the received their Space Grant award.
- Course Development: The following 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) ENGT 507/PHY207 “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) ME 406/506 “High Altitude Balloon Launch” (Special Project Course-technical elective) is an undergraduate/graduate level course to scheme, design, build, launch, track, and retrieve thermally controlled high altitude balloon payloads.
  - Portland Community College – Rock Creek Campus (PCC) GCC1: Understanding Global Climate Change; GCC2: Adaptation and Mitigation; GCC3: Solutions and ACTION! are a series of online courses designed to promote awareness and understanding of global climate change issues.

- 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 expenditure data.
- Minority-Serving Institutions: 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. There was also a focus on course development.

### 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: Nuclear Engineering.
- 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.