

Wyoming NASA Space Grant Consortium

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Affiliates:

- Casper Collge
- Casper Planetarium
- Central Wyoming College
- Eastern Wyoming College
- Embry- Riddle Aeronautical University
- Laramie Community College – Laramie and Cheyenne Campuses
- Northern Wyoming Community College District – Gillette and Sheridan Campuses
- Western Wyoming Community College
- Wickman Spacecraft & Propulsion Company

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 Wyoming NASA Space Grant Consortium is a Capability Enhancement Consortium funded at a level of \$410,000.00 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 Wyoming Space Grant Consortium does this through undergraduate and graduate scholarships/fellowships, faculty seed research grants, support for innovative curricula, and other space-related educational activities.

PROGRAM BENEFITS TO STATE

Wyoming NASA Space Grant Consortium uniquely provides the state of Wyoming with access to NASA relevant educational and research support through various grants, fellowships, internships and scholarships.

PROGRAM GOALS

The program goals of Wyoming NASA Space Grant Consortium are to bring NASA relevant resources to the people of Wyoming, and to build a stronger

Science/Technology/Engineering/Mathematics (STEM) workforce in disciplines needed to achieve NASA's strategic goals (Employ and Educate).

Wyoming NASA Space Grant Consortium's key program goals are:

- To promote a strong educational base in science, math, engineering, and technology from the elementary grades through the university levels.
- To encourage cooperation and communication among industry, government, and educational institutions.
- To encourage interdisciplinary training, research, and public service programs related to aerospace.
- To recruit and train professionals, especially women and underrepresented minorities, for careers in STEM.
- To develop state research infrastructure to enhance workforce and economic development of Wyoming.
- To raise awareness of Space Grant programs and partnerships.

PROGRAM ACCOMPLISHMENTS

The key Wyoming Space Grant Consortium (WSGC) research accomplishments for 2007 include:

- For the 2007 budget year, we have had an excellent group of undergraduate fellowship awardees. We funded five students this year. All of the students are meeting the award requirements and are on schedule based on their individual timelines.
- Wyoming Space Grant placed two students at NASA Centers for summer internships in 2007; one of the two is currently participating in her third NASA Internship as a Spring 2008 intern. WSGC provided stipends and travel expenses for these students.
- Wyoming Space Grant began an initiative in Fall, 2002 to encourage community college students in science, math, and engineering fields to pursue degrees in these fields. This program has now been expanded to fund scholarships at the five largest Wyoming community colleges. Awardees are selected based on their course records and written statements regarding their educational and career goals. Awards to students from underrepresented groups are a priority for this program – 15.6% of the community college scholarships went to underrepresented students.
- Community College Transfer scholarships are awarded to STEM students transferring to the University of Wyoming (the only 4-year university in the state) from Wyoming community colleges to complete their 4-year degrees. Four awards were made this year, with one award (25%) going to a Hispanic student, one award (25%) going to a woman, and one going to a non-traditional student (25%). Two students previously received CC STEM Scholarships.
- In the 2007 budget year, four Faculty Research Grants were awarded. These grants are awarded to faculty at the university or community college level to conduct new research.
- Likewise, WSGC awarded Faculty Education Enhancement Grants. These grants provided support for faculty members at the University of Wyoming and Wyoming community colleges who wish to develop new college courses in STEM fields. Particular interest is given to interdisciplinary courses. Two faculty grants for development of new courses were awarded in the 2007 budget year, including one to a faculty member at Casper College. Both awardees were male, there were no females or other underrepresented minorities in the applicant pool.

- WSGC also offers other STEM Pipeline programs, including:
 - Minority Student Organization Support
 - UW Research Day
 - Speaker Series Support
 - A Student Balloon Satellite Program
 - NASA Explorer School Collaboration
 - The Women In Science Conference and Nontraditional Career Fair support
 - Wyoming AstroCamp support
 - State Science Fair support
 - Teacher Educational Resource Space Trunks

STUDENT ACCOMPLISHMENTS

In the area of education, research, and building the STEM workforce WSGC accomplishments include:

- Julie Sandberg, an UW Electrical Engineering graduate who is currently in her third NASA Internship. Each internship has been funded by WSGC. Julie's first internship was at Goddard Space Flight Center-NASA Academy, research topic: *Investigation of magnetospheric-banded emissions*. In the summer of 2007, Julie participated in her second internship at NASA's Jet Propulsion Laboratory. Her research topic was: *Space-related Robotics and Rovers* (JPL Robotics Group). Not surprisingly, Julie was invited back to JPL for her third NASA Internship. During this spring Internship, Julie is continuing her 2007 summer research project. After this internship, Julie plans to attend graduate school at Texas A&M. After she is finished, JPL has already indicated to her that they would like to pursue a permanent position for Julie.
- 2007 Undergraduate Fellowship recipient, Geoffrey Luke (UW Electrical & Computer Engineering). The research project we funded him to work on was Autonomous Navigation through Binocular Computer Vision, which involved building a small robot capable of detecting obstacles and navigating around them through the use of stereoscopic cameras. Geoffrey envisioned robots of this type being useful both on Earth and in exploration of other planets in the solar system. On Earth, robots that were capable of self navigation could enter disaster areas to search for survivors or explore areas too hazardous for humans. In the exploration of the solar system, these rovers would be able to navigate and explore the surface of planets such as Mars or the surface of the Moon, with only minimal interaction with operators on Earth.
- Another 2007 fellowship recipient, a UW Electrical Engineering student, Robert Grogan. In FY2006 we funded Rob in two different WSGC programs: a NASA internship and an Undergraduate Research Fellowship. First he participated in a summer internship at JPL, where he worked on the effects of extreme environments (hot/cold) on the performance of electronic components used in spacecraft (in part, he worked on op-amps that will be used on the Mars Science Laboratory Mission). We then funded him during the school year through our Undergraduate Fellowship program to work on a research project titled *Modeling and Simulation of Parallel Robotics with Matlab* – this research project studied potential robot designs and interactions that could be used for satellite repair in orbit. In FY2007, Rob was invited back to JPL for a second internship to continue working on the project he began in 2006. Additionally, in 2007, Rob was named the Tau Beta Pi Outstanding Junior. Rob plans to graduate at the end of Spring

2008 with a bachelor's degree in electrical engineering and then continue on to graduate school with the goal of achieving a PhD.