

Washington NASA Space Grant Consortium
University of Washington
PI: Professor Robert M. Winglee
Phone: 206-543-1943
URL: <http://www.waspacegrant.org/>

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 interests 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 Washington Space Grant Consortium is a Designated Program funded at a level of \$730,000 for fiscal year 2008.

PROGRAM GOALS

The overall objective of Washington NASA Space Grant Consortium is to provide high quality programs that align with the NASA Office of Education Outcomes and serve the needs of our state. WSGC seeks to enhance higher education opportunities for students seeking to pursue careers in the fields of science, technology, engineering and math (STEM); to enrich and improve STEM education at Washington's diverse pre-college, college, university and community learning centers; and to provide public outreach for NASA missions, and thereby strengthen the future workforce for NASA and our nation. To that end, our goals are as follows:

- To attract and retain high-achieving students, especially those underrepresented in the sciences, technology, engineering and mathematics, to space-related degree programs and career tracks supporting NASA's missions.
- To support the integration of research and education in NASA-related fields at the undergraduate and graduate levels.
- To support faculty interested in deepening ties to NASA research and the development of research infrastructure at consortium member institutions
- To increase collaborative efforts of university scientists and students with industry leaders in aerospace-related programs.
- To enhance the teaching of science, technology, engineering and mathematics and to attract students to these fields of study through engaging informal and formal education programs based on NASA's missions on Earth and in space.
- To share the excitement and knowledge gained from NASA's missions with the general public.
- To strengthen collaborative efforts within the consortium as well as with industry, community, and governmental organizations to support NASA and WSGC goals and activities.

We provide here a brief report on our progress toward last year's specific goals and metrics. A full report with specifics on participant data and expenditures may be found in our annual CMIS report.

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

OUTCOME #1: EMPLOY AND EDUCATE In August, WSGC student researcher Paul Burdeaux graduated from Heritage University with a baccalaureate degree in natural resources. Paul, a local tribal member and former English major, switched to the sciences three years ago as a result of his work on the school's high-altitude balloon project, which was funded by WSGC and developed in collaboration with the University of Washington. The knowledge of GPS mapping systems that he developed during two WSGC-supported internships, including one in 2008, landed him a summer job at the U.S. Army's Yakima Firing Range, mapping traffic routes for land vehicles. He is now employed as a research scientist in the laboratory of John I. Haas, Inc., a leading developer of agronomy products.

OUTCOME #2: EDUCATE AND ENGAGE In 2008, WSGC collaborated with the University of Washington and its Department of Earth and Space Sciences to develop "Rockin' Out," a pilot program aimed at augmenting K-12 science education in the state with additional Earth science curriculum and providing pre-service teachers with classroom experience. The curriculum, developed by UW ESS graduate students, is aligned to state and national science standards. This winter, teams of graduate and undergraduate students began demonstrating the materials in the classroom and modeling use of the curriculum for in-service teachers. Seven schools will participate in the program in FY2008.

OUTCOME #3: ENGAGE AND INSPIRE In September, 42,000 people, from kindergartners to adults, were able to meet with astronauts and cosmonauts from around the world and learn about life in space. The goodwill visits were part of the Association of Space Explorers XXI Planetary Congress, held Sept. 15-19 at the Museum of Flight in Seattle. WSGC staff recruited hosts and provided logistical support for the visits. The geographic reach of the ASE Community Day ranged across the state, from a home school group in Oak Harbor to elementary students in Vancouver to middle schoolers in Bremerton to university students, faculty and staff at the University of Washington and Washington State University. The event also provided an opportunity for WSGC members to connect with new populations.

PROGRAM ACCOMPLISHMENTS

Outcome 1 Objectives: Higher Education contributions to the Development of STEM Workforce – Educate and Employ

SMART Goal #1: *To attract and retain high-achieving students, especially those underrepresented in the sciences, technology, engineering and math, to space-related degree programs and career tracks supporting NASA's missions (Education Outcome 1)*

Metric: Our objective will be to improve WSGC's coverage of the state by adding two higher education members in rural Washington. We are also proposing to increase student participation in STEM fields by 20% at our higher education affiliates (not including UW). This will be achieved through an increase in the number of scholarship and research awards.

Progress to date: Met. In 2008, WSGC added two new affiliates outside the urbanized Interstate-5 corridor. Central Washington University is a comprehensive, four-year public university that grants baccalaureate and master's degrees from its main campus in Ellensburg and six offsite centers, half in predominately rural areas: CWU-Lynnwood, CWU-Moses Lake, CWU-Des Moines, CWU-Pierce County, CWU-Wenatchee and CWU-Yakima. Whitworth University, located in Spokane, is a private, liberal-arts institution, enrolling 2,600 students in more than 50 undergraduate and graduate degree programs.

Metric: To achieve 95% retention in STEM disciplines of all scholarship awardees (by 2009 – recognizing that students may be forced to leave school due to personal circumstances).

Progress to date: Met. Of the students receiving significant scholarship support from WSGC, we have an 88.5% response rate for longitudinal tracking. Of the 319 students responding, 317 (99.3%) have remained in STEM fields.

Metric: To award WSGC scholarships to minority students at or above the percentage of enrollment of underrepresented minority students in higher education in the state of Washington. Through scholarships, we also will support NWIC's new Bachelor of Science degree in Native Environmental Science.

Progress to date: Met. The percentage of underrepresented minority students enrolled in higher education in Washington state is 13%, according to the National Center of Education Statistics Digest. Based on 2008 awards reported to date, WSGC has superseded the NCESD percentage by awarding scholarships to underrepresented minority students at 13.9% of our total scholarships and fellowships. WSGC scholarships were awarded to six NWIC students, all pursuing baccalaureate degrees in Native Environmental Science.

Metric: Establish regular communication with WSGC scholarship and fellowship alumni from all consortium institutions. Our alumni serve as role models for incoming students and can assist in opening up new opportunities for students within the program.

Progress to date: Met. WSGC continued its partnership with the National Space Grant Foundation to locate and track alumni from all of our higher education institutions. Approximately one-third of our alumni have been tracked through the system. NSGF is currently researching avenues to re-establish contact with another 7% of our alumni. We continue pursuing our long-term objective of tracking a minimum of two-thirds of our alumni. We maintain a listserv (NASAlumni) specifically for distributing alumni news and career opportunities, and publish a regular alumni update column in our newsletter to encourage continued participation.

SMART Goal #2: *To support the integration of research and education in NASA-related fields at the undergraduate and graduate levels (NASA Education Outcome 1)*

Metric: To assist in infrastructure development of two five-credit UW classes, Space and Space Travel (ESS 102) and Access to Space (ESS 205), which are at capacity. We will continue to offer Rocks and Stars (ESS 495) to provide UW students with information about NASA-supported research programs on campus and to encourage students to participate in such programs. We will work with Aerojet, UW ESS and the UW Department of Aeronautics and Astronautics to determine the potential for a space instrumentation class. In collaboration with our higher education member institutions, we will also undertake creation of a graduate student/pre-service outreach program in which graduate students will develop Earth and space science curriculum for K-12 students using NASA materials, then turn the materials over to pre-service/undergraduate students who will then teach the material in classes at elementary and secondary schools.

Progress to date: Met. Space and Space Travel (ESS 102) was offered in Fall and Winter Quarters and enrollment in both classes was at capacity (190 students), but it did not need WSGC financial support. Access to Space (ESS 205) is planned for Spring Quarter, with an enrollment of approximately 44 students. WSGC will assist with supplies for the flight of the balloon experiments. With WSGC assistance, UW ESS developed an interdisciplinary rockets and instrumentation class. The two-credit class was taught in Fall and Winter quarters with 20 undergraduates and seven graduate students. In November, the class successfully launched six L1 and two L2 rockets with payloads. The class infrastructure is being used in the development of an advanced disciplinary rocket class in the Department of Aeronautics and Astronautics (AA599).

Metric: To expand participation in existing WSGC-sponsored undergraduate research and NASA internships. We will foster expanded research opportunities for undergraduate students in at least 50% of our affiliated higher education institutions, while maintaining the 2007 level of participation in the Summer Undergraduate Research Program run by the lead institution.

Progress to date: Met. In 2008, student research programs were created at our two new affiliates (Central Washington University and Whitworth University) and programs were expanded at five other affiliates (Heritage University, Northwest Indian College, Seattle Central Community College, Washington State University, and Whitman College). Thus, of our 11 higher education affiliates, research opportunities were created or expanded at seven of them. Also in 2008, students from five different higher education affiliates participated in NASA research internships, as compared to one in 2007. In summer of 2008, 56 students participated in our Summer Undergraduate Research Program, an increase of three students over our 2007 level of participation.

SMART Goal #3: *To support faculty interested in deepening ties to NASA research and the development of research infrastructure at consortium member institutions (NASA Education Outcome 1)*

Metric: To distribute NASA announcements of opportunity to relevant faculty at all consortium member institutions.

Progress to date: Met. NASA research announcements and opportunities for special funding (such as summer programs for faculty and graduate students at NASA centers) are forwarded regularly to WSGC representatives at our higher education affiliates so they can distribute the information at their institutions. Links to these opportunities are also posted on the WSGC Web site. In addition, NASA opportunities for informal education and for classrooms are forwarded to the relevant constituencies in a timely manner.

Metric: To expand WSGC's UW graduate fellowship program to six fellowships a year while expanding support for graduate fellowship programs at WWU and WSU.

Progress to date: Met. We have awarded five graduate fellowships at the UW and will make two more awards with 2008 funding, giving UW a total of seven fellowships. Awards were made to students in the disciplines of astronomy, Earth and space sciences, and engineering. This is an increase over the two graduate fellowships awarded in the previous year at UW. WSU has awarded nine graduate fellowships in three different engineering fields and six other STEM disciplines, an increase of one fellowship over awards made with 2007 funds. WWU's graduate-level awards are for students who are completing both an undergraduate degree in a STEM discipline and WWU's elementary or secondary education program.

SMART Goal #4: *To increase collaborative efforts of university scientists and students with industry leaders in aerospace-related programs (NASA Education Outcome 1).*

Metric: To establish a summer industry internship program with local companies involved in STEM research and development for students from WSGC member institutions.

Progress to date: Met. In 2008, we again offered summer internships at Aerojet and Tethers Unlimited. Economic factors derailed our attempts to expand our internship offerings at Korry Electronics and the Institute for Systems Biology – both companies were forced to initiate layoffs due to the recession. However, in summer 2009, we will add Woodruff Scientific, Inc. as an industry affiliate and begin offering summer internships there. Two Space Grant scholars are currently working as interns at Woodruff Scientific. Aerojet and Tethers Unlimited have also committed to hiring summer interns.

Metric: To have strong industry representation at WSGC meetings and events, and participation in projects including jointly submitted proposals, papers and products.

Progress to date: Met. Aerojet representatives, as well as Senate and Congressional staff members, attended the WSGC annual reception and poster session. Aerojet representative Chuck Cushing presented the awards to students who participated in summer internships in private industry and at NASA centers. In addition, WSGC leadership has met twice with Roger Myers of Aerojet to discuss developments on UW's rockets and instrumentation classes, and with Tim Ziemba of Eagle Harbor Technologies to discuss areas of collaboration. Industry affiliate representatives will be invited to attend the WSGC annual meeting in March.

WSGC Director Robert Winglee also worked with Eagle Harbor Technologies and Aerojet to develop and win a NASA Phase I SBIR proposal for the development of a micro-thruster for formation flying of multiple spacecraft. Additional proposals have been developed and submitted in collaboration with Eagle Harbor Technologies and NVIDIA for the support of advanced computing efforts. The results of those proposal submissions are pending.

Outcome 2 Objectives: Elementary and Secondary Schools attracting and retain students in STEM Disciplines – Engage and Educate.

SMART Goal #5: *To enhance the teaching of science, mathematics, and technology and to attract students to these fields of study through engaging informal and formal education programs based on NASA's missions on Earth and in space (NASA Education Outcome 2).*

Metric: Provide technical or professional development to at least one traditionally underserved population in Washington (each year, 2005-2009). WSGC will support efforts by NCESD to establish two workshops for elementary (fourth and sixth grade) teachers involved in astronomy. As mentioned under Outcome 1, we will also conduct a pilot program where undergraduates at the larger universities (UW and WWU) will receive training from graduate students in Earth and space sciences and then provide classes for schools where this expertise is missing. The Pacific Science Center will continue to promote adoption of *Astro Adventures*, an astronomy curriculum for elementary schools that was developed and revised with WSGC funding.

Progress to date: Met. In August through October, the North Central Educational Service District (NCESD) conducted four astronomy trainings for fourth grade teachers, reaching 76 teachers in this traditionally underserved region. Additional astronomy training for fourth grade teachers is scheduled for January and astronomy training for sixth grade teachers is planned for this spring.

As described earlier under "Program/Project Benefit to Outcome," UW ESS initiated a new Earth and space sciences pilot program that recruits pre-service teachers and other undergraduate and graduate students who are interested in teaching to support classroom application of the state's K-12 standards in this area. The "Rockin' Out" curriculum was developed by graduate students and is modeled for in-service teachers in the classroom by a student team. So far, teams have visited four elementary schools and six more visits are scheduled.

Pacific Science Center staff members traveled to national and regional science conferences to promote *Astro Adventures*. PSC staff also conducted six professional development workshops for teachers who were using the *Astro Adventures* curriculum.

Metric: Provide research experiences for pre-service teachers in STEM fields.

Progress to date: Met. Future K-12 teachers in the Science, Mathematics, and Technology Education (SMATE) Program at Western Washington University complete both a major in their STEM disciplines and either the elementary or secondary education program. Participants create a poster describing their research and participate in a seminar to discuss how their research experiences will improve their inquiry-based educational methods and how it will relate to their future teaching. In December 2008, WWU also piloted a new approach, funding 11 students to conduct research during the academic year.

Metric: Work with informal organizations such as museums to provide at least one relevant science activity each year at a major event or exhibit.

Progress to date: Met. Through our publications, WSGC continues to assist the Museum of Flight with recruiting students, scientists and teachers for the state's Washington Aerospace Scholars (WAS) program. Created to serve high school juniors statewide, the program emphasizes science, technology, engineering and math, and encourages students to consider careers in those fields.

Outcome 3 Objectives: Informal Education – Build Strategic Partnerships and Linkages.

SMART Goal #6: *To share the excitement and knowledge gained from NASA's missions with the general public (NASA Education Outcome 3).*

Metric: To offer a twice-annual newsletter for WSGC subscribers that highlights NASA and consortium activities for a general audience (each year, 2005-09).

Progress to date: Met. Two newsletters were published during FY 2008 and distributed to approximately 5,000 subscribers. We will continue to relay NASA-related opportunities to our members and targeted groups (students, alumni, the general public, etc.) via our e-mail lists, Web site and electronic resources such as our regular e-letter for educators.

Metric: To provide materials for museum and public events that showcase NASA missions at least once during the year. To help our museum affiliates to publicize their NASA-related programs via our newsletter, educator e-letter and mailing lists to students.

Progress to date: Met. Materials were provided for the Museum of Flight's Educator Open House, Astronomy Night and Space Camp; UW's Washington Weekend (Astronomy and ESS departments), Expanding Horizons and IGNITE (events that encourage girls to pursue STEM careers); and public events to be conducted in Eastern Washington in 2009 by the state's International Year of Astronomy Student Ambassador.

WSGC supported and helped recruit partner schools for the Association of Space Explorers Community Day, a statewide outreach effort by astronauts and cosmonauts from around the world that reached 42,000 participants from kindergartners through adults. This event was held in conjunction with the Association of Space Explorers XXI Planetary Congress, hosted by the Museum of Flight in Seattle. WSGC also supported and provided NASA materials for "Stardust: Mission Accomplished," a workshop at the Pacific Science Center for 20 museum educators from around the country.

SMART Goal #7: *To strengthen collaborative efforts within the consortium as well as with industry, community, and governmental organizations to support NASA and WSGC goals and activities (NASA Education Outcomes 1, 2 and 3).*

Metric: Work more closely with consortium members to assure coherence in the program, to share expertise and resources, and to bring together students and faculty from all institutions to present their research (every year, 2005-9).

Progress to date: Met. The WSGC Reception and Poster Session in late October 2008 drew participation and/or attendance by students and faculty from more than half of WSGC's higher education affiliates, with the display of 75 posters showing work by WSGC student researchers, graduate fellows and interns. Attendees also included representatives from our museum and industry affiliates, and local Senate and Congressional offices. Using e-mail, we continue to inform our higher education affiliates of NASA opportunities for their students and faculty. WSGC staff also helped the Museum of Flight recruit partner schools (including WSGC higher education affiliates) for the Association of Space Explorers Community Day, a statewide outreach by astronauts and cosmonauts from around the world that reached 42,000 participants from kindergartners through adults.

Metric: Obtain additional (i.e., non-NASA Space Grant) funds to strengthen our consortium activities (every year, 2005-9).

Progress to date: Partially met. In 2008, we added two new academic affiliates, Central Washington University and Whitworth University. Both institutions provided dollar-for-dollar matching funds for their programs. We continue to receive scholarship support at the lead institution from the Louise and Irving R. Donnergaard Endowment, the Sigurd Olsen Endowment, the Lt. Col. Michael P. Anderson Memorial Diversity Scholarship and the Mary Gates Endowment for Students. Our gift fund, Friends of Washington NASA Space Grant, received donations of \$1,200 in 2008 from our industry affiliates. Aerojet also donated an additional \$5,000 for the support of "Rockets and Instrumentation," a UW course supported by WSGC. WSGC also used funding from NASA ESMD to award internships at NASA Centers and to provide support for a UW senior design course. Aerojet and Tethers Unlimited also stepped up with stronger financial support for internships, per student. The economic downturn has affected our efforts to bring in new industry affiliates.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- **Longitudinal Tracking:** Current data for 2008 show that WSGC made 122 significant awards in the Fellowship/Scholarship category and 58 in the Higher Education/Research Infrastructure category for a total of 180 awards in all categories. Of these students, 22 are from underrepresented groups. Of the total, 177 are still enrolled in their current degree programs. In addition, 77 students who received funding in FY2006 and FY2007 are still enrolled in STEM degree programs. Currently known "next steps" include 36 students who have graduated and are pursuing advanced STEM degrees, 1 student who is employed at a STEM aerospace contractor, 15 students who are employed in STEM non-aerospace fields, 1 student who is employed by NASA, 1 student who is employed in K-12 STEM academia, 9 students who are employed in "other" STEM academic fields, and 2 who are involved in non-STEM pursuits. We have 312 students in the NSGF longitudinal tracking system for 2006 through 2008. Of these, 55 students have not responded to inquiries and so we have not included these students in our longitudinal tracking table. We will continue our attempts to contact the students who have not responded. These numbers will change slightly when we receive full reports from our affiliates.
- **Course Development:** In 2008, WSGC supported the creation of one new course to target STEM skills needed in the NASA workforce. At the UW, an interdisciplinary course called "Rockets and Instrumentation" was piloted for seniors and graduate students. The UW curriculum committee has agreed to the formalization of these classes next year under the permanent numbers of ESS 472/575. The course provides hands-on experience in the development of rockets and their instrumentation. Students have participated in the building, launching and recovery of high-powered model rockets from Eastern Washington. A larger rocket launch capable of going supersonic will be launched in Nevada this spring. Through the class, students learn to collaborate successfully across engineering and science disciplines, working in a team environment on deadline-driven projects. The teams to date included students from departments of electrical engineering, aeronautics and astronautics, mechanical engineering, physics and Earth sciences, producing a truly interdisciplinary environment. In the pilot year, 20 undergraduates and 7 graduate students participated in the class.
- **Matching Funds:** The ratio of funds leveraged by NASA funds, including only non-federal sources, is 0.77, slightly higher than the required amount of 0.75. The ratio of funds leveraged by NASA funds, including both non-federal and other federal sources, is 0.87. These numbers might increase slightly at the end of our grant year when we receive full reports from our affiliates.
- **Minority-Serving Institutions:** WSGC's three minority-serving institutions (Heritage University, Northwest Indian College and Seattle Central Community College) received NASA funding totaling \$64,620 for their research and scholarship programs. Current reports from these institutions indicate that 18 scholarships and two research awards were made with 2008 funds. This year, WSGC concentrated on developing ways for its minority-serving institutions to tap into the state's research colleges while accomplishing our SMART goals of developing opportunities for hands-on research and fostering affiliate partnerships. To this

end, we extended Summer Undergraduate Research Program (SURP) internships to two Heritage students interested in conducting research at UW, a top research institution. This new collaboration with Heritage had the additional benefit of recruiting an underrepresented UW professor into SURP as a student mentor and laid the groundwork for placing future underrepresented research interns in his laboratory. WSGC has strengthened its ties with NWIC this year. For the first time, NWIC sent a student researcher to present her work during WSGC's annual reception, where her poster highlighted NWIC's research in environment science. A partnership was also facilitated between NWIC's science director and the geomorphological research group of the Quaternary Research Center in UW's Department of Earth and Space Sciences to provide NWIC with much needed data and remote sensing images. WSGC staff and administration are currently working with the three minority-serving institutions to submit a proposal for a NASA Minority Serving Institution Partnership Development grant. This application process has strengthened connections between the institutions involved and spurred new conversations on potential future collaborations.

IMPROVEMENTS MADE IN THE PAST YEAR

In FY2008, WSGC put a priority on improving access to undergraduate research opportunities in the STEM disciplines statewide, especially at the state's smaller institutions, which are primarily located outside western Washington. To accomplish this, we added two new members (Central Washington University in Ellensburg and Whitworth University in Spokane) and provided funding for their on-campus student research internships. We also supported placement of undergraduates from two of our minority-serving institutions (Heritage University and Seattle Central Community College) in UW research laboratories, where the students could gain experience not available on their home campuses and be encouraged to continue into STEM careers and graduate degrees. Overall, WSGC members chose to direct more of their WSGC resources toward student research either by increasing the number of student research awards at their institutions or by increasing the research component of their scholarship award. Western Washington University, for example, chose to expand their program of summer research awards for pre-service teachers in the winter and spring quarters. WSGC also improved the support of graduate education with expanded programs at UW and WSU.

WSGC continues working to improve the percentage of underrepresented minorities served by its programs. In an effort to strengthen our outreach efforts, travel funds were allocated this year for the student advisor to visit our minority-serving institutions and meet with students and faculty, and to attend one national conference sponsored by a minority professional group (National Society of Black Physicists conference) with the aim of fostering new working relationships and recruiting graduate students to the lead institution and NASA internships. In the latter case, WSGC travel funds were leveraged by partnering with the UW Applied Physics Laboratory and other UW departments that were eager to participate in the conference. The former effort has already resulted in new internship opportunities and closer working relationships between the lead institutions and the minority-serving institution affiliates, as demonstrated by the proposal for a NASA Minority Serving Institution Partnership Development grant.

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

WSGC is comprised of 16 member institutions and three industry affiliates, which are listed below:

Higher Education

- *University of Washington*, the lead institution, is a major research university, receiving over \$1 billion annually in research grants and contracts.
- *Central Washington University*, a four-year public university serving Central Washington, with a main campus in Ellensburg and six off-site centers.
- *Heritage University*, a Hispanic-serving institution (HSI) located within the Yakama Nation reservation in central Washington.
- *Northwest Indian College* (NWIC), a tribal college.
- *Seattle University*, the largest independent university in the Pacific Northwest.
- *University of Puget Sound*, a four-year liberal arts college located in Tacoma.
- *Washington State University* (WSU), also a major research university and the state's land grant university.
- *Western Washington University*, home to the Science, Mathematics, and Technology Education (SMATE) program for pre-service teachers and education research.
- *Whitman College*, a private liberal arts school located in central Washington.
- *Whitworth University*, a private liberal arts school located in eastern Washington.
- *North Seattle Community College* (NSCC), a two-year college serving north Seattle and the neighboring suburbs.
- *Seattle Central Community College* (SCCC), a majority-minority institution.

K-12

- *North Central Educational Service District* (NCESD), the largest ESD in the state, serving a mostly rural, Hispanic, and economically disadvantaged population.
- *Office of the Superintendent of Public Instruction* (OSPI), the primary state agency charged with overseeing K-12 education in Washington.

Informal Education

- *Museum of Flight* (MoF), a provider of informal education and training for pre-college students and in-service teachers.
- *Pacific Science Center* (PSC), a provider of informal education and training for pre-college students and in-service teachers.

WSGC industry affiliates are Aerojet, The Boeing Company, and Tethers Unlimited, Inc.; all are within the field of aeronautics and astronautics. We have traditionally distinguished between consortium members, which are eligible to apply for WSGC subcontract support, and industry affiliates, which generally contribute financial resources or expertise for specific projects such as internships.