

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

PROGRAM GOALS

The New York Space Grant (NYSG) has three SMART goals related to NASA Education Outcomes 1 and 2 (specifically our Fellowship/Scholarship, Higher Education, and Research Infrastructure programs):

1. The percentage of NYSG minority student awardees shall meet or exceed the enrollment percentage in NY higher education institutions.
2. The percentage of NYSG female student awardees shall meet or exceed the percentage of STEM bachelor's degrees awarded to females nationwide. Here we use statistics on awarded bachelor's degrees provided by the National Science Foundation, based on special tabulations of NCES data, as a benchmark.
3. NYSG shall strive for 90% or more of students receiving significant awards to take the next step to STEM employment or STEM advanced degrees upon graduation. Our progress toward this goal is measured by data obtained from longitudinal tracking of significant awardees. NYSG considers significant student awards to be \geq \$4,000 given to a student and/or \geq 160 hours of work on Space Grant projects by a student in a single budget year.

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

Columbia's "City to Sky" benefits to Outcome 1: Funds from NYSG and Columbia's Vice Provost for Diversity Initiatives are supporting a new "City to Sky" program. This program provides talented underrepresented minority graduates from City University of New York (CUNY) colleges with a year of paid research experience, coursework, and mentorship, thereby better preparing them for entrance into an astronomy PhD program.

MECSAT project benefits to Outcomes 1 and 2: During June 2008 faculty and two students from CUNY Medgar Evers College's NYSG-funded high-altitude ballooning program (MECSAT) participated in an ozone monitoring workshop with the University of Houston-Downtown (a minority serving institution) and the University of Houston. There were a total of 20 student and faculty participants. The workshop included various technical lectures on ozone, meteorology, and data analysis as well as continuous ozonesonde launches (morning, afternoon, midnight), flight monitoring, and data acquisition over three days. Students gave reports on initial results during the workshop. The outcomes of this and other MECSAT summer student programs will be presented at American Geophysical Union and American Meteorological Society meetings with student co-authors.

Sciencenter project benefits to Outcome 3: NYSG and Sciencenter matching funds were used to create a new asteroid belt station plus update and distribute wayfinding/educational materials for the Sagan Planet Walk. The Sagan Planet Walk is an outdoor walking scale model of the solar system, extending 1.2 km from downtown Ithaca to the Sciencenter, a hands-on science museum.

PROGRAM ACCOMPLISHMENTS

During FY08 the New York Space Grant conducted many programs that contributed to NASA Education Outcomes in the following ways:

Outcome 1 [Fellowship/Scholarship (F/S), Higher Education (HE), and Research Infrastructure (RI) programs] – NYSG institutions provided diverse opportunities for undergraduate students and graduate students to hone their research and technical skills. In addition, as a result of NYSG's Competition for Research Funding, the following three interdisciplinary research projects began in FY08 and will be completed in FY09:

- Cornell University – “Cooperative Human-Robotic Operations with Time/Communications Constraints”
- CUNY York College – Research and model updating performed as part of the “Observing the Diffuse Gamma-Ray Emission from Starburst Galaxies with GLAST” project
- Polytechnic University – “Supporting Doctoral Engineering Pipeline via a Synergistic Program in Mechatronics/Robotics Research and K-12 Outreach”

Outcome 2 [HE programs] – During summer 2008 we sponsored four students' participation in the NASA Academies at Glenn, Goddard, and Marshall plus six students' Space Grant internships at JPL, Kennedy, and Langley (LARSS program). We also helped support three other NY student interns with round-trip travel funds to participate in the NASA Academy at Glenn and the NASA Robotics Academy at Goddard. A new engineering seminar series, “Innovation in Spacecraft Engineering,” was supported by NYSG funds. This series has brought innovators from academia and industry to Cornell (such as Dr. Glenn Lightsey from the Univ. of Texas, Dr. Robert Fierte from ITT Corporation, and Mr. Robert Vogt from ATK Corporation) to discuss new spacecraft concepts and network with faculty and students.

Outcome 2 [Precollege programs] The Museum of Science & Technology (MOST) in Syracuse, in collaboration with Syracuse University, conducted its annual “Central New York Rocket Team Challenge” and “Bridge Build’em and Bust’em” hands-on K-12 student engineering activities. Using Space Grant and matching funds, SUNY Buffalo continued collaboration and support of the Buffalo-area Engineering Awareness for Minorities (BEAM) summer program to better prepare minority high school students for engineering majors in college. Also, undergraduate MECSAT students ran educational STEM activities for 60 middle and high school students participating in the NY State Science & Technology Entry Program (STEP) summer 2008 program.

Outcome 3 [General Public and External Relations programs] Space Grant students at Alfred University in western NY presented at Stull Observatory’s weekly public open houses. In central NY the Sciencenter updated the Sagan Planet Walk. We sponsored an additional NASA IYA student ambassador out of Space Grant funds to cover upstate NY. The free NY Space Grant Speaker Series at the Museum of Science & Technology (MOST) in Syracuse attracted hundreds of central New Yorkers of all ages to learn about diverse NASA research topics such as “Observing the Changing Earth from Space,” “Spectacular Saturn!”, and “Fun with Fluid Dynamics.”

During FY08 NYSG has made the following accomplishments and progress toward meeting its SMART goals:

1. **The percentage of NYSG minority student awardees shall meet or exceed the enrollment percentage in NY higher education institutions.** The NCES benchmark for this SMART goal states that enrollment in NY institutions is 33.4% underrepresented minorities plus Asians. Table A.1 in the accompanying *NY_FY08studentdata.xls* spreadsheet shows that 33 of 110 (30.0%) of the total FY08 NYSG student awards went to underrepresented minorities (excluding Asians). Accounting just for the seven Asian students who received significant awards ($\geq \$4k$ or ≥ 160 hours), a more accurate comparison to the NCES benchmark reveals that *at least* 40 of 110 awards (36.4%) went to underrepresented minorities plus Asians. Hence in FY08 we met SMART Goal 1.
2. **The percentage of NYSG female student awardees shall meet or exceed the percentage of STEM bachelor’s degrees awarded to females nationwide.** The benchmark we use from NSF statistics indicates that females earned 38% of the bachelor’s degrees awarded in engineering and sciences (excluding psychology and social sciences) in 2004. In FY08 the percentage of total awards to female students was 33.6%, which falls under this benchmark. However, the percentage of FY08 **significant awards** given to females was 36.8%.
3. **NYSG shall strive for 90% or more of students receiving significant awards to take the next step to STEM employment or STEM advanced degrees upon graduation.** Of the 53 significant student awardees who have graduated, 46 are pursuing STEM advanced degrees or are in STEM employment, 4 are seeking STEM employment, and 3 are non-STEM. Therefore for this reporting period, the percentage of significant awardees who have taken the next step to STEM advanced degrees or STEM employment is 87%. This is close to our goal.

PROGRAM CONTRIBUTIONS TO PART MEASURES

- Student Data and Longitudinal Tracking:
 - Total FY08 awards = 110; Fellowship/Scholarship = 67, Higher Education/Research Infrastructure = 43; 25 awards (37%) represent underrepresented minority F/S funding, 8 awards (19%) represent underrepresented minority HE/RI funding.
 - Of the seven FY08 students who have graduated and made their “next step,” 4 are pursuing advanced STEM degrees, 1 is working in a STEM position for an aerospace contractor, and 2 are in non-aerospace STEM employment.
 - Of the forty-six FY06 and FY07 students who graduated and made their “next step” after the last longitudinal tracking update, 19 are pursuing advanced STEM degrees, 4 are seeking STEM employment, 5 are working in STEM positions for aerospace contractors, 12 are in non-aerospace STEM employment, 1 is employed in a K-12 STEM field, 2 are employed in higher education STEM academic fields, and 3 are all other/non-STEM.
- Course Development: As a result of NYSG’s Competition for STEM Higher Education Enhancement Funding, the following two course development projects began in FY08 and will be completed in FY09:
 - Cornell University – “Geophysical Fluid Dynamics in Rotating Tank Experiments” entails modifying rotating tanks for hands-on experiments and demonstrations to increase students’ understanding of geophysical fluid dynamics concepts related to Coriolis accelerations.
 - Syracuse University – “Incorporating and Full-Motion Flight Simulator into Aerospace Engineering Curricula” entails integration of a recently acquired 6-DOF, FAA-approved full-motion flight simulator into existing and new undergraduate engineering courses.
- Matching Funds: For FY08, the ratio of NYSG non-federal matching funds to NASA Space Grant funds (excluding the \$183,000 in fellowships/scholarships funds not requiring a match) was 1.04%.
- Minority-Serving Institutions: Three NYSG affiliates are minority-serving institutions: CUNY City College of New York (which is also a Hispanic-serving institution), CUNY Medgar Evers College, and CUNY York College. While SUNY Stony Brook is not a minority institution, NYSG is partnered with its Louis Stokes Alliance for Minority Participation (LSAMP) program to provide underrepresented minorities with NASA-related research opportunities. The NYSG affiliate director at Medgar Evers collaborates a great deal with other minority-serving institutions on projects related to her NYSG-supported MECSAT program, thus expanding the impact of Space Grant funding.

IMPROVEMENTS MADE IN THE PAST YEAR

The NYSG had two significant changes/improvements during FY08:

1. With the four new affiliates (Alfred University, Rochester Institute of Technology, Union College and University of Rochester) added in FY08, NYSG reaches even more of New York State’s population. These new affiliates are both geographically and institutionally diverse.

2. NYSG ran an internal competition for Research Funding and STEM Higher Education Enhancement Funding, distributing the Request for Proposals to all NYSG affiliates. Five proposals were selected for funding; 3 research projects (at Cornell, CUNY York College, and Polytechnic) and 2 higher education curriculum projects (at Cornell and Syracuse).

PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

1. **Alfred University**, Alfred, NY [*highly residential, Master's I, private*] undergraduate research and F/S
2. **Barnard College**, New York, NY [*highly residential, Baccalaureate - Liberal Arts, private*] **women's college**, undergraduate research and F/S
3. **CUNY City College of NY**, New York, NY [*primarily nonresidential, Master's I, public*] **Hispanic and Minority Serving Institution**, graduate research and F/S
4. **CUNY Medgar Evers College**, Brooklyn, NY [*primarily nonresidential, Baccalaureate - General, public*] **Minority Serving Institution**, undergraduate research and F/S, student ballooning program (MECSAT)
5. **CUNY York College**, Jamaica, NY [*primarily nonresidential, Baccalaureate - General, public*] **Minority Serving Institution**, undergraduate research and F/S
6. **Clarkson University**, Potsdam, NY [*highly residential, Doctoral/Research - Intensive, private*] undergraduate and Master's research and F/S
7. **Colgate University**, Hamilton, NY [*highly residential, Baccalaureate - Liberal Arts, private*] undergraduate research and F/S
8. **Columbia University**, New York, NY [*highly residential, Doctoral/Research - Extensive, private*] undergraduate research and graduate F/S
9. **Cornell University**, Ithaca, NY [*primarily residential, Doctoral/Research - Extensive, private and public (land grant)*] **NYSG lead institution**, undergraduate research and F/S and higher education projects, graduate F/S, curriculum development, other consortium-wide projects such as summer internship programs
10. **Lockheed Martin Systems Integration**, Owego, NY – Aerospace industry affiliate providing student internships.
11. **Manhattan College**, Bronx, NY [*highly residential, Master's I, private*] No active Space Grant projects during FY08.
12. **Polytechnic University**, Brooklyn, NY [*primarily nonresidential, Doctoral/Research - Intensive, private*] undergraduate and graduate research and F/S
13. **Rensselaer Polytechnic Institute**, Troy, NY [*highly residential, Doctoral/Research - Extensive, private*] undergraduate and graduate research and F/S
14. **Rochester Institute of Technology**, Rochester, NY [*highly residential, Master's I, private*] graduate research and F/S
15. **Sciencenter**, Ithaca, NY – Non-profit informal education affiliate.
16. **SUNY at Buffalo**, Buffalo, NY [*primarily residential, Doctoral/Research - Extensive, public*] undergraduate and graduate research and F/S
17. **SUNY at Geneseo**, Geneseo, NY [*highly residential, Master's I, public*] undergraduate research and F/S
18. **SUNY at Stony Brook**, Stony Brook, NY [*highly residential, Doctoral/Research - Extensive, public*] **NYSG is partnered with the LSAMP program which runs minority-focused projects**, undergraduate research and F/S
19. **Syracuse University**, Syracuse, NY [*highly residential, Doctoral/Research - Extensive, private*] undergraduate research and F/S, curriculum development, involved in informal education projects with the Museum of Science & Technology in Syracuse.
20. **Union College**, Schenectady, NY [*highly residential, Baccalaureate - Liberal Arts, private*] undergraduate research and F/S
21. **University of Rochester**, Rochester, NY [*highly residential, Doctoral/Research - Extensive, private*] graduate research and F/S