

New Jersey Space Grant Consortium  
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Consortium URL: <http://njsgc.rutgers.edu>  
Grant Number: NNX10AR62H

## 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 Jersey Space Grant Consortium is a Program Grant Consortium funded at a level of \$430,000 for fiscal year 2012.

## PROGRAM GOALS

Goal 1: To develop a scholarship and fellowship program that provides graduate as well as undergraduate research and educational opportunities to a diverse spectrum of New Jersey students in the disciplines of science, math, technology, and engineering, with emphasis on aerospace, and with research opportunities at NASA centers.

- Objective 1.1: \$110,000 will be awarded in fellowships to N.J. students in STEM fields and in a way that reflects the diversity characteristics of N.J. college students.
- Objective 1.2: \$22,000 will be awarded through research fellowships to graduate students, through the NASA/NJSGC Graduate Student Fellowship program.
- Objective 1.3: \$42,000 will be awarded as Summer Fellowships to undergraduates in N.J. to conduct research at a NJSGC member university, at an approved industrial corporation, or at a NASA Center.
- Objective 1.4: \$46,000 will be awarded as Academic Year Fellowships to New Jersey undergraduate students in STEM. Twenty-three \$2,000 fellowships will be awarded.
- Objective 1.5: At least 90% of the summer fellowship students and graduate research fellows will present their research at the NJSGC fellowship conference, usually held in late summer.
- Objective 1.6: All of the fellowship recipients will be subject to longitudinal tracking. At least 80% of award recipients will respond to the longitudinal tracking survey.

- Objective 1.7: Based on national statistics on minority enrollment in N.J. colleges, at least 28% of all student awards and other direct support will be awarded to students from underrepresented minorities. At least 45% of all award recipients will be female students and faculty.

Goal 2: To promote research activities that are relevant to NASA and New Jersey industry, to build research networks and to create pipelines from research to industrial development, and support STEM workforce development. To support junior faculty and graduate students in research, to increase diversity among researchers and graduate students.

- Objective 2.1: \$0 will be awarded for Support of New Jersey Research Centers to collaborate with their activities in aerospace research and publication during FY2012. (A NJSGC program to be revived when budgets rise).
- Objective 2.2: \$2,000 will be provided for Travel Support to students (undergraduate and graduate) and faculty in New Jersey universities to attend scientific conferences and technical meetings.
- Objective 2.3: The Research Clusters and Mini Grants program will provide \$30,121 to research clusters in NJ universities or to junior faculty in STEM.

Goal 3: To produce diverse and well-educated college graduates in STEM who will be inspired by their NJSGC experience and will be motivated to pursue careers in STEM and aerospace, as well as graduate study, thus creating a pipeline to the STEM workforce. To nurture interdisciplinary approaches and to develop higher education networks.

- Objective 3.1: Allocate \$6,000 for support of Design Projects that will foster a higher education network in New Jersey and give design and hands-on experience to students.
- Objective 3.2: Allocate \$7,000 for a Industry Co-Op/Internship program for students to receive co-op or internship experience.
- Objective 3.3: \$4,000 will be allocated for the Aerospace Course Development program, for N.J. faculty to develop new college courses in aerospace and teach them.
- Objective 3.4: \$15,000 will be allocated for the Princeton University Suborbital Flight Higher Education and Research program, for Princeton University students and faculty to develop projects and to conduct research that is related to suborbital flight.
- Objective 3.5: \$24,000 will be allocated for programs for Minority Student Development for Graduate Study (RiSE).
- Objective 3.6: \$10,000 will be provided to New Jersey Universities for Summer Development programs for entering freshmen and for K-12 college bridge programs.
- Objective 3.7: \$15,000 will be allocated to support academic teams participating in the NYCRI Summer Institute. Each team will have a high school student, and an undergraduate or graduate college student, to conduct research at a New Jersey University.
- Objective 3.8: \$11,000 will be allocated to New Jersey college faculty members and students to participate in the Rock-SAT workshops.
- Objective 3.9: \$13,000 will be allocated for the running of K-12 bridge programs, which connects K-12 students with college faculty and industrial experts for a summer of enrichment.

Goal 4: Keeping in mind New Jersey's shortage for science teachers and the astronomy standards imposed on the K-12 curriculum statewide, to inspire, motivate, and improve

the quality of New Jersey's math and science teachers by means of teacher training, educational outreach and professional development programs.

- Objective 4.1: Allocate \$21,000 to support science Teacher Training programs at Raritan Valley Community College, Rutgers University, as well as at other institutions.
- Objective 4.2: At least 80% of teachers will respond to our survey. At least 75% of teachers will have used their training within a year and 90% within two years of receiving their training. At least 75% of participating teachers will have used their training within a year of receiving their training and 90% will have used their training within two years of receiving their training (PART Measure).

Goal 5: To stimulate a broad interest in, and an understanding of, various scientific and technical disciplines of interest to NASA by supporting informal education STEM programs. Promote awareness of NASA's mission and its contribution to society.

- Objective 5.1: \$4,000 will be allocated for support of planetarium and new programs.

Goal 6: NJSGC will be a proactive and diverse organization that is run efficiently and effectively. All activities will continuously be monitored and new initiatives pursued.

- Objective 6.1: NJSGC will have an effective, efficient and frugal office which continuously monitors itself, and whose documents are up to date. NJSGC will have well-defined operational policies and procedures for all of its activities.
- Objective 6.2: NJSGC will have a set of active affiliates who contribute to the programs of the consortium by serving on committees, publicizing NJSGC activities at their organizations, and by recruiting students and faculty to apply for NJSGC awards.
- Objective 6.3: NJSGC will actively seek alliances with aerospace and educational organizations in New Jersey, with NASA centers and with New Jersey elected officials.
- Objective 6.4: NJSGC will advertise its programs statewide and administer its programs competitively and fairly. Applicants will be evaluated without bias or any artificial criteria.
- Objective 6.5: NJSGC will track all its major award recipients to monitor their progress and to evaluate the effectiveness and success of its programs. We will administer satisfaction surveys.
- Objective 6.6: NJSGC will continuously monitor its offerings and modify or discontinue programs that are not effective, have run their course or have not met expectations.

Goal 7: NJSGC will strive for diversity in all of its programs and will make its awards in a way that reflects the diversity of the state of New Jersey. NJSGC will inspire members of the minority community to choose careers in STEM and will work with minority serving institutions in New Jersey and as well as other states, supporting them with funding, fellowships and internships.

- Objective 7.1: Based on national statistics on minority enrollment in New Jersey colleges, at least 28% of all student awards and other direct support will be awarded to students from underrepresented minorities. At least 45% of all award recipients will be female students and faculty.
- Objective 7.2: NJSGC will actively engage and support minority serving institutions in New Jersey and in nearby states, universities with sizable minority populations, such as Rutgers Newark and Rutgers Camden, as well as community colleges.

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

Outcome 1 - Educate and Employ. We continue to respond to affiliate requests to tailor our programs to affiliate needs and opportunities as they arise. For example, the research cluster program has now become a dominant part of the research clusters and mini grants program. We have shifted our focus to primarily support students.

Outcome 1 - Educate and Employ. We continue to allocate more funding to the academic year fellowship program. The NJS GC network of affiliates include small colleges without major research or graduate STEM programs. Academic year fellowships usually are the only support we can provide them.

Outcome 1 - Educate and Employ. Due to ongoing budget cuts, we have reduced the amount of summer fellowship awards from \$6,000 to \$4,000. This will maintain support of the same number of students (9) in FY2012 as we did last year.

Outcome 2 - Engage and Educate. Three of the six Rock-On students who participated in the 2010 program have graduated into the Rock-SAT-C program in 2011 and 2012. They have increased their expertise and gained experience in building and integrating rocket payloads. They are mentoring six new Rock-SAT-C students in 2013. The program has also helped two juniors (Mark Siembab and Ethan Hayon) obtain summer jobs in 2013.

## PROGRAM ACCOMPLISHMENTS

### Outcome 1 Activities:

Over 80% of NJS GC's programmatic expenditures are for Outcome 1 activities.

NJS GC runs three fellowship programs: undergraduate Academic Year Fellowships (23 at \$2,000 each), undergraduate Summer Fellowships and NASA Academies (10 students for a total of \$42,000), and Graduate Fellowships (3 for a total of \$22,000). This year, we are supporting nine summer fellows and one NASA Academy student (at Goddard).

While fellowship programs do not require match, NJS GC asks the institutions receiving graduate fellowships to provide a more than one-to-one match. The maximum fellowship amount we allocate, \$7,500, is much lower than the cost of graduate education. During 2012, we reduced the number of Graduate and NASA Center fellowships and we increased the number of Academic Year fellowships. We reduced the summer fellowship stipend to \$4,000, to maintain the program at the same headcount as in prior years.

NJS GC holds two fellowship conferences each year to feature the activities of its award recipients. One meeting is held in April, with all the academic year fellows highlighting their work in a poster session. The poster session is preceded by the NJS GC annual affiliate meeting, to which legislators at the state and national levels are invited. The second meeting is held in August, where the summer fellows and research cluster participants

make presentations. Also, NJSGC-supported students in other programs, such as RiSE and NYCRI, make presentations at those organizations conferences. Thus, there are four (poster and presentation) venues for NJSGC students to make research presentations.

NJSGC considers all fellowship recipients as direct funded and tracks them.

In research, NJSGC shifted the focus of its research clusters-mini grants program to primarily support students. In FY2012, NJSGC is supporting research clusters at Rowan, Princeton, as well as Ramapo College students at NJIT. The total number of students supported is 10 (4 at Rowan, 3 at NJIT, and 3 at Princeton).

Among Outcome 1 programs in higher education, NJSGC supported the following:

- The Senior or Multiyear Design Project program provides support to design projects in New Jersey universities for project supplies.
- The NJSGC Co-Op/Internship program integrates learning with hands-on development work at a NASA contractor or other aerospace company. Hamilton Sundstrand has been our primary partner. This year we introduced a new opportunity with “JAK Tool and Model, LLC”. During FY2012, NJSGC is supporting one student at each organization. NJSGC has cut back co-op programs as our NASA budget has diminished.
- The Course Development program supports higher education institutions to develop new STEM courses and programs related to astronomy, aeronautics and space sciences. NJSGC this year is supporting Rutgers University to develop a B.S. degree program in aerospace engineering. Apart from the small aerospace engineering program at Princeton, this new degree program will be the only one of its kind within a 150 mile radius.
- Because of contacts established with EOF offices (EOF, or Equal Opportunity Fund, is a program established by the state of New Jersey to improve minority college enrollment and retention rates.) NJSGC supports summer courses and curricula for incoming first-year science and engineering minority students.
- The suborbital science program is continuing at Princeton. Students involved do research on issues related to suborbital flight. This program will end in FY2013.
- The Minority Student Support for Graduate Study program currently supports the Research in Science and Engineering (RiSE) program, run by the Graduate School, New Brunswick, offices of Rutgers University. Through a focused summer program, RiSE recruits, trains and encourages promising underrepresented, disadvantaged and underserved undergraduate students in STEM disciplines, and prepares them for graduate school and research. This program fully aligns with NASA objectives. This year, NJSGC is supporting five students.

#### Outcome 2 Activities:

The NJSGC Outcome 2 activities consist of Higher Education and Pre-College programs. NJSGC has increased its outcome 2 activities, especially involving teacher training to improve the teaching of science in K-12.

- In higher education, we continued supporting the New York City Research Initiative (NYCRI), a program which brings together high school students, college students and

high school teachers in a hands-on environment during the summer. While this program is run out of the NYCRI offices in New York City, the participants that NJSGC sponsors are New Jersey students. We are supporting two groups of students in FY2012 for a total of eight individuals (5 at Stevens and 3 at Rutgers).

- NJSGC initiated participation in the Rock-ON program in 2010 by sending Joseph S. Miles, NJSGC's Program Coordinator. In 2011, six students attended Rock-ON. Three of the original six students attended the 2012 Rock SAT-C program. During FY2012 the three original students are mentoring six new students.
- During FY2012, NJSGC initiated support of the Helicopter/UAV workshop coordinated by the Connecticut Space Grant Consortium. NJSGC sponsored two students who expect to align their careers with helicopter technology.
- NJSGC bridge programs provide a link between high school and college as well as summer experiences for entering college freshmen. During FY2012 several programs were maintained and others were scaled back due to budget cuts.
  - The TARGET (The Academy at Rutgers for Girls in Engineering and Technology) program at Rutgers sponsors female high school students during the summer and introduces them to a hands-on engineering experience. Mentoring is provided by engineering faculty. During the academic year, female engineering students provide mentoring. NJSGC is funding about 15% of the program in FY2012.
  - The Liberty Science Center Partners in Science program brings together high school students, primarily from disadvantaged areas, for a summer of enrichment under the tutelage of an industry professional. We have reluctantly reduced support of this program due to budget cuts.
  - The MEET (Minority Engineering Education Task) program is a student group at Rutgers that promotes the study of engineering. While it was funded in FY2011, it was not in FY2012 as we did not receive a proposal from them. The GIST (Girls in Science and Technology) program did not run in FY2012 because Georgian Court University, who runs the program, is evaluating their approach to K-12 outreach.

The Pre-College programs consist of teacher training. NJSGC has diversified its support of our teacher training activities. In FY 2012, besides the New Jersey Astronomy Center for Education at Raritan Valley Community College, NJSGC is also funding Pre-service science teacher training program, jointly run by Rutgers School of Education and Rutgers School of Engineering. The Rutgers School of Education is one of our newer partners.

#### Outcome 3 Activities:

NJSGC supports informal education programs only minimally, about 1% of its budget. Our informal education programs are primarily planetarium support, which include the planetarium at Raritan Valley Community College (and Edelman Planetarium at Rowan in the past). Both planetariums provide formal education in astronomy to students, and to the public on a weekly basis as public planetarium shows.

#### Activities that can be classified under All Outcomes:

- NJSGC uses databases in the management of the consortium and for longitudinal tracking. All tracked students are required to complete pledge forms. These students agree to provide information regarding their whereabouts and career progressions for 10 years after the completion of their projects, or through their first job.
- NJSGC also continues to enhance and upgrade its Website (<http://njsgc.rutgers.edu/>) to attract more viewers to advertise its programs.

## PROGRAM CONTRIBUTIONS TO NASA EDUCATION PERFORMANCE MEASURES

### Student Data and Longitudinal Tracking:

Because the NJSGC award year begins in September, many of the awards are made during the summer before the end of the award year. As such, some of our affiliates have not reported on the statistics of the award recipients for FY2012. Our mostly complete data, based on 53 direct funded students, shows a 32% minority (17/53, target 28%) and 40% female (21/53, target 45%) participation. The female percentages are the same as last year and the minority participation is better (up from 29%).

Because of budget cuts, NJSGC has made the decision to reduce research support to faculty. We are not supporting anyone this year. We continue to support faculty for course development.

NJSGC has in place an aggressive longitudinal tracking program. We summarize that 85% of our FY 2012 awardees were continuing in STEM fields, 10% were not, and 5% of the awardees were unreachable. Some of our awards for FY2012 have not been made yet, especially those involving minority students. We will have more details when we complete the requisite spreadsheets that will become due late summer of 2012.

### Diversity:

New Jersey is a very diverse state, with a college population that is 28% minority. Most universities in the state have enrollments that reflect this. All the major universities with sizable STEM programs are members of NJSGC, so that NJSGC is able to reach almost all minority college students in STEM subjects.

### Minority-Serving Institutions:

There are no historically black or other minority institutions in New Jersey. However, because of their location, there are two four-year institutions classified as minority-serving. The largest is the New Jersey City University, which is an affiliate of NJSGC. The second, St. Peter's College, has been contacted by NJSGC but they have shown no interest (we will try again this year). In addition, their STEM offerings are very small. NJSGC has developed excellent relationships with the following minority-serving institutions:

- Essex County College, which has a high African American and Hispanic enrollment. We have awarded them three academic year fellowships in each of the 2010 and 2011 budget years. We frequently visit them to develop new programs and courses. However for 2012, they could not identify any qualified candidates for fellowships.
- The New Jersey City University is listed as an institution with “High Hispanic Enrollment.” We support them with academic year fellowships. We have also collaborated with them in proposal writing.

#### NASA 2012 Education Priorities

***Authentic, hands-on student experiences in science and engineering disciplines – the incorporation of active participation by students in hands-on learning or practice with experiences rooted in NASA-related, STEM-focused questions and issues; the incorporation of real-life problem-solving and needs as the context for activities.***

We have supported research clusters, fellowships, and we have sent six students to Rock-SAT. Most of our direct funded students receive this type of experience as they work in the labs of New Jersey universities.

In FY2012, NJS GC initiated support for the Helicopter workshop sponsored by the Connecticut Space Grant Consortium. NJS GC sent two students to the workshop.

***Diversity of institutions, faculty, and student participants (gender, underrepresented, underserved)***

- Awards: 32% minority (17/53, target 28%) and 40% female (21/53, target 45%) participation. The minority percentages are stronger than last year and the female participation is the same.
- NJS GC has continued with supporting the RiSE program at Rutgers, where minority college students from across the country come to the Rutgers campus and conduct research. They also receive mentoring and tutoring about graduate school.
- We have expanded our relationship with offices at colleges that promote minority enrollment and retention.
- We have expanded our relationship with New Jersey City University. NJCU is the one of two four-year academic institutions that qualifies as minority-serving and they have a relatively large science program.
- We have expanded our relationship with Bloomfield College, which has a sizable minority enrollment (nearing 50%, primarily because of its proximity to Newark), and we have sponsored two academic-year fellows annually.
- NJS GC has geographic diversity in all its programs. From Ramapo College, at the northern boundary of the state, to Rowan University in southern New Jersey, we have programs at most New Jersey colleges. We make efforts to ensure that each congressional district is represented among our award recipients. There are at least three direct funded students from each congressional district.

***Engage middle school teachers in hands-on curriculum enhancement capabilities through exposure to NASA scientific and technical expertise. Capabilities for teachers***

***to provide authentic, hands-on middle school student experiences in science and engineering disciplines (see above).***

We are building a network of K-12 science and math teachers. We keep lines of communication open with the New Jersey Department of Education Science Coordinator. We support teacher training efforts in several venues (Raritan Valley Community College, Rutgers, Rowan in the past) and this year we have awarded Georgian Court University with a grant to support their teacher workshops.

***Summer opportunities for secondary students on college campuses with the objective of increased enrollment in STEM disciplines or interest in STEM careers.***

For FY2012, summer opportunities consisted mainly of two programs: TARGET, and the program at Liberty Science Center (LSC) Partners in Science program. The LSC program sends high school students to industrial corporations to do a 10 week research project. The TARGET (The Academy at Rutgers for Girls in Engineering and Technology) program sponsors female K-12 students during the summer and introduces them to a hands-on engineering experience.

***Community Colleges – develop new relationships as well as sustain and strengthen existing institutional relationships with community colleges.***

Presently, we have an excellent relationship with only one community college (Essex County) and good relations with two (Raritan Valley and Middlesex County). We are continuously working to develop contacts with other community colleges.

***Aeronautics Research – research in traditional aeronautics disciplines; research in areas that are appropriate to NASA's unique capabilities; directly address the fundamental research needs of the Next Generation Air Transportation System (NextGen).***

No funds allocated in FY2012. We are working with the FAA outreach offices to develop educational programs in aeronautics and air traffic control systems. Also, the director of NJSGC is co-chair of the Aeronautics Working Group and has made contacts at the Aeronautics Mission Directorate at NASA HQ. Unfortunately, FAA funding is also in limbo and it is a struggle to develop new programs with them.

***Environmental Science and Global Climate Change – research and activities to better understand Earth's environments.***

No funds allocated in FY 2012, but we are in talks with the New Jersey Sea Grant Consortium to develop collaborative research programs. Unfortunately, their funding has also gone down and it is a struggle to develop new programs with them.

***Enhance the capacity of institutions to support innovative research infrastructure activities to enable early career faculty to focus their research toward NASA priorities.***

In FY 2012, we have supported one junior faculty member with funding (Princeton sub-orbital). Several others have been supported indirectly, through support of their students. We are supporting the development of a B.S. degree in aerospace engineering at Rutgers. This program will lead to the hiring of junior faculty in aeronautics and space science.

## IMPROVEMENTS MADE IN THE PAST YEAR

- NJSGC is more active at the national level. The director of NJSGC was elected Secretary of the Executive Council of Space Grant Directors. Dr. Baruh is also co-chair of the Aeronautics Working Group.
- NJSGC initiated participation in the Helicopter/UAV Workshop coordinated by the Connecticut Space Grant Consortium by sending two students during June 2013.
- The Rock-On program has become successful. During FY2012, three of the original six participants attended the Rock-Sat program. These three students are mentoring six new students.
- The NJSGC team has continues to make periodic visits to targeted institutions to promote NJSGC programs. Because of our site visits and personal contacts, we are able to assess the needs and interests of our affiliates a better and we are tailoring our funding and programs to better serve their needs.
- NJSGC has expanded its relationships with programs at NJ colleges that provide support to incoming students and to other students to improve retention rates. We have created a partnership between Rutgers and Rowan that applied for the NASA CAN in December 2012 for improvement of retention rates in STEM.
- NJSGC has expanded its outreach efforts to attract and retain minority students in STEM, as can be observed from our diversity statistics, which this year have exceeded our targets. We have done this for high school students as well as college students.

## PROGRAM PARTNERS AND ROLE OF PARTNERS IN PROJECT EXECUTION

### Affiliate Partners:

Three-fourths of NJSGC members are active or very active partners of the consortium, and the remaining quarter are mildly active or engaged. Affiliate activity peaks and wanes over the years; many times having nothing to do with NJSGC itself. A lot depends on the campus representative. The list below (in alphabetical order) gives our evaluation of NJSGC affiliate institutions as very active, active, not very active and inactive, as well as key characteristics.

- Astronomy Education Center at Raritan Valley Community College. Very active, key player in our pre-college efforts. This organization is the teacher training arm of Raritan Valley Community College.
- Georgian Court University. Very active. We have funded them with academic year fellowships, K-12 bridge programs for higher education, and support of teacher workshops. A Jesuit institution with a small graduate program in teacher education, whose undergraduate college was all female and is in the process of transitioning to co-ed.
- Goddard Institute of Space Sciences. Active. Most of their activities are NASA funded. Their main affiliation with NJSGC is the New York City Research Initiative program, which NJSGC has supported for over 10 years.

- New Jersey City University. Very active. Designated minority-serving institution. We have partnered with them for responding to NASA solicitations. Public institution with a primarily undergraduate enrollment, with small graduate programs.
- New Jersey Institute of Technology. Active, we have funded research programs and bridge programs for graduate study. This public university provides undergraduate and graduate education mostly on STEM topics.
- Princeton University. Very active, we have funded research programs with them and historically sent their students to NASA Academies and centers. Very highly ranked private university.
- Rowan University. Very active, they are involved in research, fellowships, research clusters, and informal education. Originally a teachers college, they have become a comprehensive university with bachelors and masters programs.
- Rutgers. Very active. We have been working on increasing programs with Rutgers Newark and Rutgers Camden. Flagship state university with 58,000 students.
- Seton Hall University. Not very active. They recently rejoined and NJSJC funds academic year fellowships at Seton Hall. Jesuit university with a primarily liberal arts undergraduate enrollment.
- Stevens Institute of Technology. Very active. As former lead institution, they are active in all aspects of the consortium. Private university that provides undergraduate and graduate education in STEM topics.
- University of Medicine and Dentistry of NJ. Inactive, but this year it is merging with Rutgers. We expect them to nominate a representative when the merger is finalized.
- The College of New Jersey. Active. We have supported them with fellowships and research clusters. Small public college, with primarily undergraduate programs.

#### Non-Affiliate Partners:

- Liberty Science Center. We support their Partners in Science program. This program inspires high school students to pursue careers in STEM by providing hands-on, interactive research experiences with professionals in scientific fields. This program pairs 11th and 12th graders with scientists and engineers who serve as one-on-one mentors.
- Bloomfield College. Bloomfield College is a small independent college related to the Presbyterian Church. NJSJC supports academic year fellowships at Bloomfield College. We currently are working with them to develop research clusters.
- Ramapo College. NJSJC supports a research cluster of Ramapo physics students, who conduct research at NJIT during the summer. These students then apply for graduate study at NJIT (Ramapo does not have a graduate program in physics).
- RiSE - Research in Science and Engineering. This program, which is run by the Graduate School at Rutgers University, is a strong magnet to attract minority students to STEM and encourage these students to continue on to graduate school. One of the objectives is to create a STEM pipeline into graduate study.
- FAA and New Jersey Sea Grant Consortium. Our best efforts to establish programs with these organizations have not been very successful so far. Both organizations suffer from cuts and sequestration, which makes them hesitant to develop new programs, with us or with others. We have not given up and will continue trying.

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- **The National Space Grant Office requires two annual reports, this Annual Performance Data Report (APD) and the Office of Education Performance Measurement System (OEPM) report. The former is primarily narrative and the latter data intensive. Because the reporting timeline cycles are different, data in the two reports may not necessarily agree at the time of report submission. OEPM data are used for official reporting.**
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