

EDUCATION

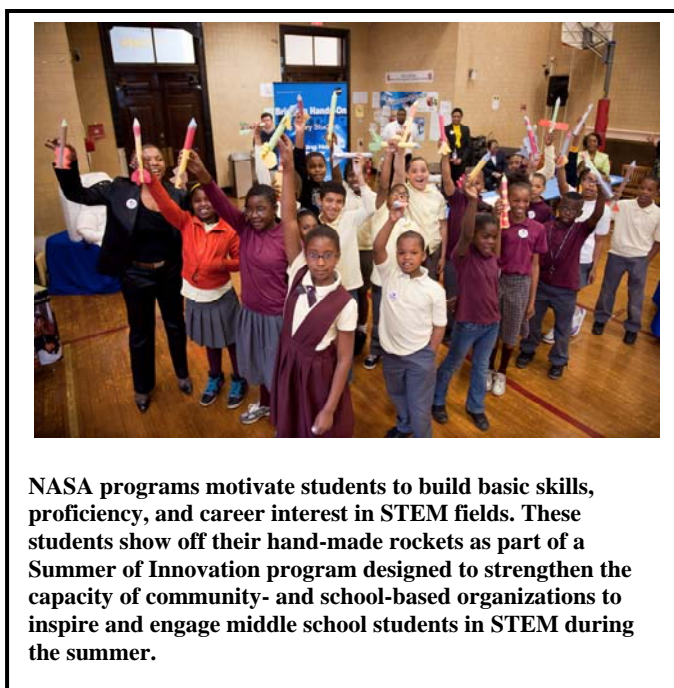
Budget Authority (in \$ millions)	Actual	Estimate	FY 2013	Notional			
	FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President's Budget Request	145.4	136.1	100.0	100.0	100.0	100.0	100.0
Aerospace Rsch. and Career Development	70.4	56.1	33.0	33.0	33.0	33.0	33.0
STEM Education and Accountability	75.0	80.0	67.0	67.0	67.0	67.0	67.0

EDUCATION OVERVIEW	EDUC- 2
AEROSPACE RESEARCH AND CAREER DEVELOPMENT	EDUC- 6
NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP	EDUC- 8
PROGRAM (SPACE GRANT)	
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE	EDUC- 13
RESEARCH (EPSCoR)	
STEM EDUCATION AND ACCOUNTABILITY	EDUC- 18
MINORITY UNIVERSITY RESEARCH AND EDUCATION	EDUC- 24
PROGRAM (MUREP)	

EDUCATION

FY 2013 BUDGET

Budget Authority (in \$ millions)	Actual Estimate		FY 2013	Notional			
	FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President's Budget Request	145.4	136.1	100.0	100.0	100.0	100.0	100.0
Aerospace Rsch. and Career Development	70.4	56.1	33.0	33.0	33.0	33.0	33.0
STEM Education and Accountability	75.0	80.0	67.0	67.0	67.0	67.0	67.0
Change From FY 2012 Estimate	--	--	-36.1				
Percent Change From FY 2012 Estimate	--	--	-26.5%				



NASA programs motivate students to build basic skills, proficiency, and career interest in STEM fields. These students show off their hand-made rockets as part of a Summer of Innovation program designed to strengthen the capacity of community- and school-based organizations to inspire and engage middle school students in STEM during the summer.

NASA's education programs inspire interest in science, technology, engineering and mathematics (STEM) among America's youth and have a positive impact on the number of students who are proficient in STEM and choose to pursue careers in STEM fields. NASA increases the pool of future STEM workers, thus contributing to the workforce of the future by attracting and retaining students in STEM disciplines. With these efforts in STEM education, NASA helps the United States remain globally competitive and sustain a strong national economy. NASA Education accomplishes its mission through mutually beneficial relationships with over 500 colleges and universities, hundreds of elementary and secondary schools and school districts, and over 400 museums and science centers. NASA works through communities of practice to identify content areas and special events that supplement programming offered

by informal education organizations. These relationships provide educational experiences that engage Americans in NASA's mission, while building strategic partnerships that promote STEM literacy.

NASA provides practical experience and STEM skills development through internships, fellowships, and student research opportunities. NASA attracts students to pursue STEM study and careers through its remarkable missions, by fostering collaborative relationships between students and the current workforce, and offering students opportunities to work in facilities that provide excellent learning experiences. Additionally, hands-on challenges with expert mentors generate increased interest in undergraduate STEM study, thereby increasing the number of students who seek employment in aerospace or related STEM fields.

Education staff at NASA Centers work with professional organizations, academia, local state departments of education and school districts to identify and address content needs and opportunities in STEM education. They also work with university partners to ensure that NASA investments will be effective in improving STEM teaching methods.

EDUCATION

EXPLANATION OF MAJOR CHANGES FOR FY 2013

In FY 2013, decreases in funding authority due to budget reductions will be managed by reducing the number of new grant awards and seeking operational efficiencies (e.g., increased use of education technologies, reduced printing/warehousing/shipping costs, reduced travel expenses, and coordinated solicitations).

ACHIEVEMENTS IN FY 2011

- NASA's K-12 education projects reached more than 1,000,000 students through STEM programs and initiatives, including the Summer of Innovation project.
- More than 67,000 elementary and secondary educators participated in NASA education programs. NASA successfully reached almost 100,000 educators along the full length of the education pipeline, of which almost 28,000 participated in NASA's national higher education programs.
- The NASA Explorer Schools (NES) project served as NASA's classroom-based gateway for middle and high school students and engaged 170,000 students in STEM education activities through 1,300 participating educators across all 50 states.
- NASA's interactive "For Educators" section on <http://www.nasa.gov> was named one of the top ten Web sites with free resources for educators.
- NASA's Higher Education projects engaged more than 4,000 students in STEM fields through internship and fellowship opportunities.
- The One Stop Shopping Initiative and single online portal continued to demonstrate significant contributions in attaining qualified interns and connecting NASA to more than 500 universities nationwide through the National Space Grant College and Fellowship Program and other projects.
- Several universities designed CubeSats and participated in the first NASA education launch of nanosatellites as part the Glory satellite launch. Although the satellite failed to reach orbit, the students had invaluable hands-on experience as they designed, built, and integrated their nanosatellites.

KEY ACHIEVEMENTS PLANNED FOR FY 2013

In FY 2013, NASA will refine the focus of its STEM education program by:

- Focusing competitive opportunities for learners and educators on middle school pre- and in-service educator professional development;
- Providing experiential opportunities, internships, and scholarships for high school and undergraduate students;
- Using NASA's unique missions, discoveries, and assets to inspire student achievement and educator teaching ability in STEM fields; and
- Aligning projects and activities with the five-year STEM strategic plan issued by the Office of Science and Technology Policy Committee on STEM.

NASA will also increase its role in national and state STEM policy discussions and place more emphasis on project evaluation, and external, independent evaluation and assessment, to ensure that investments are providing desirable STEM impacts.

EDUCATION

BUDGET EXPLANATION

The FY 2013 request is \$100.0 million. This represents a \$36.1 million decrease from the FY 2012 estimated (\$136.1 million). The FY 2013 request includes:

- \$24.0 million for the National Space Grant College and Fellowship Program (Space Grant), a Nationwide network of colleges, universities, and other organizations that provide NASA space-related opportunities to students, educators, and the public;
- \$9.0 million for the Experimental Program to Stimulate Competitive Research (EPSCoR), which provides competitive research opportunities to institutions in targeted states;
- \$30.0 million for the Minority University Research and Education Program (MUREP), which provides NASA research and study opportunities to students of underserved and underrepresented groups; and
- \$37.0 million for STEM Education and Accountability projects, which provide competitive opportunities, foster innovative education efforts at NASA Centers and through grantees, and formal evaluation activities.

NASA will align the activities conducted by each of these projects with the priorities identified in the five-year STEM strategic plan issued by the Office of Science and Technology Policy Committee on STEM. The Agency will coordinate the education activities within NASA's mission directorates, the Office of the Chief Technologist, and Centers to ensure their educational activities are well integrated with the programs proposed to be funded in this account. The Office of Education proposes to allocate 63 percent of its funding in support of three successful existing programs: Space Grant, EPSCoR, and MUREP. The remaining funds are proposed for competitive opportunities to support innovative education efforts at NASA Centers and through grantees.

NASA will also continue to focus its funds on existing commitments and grant renewals, the continuation of scholarships, internships and fellowships, and activities that directly serve educators, learners, and institutions.

Programs

AEROSPACE RESEARCH AND CAREER DEVELOPMENT

The Aerospace Research and Career Development program strengthens the research capabilities of the Nation's colleges and universities and provides opportunities that attract and prepare increasing numbers of students for NASA-related careers. The student programs serve as a major link in the pipeline for addressing NASA's human capital strategies. The programs build, sustain, and effectively deploy the skilled, knowledgeable, diverse, and high-performing workforce needed to meet the current and emerging needs of NASA and the Nation. The research conducted contributes to the research needs of NASA's Mission Directorates and advances the Nation's scientific and technology innovation agendas.

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

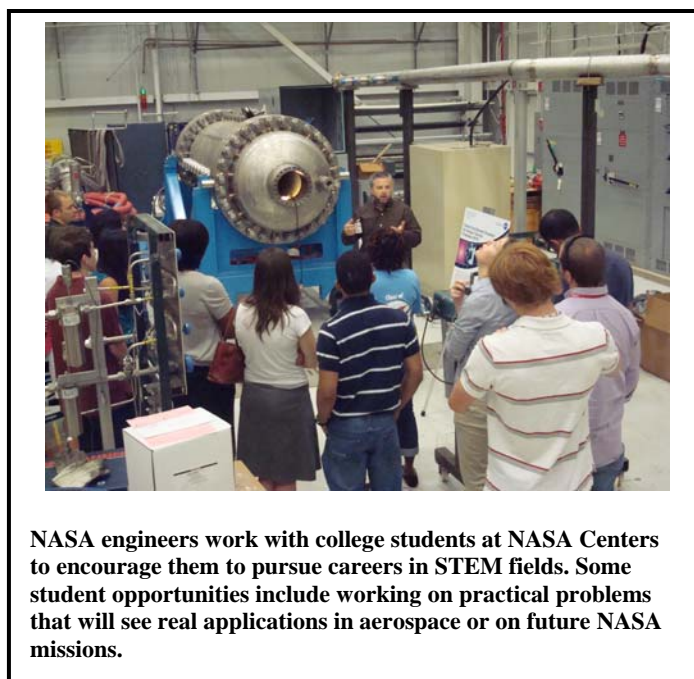
The STEM Education and Accountability program provides competitive opportunities for NASA Centers, visitor centers, institutions of informal education, schools, universities, and non-profit organizations. These groups develop lessons, materials, research opportunities, and hands-on activities that draw on NASA's unique missions. The program includes learners from kindergarten through graduate school, educators in the classroom and in informal learning environments, college faculty, and the general public. The program emphasizes undergraduate participation in STEM research and education, preparing future scientists and engineers to enter the STEM workforce. Consistent with input received from the National Science and Technology Council Committee on STEM, NASA will provide middle school pre-service and in-service educators with NASA-themed experiences that build critical instructional STEM skills, and better enable them to motivate students in STEM. NASA activities and experiences spark interest in STEM and expose students to new career paths. Educators, both in schools, and in museums, science centers, and in community-based education organizations, will enhance their teaching practices with NASA-themed materials, experiences, and teaching strategies. NASA will engage learners of all ages through its missions, engineering challenges, and scientific discoveries. The program also includes a more robust Evaluation, Performance Monitoring, and Accountability project that enables effective management of all education investments.

EDUCATION

**AEROSPACE RESEARCH AND CAREER DEVELOPMENT
(ARCD)**

FY 2013 BUDGET

Budget Authority (in \$ millions)	Actual	Estimate	FY 2013	Notional			
	FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President's Budget Request	70.4	56.1	33.0	33.0	33.0	33.0	33.0
Space Grant	45.5	38.9	24.0	24.0	24.0	24.0	24.0
EPSCoR	24.9	17.3	9.0	9.0	9.0	9.0	9.0
Change From FY 2012 Estimate	--	--	-23.1				
Percent Change From FY 2012 Estimate	--	--	-41.2%				



ARCD supports national STEM efforts through the Space Grant and EPSCoR. These national programs enable NASA to more strategically advance STEM literacy by enhancing science and engineering education and research efforts in higher education, K-12, and informal education. In addition to education, ARCD promotes research and technology development opportunities for faculty and research teams that advance the Agency's scientific and technical priorities.

EXPLANATION OF MAJOR CHANGES FOR FY 2013

NASA realigned projects and activities that previously resided in the Higher Education program to the newly formed ARCD in FY 2012.

ACHIEVEMENTS IN FY 2011

ARCD is a new programmatic structure in FY 2012. The projects included in this program were contained in the Higher Education program in FY 2011. In 2011, NASA supported 23,000 students in Space Grant, over 1,000 partners as members of the consortia, and awarded over \$22 million to EPSCoR eligible states.

EDUCATION

AEROSPACE RESEARCH AND CAREER DEVELOPMENT (ARCD)

KEY ACHIEVEMENTS PLANNED FOR FY 2013

The ARCD program is designed to increase the number of students pursuing STEM degrees and careers and to enhance the capacity of institutions to participate in NASA's mission. The program will align with the priorities of the Co-STEM Education Strategic Plan and engage approximately 11,000 students and over 800 affiliates in this effort.

BUDGET EXPLANATION

The FY 2013 request is \$33.0 million. This represents a \$23.1 million decrease from the FY 2012 estimate (\$56.1 million). The FY 2013 request includes:

- \$24.0 million for Space Grant, a nationwide network of colleges, universities, and other organizations that provide NASA opportunities to students, educators, and the public; and
- \$9.0 million for EPSCoR, which will provide NASA research opportunities for 29 selected jurisdictions (28 states plus the Commonwealth of Puerto Rico).

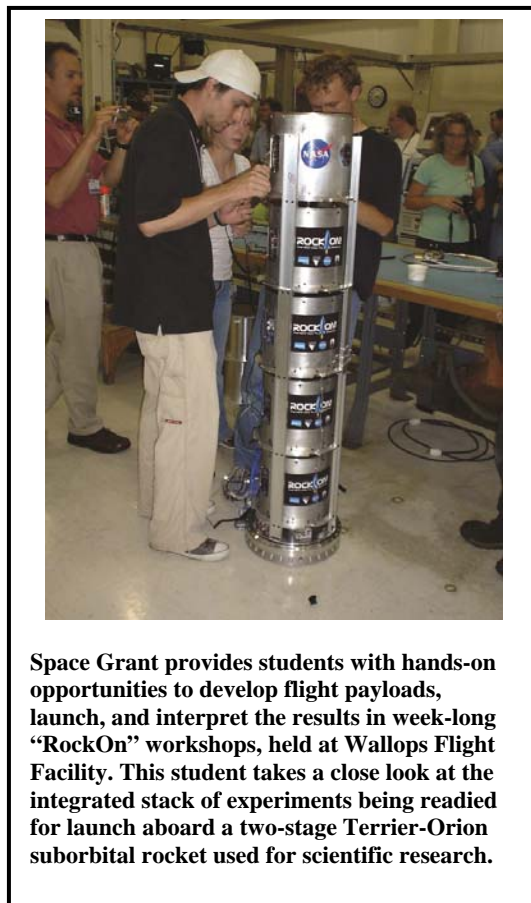
EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations
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FY 2013 BUDGET

Budget Authority (in \$ millions)	Prior	Actual Estimate		FY 2013	Notional			
		FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President’s Budget Request	45.6	45.5	38.9	24.0	24.0	24.0	24.0	24.0
Change From FY 2012 Estimate	--	--	--	-14.9				
Percent Change From FY 2012 Estimate	--	--	--	-38.3%				



Space Grant provides students with hands-on opportunities to develop flight payloads, launch, and interpret the results in week-long “RockOn” workshops, held at Wallops Flight Facility. This student takes a close look at the integrated stack of experiments being readied for launch aboard a two-stage Terrier-Orion suborbital rocket used for scientific research.

Space Grant enables the active involvement of the entire country in NASA activities through its national network composed of 52 consortia in 50 states, the District of Columbia, and the Commonwealth of Puerto Rico. Space Grant supports and enhances science and engineering education and research efforts for educators and learners, by leveraging the resource capabilities and technologies of over 1,000 affiliates from universities, colleges, industry, museums, science centers, and state and local agencies. Training grants with each consortium align their work with the education priorities and the annual performance goals of the Agency.

Space Grant enables NASA to provide opportunities for student flight projects to access space to gain research and hands-on engineering experiences on a variety of authentic flight platforms, including high-altitude balloons, sounding rockets, aircraft, and space satellites. Space Grant leverages Agency investments in STEM education through collaborations with other national NASA education projects, including those conducted by NASA mission directorates and Centers. Space Grant also supports student participants in internship experiences at NASA Centers.

EXPLANATION OF MAJOR CHANGES FOR FY 2013

No changes.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations
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ACHIEVEMENTS IN FY 2011

In FY 2011, over 23,000 Space Grant-supported undergraduate and graduate students participated in scholarships, fellowships, internships and authentic hands-on research and engineering challenges. Diversity is a key component within the Space Grant project, achieving a 26 percent participation of underrepresented students in Space Grant activities.

KEY ACHIEVEMENTS PLANNED FOR FY 2013

Space Grant will continue to provide competitive funding opportunities to consortia in all 50 states, Washington D.C. and Puerto Rico. NASA will issue competitive announcements for consortia to engage in hands-on experiences, professional development for educators, research experiences for learners, and opportunities for teams of students and faculty to participate in NASA’s aeronautics and exploration missions. NASA anticipates Space Grant consortia involvement in the research and exploration agendas of all mission directorates, and approximately 11,000 students awarded internships, fellowships or other experiential opportunities.

BUDGET EXPLANATION

The FY 2013 request is \$24.0 million. This represents a \$14.9 million decrease from the FY 2012 estimate (\$38.9 million). The FY 2013 request includes:

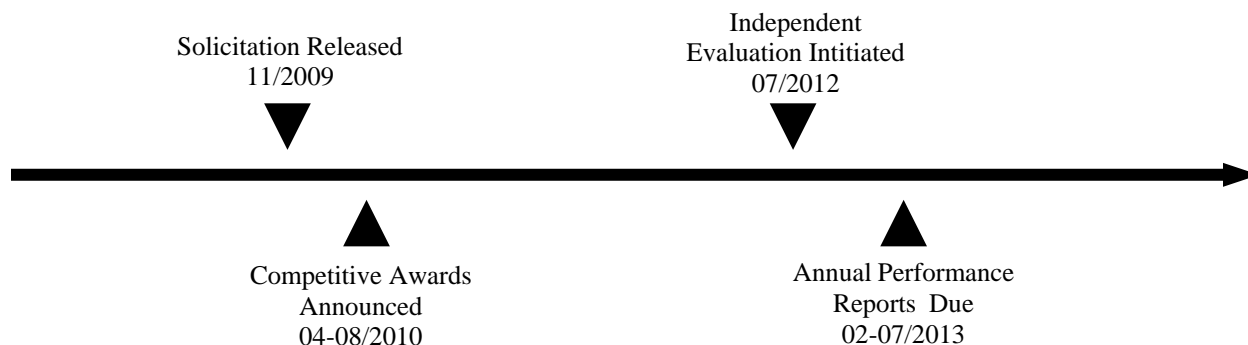
Space Grant proposes to:

- Provide competitive grant opportunities for 52 consortia in each state plus the District of Columbia and the Commonwealth of Puerto Rico;
- Provide hands-on experiences for U.S. graduate and undergraduate students to prepare them for future workforce and/or academic careers; and
- Conduct state-based programs and projects along the education pipeline including pre-college, higher, and informal education.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations
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Project Schedule



Project Management & Commitments

The Space Grant Program Manager is based at NASA Headquarters and provides management responsibility for day-to-day Space Grant operations. Space Grant operates through a network of 52 consortia in 50 states, the District of Columbia, and the Commonwealth of Puerto Rico. Lead institution selections are based on peer reviews by external panels that evaluate performance, and internal/external panels that assess performance, merit, and alignment to Agency education, research, and technology goals. Each consortium program or project must demonstrate alignment with NASA education objectives that align with NASA strategic goals.

Acquisition Strategy

MAJOR CONTRACTS/AWARDS

NASA solicits Space Grants through full and open competition for proposals accepted from the lead institution of the Space Grant consortia in each state, Washington D.C., and the Commonwealth of Puerto Rico. Each consortium program or project must demonstrate alignment with NASA education objectives that align with NASA strategic goals. Lead institution selections are based on peer reviews by external panels that evaluate performance, and internal/external panels that assess performance, merit, and alignment to Agency education, research, and technology goals. Awards are typically for five years.

Consortia are required to submit annually performance data, student profile and award information (for students who meet the longitudinal tracking threshold), project information, and other performance data. The Space Grant Program Office also performs comprehensive program reviews every five years.

EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations
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INDEPENDENT REVIEWS

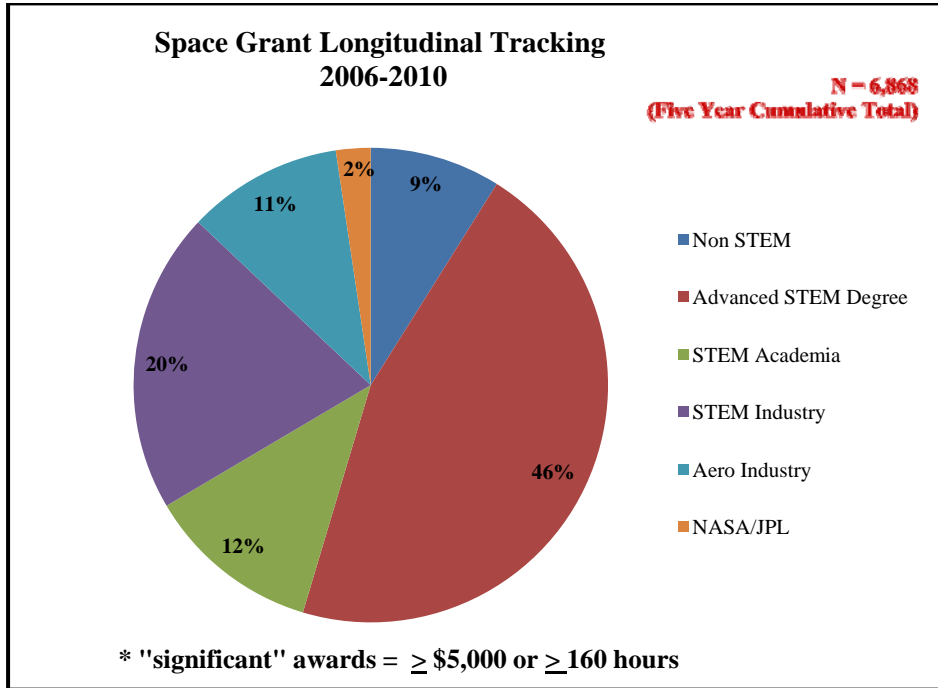
Review Type	Performer	Last Review	Purpose/Outcome	Next Review
Quality	Space Grant Executive Review Panel	2009	Merit review of performance by each consortium	2014
Independent/external	TBD	N/A	An independent review by an external organization to assess the accomplishments and strategy of the Space Grant program	Jul-12

Historical Performance

In FY 2011, Space Grant programs reached over 21,000 higher education participants, including 4,617 individuals receiving significant education and research support. Consistent with the definition of all Office of Education higher education student participants, significant awardees receive more than \$5,000 in monetary support or participate in activities of more than 160 hours in duration. Longitudinal tracking of significant student awardees indicates that typically over 90 percent of Space Grant award recipients either become employed in STEM fields after graduation or matriculate into an advanced STEM degree program. The following graph demonstrates student post-graduation employment in STEM career fields.

NATIONAL SPACE GRANT COLLEGE AND FELLOWSHIP PROGRAM (SPACE GRANT)

Formulation	Development	Operations
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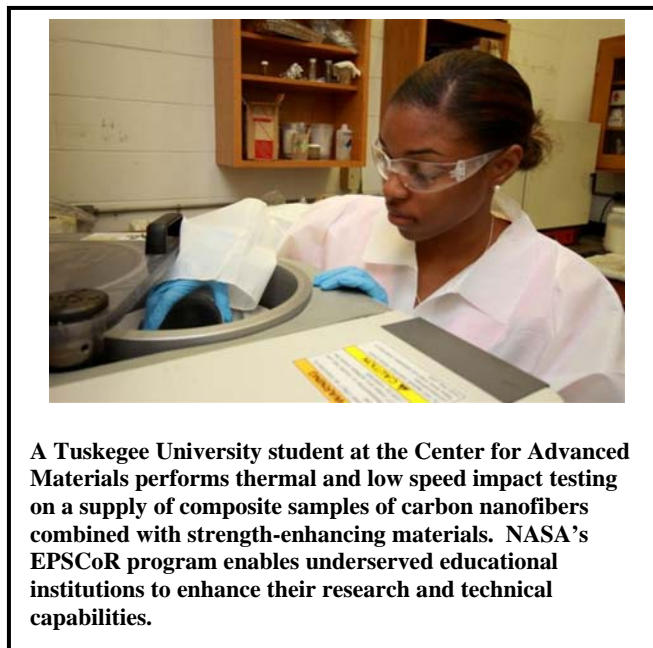


EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT:
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Formulation	Development	Operations
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FY 2013 BUDGET

Budget Authority (in \$ millions)	Actual Estimate			FY 2013	Notional				
	Prior	FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017	
FY 2013 President's Budget Request	25.0	24.9	17.3	9.0	9.0	9.0	9.0	9.0	
Change From FY 2012 Estimate	--	--	--	-8.3					
Percent Change From FY 2012 Estimate	--	--	--	-48.0%					



A Tuskegee University student at the Center for Advanced Materials performs thermal and low speed impact testing on a supply of composite samples of carbon nanofibers combined with strength-enhancing materials. NASA's EPSCoR program enables underserved educational institutions to enhance their research and technical capabilities.

EPSCoR establishes partnerships between government, higher education, and industry and promotes lasting improvements in the R&D capacity of that state or region. By improving research infrastructure, a region will improve its national R&D competitiveness and economy. EPSCoR develops academic research projects to establish long-term, self-sustaining and nationally competitive activities in states with modest research infrastructure so that they become more competitive in attracting non-EPSCoR funding.

EPSCoR funds states and regions that have not historically participated equally in Federal competitive aerospace and aerospace-related research activities. EPSCoR supports competitively funded awards in eligible states (as identified by NSF) and provides research technology development opportunities for

faculty and research teams. NASA actively seeks to integrate the research conducted by EPSCoR jurisdictions with the scientific and technical priorities pursued by the Agency.

EXPLANATION OF MAJOR CHANGES FOR FY 2013

In FY 2013, the reduced budget will result in fewer awards.

EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT:
**EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE
RESEARCH (EPSCoR)**

Formulation	Development	Operations
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ACHIEVEMENTS IN FY 2011

NASA received 51 proposals in response to its annual competitive call for research. NASA funded 27 proposals from 20 states with a net value of \$20 million over the three year term of the grants. The selected proposals represent research or technology development in each NASA mission directorate and the Office of the Chief Technologist. These awards expire at the end of FY 2013. Scientific and technical achievements by the research teams will be identified in the final reports.

KEY ACHIEVEMENTS PLANNED FOR FY 2013

In FY 2013, NASA EPSCoR will issue a competitive call for extramural research awards and will support the second of the five-year project's infrastructure development awards to build NASA connections. The research solicitation will focus on priority research and technology development needs of NASA mission directorates and the Office of the Chief Technologist.

BUDGET EXPLANATION

The FY 2013 request is \$9.0 million. This represents a \$8.3 million decrease from the FY 2012 estimate (\$17.3 million). The FY 2013 request includes:

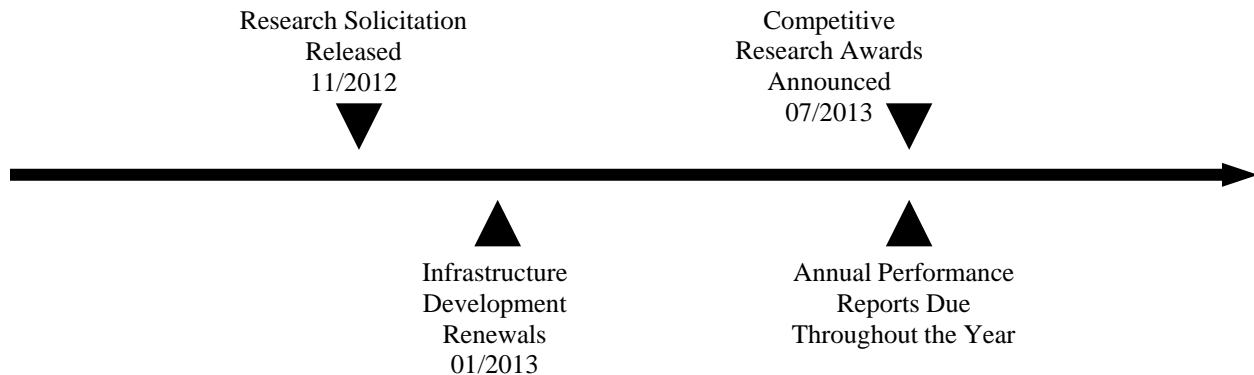
EPSCoR proposes to:

- Enabling opportunities for 29 jurisdictions (28 states plus Puerto Rico) to compete for research and technology development awards in areas of importance to NASA;
- Providing funding for Research Infrastructure Development cooperative agreements that connect jurisdiction researchers to NASA scientists and engineers, and research and technology development areas of importance to NASA; and
- Providing funding for peer-reviewed research cooperative agreements that build R&D capability and capacity within jurisdictions.

EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT:
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Formulation	Development	Operations
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Project Schedule



Project Management & Commitments

The EPSCoR Project Manager is based at KSC and provides management responsibility for day-to-day operations. Representatives from each of NASA’s Mission Directorates work closely with EPSCoR program management so that current and future research and engineering needs are reflected in EPSCoR solicitations. The mission directorate representatives serve as the proposal selection committee, further ensuring that the selected work contributes to NASA priorities. Technical monitors at the NASA Centers and Headquarters monitor and assess the progress of each award. They provide scientific guidance and technical advice throughout the year, as required, on the overall progress of the proposed effort, and review the annual progress report. Additional involvement may occur, depending upon the nature of the collaboration already established or desired. This includes integrating the EPSCoR research into ongoing activities or research efforts, and increasing the principal investigator and his or her team’s awareness of other related or relevant research in NASA.

NASA is a member of the Federal EPSCoR Interagency Coordinating Committee, chaired by NSF. The committee works to improve the leverage of Federal EPSCoR investments.

Acquisition Strategy

NASA solicits and awards EPSCoR through full and open competition among institutions from designated EPSCoR states. Each consortium program or project must demonstrate alignment with the goals of NASA’s education programs and the NASA Strategic Plan. Selections are based on peer reviews

EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT:
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Formulation	Development	Operations
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by external panels that evaluate technical merit and internal and external panels that assess content, merit, feasibility, and alignment to Agency education, research, and technology goals. Awards of up to three years may be made for research and awards of up to five years may be made for infrastructure development, depending on the availability of appropriated funds. Grantees are required to submit performance data annually.

INDEPENDENT REVIEWS

Review Type	Performer	Last Review	Purpose/Outcome	Next Review
Independent	National Academies	N/A	Cross-agency evaluation of EPSCoR and other Federal EPSCoR-like programs and accomplishments per H.R. 5116 America Competes Reauthorization of 2010.	2012

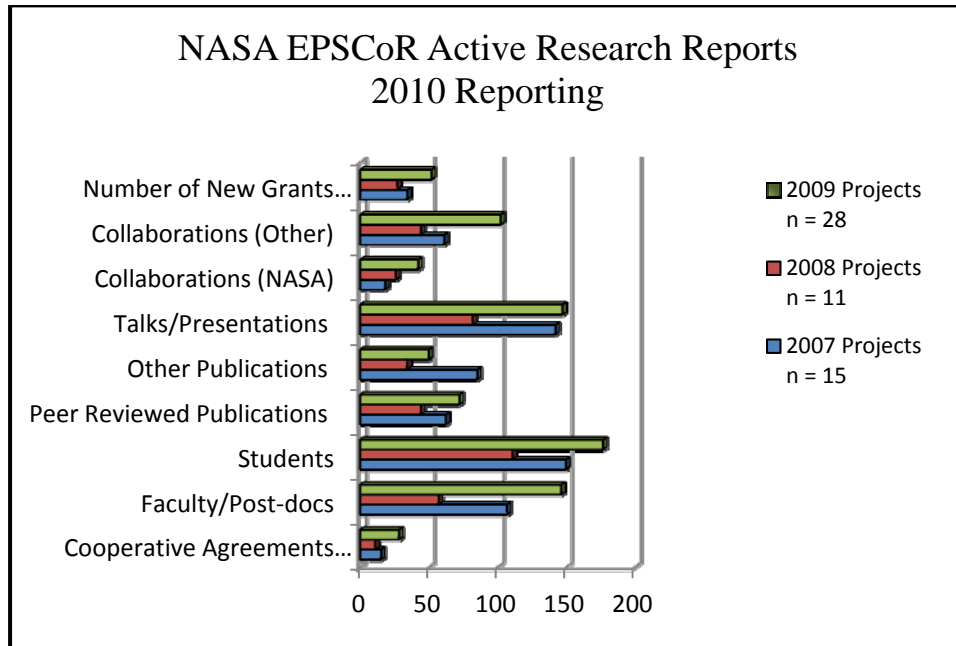
Historical Performance

The graph below shows overall achievements of the active research and infrastructure development awards in FY 2010, the most recent year for which data have been aggregated.

The data are consistent with the EPSCoR Interagency Coordinating Committee expectations to measure EPSCoR project performance and the Research Performance Progress Report established by the National Science and Technology Council, Committee on Science, Research Business Models Working Group,

EDUCATION: AEROSPACE RESEARCH AND CAREER DEVELOPMENT:
EXPERIMENTAL PROGRAM TO STIMULATE COMPETITIVE RESEARCH (EPSCoR)

Formulation	Development	Operations
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NASA's full report of accomplishments for EPSCoR can be found at <http://www.nasa.gov/offices/education/performance/index.html>.

STEM EDUCATION AND ACCOUNTABILITY

FY 2013 BUDGET

Budget Authority (in \$ millions)	Actual	Estimate	FY 2013	Notional			
	FY 2011	FY 2012		FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President's Budget Request	75.0	80.0	67.0	67.0	67.0	67.0	67.0
Minority University Research Education Program	28.5	30.0	30.0	30.0	30.0	30.0	30.0
STEM Education and Accountability Projects	46.5	50.0	37.0	37.0	37.0	37.0	37.0
Change From FY 2012 Estimate	--	--	-13.0				
Percent Change From FY 2012 Estimate	--	--	-16.3%				



NASA's Astro Camp at Stennis Space Center encourages young students ages 7-12 to participate in themed missions filled with exciting hands-on STEM experiments and activities. Astro Camp Saturdays are one-day science camps during the school year where "campers" take part in computer learning, onsite field trips and presentations by engineers and scientists.

The STEM Education and Accountability Program provides funding for NASA-unique STEM education opportunities. These opportunities include student internships at NASA Centers, launch initiatives, hands-on payload development, and competitive grants to higher education institutions, including minority-serving institutions and community colleges, as well as museums, planetariums, and NASA visitor centers. This program also provides students and educators with NASA's STEM content through a variety of innovative education technologies.

Through MUREP, NASA will continue to support the Nation's Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges through multi-year research grants. Additional MUREP-provided services include scholarships, internships, mentoring, and tutoring for underserved and underrepresented students in K-12, informal, and higher education settings. MUREP will broaden NASA's reach to

community colleges, as they demonstrably serve a high proportion of minority and underserved students, including those with disabilities. These efforts will help build students' STEM ability and prepare them for study at four-year institutions.

STEM Education and Accountability projects include the Formal and Informal Education (FIE), Innovations in Education (IE), and Evaluation, Performance Monitoring, and Accountability (EPMA) which complement the MUREP program portfolio. FIE and IE advance NASA's education strategy by serving higher education, K-12, and informal education audiences, often through collaborations with key stakeholders and strategic partners. Under Section 616 of the NASA Authorization Act of 2005 (P.L.109-155), Congress authorized NASA to establish a competitive program for science museums, NASA visitor centers, and planetariums to enhance programs related to space exploration, aeronautics, space science,

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

Earth science, or microgravity. EPMA provides the infrastructure and expertise required to demonstrate the results and overall effectiveness of the Agency's investments in STEM education.

EXPLANATION OF MAJOR CHANGES FOR FY 2013

The STEM Education and Accountability program consolidates projects and activities that were previously funded in the FY 2011 programmatic and budgetary structure for "K-12 STEM Education," "Informal STEM Education," and "Higher Education STEM Education". The new structure is consistent with the program and projects established in FY 2012 and it supports the Agency's strategic goals.

ACHIEVEMENTS IN FY 2011

The STEM Education and Accountability program is a new programmatic structure in FY 2012. In FY 2011, NASA's higher education efforts increasingly targeted community colleges, which generally serve a high proportion of minority students. NASA projects at community colleges build student STEM ability, preparing students for study at a four-year institution. Thirty-five percent of students participating in NASA's higher education activities and reporting demographic information were from underrepresented/underserved communities and 39 percent were women.

In FY 2011, 69,415 educators participated in NASA education programs. When combined with the 27,674 faculty members who participated in NASA's national higher education programs, the Agency has successfully reached 97,089 educators along the full length of the education pipeline. Additionally, 40,352 undergraduate and graduate students and 791,285 elementary and secondary students participated in NASA education opportunities during this reporting period.

KEY ACHIEVEMENTS PLANNED FOR FY 2013

STEM Education and Accountability will:

- Focus resources, including content, facilities, and personnel, to improve the impact of NASA's STEM education efforts on areas of greatest national need, as identified in the 2011 NASA Education Design Team report, ensuring that NASA-unique assets are leveraged when conducting direct-service student activities;
- Continue to provide opportunities for learners to engage in STEM education through NASA content provided to informal education institutions;
- Maintain no fewer than 1,000 online STEM-based teaching tools for K-12 and informal educators and higher education faculty;
- Conduct no fewer than 200 interactive K-12 student activities that leverage the unique assets of NASA's missions;
- Increase NASA's engagement in national STEM education policy discussions to improve curricula, inform national standards in STEM subjects, and ensure coordination and sharing of best practices across Federal STEM agencies to avoid duplication, overlap, or fragmentation by

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

participating in STEM education advisory boards, STEM-related committees, or other events or activities related to national STEM education policy.

BUDGET EXPLANATION

The FY 2013 request is \$67.0 million. This represents \$13.0 million decrease from the FY 2012 estimate (\$80.0 million). The FY 2013 request includes:

\$30.0 million for MUREP which will provide:

- Internships and scholarships for underrepresented and underserved students; and
- STEM curricula development at minority higher education institutions and community colleges, thereby increasing the number of underrepresented and underserved students in STEM disciplines and careers.

\$37.0 million for STEM Education and Accountability, which includes formal and informal education experiences (e.g. the Summer of Innovation, or SoI) for learners and educators.

NASA will align the activities conducted by each of these projects with the priorities identified in the five-year STEM Strategic Plan issued by the Office of Science and Technology Policy Committee on STEM.

Projects

MINORITY UNIVERSITY RESEARCH AND EDUCATION PROJECT (MUREP)

See separate project page.

STEM Education and Accountability Projects

FORMAL AND INFORMAL EDUCATION (FIE)

FIE provides tools, experiences, and opportunities for the Nation's diverse formal and informal education communities. FIE provides STEM resources featuring NASA content to elementary and secondary schools, colleges, universities, museums, science centers, planetariums, libraries, informal education institutions, and NASA visitor centers. Increasingly, many of these resources are provided through NASA Education's substantial Internet presence, which includes the NASA Kids Club and the Digital Learning Network. NASA resources and opportunities are widely available to educators and students nationwide, and many investments place an emphasis on attracting women and girls, minorities, and persons with disabilities to STEM careers.

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

In FY 2013, a key education strategy is to immerse educators and learners in current NASA science and technology through hands-on activities and cyber-learning. These opportunities will be generated by utilizing assets such as the Museum Alliance, a free-of-charge NASA STEM content facilitation service and on-line education community that currently has over 420 member institutions across the country, and Earth Knowledge Acquired by Middle School Students (EarthKAM), a partnership with Sally Ride Science, that allows middle school students to take pictures of Earth from a digital camera onboard ISS. NASA-infused curricular support materials will be incorporated at NASA Centers and visitor centers and through on-line learning activities.

INNOVATION IN EDUCATION (IE)

IE uses innovative ways to reach educators and students, improve student retention in STEM disciplines, and better engage community colleges and minority-serving institutions. IE enables NASA to seek out and support innovative, replicable, and scalable approaches to improve STEM learning and instruction. For example, NASA provides opportunities for higher education students and faculty to participate in NASA-related research, as well as launch vehicle and payload development activities. This activity will enable students and faculty to design ISS hardware, conduct ISS-related experiments, and develop new strategies for utilizing ISS data. Additionally, the IE project encourages collaborations between government, academia, and industry to leverage NASA's investments in STEM to reach a greater number of students and educators.

In FY 2011, SoI served over 40 thousand middle school students in grades 4 to 9 (a 76 percent increase from 2010) and provided professional development experiences to more than 3,700 teachers (certified and informal educators).

In FY 2013, NASA will provide competitive opportunities for prospective partners to engage students in authentic, hands-on learning through design challenges and engineering competitions. The Agency will evaluate SOI three-year pilot for its effectiveness in engaging middle school educators and underrepresented/underserved youth with NASA's content and improving STEM ability. NASA will identify and validate practices that can improve STEM education impacts, and then replicate those that have proven most effective.

EVALUATION, PERFORMANCE MONITORING, AND ACCOUNTABILITY (EPMA)

EPMA supports the Administration's commitment to transparency in program operations and ensuring desired outcomes. This project provides technical assistance for the monitoring activities conducted by NASA grantees, Centers, and external partners. It helps set performance goals and measures progress toward meeting those goals to assess and publicly report the impact of NASA's educational investments.

In FY 2011, NASA provided numerous examples of published, third-party evaluations in response to GAO query on evaluation. NASA cited independent assessments of several NASA educational activities, including informal education, and the Science, Engineering, Mathematics and Aerospace Academy (SEMAA).

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

In FY 2013, EPMA will continue implementing the One-Stop Shopping Initiative, an Agency-wide workforce development system used to recruit, retain, develop, select, and place highly qualified students in NASA internship, fellowship, and scholarship opportunities. By expanding the system's IT requirements to better meet the needs of NASA mission directorates and Centers, NASA expects a 50 percent increase in student applications/application effectiveness.

Program Schedule

Consistent with the status report on the NSTC Five-Year Federal STEM Education Strategic Plan released by the National Science and Technology Council, the STEM Education and Accountability Program will align its portfolio of activities over the next three years. In Year one, NASA will work with the Co-STEM to finalize criteria for success, develop common evidence standards, evaluation and research toolkits, and identify efficiency and productivity opportunities. In Years two and three, the Agency will establish baselines and increase alignment with the adopted criteria. NASA will align its future evaluation strategy with the Status Report on the NSTC Five-Year Federal STEM Education Strategic Plan. Successful STEM education practices and strategies identified through STEM education research studies and evaluations will also be used to guide NASA investments in STEM education. NASA will continually adjust the design of STEM education investments to align with best practices in STEM education derived from existing and new evidence from education research and evaluation.

Program Management & Commitments

The STEM Education and Accountability program managers are located at NASA Headquarters and provide management oversight for overall program operations. NASA Centers manage significant investments in project activity elements.

Acquisition Strategy

MAJOR CONTRACTS/AWARDS

NASA solicits new and innovative education products, tools, and services from qualified external organizations. This occurs in response to changes in STEM education trends, identified gaps or opportunities in the education portfolio of investments, a response to demonstrated customer need or demand, or when the Administration or Congress identifies new priorities.

NASA encourages participation of new or less experienced organizations and awards education grants and contracts through full and open competition. NASA includes feedback from staff, subject matter experts, and the public in developing solicitations, including the requirements, expected outcomes,

EDUCATION

STEM EDUCATION AND ACCOUNTABILITY

schedules, proposal instructions, and evaluation approaches. NASA solicits comments on perceived programmatic risk issues associated with performance of the work. Procurement offices at NASA review all solicitations.

NASA awards all major grants and cooperative agreements based on reviews by external panels of peers for educational merit; NASA and external scientists and engineers for content, merit, feasibility, and alignment to education goals; and mission directorates for alignment with NASA's research and development interests. Indications of clear competitive process are an integral part of reviews. NASA makes awards only after qualified assessments of merit.

INDEPENDENT REVIEWS

All projects in the STEM Education and Accountability program participate in independent reviews and evaluations.

Review Type	Performer	Last Review	Purpose/Outcome	Next Review
Quality	Abt Associates, Cambridge, MA	FY 2011	Contractor has initiated a formative evaluation on the SOI following completion of implementation evaluation in FY 2011.	2012
Quality	Abt Associates, Cambridge, MA	FY 2011	The external evaluator is conducting formative evaluation on the NASA Explorer Schools following the FY 2011 pilot analysis and review. Continued evaluation is planned beyond FY 2012, if project remains in the Education portfolio following portfolio redesign.	2012

Historical Performance

NASA supports the country's educators who play a key role in preparing the minds that will manage and lead the Nation's laboratories and research centers of tomorrow. To prepare the Agency's future workforce and leverage the Agency's unique resources, it partners with other Agencies, and collaborates with the Education community. In the NASA Strategic Plan, the Agency articulates three major education goals, which will continue to support U.S. innovation and competitiveness now and in the future. NASA's full report of accomplishments for STEM Education and Accountability can be found at <http://www.nasa.gov/offices/education/performance/index.html>.

EDUCATION: STEM EDUCATION AND ACCOUNTABILITY

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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FY 2013 BUDGET

Budget Authority (in \$ millions)	Prior	Actual Estimate			Notional			
		FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017
FY 2013 President’s Budget Request	0.0	28.5	30.0	30.0	30.0	30.0	30.0	30.0
Change From FY 2012 Estimate		--	--	0.0				
Percent Change From FY 2012 Estimate		--	--	0.0%				



NASA’s MUREP: enhances the research, academic, and technology capabilities of Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Colleges and Universities, and other Minority Serving Institutions; provides targeted opportunities for underrepresented and underserved learners to participate in research and education opportunities through internships, scholarships, and fellowships; and provides opportunities for minority institutions to improve the quality of their teacher preparation programs and thereby improve the quality and diversity of future STEM educators. NASA targets recruitment and retention of underrepresented and underserved students, including women and girls, Hispanics, and students with disabilities.

Participation in NASA projects and research stimulates increasing numbers of learners to continue their studies at all higher education levels and encourages these students to earn advanced degrees in STEM fields critical to NASA and the Nation.

EXPLANATION OF MAJOR CHANGES FOR FY 2013

No significant changes.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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ACHIEVEMENTS IN FY 2011

In FY 2011, NASA collaborated with Navajo Technical College to provide student stipends and internships to 15 Native American students, with six students also participating in eight-week summer internships. The college has leveraged NASA funding to help it develop into a four-year university. The Navajo Technical College Governing Board has recently approved a four-year industrial engineering degree and a four-year digital manufacturing curriculum that teach many of the core competencies needed by NASA Centers.

KEY ACHIEVEMENTS PLANNED FOR FY 2013

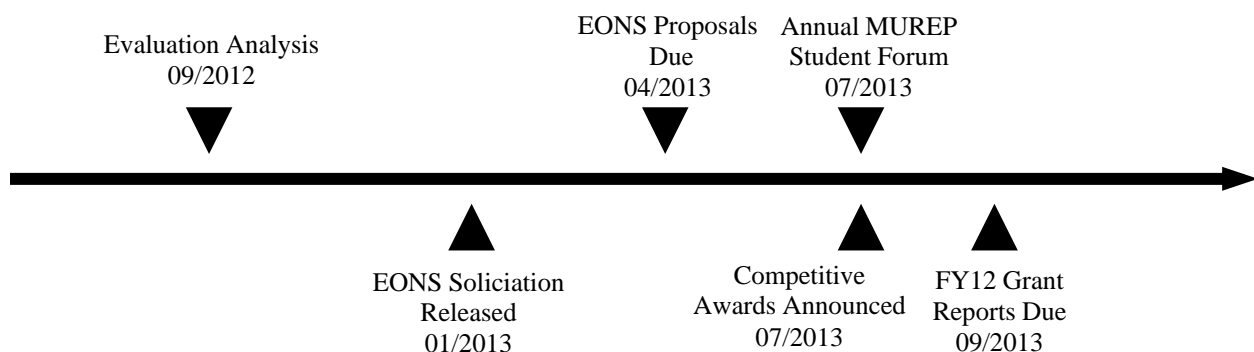
MUREP will increase investments supporting undergraduate underrepresented and underserved STEM students, and increasingly target community colleges.

BUDGET EXPLANATION

The FY 2013 request is \$30.0 million. This represents a zero-sum change from the FY 2012 estimate (\$30 million). The FY 2013 request includes:

- Funding for internships and scholarships for underrepresented and underserved students; and
- Increased support for the development of STEM curricula at minority institutions and community colleges to help prepare underrepresented and underserved students in STEM disciplines and careers.

Project Schedule



MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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Project Management & Commitments

The MUREP Program Manager is located at NASA Headquarters and provides management oversight for overall MUREP operations. NASA Centers managed significant investments in MUREP activity elements in FY 2011 including the following:

Program/Element	Provider	Description
University Research Centers (URC)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	URCs are multi-disciplinary research centers at Minority Serving Institutions (MSI) that are supported to expand the Nation's base for aerospace research and development, and increase the production of underrepresented/underserved students who obtain degrees undergraduate and graduate degrees in NASA-related fields.
Curriculum Improvements Partnership Award for the Integration of Research (CIPAIR)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	CIPAIR was designed to strengthen the curricula of MSIs and community colleges in order to attract more students into STEM-based academic programs, retain them, and prepare them for success when they take the next steps in their education or in their careers.
Motivating Undergraduates in Science and Technology (MUST)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	MUST increases the number of underrepresented/underserved students in STEM disciplines. Each MUST participant receives three-years of support in the form of a scholarship, internships at a NASA Center, mentoring, and professional development.
TCU	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	TCU activity supports the Nation's Tribal Colleges through grants that provide funding for academic and research infrastructure development and support of STEM students at tribal colleges and universities.

EDUCATION: STEM EDUCATION AND ACCOUNTABILITY

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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Program/Element	Provider	Description
MUREP Small Activities (MSA)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	MSA advances MUREP priorities by identifying gaps or areas where new projects will enhance NASA higher education portfolio and better meet Agency objectives. Achieving Competence in Computing, Engineering, and Space Service is an example of an MSA activity that now fills an identified programming gap (i.e., internships for students with disabilities).
Jenkins Pre-Doctoral Fellowship (JPF)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	JPF increases the number of underrepresented/underserved STEM students at the graduate level. JPF provides three-years of support for each participant with a stipend, tuition offset, a NASA internship, mentoring, and professional development.
NASA Science and Technology Institute for Minority Serving Institutions (NSTI-MSI)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	NSTI-MSI increases the research capacity of MSIs, increases the number of undergraduate STEM students, and supports Agency research objectives.
NASA Innovations in Climate Education (NICE) (Note: renamed from Innovations in Global Climate Change Education)	Provider: All NASA Centers Project Management: NASA HQ NASA Center: All NASA Centers Cost Share: N/A	NICE provides grants to MSIs to: enhance climate change education; improve the teaching and learning about climate change and Earth system science; increase the number of underrepresented and underserved K-12 teachers of math and science; and increase the number of students prepared for graduate study in climate-related subjects.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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Acquisition Strategy

MUREP funding is available through competitive opportunities. In FY 2013, an omnibus solicitation (Educational Opportunities in NASA STEM) will be used to select MUREP grantees.

INDEPENDENT REVIEWS

All MUREP activities document performance either through external evaluations or internal reviews conducted by NASA staff. For example, a Technical Review Committee, made up of NASA and industry engineers and scientists, reviews each University Research Centers grantee annually during the five-year performance period. All review reports are used as a part of the renewal package for the individual grantee.

Review Type	Performer	Last Review	Purpose/Outcome	Next Review
External Evaluation	MRP Associates	FY 2011	Evaluate MUST against goals and objectives. Report strongly indicates that the MUST activity was meeting its goals and objectives. Note: final report in work.	TBD

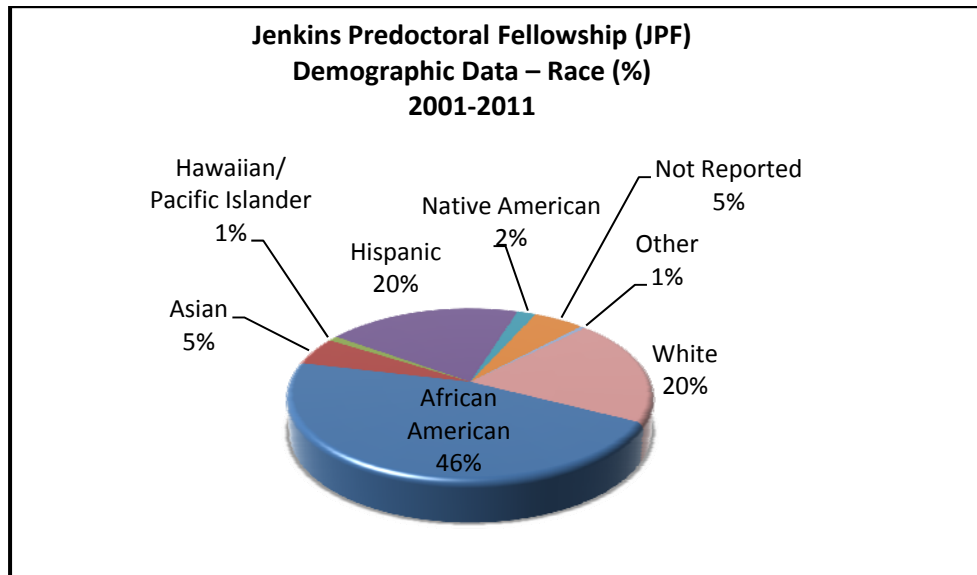
Historical Performance

MUREP strives to achieve the full participation of MSIs in the NASA-sponsored research and education community, as well as in enabling academic excellence and outstanding achievements. Through hands-on, interactive, educational activities, NASA will engage students, educators, families, the general public and all Agency stakeholders to increase Americans' science and technology literacy.

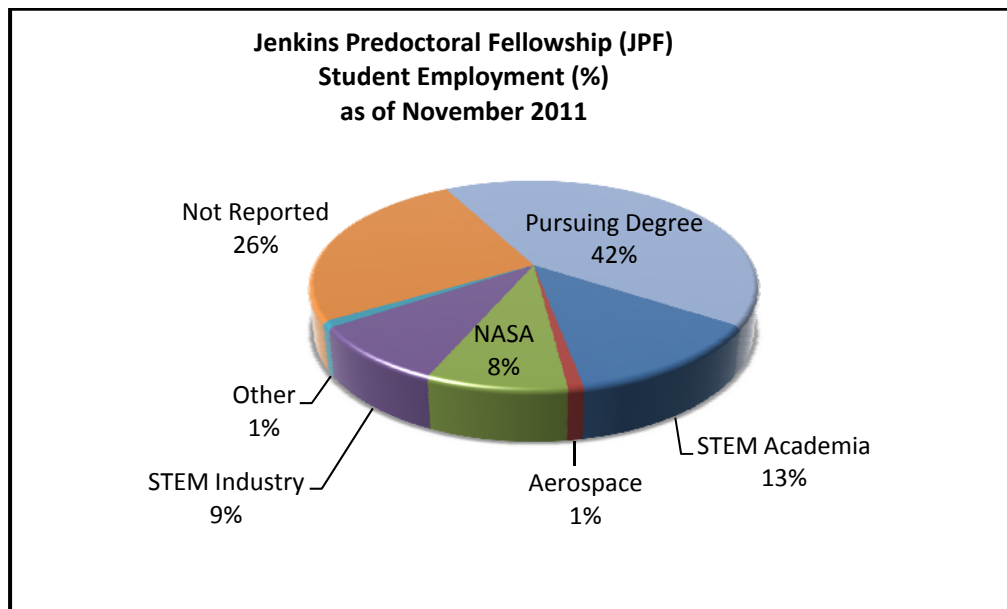
NASA's full report of accomplishments in MUREP can be found online at:
<http://www.nasa.gov/offices/education/performance/index.html>.

MINORITY UNIVERSITY RESEARCH EDUCATION PROJECT

Formulation	Development	Operations
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Since its inception in 2001, Pre-Doctoral JPF has supported 210 students as they obtained Masters and Doctoral degrees. The racial and ethnic diversity of JPF students is shown here.



JPF is successful in helping well-trained candidates into to the STEM workforce. The graph above shows the type of employment obtained by JPF students upon completion of a terminal degree.