NASA STEM Education and Accountability Projects (SEAP)

Abstracts for
FY 2015-2016 SEAP Activities

Results from the
FY 2015 SEAP Internal-to-NASA-Competition

February 8, 2017
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**SEAP Activity:** Microgravity University for Educators

**Brief Description:** Microgravity University for Educators (MgUE) provides training on strategies for teaching microgravity-related concepts, experimental testing using NASA’s simulated microgravity test facilities, and guidance on outreach in the education community. MgUE allows educators to perform experiments in simulated microgravity environments on behalf of their K-12 students. Experiments involve student-derived solutions to technical problems or improvements to solutions identified by NASA scientists and engineers who use simulated microgravity environments in their work. Examples include designing a docking device that will lock with no given rotational force, designing a grapple structure to transfer cargo, and designing satellite deployment or capture systems. This professional development institute includes online activities and face-to-face activities at a NASA field center. The online activities provide training on microgravity concepts (i.e. law of gravity, free fall, orbital mechanics, long duration space flight, etc.) and mentor support for prototyping student solutions. There are two weeks of face-to-face activities for groups of approximately 30 teachers each at a NASA field center. These include presentations from subject matter experts, tours of center facilities, experimentation on a simulated microgravity test platform, and videoconferences with home campuses.

**NASA Education Line of Business:** Educator Professional Development

**Audience Served:** K-12 educators

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (APIs):**
- **Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities
- **API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.
- **API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.
- **Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.
- **API ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

**Federal Priority Investment Areas for STEM Education:**
- Improve STEM Instruction

**Federal STEM Education Coordination Approaches:**
- Build New Models for Leveraging Assets and Expertise
- Build and Use Evidence-Based Approaches
Microgravity University for Educators (continued)

Activity Period of Performance: August 2016 – June 2019

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**SEAP Activity:** NASA Network of States

**Brief Description:** NASA Network of States is a collaborative activity among NASA’s centers, including the Jet Propulsion Laboratory. Each center has a wealth of formal education partners, including school districts serving populations underrepresented in STEM, higher education institutions, and informal education organizations and consortiums. Network of States will provide systemic, long-term support for NASA centers and partners by building strong regional networks for partner-delivered NASA educator professional development. Using the systemic structural design of a connected teaching model, NASA centers and partners will build a partnership network that aligns with national standards, integrated STEM content, learning theories that allow varied solutions in conceptual understanding for all students, and effective use of technology with outcomes to ensure that teachers have sufficient and necessary resources to enhance teaching practice.

**NASA Education Line of Business:** Educator Professional Development

**Audience Served:** K-12 educators in formal or informal settings

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities

**API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**Performance Goal 2.4.4:** Continue to provide opportunities for learners to engage in STEM education through NASA unique content provided to informal education institutions designed to inspire and educate the public.

**API ED-17-4:** Support informal education institutions, including youth-serving organizations, to use NASA-unique content in no fewer than 40 states, U.S. Territories and/or the District of Columbia.

**Federal Priority Investment Areas for STEM Education:**
- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM
- Better Serve Groups Underrepresented in STEM

**Federal STEM Education Coordination Approaches:**
- Build New Models for Leveraging Assets and Expertise
- Build and Use Evidence-Based Approaches
NASA Network of States *(continued)*

**Activity Period of Performance:** April 2016 – September 2018

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**SEAP Activity:** NASA’s Beginning Engineering Science and Technology Educators

**Brief Description:** NASA’s Beginning Engineering, Science, and Technology (BEST) Educators provides educator guides to help teach K-8 students the engineering design process in a real-world context using NASA engineering content. NASA’s BEST Educators is a demonstrated pedagogical framework of the engineering design process that correlates to national standards frameworks. Content can supplement curricula during the school day or as activities out of school. Educators may use materials as a set or as individual activities. NASA’s BEST Educators incorporates engineering-themed content into institutions of learning by cultivating systemic partners where the emphasis is on the collective participation of educators and staff from the same region with a common purpose for science, technology, engineering and mathematics (STEM) standards and student performance. Target audiences may vary across NASA centers, but will result in content integration into teacher pathway programs, formal or informal institutions, or youth-serving organizations with an emphasis on institutions who serve underrepresented / underserved student populations. Delivery mechanisms encompass face-to-face, partner-delivered or online methods. NASA’s BEST Educators will identify industry partners who can provide implementation sites with readily available, low-cost and, where feasible, reusable activity materials.

**NASA Education Line of Business:** Educator Professional Development

**Audience Served:** K-12 educators in formal or informal settings

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities

- **API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.
- **API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**Performance Goal 2.4.4:** Continue to provide opportunities for learners to engage in STEM education through NASA unique content provided to informal education institutions designed to inspire and educate the public.

- **API ED-16-4:** Maintain the NASA Museum Alliance and/or other STEM education strategic partnerships in no fewer than 30 states, U.S. Territories and/or the District of Columbia.
- **API ED-17-4:** Support informal education institutions, including youth-serving organizations, to use NASA-unique content in no fewer than 40 states, U.S. Territories and/or the District of Columbia.
Performance Goal 2.4.5: Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

API ED-16-5: Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.

API ED-17-5: Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

Federal Priority Investment Areas for STEM Education:
- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM

Activity Period of Performance: April 2016 – September 2018

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**SEAP Activity:** Aeronautics Scholarship & Advanced STEM Training and Research Fellowships (AS & ASTAR)

**Brief Description:** AS & ASTAR engages self-directed STEM learners in NASA’s scientific, engineering research and development, design, and STEM operational activities. AS & ASTAR recipients participate in research opportunities that are relevant to NASA Mission Directorates. The research opportunities are experiential learning experiences that contribute to graduate theses and doctoral dissertations. NASA awards graduate level fellowships through training grants to the institutions where the NASA Fellows are pursuing graduate studies leading to a Master’s or Doctoral degrees. The fellowship supports learners majoring in the workforce needs of the nation, and NASA’s Aeronautics; Human Exploration and Operations; and Science Mission Directorates.

**NASA Education Line of Business:** NASA Internships, Fellowships and Scholarships

**Audience Served:** Masters and PhD students

**FY 2016 and FY 2017 Performance Goal and Annual Performance Indicators (API):**

**Performance Goal 2.4.1:** Assure that students participating in NASA high education projects are representative of the diversity of the Nation.

**API ED-16-1:** Provide significant, direct student awards in higher education to (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students, (3) women, and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations by major, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**API ED-17-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**Federal Priority Investment Areas for STEM Education:**
- Design Graduate Education for Tomorrow’s STEM Workforce

**Federal STEM Education Coordination Approaches:**
- Build New Models for Leveraging Assets and Expertise
- Build and Use Evidence-Based Approaches

**Activity Period of Performance:** March 2016 – August 2017
AS & ASTAR (continued)

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**SEAP Activity:** Application & Selection Through Implementation & Evaluation (ASTIE)

**Brief Description:** ASTIE will support the design and implementation of a new IT infrastructure (System 2.0) to facilitate NASA Internships, Fellowship, and Scholarships (NIFS) activities. System 2.0 will replace existing software applications supporting Office of Education (OE) Performance Management tracking and reporting and NIFS recruitment. System 2.0 will meet the needs of the NASA Education Lines of Business, sources of funding, Centers and Mission Directorates. System 2.0 will be a modular, web-based relational database system for implementing the full scope of activities defined in the NIFS Roadmap from application through evaluation. System 2.0 capabilities include capacity to facilitate or track all stipend-based NASA education efforts. This includes STEM and non-STEM majors and both educational and technical funding sources applied singly or in combination. The NIFS experiences supported may be full or part-time; conducted at a NASA facility; contractor facility; or anywhere NASA activities are ongoing. The resulting modernized infrastructure will improve the capabilities within the OE Shared IT services software applications, streamline the IT infrastructure, improve IT security, and enhance capabilities and stability of the IT infrastructure.

**NASA Education Line of Business:** NASA Internships, Fellowships and Scholarships

**Audience Served:** NASA Office of Education; all NASA Centers and the Jet Propulsion Laboratory; high school students; undergraduate students; K-12 teachers and community college instructors

**FY 2016 and FY 2017 Performance Goal and Annual Performance Indicators (API):**

**Performance Goal 2.4.1:** Assure that students participating in NASA high education projects are representative of the diversity of the Nation.

**API ED-16-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations by major, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**API ED-17-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.
Federal Priority Investment Areas for STEM Education:
• Enhance STEM Experience of Undergraduate Students
• Better Serve Groups Underrepresented in STEM

Federal STEM Education Coordination Approaches:
• Build New Models for Leveraging Assets and Expertise
• Build and Use Evidence-Based Approaches

Activity Period of Performance: January 2016 – September 2017

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**SEAP Activity:** Building the Agency’s Future Workforce through Internships

**Brief Description:** Building the Agency’s Future Workforce through Internships will fund approximately 100 NASA internship experiences for STEM students. Internships will occur at all NASA facilities and take place during both summer and semester internship sessions. Two pilot efforts will be funded. Glenn Research Center will develop a set of procedures to ensure internship experiences generate the competencies needed for future workforce needs. These processes will include strategic guidelines, common tools, templates and selection guidance to aid Centers in creating and assigning opportunities for students. Johnson Space Center will pilot a set of collection instruments, software, and protocols to collect student success stories for interns. These processes will follow export control guidelines and result in a library of stories useful in illustrating the worth and impact of NASA internship experiences for multiple audiences.

**NASA Education Line of Business:** NASA Internships, Fellowships and Scholarships

**Audience Served:** All NASA Centers and the Jet Propulsion Laboratory; High school, undergraduate and graduate students majoring in STEM disciplines

**FY 2016 Performance Goal and Annual Performance Indicator (API):**
**Performance Goal 2.4.1:** Assure that students participating in NASA high education projects are representative of the diversity of the Nation.
**API ED-16-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations by major, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**Federal Priority Investment Areas for STEM Education:**
- Enhance STEM Experience of Undergraduate Students
- Design Graduate Education for Tomorrow’s STEM Workforce

**Federal STEM Education Coordination Approaches:**
- Build New Models for Leveraging Assets and Expertise
- Build and Use Evidence-Based Approaches
Building the Agency’s Future Workforce through Internships (continued)

Activity Period of Performance: January 2016 – June 2017

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**SEAP Activity:** NASA Scholarship and Research Opportunities (SRO)

**Brief Description:** NASA SRO awards scholarships to undergraduate students pursuing Associate’s or Bachelor’s degree in the nation’s high-need, NASA relevant STEM disciplines. NASA SRO supports learners majoring in the workforce needs of the nation and NASA’s four Mission Directorates: Aeronautics; Human Exploration and Operations; Science; and Space Technologies. Awarded scholars pursue undergraduate STEM studies at their respective campuses during the academic year under the guidance of their University Faculty Research Advisor. Each student is also paired with a NASA researcher who serves as the scholar’s NASA Center Technical Mentor. Scholars work with their designated NASA Technical Mentors at a host NASA center during an annual 10-week summer internship. Scholars become part of Professional Learning Communities that support the scholars to advance their growth in academics, expand their social network, learn best practices for technical research skills, and enhance their understanding of the research process. The projected outcome for NASA SRO is to produce high-achieving STEM graduates to fill the projected deficiencies in the Nation’s STEM workforce and to encourage students to stay in the academic STEM pipeline through completion of graduate degrees.

**NASA Education Line of Business:** NASA Internships, Fellowships and Scholarships

**Audience Served:** Undergraduate Students

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.1:** Assure that students participating in NASA high education projects are representative of the diversity of the Nation.

**API ED-16-1:** Provide significant, direct student awards in higher education to (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students, (3) women, and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations by major, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**API ED-17-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.
Performance Goal 2.4.5: Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

API ED-17-5: Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

Federal Priority Investment Areas for STEM Education:
• Enhance STEM Experience of Undergraduate Students
• Better Serve Groups Underrepresented in STEM

Federal STEM Education Coordination Approaches:
• Build New Models for Leveraging Assets and Expertise
• Build and Use Evidence-Based Approaches

Activity Period of Performance: March 2016 – August 2017

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**SEAP Activity:** NIFS Integrated Recruiting

**Brief Description:** NIFS Integrated Recruiting will create a strategic framework for generating a robust and continuous pool of applicants for NASA’s competitive internship, fellowship, and scholarship opportunities. The goal of NIFS Integrated Recruiting is to cohesively recruit a qualified pool of applicants that represents the diversity of the nation and is capable of being pipelined into NASA’s competitive opportunities. NIFS Integrated Recruiting will leverage existing relationships to provide an efficient and organized recruiting effort which is cohesive across NASA Centers. NIFS Integrated Recruiting will collaborate with a proportional mix of nationally ranked universities, two-year colleges, & Minority Serving Institutions to support recruitment efforts. The millennial generation receives and processes information in a much different way than previous generations. The NIFS Integrated Recruiting Strategy will implement a modern approach to recruitment, while keeping best practices of past recruiting efforts in mind.

**NASA Education Line of Business:** NASA Internships, Fellowships and Scholarships

**Audience Served:** Undergraduate, Graduate & Ph.D students majoring in STEM disciplines

**FY 2016 and FY 2017 Performance Goal and Annual Performance Indicators (API):**

**Performance Goal 2.4.1:** Assure that students participating in NASA higher education projects are representative of the diversity of the Nation.

**API ED-16-1:** Provide significant, direct student awards in higher education to (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students, (3) women, and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations by major, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**API ED-17-1:** Provide significant, direct student awards in higher education to: (1) students across all institutional categories and levels (as defined by the U.S. Department of Education); (2) racially or ethnically underrepresented students; (3) women; and (4) persons with disabilities at percentages that meet or exceed the national enrolled percentages for these populations, as determined by the most recent, publicly available data from the U.S. Department of Education’s National Center for Education Statistics for a minimum of two of the four categories.

**Federal Priority Investment Areas for STEM Education:**
- Enhance STEM Experience of Undergraduate Students
- Better Serve Groups Underrepresented in STEM
NIFS Integrated Recruiting (continued)

Federal STEM Education Coordination Approaches:
• Build New Models for Leveraging Assets and Expertise
• Build and Use Evidence-Based Approaches

Activity Period of Performance: June 2016 – May 2018

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**SEAP Activity:** First Nations Launch Competition

**Brief Description:** The First Nations Launch (FNL) Competition provides Native American college students the opportunity to build and launch class K high-powered rockets. Teams attend a workshop to learn concepts necessary for a successful launch, including guidance, navigation, control, propulsion, electrical systems and flight software. Teams generate a Preliminary Design Review, Critical Design Review, safety package, and give formal presentations. Teams also engage in outreach to local communities. Teams are provided the basic parts to build their rocket, travel expenses to the launch site in Wisconsin, and faculty stipend. Students are either members of the American Indian Science and Engineering Society (AISES) or attend a Tribal College.

**NASA Education Line of Business:** STEM Engagement

**Audience Served:** Native American college students

**FY 2016 and FY 2017 Performance Goal and Annual Performance Indicators (API):**

**Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

**API ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.

**API ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

**Federal Priority Investment Areas for STEM Education:**
- Enhance STEM Experience of Undergraduate Students
- Better Serve Groups Historically Underrepresented in STEM Fields

**Activity Period of Performance:** December 2015 – August 2018

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**SEAP Activity:** NASA Human Exploration Rover Challenge

**Brief Description:** The NASA Human Exploration Rover Challenge Workshop is an educator professional development activity developed to engage underserved secondary schools and Historically Black Colleges and Universities (HBCUs) in the annual NASA Human Exploration Rover Challenge. The Rover Workshop also seeks to engage educators from states with no previous participation in the Rover Challenge. The Rover Challenge is a research-based competitive hands-on learning experience that requires high school and college/university students to address engineering problems similar to those faced by NASA as the Agency makes plans to explore the universe. The Rover Workshop provides an opportunity for STEM educators and their selected accompanying students to gain essential knowledge and skills needed to plan and implement a rover project in their own schools and institutions. Workshop participants are guided through the process of preparing students to design, build, and test human powered rover vehicles and given the opportunity to participate in hands-on design sessions guided by experienced rover advisors and NASA engineers and scientists. Following the workshop, participants observe the Rover Challenge competition and interact with Rover Challenge faculty advisors and student teams.

**NASA Education Line of Business:** Educator Professional Development and STEM Engagement

**Audience Served:** High school, college and university faculty and students

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities.

- **API ED-16-2:** Engage with at least 80,000 educators in NASA supported professional development, research, and internships that use NASA-unique STEM content.
- **API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

- **API ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.
- **API ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.
Federal Priority Investment Areas for Stem Education:
- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM
- Enhance STEM Experience of Undergraduate Students

Federal STEM Education Coordination Approaches:
- Build and Use Evidence-Based Approaches

Activity Period of Performance: February, 2016- September 30, 2018

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**SEAP Activity:** STEM on Station

**Brief Description:** STEM on Station (SOS) uses the International Space Station (ISS), crew and onboard research to inspire, engage and educate a national audience of K-12 students and educators. SOS education activities will bring the excitement of human spaceflight into classrooms, institutions, and homes around the world. A component of STEM on Station includes a website which serves as a one-stop shop for resources, opportunities and activities targeted for students, educators, and education personnel across the NASA centers.

Johnson Space Center Education will identify unique NASA content, facilities and people to support these activities and education resources. Activity and resource design will be based on best practices to increase K-12 learners’ engagement, interest and participation in STEM; aligned to K-12 STEM content and national education standards; and appropriate for use in formal and informal education settings.

**NASA Education Line of Business:** STEM Engagement

**Audience Served:** K-12 students; undergraduates; educators; NASA center education personnel

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

- **API ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.
- **API ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

**Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities.

- **API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.
- **API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**PG 2.4.4:** Continue to provide opportunities for learners to engage in STEM education through NASA-unique content provided to informal education institutes designed to inspire and educate the public

**API ED-16-4:** Maintain the NASA Museum Alliance and/or other STEM education strategic partnerships in no fewer than 30 states, U.S. Territories and/or the District of Columbia.
**STEM on Station (continued)**

**API ED-17-4:** Support informal education institutions, including youth-serving organizations, to use NASA-unique content in no fewer than 40 states, U.S. Territories and/or the District of Columbia.

**Federal Priority Investment Areas for STEM Education:**
- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM

**Federal STEM Education Coordination Approaches:**
- Build and Use Evidence-Based Approaches

**Activity Period of Performance:** February 2016 – September 2018

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SEAP Activity: NASA Out of School Learning (NOSL) Network

Brief Description: The NOSL network is collaboratively managed by three NASA Centers: Glenn Research Center, Langley Research Center, and Stennis Space Center. NOSL will develop and execute a common implementation framework for providing NASA technical assistance to out-of-school (OST) time programs. The framework will be grounded in evidenced-based practice and past program evaluation from the Summer of Innovation. NASA Centers will identify regional partners and deliver structured support to meet the needs of local school districts, community and Youth Serving Organizations, and/or informal education institutions that provide OST STEM education opportunities for elementary and secondary students. Each Center will implement a model where they serve as a hub on NASA-related, project-based STEM learning experiences, the NOSL Network will connect NASA scientists, engineers, and mission content with local OST initiatives. The NOSL Network will focus on the implementation of evidence-based practices through a shared cross-center framework that includes: 1) Professional development practices 2) Delivery of place-based learning opportunities; 3) Strategies for access to scientists and engineers; 4) Connections to regional and national OST and partner-led learning networks; 5) Evaluation technical assistance both internally to other NASA Centers and externally to collaborating partners; and 6) Standards-based lessons.

NASA Education Line of Business: STEM Engagement

Audience Served: Middle school students and OST educators and organizations; NASA center education personnel

FY 2016 Performance Goals (PG) and Annual Performance Indicators (API):
FY 2016 PG 2.4.5: Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.
API ED-16-5 Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.
PG 2.4.2: Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities.
API ED-16-2 Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

Federal Priority Investment Areas for STEM Education:
- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM
NOSL Network (continued)

Activity Period of Performance: March 2016 – December 2017

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**SEAP Activity:** NASA Student Launch

**Brief Description:** NASA Student Launch is a researched-based, competitive, experiential exploration activity that provides relevant, cost-effective research and development. NASA Student Launch connects learners, educators and communities in NASA-unique opportunities. NASA’s missions and propulsion assets provide opportunities for students that do not exist elsewhere. The 2016-2017 NASA Student Launch is based on multiple experiment options including target identification and landing control, launch vehicle roll maneuvers, and fragile material protection. NASA Student Launch reaches a broad audience of middle schools, high schools, colleges and universities across the nation through an eight-month commitment to design, construct, and fly payloads and vehicle components. Teams launch experiments on high-power rockets and share the research results, which could be used in future design and development of NASA projects.

**NASA Education Line of Business:** STEM Engagement

**Audience Served:** Middle school, high school, and undergraduate students

**FY 2016 and FY 2017 Performance Goals and Annual Performance Indicators (API):**

**Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

- **API ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.
- **API ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

**Performance Goal 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities.

- **API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.
- **API ED-17-2:** Engage with at least 10,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**Federal Priority Investment Areas for STEM Education:**

- Improve STEM Instruction
- Increase and Sustain Youth and Public Engagement in STEM
- Enhance STEM Experience of Undergraduate Students

**Federal STEM Education Coordination Approaches:**

- Build and use evidence-based approaches
NASA Student Launch (continued)

Activity Period of Performance: January 2016 – May 2018

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**SEAP Activity:** 21st Century Community Learning Centers (21st CCLC) Engineering Design Challenge Development and Testing

**Brief Description:** 21st CCLC Engineering Design Challenge Development and Testing is an ongoing collaboration between NASA and the U.S. Department of Education (ED) to enhance STEM programming under ED’s 21st CCLC program. ED awards grants to State educational agencies (SEAs). SEAs, in turn, award competitive sub-grants to local educational agencies, community-based organizations, and other public and private entities to enable them to provide academic enrichment experiences to students, particularly students attending high-poverty and low-performing schools, during non-school hours. Nationwide, there are more than 9,560 21st CCLC program sites. Through this collaboration, NASA and ED continue to advance mutual STEM education goals by providing 21st CCLC program participants with access to dynamic academic enrichment experiences that use NASA’s unique mission of engaging Americans in NASA’s vision—“to reach for new heights and reveal the unknown to benefit all humankind”—as a context for engagement. This interagency collaboration will align resources between ED and NASA to address the national need for a STEM-educated workforce. 21st CCLCs seek to elevate awareness of and interest in STEM fields by providing interesting and engaging activities that shows real-life applications of STEM. NASA will plan and conduct staff training, provide ongoing programmatic technical assistance, and deliver subject matter expert engagement opportunities related to two NASA STEM programs: Glenn Research Center’s Engineering Design Challenges (EDC) and the Global Learning and Observations to Benefit the Environment (GLOBE) program.

**NASA Education Line of Business:** STEM Engagement

**Audience Served:** 5-8 formal and informal educators in an out of school time setting

**FY 2016 Performance Goal and Annual Performance Indicator (API):**

**Performance Goal 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

**API: ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.

**API: ED-17-5:** Engage with at least 50,000 elementary, secondary, and higher education students in NASA STEM activities.

**Federal Priority Investment Areas for STEM Education:**

- Increase and Sustain Youth and Public Engagement in STEM
21CCLC (continued)

Activity Period of Performance: March 2016 – January 2017

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**SEAP Activity:** Informal STEM Education (I-STEM Ed)

**Brief Description:** I-STEM Ed uses NASA’s missions, education resources, and unique facilities to provide high-quality STEM content and hands-on learning experiences to in-service, pre-service and informal educators. The goals of I-STEM Ed are: to increase learners’ engagement and interest in STEM; to increase learners’ perception of the value of STEM to their lives, or their ability to participate in STEM; to develop STEM skills, practices, or knowledge among students and the public; and to support advancement and development of STEM personnel, programs, and infrastructure at universities, informal education institutions, state education agencies, local education agencies and other education institutions. I-STEM Ed works towards these goals by managing the Competitive Program for Science Museums, Planetariums, and NASA Visitor Centers, Plus Other Opportunities (CP4SMPVC+). CP4SMPVC+ is authorized by P.L. (Public Law) 109-155 SEC. 616. MUSEUMS. CP4SMPVC+ solicits proposals to support NASA-inspired space, science, technology, engineering, or mathematics (S-STEM) informal education projects, including exhibits, through partnerships with K-12 schools or districts, youth-serving organizations, higher education, and/or other agencies to support Federal STEM education goals. Successful proposals are typically funded as grants or cooperative agreements depending on the size and complexity of the proposed project.

**NASA Education Line of Business:** Institutional Engagement

**Audience Served:** Informal education educators and students

**FY 2016 Performance Goal (PG) and Annual Performance Indicator (API):**

**PG 2.4.2:** Continue to support STEM educators through the delivery of NASA education content and engagement in educator professional development opportunities.

**API ED-16-2:** Engage with at least 80,000 educators in NASA-supported professional development, research, and internships that use NASA-unique STEM content.

**PG 2.4.4:** Continue to provide opportunities for learners to engage in STEM education through NASA-unique content provided to informal education institutes designed to inspire and educate the public.

**API ED-16-4:** Maintain the NASA Museum Alliance and/or other STEM education strategic partnerships in no fewer than 30 states, U.S. Territories and/or the District of Columbia.

**PG 2.4.5:** Continue to provide opportunities for learners to engage in STEM education engagement activities that capitalize on NASA unique assets and content.

**API: ED-16-5:** Engage with at least 750,000 elementary and secondary students in NASA STEM engagement activities.

**Federal Priority Investment Areas for STEM Education:**
- Increase and Sustain Youth and Public Engagement in STEM
Informal STEM Education (continued)

Activity Period of Performance: May 2016 – September 2017

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