

## **EDUCATOR ASTRONAUT PROJECT (EAP)**

Administered by Oklahoma State University (OSU)

Type of Agreement: Teaching From Space Cooperative Agreement

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### **PROJECT DESCRIPTION**

The Educator Astronaut Project (EAP) provides high quality professional development and classroom resources to the Nation's K-12 educators. The project facilitates professional development activities and educator resources that are based on NASA missions. EAP recognizes that the excitement associated with space exploration is a valuable tool for educators to use to inspire, engage, and educate their students. The project seeks to give educators the skills and knowledge to successfully use NASA-related content in their classrooms.

As an outcome of the recruitment of K-12 educators to join the Astronaut Corps, NASA Education established EAP in 2004. EAP provides professional development opportunities to approximately 190 educators identified during the educator astronaut selection process as highly qualified. These educators became members of the Network of Educator Astronaut Teachers (NEAT). EAP shares NASA science, technology, engineering, and mathematics (STEM) education content with NEAT members, and develops and utilizes the leadership capabilities of these exemplary elementary and secondary teachers. By offering opportunities to gain first-hand knowledge of NASA missions, facilities, and personnel, NEAT members engage both their colleagues and their students in NASA-related STEM content.

The spaceflights of educator astronauts offer the project outstanding opportunities to connect educators and students to NASA missions. EAP develops professional development, educator resources, and student activities specifically associated with these flights. Essential to these efforts is the development of web sites to ensure well-designed on-line delivery of educator and student resources. The project partners with internal and external groups to provide flight-specific content and resources to educators through face-to-face and electronic short duration professional development activities. To continue to reach new audiences, EAP constantly looks for new content and innovative delivery methods for both teacher training and education resources

### **PROJECT GOALS**

EAP recognizes that well-trained and highly motivated educators are essential to increasing student interest and achievement in STEM. EAP provides the Agency with rich opportunities to inspire, engage, and educate educators, and through them reach their students. The project focuses on the design and delivery of both short and long duration professional development activities for K-12 educators, those who are NEAT members and those who are not associated with NEAT. These activities utilize the unique content associated with NASA missions, Centers, facilities, and people. Through its efforts to improve educator knowledge and skills, the project directly contributes to NASA's efforts to inspire "the next generation of explorers and innovators" and to build the "highly educated and well-prepared workforce" necessary to continue future space exploration.

In FY08, EAP was managed with Education Flight Projects (EFP) and shared an integrated vision and objectives. The vision for the projects is to:

*Facilitate education opportunities that use the unique environment of spaceflight and other flight platforms.*

EAP and EFP work to meet the following objectives:

1. Develop and provide NASA-unique experiences, opportunities, content, and resources to educators to increase K-12 student interest in STEM disciplines.
2. Develop and facilitate NEAT-like group of highly motivated educators.
3. Build internal and external partnerships with NASA Program Offices and formal and informal education

communities to create unique learning opportunities and professional development experiences.

In FY09, EAP activities will become part of EFP, and the project name, EAP, will no longer exist.

### **PROJECT BENEFITS TO OUTCOME 2**

EAP directly contributes to: *Outcome 2 – Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.*

EAP reaches K–12 students by providing short and long duration professional development opportunities and educator resources for their teachers. The project offers educators experiences and materials that focus on STEM disciplines and that highlight NASA missions and content. Collaborating with other NASA Education projects, Mission Directorates, and Center Education offices, EAP provides content and resources for use on NASA Education web sites and in educator workshops.

In FY08, EAP professional development, content, and resources were primarily associated with STS-118, the first flight of an educator astronaut. Beginning in FY08 and continuing into FY09, the project will develop resources and professional development activities related to STS-119, a space shuttle mission on which two mission specialists, who are educators, will conduct spacewalks. The project continues to provide sustained professional development to NEAT members through a variety of experiences, including the NEAT list-serv, electronic professional development, and Center-based workshops.

In FY08, EAP significantly contributed to Outcome 2 by promoting educator and student involvement in STS-118 and the NASA Engineering Design Challenge (EDC). The project used this high visibility event to involve large numbers of educators and students in a NASA mission. EAP developed a highly successful promotion plan for the mission and the EDC that specifically targeted new audiences for NASA Education and Outcome 2. Of the over 10,000 educators who registered for the EDC, over 57% stated that they had never used NASA materials or NASA topics in their teaching. Nearly 80% reported that they had never participated in another NASA-sponsored education or research program. Other NASA education activities that contribute to Outcome 2 have requested to use this EAP developed promotion model.

### **PROJECT ACCOMPLISHMENTS**

EAP contributes to two annual performance goals:

***APG8ED04 -- Increase by 5 percent the number of elementary and secondary student participants in NASA instructional and enrichment activities.***

In FY07, EAP had 1,185 students involved in its activities. In FY08, the number of students was 1,196,105. See the section on *Project Contributions to PART Measures* for specific information on the breakdown of the FY08 total number of students.

***APG8ED05 -- Increase by 5 percent elementary and secondary educators' use of NASA resources in their classroom instruction.***

In FY07, NASA Education baseline numbers did not include EAP numbers. New baselines for the project will be established using the FY08 numbers. For specific information on the EAP FY08 numbers see the section on *Project Contributions to PART Measures*.

The integrated EAP and EFP FY08 plan listed expected project milestones for the year. The project accomplished the following tasks, as listed in the project plan:

- Begin and/or complete third party, independent assessment/benchmarking of existing activities (i.e., NEAT)
- Investigate existing Elementary and Secondary and Outcome 2 projects and activities to identify and explore possible synergy/continuity
- Evaluate and define role of Centers in support of specific activities and projected future FTEs by Center
- Communicate and work with Performing Centers on project direction and collaboration opportunities
- Continue dialogue with NEAT group
- Continue to promote and evaluate Engineering Design Challenge
- Develop a strategy to implement National Research Council (NRC) recommendations

- Develop a plan for an internal partnership call
- Release the Cooperative Agreement Notice (CAN) for Teaching from Space (TFS)
- Complete development and begin implementation of a TFS web strategy
- Use the NEAT benchmarking study to redefine NEAT
- Lead the Agency efforts to design education activities for STS-119
- Coordinate two face to face meeting with Center Leads
- Investigate partnerships with external education organizations, private industry, and other federal agencies

EFP partnered with NES and DLN to develop a virtual student symposium model for NES schools. NES students participated in the NASA Engineering Design Challenge. This innovative idea has served as a model for other student involvement events.

In addition, NEAT members were recognized as outstanding educators and leaders in education. The following honors were reported in FY08: Finalist – Minnesota Teacher of the Year; Wal-Mart Teacher of the Year – North Carolina; The A. Scott Crossfield Aerospace Educator of the Year Award; National Space Club Space Educator Award; US Department of Education Washington Fellow; one year position in KSC Education Office; and, Finalist – Alabama Presidential Award for Excellence in Mathematics and Science.

For its support of the STS-118 mission, the Teaching From Space office received a NASA Johnson Space Center Group Achievement Award.

### **PROJECT CONTRIBUTIONS TO PART MEASURES**

*PART Measure 7 – Percentage of elementary and secondary educators “who haven’t participated in intensive NASA training programs and use” NASA content based resources in their classroom instruction.*

In FY08, EAP reached a total of 45,684 elementary and secondary educators. Included in that total number are: 22,689 downloads of NASA Engineering Design Challenge materials; 12,452 educators in workshops; 10,543 educators registered for the NASA Engineering Design Challenge. The total number includes an overlap with the following projects: ERCN – 2,617; DLN – 1,387, AESP – 3,153, and NES – 20. NEAT members contributed to the total number by providing professional development for their colleagues.

*PART Measure 8 – Percentage of elementary and secondary educators who participate in NASA training programs who use NASA resources in their classroom instruction.*

In FY08, EAP reached 236 educators through long duration professional development. This number includes NEAT members and other educators who participated in the NEAT Flight Week. Out of the 42 teachers who responded to a follow-up survey, all (100%) reported that they used NASA materials

*PART Measure 9 – Percentage increase in number of elementary and secondary student participants in NASA instructional and enrichment activities.*

In FY07, EAP reported that 1,185 students were reached by the project. In FY08, EAP reached a total of 1,196,105 students. Out of the FY08 total, teachers who registered for the Engineering Design Challenge reported that 1,186,415 students were involved in the challenge. The total number of students also includes 9,690 students involved in other student activities. This number includes an overlap with the following projects: DLN - 452; AES – 99, and INSPIRE – 19. NEAT members contributed to the total number by providing student programs.

### **IMPROVEMENTS MADE IN THE PAST YEAR**

In FY08, EAP management continued the integration of EAP and EFP. Management structure, processes, and budget were fully integrated by the start of FY09. This complete integration provides a more efficient and effective approach to project management, budget oversight, and evaluation. In FY09, traditional EAP activities will be incorporated into EFP, resulting in increased opportunities for educators and students to become involved in NASA missions and flight projects.

EAP successfully involved NASA Center Education Offices in project management. EAP established regular communication with project points of contact at each Center and held two face-to-face meetings. EAP

management worked with other Elementary-Secondary project managers to hold EAP meetings in conjunction with other project meetings, minimizing travel costs. Center points of contact contributed to project tasks, promoted project activities, and provided input to mid-year and year-end data collection.

In FY08, EAP began development of a NASA Education web site to promote project activities. The website is scheduled to launch in FY09. The site will highlight EAP and EFP activities, including student flight projects, mission-related education resources, and educator professional development opportunities. The web site is intended to provide "one stop shopping" for educators and students.

Management implemented improved communication with NEAT members and new professional development models. A new NEAT listserv, a cost-effective way to share information quickly, was developed, and members receive regular emails with information on opportunities for them and for their students. EAP partnered with the Reduced Gravity Office (RGO) to offer NEAT members, their colleagues, and their students, an opportunity to design an experiment to fly on the DC-9. EAP developed a new summer workshop design, offering two Center-based workshops open to any NEAT member. The project collaborated with Solar System Ambassadors and the Museum Alliance, to introduce NEAT members to electronic professional development.

In FY08, EAP management began the process to redesign NEAT. Magnolia Consulting, LLC was hired to conduct an external benchmarking study to validate the Network of Educator Astronaut Teachers and to provide recommendations for changes. The study examined best practices in educator networks and STEM professional development. Magnolia solicited input from current NEAT members, and EAP management met with NEAT members at major education conferences to solicit their ideas on a redesign. In FY08, some study recommendations were implemented, and in FY09, additional elements in the redesign will be introduced.

#### **PROJECT PARTNERS AND ROLE OF PARTNERS IN PROJECT**

EAP recognizes that partnering with other NASA Education projects and activities is often mutually beneficial, has the potential to increase the worth and reach of all associated projects, and to result in enhanced continuity between NASA Education portfolio elements. The project also seeks opportunities to work with NASA Center Education offices and Mission Directorates to develop and deliver EAP activities. The project works closely with appropriate NASA Program and Project Offices, including Space Shuttle, International Space Station (ISS), Constellation and Extravehicular Activity (EVA), to identify content for and subject matter experts to participate in the project's activities. EAP also collaborates with external education organizations to expand the scope and value of its activities.

In FY08, EAP activities that utilized strategic partnerships included:

- NASA Engineering Design Challenge (EDC) – Exploration Systems Mission Directorate (ESMD); International Technology Education Association (ITEA); NASA Education Technology Services (NETS); Challenger Centers; NASA Explorer Schools (NES); Science, Engineering, Mathematics Aerospace Academies (SEMAA); Digital Learning Network (DLN)
- STS-118 Seed Distribution – Park Seed; Central Operations of Resources for Educators (CORE); Center Education Offices; NETS; Educator Resource Center Network (ERCN); Museum Alliance; SEMAA
- STS-118/EDC Educator Professional Development – ESMD; Aerospace Education Specialists Project (AESP); ERCN; Sally Ride Science; National Science Teachers Association (NSTA); ITEA; Digital Learning Network (DLN); NES; Solar System Ambassadors (SSA); Space Center Houston (SCH)
- Integrated Project Web Site – NETS
- STS-118 Content and Web Site – ESMD; Space Operations Mission Directorate (SOMD); NETS; ISS Program Office
- STS-119 Content and Web Site – SOMD; NETS; Center Education Offices; EVA Project Office; Space Shuttle Program Office
- International Education Week (IEW) – US Department of Education; US Department of Agriculture; DLN; National Arboretum
- Teacher to Teacher Workshop – US Department of Education; AESP; Center Education Offices; ERCN; Astronaut Office; EVA Office
- NEAT Professional Development – SSA; Museum Alliance; Reduced Gravity Office (RGO); Center Education Offices
- Teach For America – NETS; AESP