

NASA Ames Research Center  
The AERO Institute, Cooperative Agreement (NNX08B70A)  
California State University Fresno, Cooperative Agreement (NNX08AT65A)  
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## PROJECT DESCRIPTION

In FY 2010 the NASA Ames Education and Public Outreach office used the Informal Education Visitor Center funds to develop, implement and evaluate education events based on the NASA Education Framework; create and upgrade the Ames Exploration Center (Visitor Center) and exhibits; provide opportunities to feature NASA historical and current events; and sustain and refresh existing NASA education communities.

## PROJECT GOALS

- 1) Develop, implement and evaluate education events based on the NASA Education Framework
- 2) Upgrade the Ames Exploration Center and exhibits
- 3) Provide opportunities to feature NASA historical and current events
- 4) Sustain and refresh existing NASA education communities

## PROJECT BENEFIT TO OUTCOME (1,2, OR 3)

The application of the Visitor Center funds have primarily benefited Outcome 3 (Inspire, Engage) by telling the story of space exploration to varied audiences in an engaging and compelling way and providing linkages between formal and informal education that promote STEM literacy. Outcome 2 (Engage, Educate) also benefits from these funds in two ways: 1) school groups and students constitute a large number of the annual visitors to the Exploration Center and the events and programs that have been created may be the first step in a progression of educational opportunities they participate in, and 2) early career elementary educators that have participated in other NASA higher education programs will have an opportunity for progressive training to strengthen their skills as STEM educators. Outcome 1 (Educate, Employ) also benefits from the enhancement of new collaborations and partnerships by bringing in student interns from local colleges and providing opportunities for students and faculty within other higher education programs operating at NASA Ames to participate in the development of new programs and content.

## PROJECT ACCOMPLISHMENTS

The full scope of the project has yet to be accomplished; however, the following accomplishments have been achieved to date:

### **Goal 1 (develop/implement education events):**

In FY 2010 the visitor center funds were used to support the development and implementation of a variety of educational events and opportunities that were held within the Exploration Center and/or the surrounding community. Audiences included K-12 classes and students, home-school organizations, after school groups, college students, formal and informal educators, and the general public. The goal of the events was to increase STEM awareness and literacy using a variety of mechanisms including exhibits, lectures, hands-on activities, demonstrations and shows. Over 23,850 people participated in over 30 events, some of which are highlighted and/or summarized below. Events that also contribute to Goal 3 (create opportunities to feature NASA historical and current events) have also been noted.

#### Lunar Crater Observation and Sensing Satellite Impact Event (Goal 1 and 3) –

On October 8 the NASA Exploration Center was a featured stop during the public evening event to watch as the LCROSS mission came to a successful end by impacting the surface of the moon. Over 3,000 people including families, youth groups, and members of the public attended the event and were treated special exhibits and programming about the moon.

Science Castle Lesson – On November 14 the NASA Exploration Center opened early so that ScienceCastle.com could film a lesson that featured several NASA projects. Science Castle provides online science classes, science kits, and science projects for students and educators.

Yuri's Night Celebration (Goal 1 and 3) - On April 9 and 10, 2010 Ames hosted and co-sponsored the "Yuri's Night Celebration at Ames" (Yuri's Night), an educational outreach event and celebration to commemorate the launch and orbit of the first man in space, Yuri Gagarin, and the flight of the first space shuttle. The event was divided into two segments, Yuri's Night Education Day (YN-ED) on Friday April 9 and the Yuri's Night celebration on Saturday April 10. Approximately 6,000 3-12<sup>th</sup> grade students, their educators and chaperones attended the education day event which provided an opportunity for students to visit exhibits, participate in hands-on activities, listen to NASA speakers, and watch demonstrations – all designed to promote interest in and learning about science, technology, engineering and math concepts. An estimated 6,000 attendees (young adults and older) had the opportunity to visit exhibits, hear talks by NASA speakers and other STEM professionals, and enjoy musical acts during the Yuri's Night celebration on April 10. Topics discussed by the speakers for both days included the LCROSS and Kepler missions and the Stratospheric Observatory for Infrared Astronomy (SOFIA).

- YN-ED demographics included 49.9% elementary students, 27.8% middle school students, 11.4 % high school students, 4.5% college students, and 6.4% home-school students. 43.7% of the students were male, 41.6% of the students were female, and 14.7% of the students did not report their gender. Ethnicity was distributed as follows: 48.5% Asian/Pacific Islander, 23.5% white, 18.4% Hispanic or Latino, 6.6% African American, 2.9% other/multiple, and .1% Native American. Over 60% of the students were from Title I schools within Santa Clara, San Mateo, San Francisco and Contra Costa counties.
- Yuri's Night festival demographics (approximate percentages based on sample data sets): 53% male, 47% female with an ethnic distribution of 55% white, 30% Asian/Pacific Islander, 5% Hispanic or Latino, 5% African American, 4% other/multiple, and 1% Native American.

The successful Yuri's Night Education Day will be repeated in 2011.

STS-132 Launch Event (Goal 1 and 3) – On May 14 members of the public were invited to the NASA Exploration Center to view the live, televised launch of the STS-132 mission in the large, immersive theater. In addition to viewing the launch, 433 guests were treated to special programming to learn more about NASA Ames' role in the space shuttle program and about the activities that take place during the launch countdown by former astronaut Bo Bobko who provided commentary during the countdown.

Exploration Day – On July 26, 2010 NASA Ames hosted "Exploration Day", an opportunity to visit existing and special exhibits within the NASA Exploration Center, participate in hands-on activities, hear from NASA and special guest speakers (e.g., former astronaut Dan Barry, actress Nichelle Nichols), get a brief bus tour of NASA Ames, and visit the Ames Exploration Encounter – a hands-on field trip experience normally limited to formal class visits. Over 1355 attendees including families, scouting groups (e.g., boy and girl scouts), summer camp groups (e.g, YMCA, Boys and Girls Club), and other individuals wanting to learn more about NASA participated.

After School Events (Goal 1 and 3) – 21 special programs for after school organizations (e.g, boy scouts, girl scouts, boys and girls club, science clubs) were provided in the NASA Exploration Center, many of them featured current and upcoming NASA missions. 849 youth, plus their chaperones, were treated to customized programming, special activities and guest speakers to help meet each organization's goals. An additional 5071 youth were reached through NASA participation (e.g., providing hands-on activities) at events hosted by after school organizations.

Evening Lectures (Goal 1 and 3) – 1,142 people attended four special evening lectures/symposia on themes and topics including Earth day, the Kepler mission, the impact and importance of NASA technology, and the value of scientific discovery were completed.

Finally, a new Informal Education Specialist has been hired. Her duties specifically include creating greater educational opportunities (e.g., a field trip experience) within the Exploration Center, working with after school groups (initially the Girl Scouts) to create experiences that more readily map to their requirements, and participating in the upgrade of the Exploration Center to tell NASA's story in ways that better excite a student's interest in STEM.

**Goal 2) Upgrade the Ames Exploration Center and exhibits.**

The Exploration Center hosted 49,069 visitors in FY'10, all of whom benefited from the funds provided.

A support and maintenance contract with Global Immersion for the immersive theater in the NASA Exploration Center (visitor center) was procured. Visitors to the NASA Ames Exploration Center can learn about NASA missions and science through interactive shows conducted in the digital immersive theater. The theater also provides a venue for talks and lectures, and the ability for the NASA Exploration Center to network with other science centers and museums throughout the country that use the same Global Immersion technology. The support and maintenance contract assures the ability to reliably deliver high quality shows to our guests.

Items were also procured to increase the effectiveness of the exhibit about the Stratospheric Observatory for Infrared Astronomy (SOFIA). The exhibit upgrade increases the interactivity of the exhibit and includes the addition of traditional light and infrared cameras and monitors to demonstrate the differences between how traditional telescopes and the SOFIA telescope functions. In addition, the modular nature of the upgrade makes it suitable for use at off-site events and for loan to other science centers and museums interested in sharing information about SOFIA with their visitors.

In addition, a tiger team has been established to work with NASA to redesign the visitor experience. In addition to contributing expertise in various aspects of exhibit design and development and creating educational experiences, the tiger team will strengthen NASA's relationships and provide greater partnership opportunities with museums and science centers in our region and beyond. Current members include:

- Greg Brown, Senior VP of Exhibit Content Development, Formerly the Tech Museum
- Elizabeth Babcock, Dean of Education, Cal Academy of Sciences
- Lisa Dunmeyer, Independent Interactive Content designer (e.g., Cal Academy of Sciences, Science Discovery Center, Long Beach Aquarium, etc.)
- Dirk Dieter, Independent Interactive Content Designer (Cal Academy of Sciences, OMCA, etc.)
- Paul Martin, Director of Exhibits, Museum of Science, Minnesota

Tamara Schwartz, Director of Exhibit Development, Chabot Space and Science Center  
Chris Chan, Senior Exhibits Developer, Children's Discovery Museum  
Nina Simon, Independent Exhibit Consultant, Leading field expert on Participatory Experience Development  
Wendy Melunch, Visitor Experience Consultant and Outside Evaluation specialist  
Susan Spero, Museum Studies faculty, JFKU, local intern opportunity specialist  
Angela Booker, Interactive Education Design theorist, Stanford University, School of Education

**Goal 3: Provide opportunities to feature NASA historical and current events**

Over 14 special events (described within Goal 1) were created to feature NASA historical and current events. Topics included the LCROSS, Kepler and SOFIA missions, recognition of the first space shuttle flight and the first human to orbit in space. In addition, the upgrades within the NASA Exploration Center create further opportunities – through exhibits, shows and interactive presentations – to share information about NASA's historical, current and even future events.

**Goal 4: Sustain and refresh existing NASA education communities**

Funds have been used to sustain and refresh NASA education communities in the elementary and secondary and higher education arenas.

Within the elementary and secondary program, funds have been used to provide a part-time intern to staff the Educator Resource Center (ERC) at NASA Ames. The ERC is a regional resource where K-12 teachers (and home school organizations) can obtain NASA information and materials to supplement their classroom experiences.

In addition, the leads for informal education and elementary and secondary education at NASA Ames have agreed to collaborate to create a "Science on Saturday" series. Through the collaboration local middle school educators will have an opportunity to work with NASA scientists to create a lecture and demonstration for middle school students (although all ages welcome). The elementary and secondary education staff will manage the selection and coordination of the educators, and the informal education lead will provide funds to pay a small honorarium and purchase supplies for the demonstrations. The talks will be given at the NASA Exploration Center and at the educator's home institution. This work is anticipated to begin in late Spring 2011.

Within the higher education area (transitioning into the secondary and elementary education area of teacher professional development), an augmentation to the highly successful Ames Pre-Service Teacher Institute (PSTI) cooperative agreement with California State University Fresno (NNX08AT65A) was awarded to operate a PSTI Alumni (PSTI-A) program the summer of 2011.

The PSTI-A will provide an opportunity for up to 20 PSTI alumni to attend a two-week residential session at NASA Ames, where they will receive follow-up training to further improve their skills in teaching mathematics and science within a NASA-themed problem-based context, using technology to support the curriculum. The program will be open to PSTI alumnae who have graduated from college and have completed at least one year of classroom teaching.

### PROJECT CONTRIBUTIONS TO PART MEASURES

49,069 visitors came to the NASA Exploration Center for visits and special programming in FY'10. Visitors included families, school groups, after school groups, tour groups (US and international) and other members of the general public.

An additional 18,126 were reached through special education events that were held outside of the Exploration Center (described in Goal 1). These audiences were generally school groups and families, although some events (e.g., evening lectures) also drew adult audiences.

### IMPROVEMENTS MADE IN THE PAST YEAR

The cooperative agreement with the Aero Institute (located near Dryden Flight Research Center) has completed its first full year of operation. During this time resources located at Dryden and managed by the Aero Institute were provided to NASA Ames in support of the Yuri's Night events. In addition, a workshop with the staff from Dryden and Ames is being planned to discuss ideas for further collaboration and synergies that will allow the combined resources to have greater impact within California and the multi-state region that each center supports.

### PROJECT PARTNERS TECHNICAL POINT OF CONTACT INFORMATION AND ROLE OF PARTNERS IN PROJECT EXECUTION

#### Aero Institute

Project Partner Point of Contact: Dr. Susan Miller, Executive Director, AERO Institute, 38256 Sierra Highway Palmdale, CA 93550. 661-276-7428

AERO Institute (AERO) will build upon the Education and Education Outreach programs at the Ames Research Center by advancing the strategy of engagement of all education customers, integration of education programs, and incorporation of information delivery technologies in the operational processes. AERO has analyzed the operational structure and activities of the Ames Education Office and Educational outreach programs and recognizes unique opportunities for enhancement. AERO's vision statement "CESIS will integrate the operational processes of the Education Programs and the education Outreach Programs and continually leverage partnerships and facilities to

maximize the human capital and financial resources necessary to sustain and enhance the activities of the Ames Office of Education in a cost effective manner” captures the proposed strategic focus.

Specific goals include:

1. Schedule off-hour events in current education outreach facilities, including the Visitor Center
2. Cultivate Partnerships to provide subject matter expertise to help develop:
  - a. The road map to implement the vision statement
  - b. Contents for the Visitor Center programs, Education Resource Center workshops, and other education outreach programs
  - c. Support the operation for the educational and outreach activities
3. Provide, retain and train staff to support education and education outreach activities. AERO Institute will leverage local internship programs to the extent feasible to provide staff support.

California State University Fresno (PSTI-A)

Project Partner Point of Contact: Steve Price, Ed.D., Director, Community Based Learning, California State University, Fresno 5005 N. Maple, M/S ED201, Fresno, CA 93740

Steve Price, Ed.D., will serve as Principal Investigator and will work closely with the NASA Ames Higher Education and Informal Education leads in program planning and implementation of the PSTI-A. CSU, Fresno will engage the service of an experienced Project Coordinator to assist in logistics. The PI and Coordinator will recruit participants, engage the instructional staff in Institute planning, schedule and coordinate the institute activities and curriculum, procure materials needed for the institute, arrange travel for participants, set up middle school classrooms, and evaluate the PSTI-A.