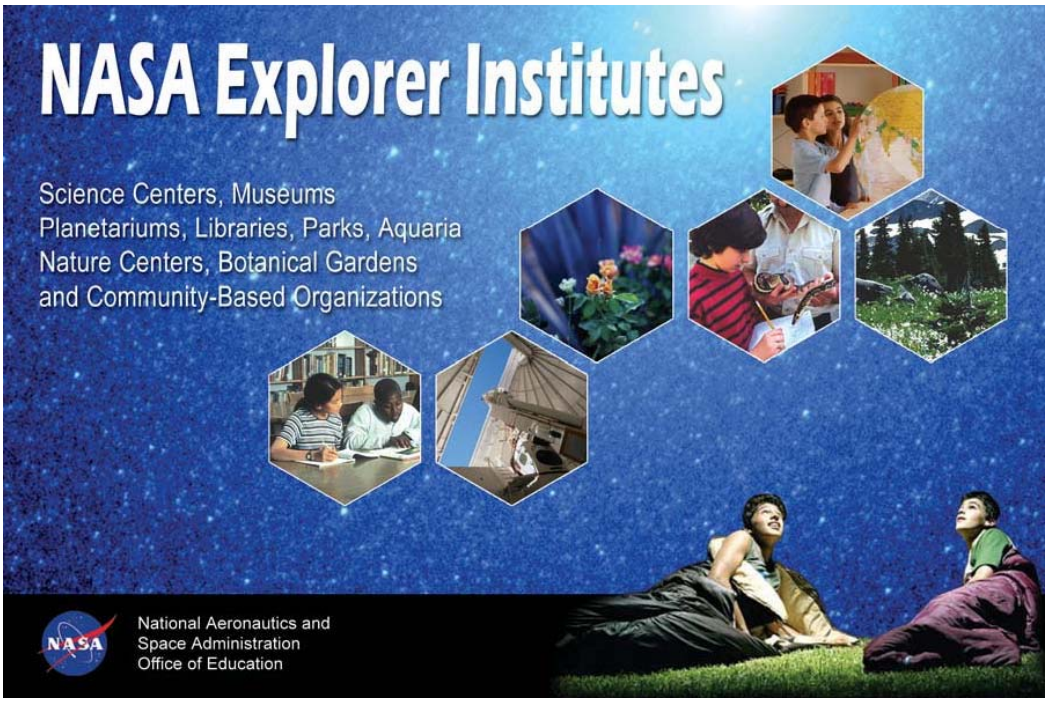
NASA Explorer Institutes: Exploring the Possibilities for Collaboration with the Informal Education Community



Report of the NASA Explorer Institutes

Focus Groups and Pilot Workshops
September 2004 – March 2005

Planning and Evaluation Meeting
March 14-17, 2005

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Executive Summary

NASA Explorer Institutes, a new national level program, is intended to provide, "...as only NASA can," engaging experiences, opportunities, materials, and information to members of the informal education community including, but not limited to, representatives of science centers, museums, planetariums, libraries, parks, aquaria, nature centers, botanical gardens, youth groups, and community-based organizations.

In FY04, 17 NEI pilot projects were funded. Over 270 individuals, representing more than 145 informal education organizations, participated in six pilot professional development workshops. These workshops were designed to support informal science educators in using the unique assets of NASA Field Centers. Over 300 experts from the informal education community, representing over 200 institutions, participated in eleven focus groups. These individuals represented a wide range of expertise and were asked to identify strategies and approaches that can be used to effectively implement the NEI goals and objectives.

This report contains summary information and conclusions from the pilot workshops, focus groups, and the NEI Planning and Evaluation Conference which united representatives of the workshops, focus groups, and NASA education. The culmination of these NEI pilot initiatives resulted in the identification of strategies that could be used to increase collaboration between NASA and the informal education community. Based on that information, the Informal Education Division plans to support projects in four categories in FY05.

The four categories of NEI projects that will be considered for funding in FY05 include Professional Development Workshop Opportunities, STEM Teaching Tools and Products, Infrastructure Development Projects, and Partnerships for Sustainability. All NEI projects will be conducted by NASA Field Centers in partnership with members of the informal education community. NASA will continue to support the IEC through funding initiatives sponsored by the Informal Education Division and program support by informal education points of contact at the NASA Field Centers.

NASA Explorer Institutes Purpose

In 2004, the Informal Education Division initiated a new national level project called NASA Explorer Institutes (NEI). NEI provides, "...as only NASA can," engaging experiences, opportunities, materials, and information to members of the informal education community including, but not limited to, representatives of science centers, museums, planetariums, libraries, parks, aquaria, nature centers, botanical gardens, youth groups, and community-based organizations.

The goal of NEI is to encourage and support projects that:

- Improve the public's understanding and appreciation of science, technology, engineering, and mathematics (STEM) disciplines to enhance their scientific and technological literacy, mathematical competence, problem solving skills, and the desire to learn;
- Establish linkages that promote new relationships between providers of informal and formal education resulting in improved and creative STEM education in all learning environments;
- Excite youth, particularly those who are underrepresented and underserved, about STEM disciplines;
- Expand STEM informal education programs and activities to communities/locations that have been traditionally underserved by such opportunities;
- Stimulate parents and others to support their children's learning endeavors in formal and informal settings and to become informed proponents for high-quality, universally available STEM education in the home and elsewhere;
- Encourage and implement innovative strategies that support the development of a socially responsible and informed public who can make responsible decisions about STEM policy issues affecting their everyday lives.

The objective of the NASA Explorer Institutes is to enhance the capabilities of the informal education community to inspire the next generation of explorers by providing access to NASA staff, research, technology, information, and/or facilities and by:

- Engaging the informal education community in discussions about how to involve the public in shaping and experiencing NASA-related missions;
- Identifying NASA-related instructional content, resources, and information, in collaboration with the informal education community, that will enhance informal education program goals and objectives;
- Providing NASA-related professional development opportunities for members of the informal education community across the nation;
- Facilitating the formation of collaborative partnerships between informal and formal education communities.

In the first year, a comprehensive planning process was developed to inform the direction of NEI by working with the informal education community (IEC) to identify shared goals, needs, strengths and strategies.

Pilot Year Process

The 2004-2005 NEI Project was conducted in three phases. In phase one, NASA Field Centers competed internally for the opportunity to design and host pilot professional development workshops for informal science educators. In phase two, informal education institutions applied to host focus groups on the needs of particular informal science education sectors, geographical regions, or target audiences. In phase three, representatives from both the pilot workshops and the focus groups convened at a conference to collaborate, clarify, synthesize, prioritize and elaborate on the ideas developed in their individual projects.

Pilot Professional Development Workshops and Focus Groups

NASA funded pilot professional development workshops to support informal science educators using the unique assets of NASA Field Centers. NASA education and mission staff were invited to develop workshops in conjunction with an informal education partner. In several cases, the workshops were a product of multiple centers, mission offices, and/or informal education organizations.

NEI Pilot Workshops – October/November 2004

Workshop Title	Host NASA Center(s)	Partner Institutions
Earth Explorer Institute	Goddard Space Flight Center	Maryland Science Center
From Earth to Sky	Ames Research Center and Goddard Space Flight Center	National Park Service
Girl Scouts USA NASA Experiences	Jet Propulsion Laboratory	GSUSA
An Innovative Collaboration Involving NASA's Office of Biological and Physical Research, NASA Langley, and North Carolina 4-H	Langley Research Center	North Carolina 4-H
NASA Informal Education Partners for Excellence	Langley Research Center	Virginia Air and Space Center
Workshop for Informal Education Specialists (Return to Flight)	Kennedy Space Center	KSC Visitors Center; NASA Marshall, Johnson, Stennis

NEI Focus Groups assembled experts from the IEC. These experts were asked to identify strategies and approaches that can be used to effectively implement the NEI goals and objectives. Each focus group examined a different strategy to enhance the capabilities of the informal education community to inspire the next generation of explorers through access to NASA staff, research, technology, information, and/or facilities. Focus groups covered a wide range of topics, and many of the groups crossed multiple disciplines. However, to help with synthesis, some broad categories are used here to describe the groups:

NEI Focus Groups – January/February 2005

Topic	**Host Institution**	**Products** for Public Audiences (Exhibitions, media, etc.)	**Programs** for Public Audiences (one-time events, courses, camps)	**Professional Development** (Including all support for formal education)	**Community -based** programs for youth and families.
Bringing NASA into Focus: Improving Effective Use of NASA Resources within the Informal Science Education Community	Pacific Science Center	X	X	X	
Digital Planetaria: Building Bridges Between Institutions, Universities, Programmers, and NASA	Chabot Space and Science Center	X	X		
Encouraging American Indians to Study Aerospace	ArtReach				X
Exploring Common Resources and Needs with NASA Field Centers and Education Offices	Challenger Center for Space Science Education			X	X
Extending NASA Education Resources through 4-H	Auburn University				X
Internet2 and Informal Science: Connecting K-6 with NASA	Franklin Institute			X	
NASA Listens to the Four Corners	Space Science Institute	X	X	X	
New Frontiers: Focusing on the Future of NASA	OU Sooner Flight Academy			X	X
Seeing the Universe: Visualizing Space for Informal Science Education	American Museum of Natural History	X			
Stellar Strategies to Understand the Universe	Great Lakes Planetarium Association	X	X		
The Integration of NASA NEI Programs and Resources into After School and Professional Development Programs Offered by Informal Science Education Institutions in the Eastern Region	The EdVenture Group			X	X

Each focus group and workshop reported on the needs of the IEC, identified relevant NASA assets and effective mechanisms to access and leverage resources, and made recommendations for next steps. These reports were analyzed by NEI staff for goals, strategies, needs and strengths.

NEI Planning and Evaluation Conference

The NEI Planning and Evaluation Conference, held in March 2005, brought together representatives of the focus groups and pilot workshops with NASA education representatives. The conference was designed to facilitate the sharing and synthesis of ideas generated and lessons learned in the eleven focus groups and six pilot workshops.

Conference participants were initially divided into groups to discuss ideas and needs. Focus group and pilot workshop representatives were organized into four groups: products, programs, professional development, and community-based organizations (see table above for groupings). Other NASA education representatives met in their own groups (customer focus and content). Each discussion group described the intersection of their goals with NASA Explorer Institutes, then discussed and reported on common themes/issues, unique themes, short-term needs and long-term needs, organizing information under these categories:

1) Things NASA should know about working with our group
2) Factors involved in effectively serving our audiences
3) NASA assets relevant for our group
4) Mechanisms for the relationship between NASA & our group
5) Professional development for our group

Output from the subgroups was analyzed by the Informal Education Division staff and the conference facilitation team. Emerging themes, concerns, and program ideas were identified. Program ideas emerging in the first session drove the remaining sessions, as each idea was first elaborated by self-selected groups of conference participants, and refined by the original conference subgroups.

Each group working on the development of a program idea completed the following sentence stems:

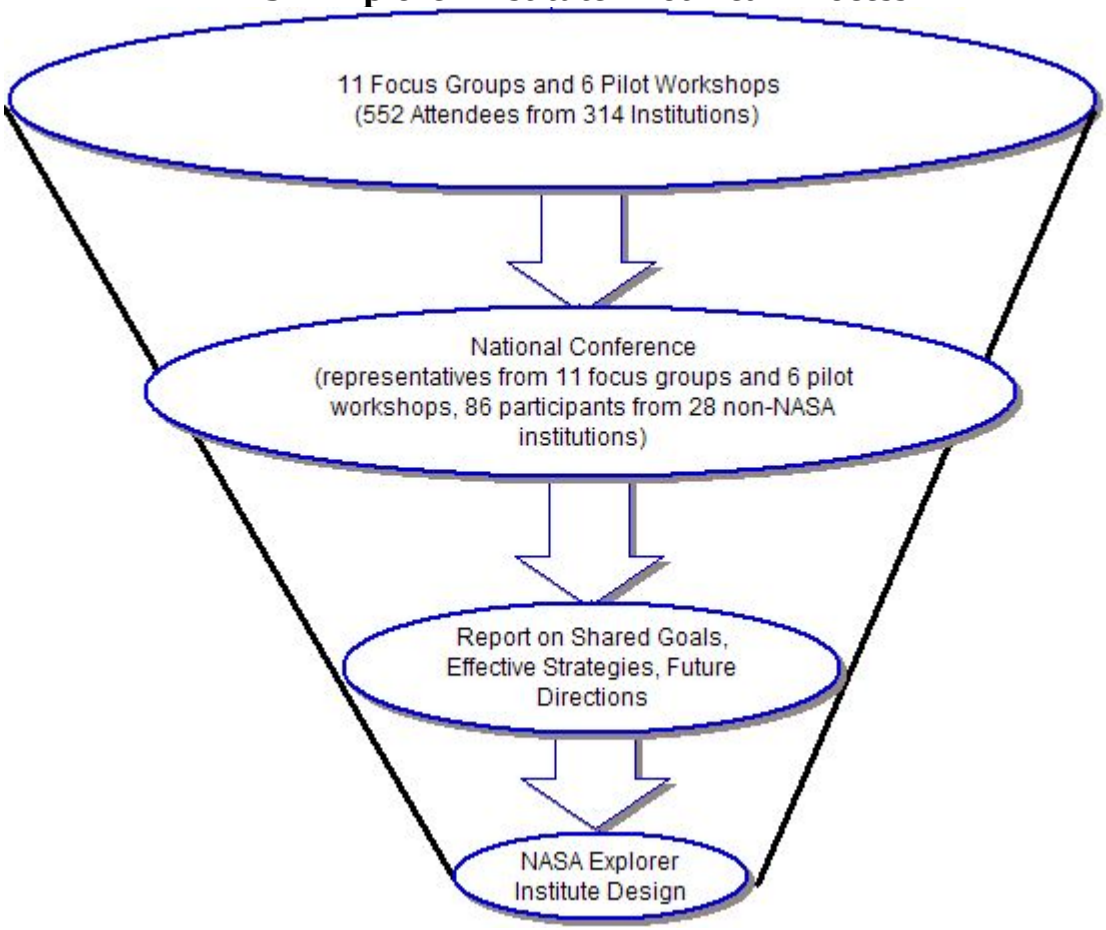
1) Our big idea is …
2) Intended outcomes for this program, product, service are …
3) This program, product, service would serve …
4) This program, product, service would make use of these NASA resources …
5) Mechanisms needed to support this idea are …
6) This program reaches NEI goals by …

Refinement of ideas focused on implementation, feasibility, sustainability and evaluation strategies for each idea.

The results of the three day meeting were captured and analyzed for shared goals, strategies, needs and strengths. Pilot workshop and focus group reports were then analyzed for key themes and strategies in relationship to the themes that emerged from the conference to ensure that nothing was overlooked.

The NEI staff combined the results of the meeting with analysis of the final reports from each pilot workshop and focus group. The results of all of these efforts provided the framework for the FY05 NEI funding opportunity.

NASA Explorer Institute Pilot Year Process



Supporting Collaboration between NASA and the Informal Education Community

NASA's Informal Education Division is designed to serve as a bridge between the large, diverse, and unique communities that exist both within NASA and throughout informal education. The pilot year of the NEI project identified the shared goals, strategies, needs, and strengths of NASA and the informal science education community that will serve as the foundation for future collaborations and partnerships.

Shared Goals:

- Promote public science learning: Both NASA and informal institutions seek to educate the public about science, particularly current scientific research.
- Reach underserved audiences (minorities, women, people with disabilities).
- Connect formal and informal education opportunities.
- Broaden participation in STEM pipeline: Both groups seek to inspire and support young people in the pursuit of STEM careers.
- Involve families: Informal institutions serve families and seek to engage entire families in cross-generational activities.

Strategies for Reaching Shared Goals:

- Build an infrastructure for accessing, developing, funding, supporting, sustaining programs in informal education community that utilize NASA resources.
- Provide STEM content and teaching tools to informal institutions and work together to develop curriculum and programs.
- Provide professional development opportunities based on the varying needs of different segments of the informal science communities – the professional development needs of science center staff are different from those of afterschool leaders.

The representatives of the informal education institutions and NASA each identified their **needs and strengths** to facilitate future collaboration. These themes emerged:

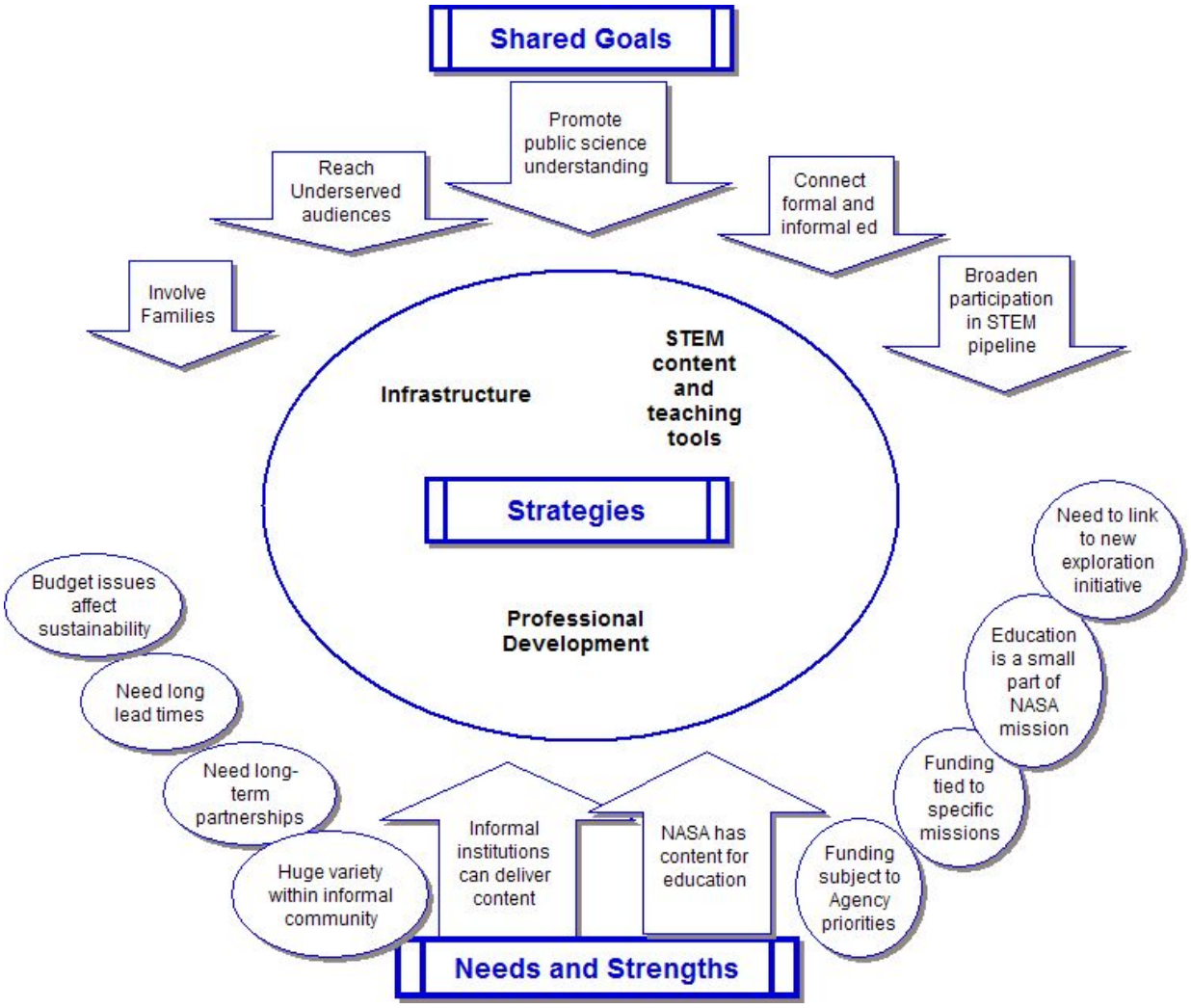
What **Informal Institutions** would like NASA to know:

- **Content:** The informal education community's expertise is content delivery. Informal education needs NASA content. Work **with** us to design products and programs for the public.
- **Sustainability:** Informal education institutions need long-term commitments to be able to plan, deliver and sustain programs.

- **Leverage Funding:** Budget and staff shortages often impact program sustainability. Resources are limited, and there are competing content agendas. Informal education institutions need to be able to leverage partnerships with NASA to bring in additional funding.
- **Advanced Planning:** Long lead times are needed. Calendars are set and event planning happens months in advance. Curriculum takes time to adapt and/or develop. Institutions need long lead times to take full advantage of current science missions/events.
- **Variety:** Informal education institutions are as varied as the audiences they serve. There is variation in capacities and needs.

What **NASA** would like informal education institutions to know:

- **Limited Budgets:** Budget and staff time are limited. NASA education budgets can be tied to specific missions, projects, etc., that operate on specific time frames and need to cover related content. NASA's strategic plan and budget are variable and subject to government oversight.
- **Larger NASA Mission:** Education is one piece of NASA's overall agenda. The Agency has other missions to carry out in addition to its education missions. These missions receive the bulk of the resources and the bulk of the staff effort.
- **Advanced Planning:** As a federal agency, answerable to Congress and taxpayers, change and motion is sometimes slow, yet, at other times, sudden. Working with NASA requires long lead times and patience. NASA staff members should concentrate on managing partnerships but may not know the needs of a particular institution. Collaboration requires active participation on both sides.
- **Exploration Vision:** The new exploration initiative is a central focus: NASA's next educational challenge is to consider how to integrate the exploration focus into NASA's educational mission.

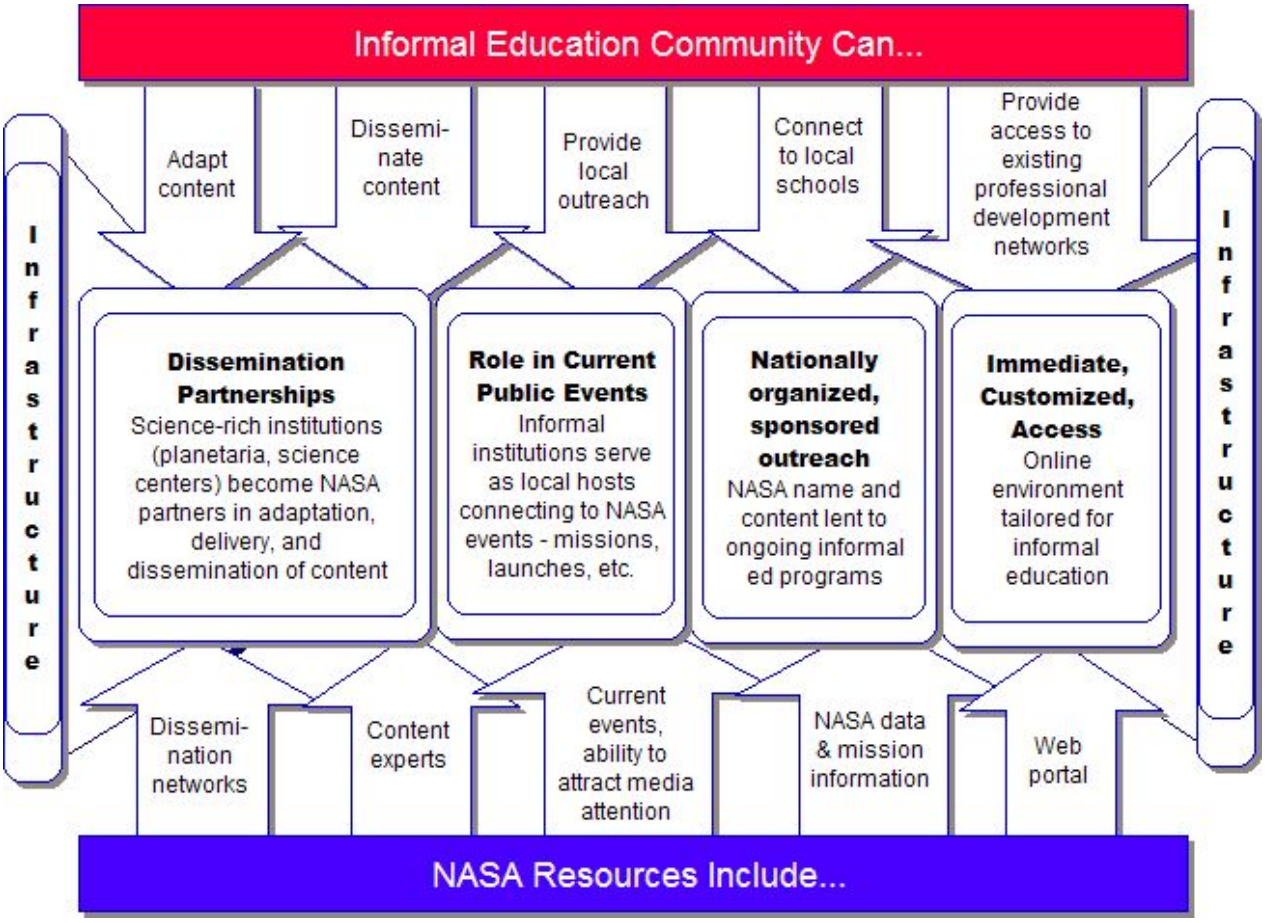


The synthesis across focus groups and pilot workshops reveals a strong set of shared goals, a clear strategic direction, and a strong match between IEC needs for content and NASA as a content provider. Challenges facing collaboration include maximizing limited budgets for program sustainability and coordinating the long lead times needed by both NASA and the IEC. The next section includes specific solutions proposed to address the needs and strengths of the two groups.

Future Directions

The recommendations that NASA received from the pilot workshops, focus groups, and the evaluation and planning conference are presented in three areas: *Infrastructure*, or mechanisms for collaboration; *STEM content*, needs and resources; and, *Professional Development*.

Infrastructure



An overarching theme emerging from this collaborative planning process was the opportunity for NASA and the informal education community to learn from each other. The informal education community has an extensive grassroots reach into their target communities. They are experienced in recruiting and engaging members of their communities over time in a variety of activities. They are used to adapting and dovetailing with formal educational programs. NASA has rich and deep resources, name recognition and public events that interest people. NASA and the informal education community share the goals of increasing everyone's science literacy, particularly families and the underserved.

Infrastructure recommendations for NASA action:

- Creating ways to make NASA resources easily accessible to the informal education institutions (through Field Centers and a web portal).
- Supporting the adaptation and dissemination of materials for informal education (host and maintain a best practices database, co-develop instructional materials with informal institutions).
- Using NASA tools such as NASA TV to provide content for informal education.
- Seeing informal education institutions as partners in educating the public about current events in the media.

Infrastructure recommendations for IEC action:

- Providing advisors to NASA on informal education constituents and delivery.
- Becoming involved with scientists for education and public outreach (E/PO).
- Creating and managing traveling exhibits on timely topics through the Museum Alliance Network.
- Creating and maintaining a STEM Ambassador program with certification in NASA content and resources.

Possible Infrastructure Strategies/Solutions

Several general categories of infrastructure and solutions for providing that infrastructure emerged from the discussions. Recommendations from the focus groups and pilot workshops included:

Portal for Resources and Partnerships

NASA should provide an online environment that allows easy posting and searching of resources, matchmaking tools which promote partnerships, and access which encourages informal education institutions to use NASA resources. Such information should be searchable by theme, content, age, audience, or tool.

National-level Partnership and Sponsorship

Ongoing programs primarily sponsored by informal education institutions can enter partnerships to use the NASA name, content, and expertise, as well as funding. Existing afterschool science clubs and space-related programming hosted by informal institutions could connect directly with NASA-provided materials and STEM advisor support. Program developers at informal institutions can use the NASA support to integrate NASA content. A more direct connection between such programs and NASA would promote a continuous NASA presence for informal education customers.

Role in Current Public Events

Informal education institutions seek involvement in timely events (celestial events, launches) as part of the NASA's public outreach. Informal institutions can serve as local hosts for NASA mission events, feeding NASA content into their existing infrastructure of family nights, exploration clubs, after school programs, and support for schools/formal education institutions. The establishment of such a network would require a centralized point of contact that alerts informal institutions of upcoming events with sufficient lead

time to work into their event planning cycle, and a consistent format for NASA supplied content/resources.

Dissemination Partners

Science-Rich Institutions (museums, planetaria, Challenger Centers) could become "NASA-certified" partners and provide programs, professional development, creation or adaptation of curriculum and serve as hubs for informal education activities.

STEM Content

NASA has science content, facilities, and professionals to offer. The IEC has expertise in content delivery. Facilitating collaboration between NASA and IEC partners requires an understanding of what content is available and which formats will best support eventual delivery of that content. This is not a simple determination to make.

One-NASA Resource for Informal Education

Informal educators throughout the NEI project urged NASA to present "one NASA" to their community. Informal educators want a single point of contact to help find upcoming events, available resources, and lessons learned by others who have delivered the same content. In the above infrastructure section, an Internet portal was highly recommended. Other recommendations included use of specific individuals or physical locations to provide this single stop for NASA content.

Content Adapted to Unique IEC Programming

However, one point of contact does not translate into 'one size fits all.' IEC institutions vary widely in STEM expertise. Institutions may have certified teachers, high school student instructors, retired scientists, or parent/community leaders as facilitators of activities. Informal educators are hungry for rich content in multiple forms, such as visualization tools, images, live broadcasts, interactive video-conferencing and web interfacing. They want access and know-how to bring these resources to their constituents, support formal education, and represent NASA in the field. Informal educators are used to adapting materials from different sources as well as creating content for their audiences. IEC programs often serve different ages and abilities, as well as different cultures and interests. They want to partner with NASA to adapt and develop materials for informal setting such as afterschool programs, evening events, family nights, special presentations and projects.

"Hub and Spoke" Dissemination Networks

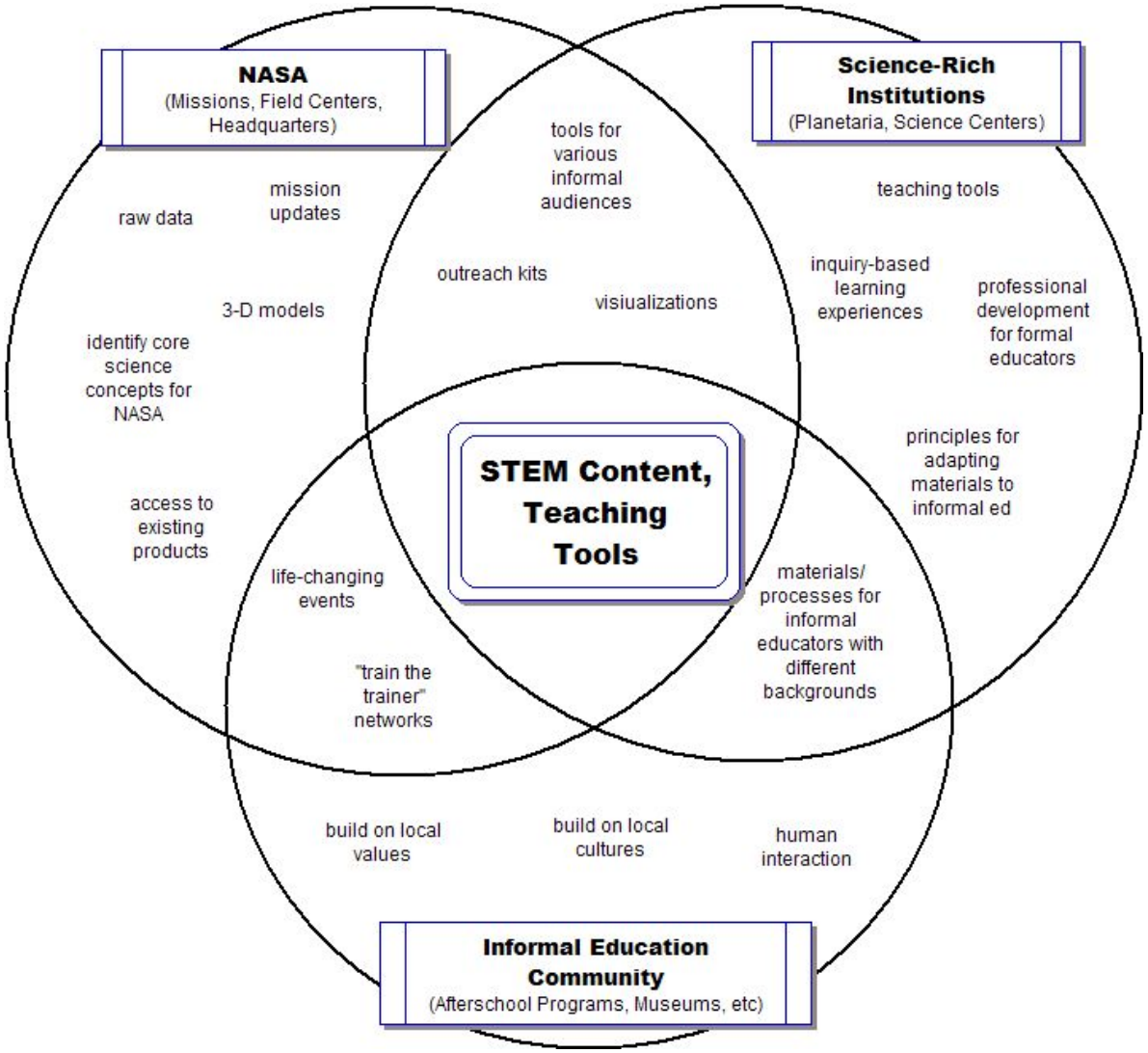
NASA/IEC collaboration might best be served by taking advantage of the diversity of capacity and knowledge within the IEC community. A "hub and spoke" relationship could be created with the larger, science-rich organizations as the hubs for NASA products and professional development. These hubs then provide support for smaller, less resource-rich informal education groups. Community-based organizations with knowledge of specific communities, could work with the hubs to create spokes tailored to their community's needs. This strategy would create a dissemination network organized

by region. This would encourage collaboration to build the IEC capacity to offer NASA content.

STEM Activity Kits

It was also suggested that core STEM content could be identified and packaged in activity kits or traveling exhibits. Development of such kits and training on use could be done through science-rich institutions such as planetaria and museums. This would provide a new, unique context for NASA missions and events.

NASA's mission has the power to inspire. As one of, if not the, premier science organization in the world, NASA inspires people to achieve what they thought they could not. NASA and informal educators can work together to tell the stories of those who work for NASA and those for whom NASA has been an inspiration. Informal educators suggested that, by partnering with NASA, they can offer life-changing events. They can focus STEM content on local, as well as, global issues of significance and make NASA content relevant to people's immediate lives and their dreams. They can use NASA resources to feed the pipeline for STEM careers.



Professional Development

Professional development can promote collaboration by building the capacity of collaborators, facilitating communication, and providing a mechanism for continuity, both among informal education institutions and between the IEC and NASA.

NASA-sponsored professional development workshops

NASA can provide life-changing content and experiences. To make these experiences available and accessible to as many people as possible, NASA must make its unique content available to local users. Two strategies were identified for promoting the professional development of informal educators. These strategies can leverage the efforts of both NASA and the IEC and take advantage of existing networks in both communities.

NASA can increase the capacity of local organizations by establishing a network of trainers. To develop and nurture content expertise within the informal community partner's infrastructure and culture, NASA could host regional training on relevant topics open to the IEC. Some groups even suggested that NASA train and certify STEM Ambassadors, creating a web of trainers and education providers.

Another strategy for leveraging professional development is the "train-the-trainers" model. Different segments of the IEC have established professional development networks and their own communities of trainers. By working with these established networks, NASA can benefit from IEC organizations' ability to adapt programs to their own backyard. Creating a strong infrastructure will support significantly more local programming, as implemented by local educators, than could be supported by NASA alone.

To further encourage connections between NASA and the IEC, NASA could invite an "informal educator in residence" to develop curriculum. There could also be a staff exchange program where informal educators work at NASA and vice versa.

Replicating best practices

NASA projects with informal education should be designed for sustainability and replication. By establishing a common infrastructure, best practices and programs can be shared throughout the informal community, reducing duplication of effort, maximizing the impact of each program, and providing continuity in NASA-sponsored programming.

Suggestions for promoting continuity across programs included:

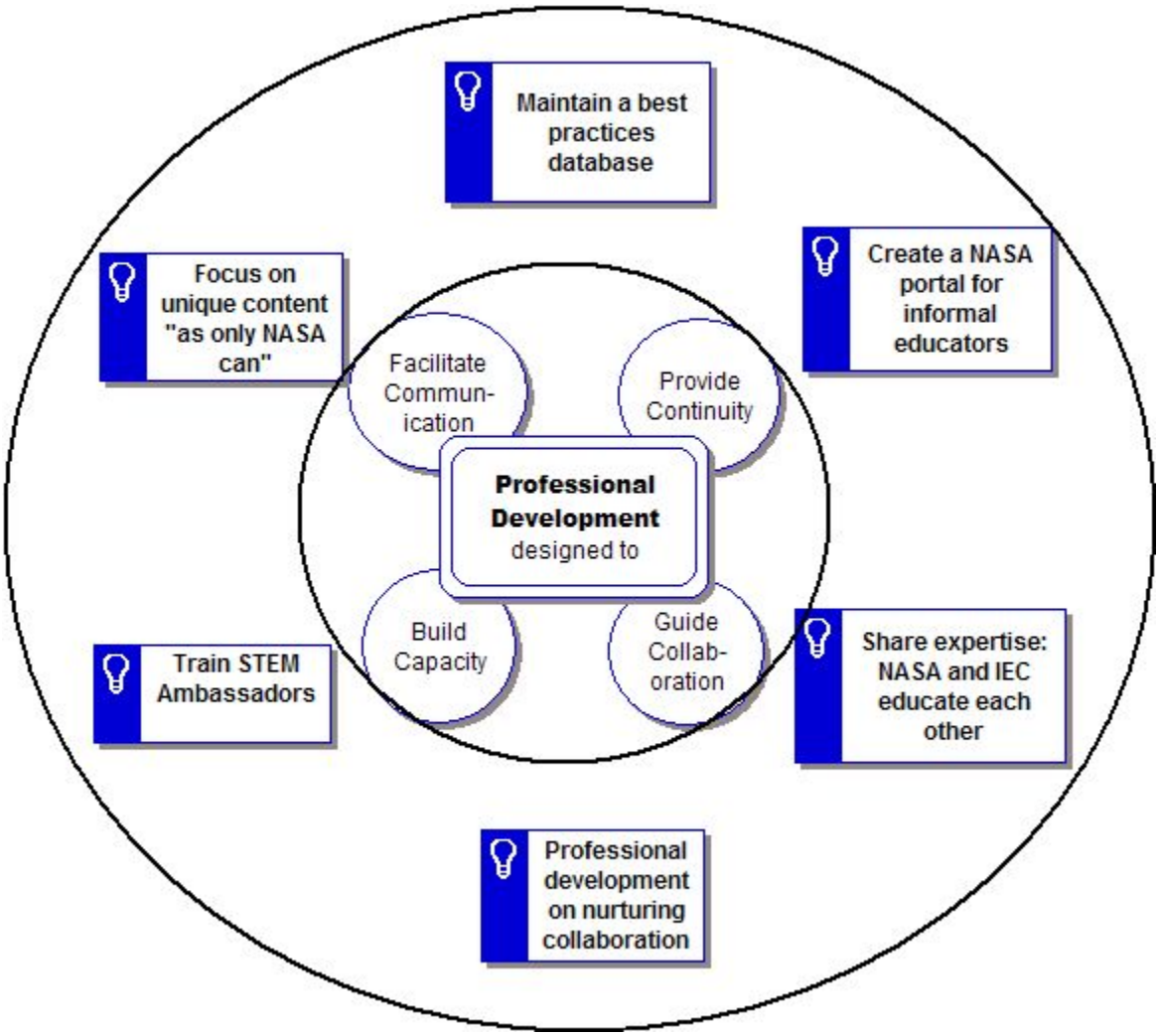
- Creating standards for informal educational materials, a NASA "seal of approval," or a credential for dissemination sites for NASA content.
- Building expertise and recognition within partner organizations for unique capacities that can then be shared through training or provided as services.
- Establishing several common levels of technology and format for the dissemination of data, visualizations, and other mission information.

Replication of best practices can be promoted through training and documentation. NASA should support efforts to teach core STEM content which then supports all other educational

opportunities. Using the NASA portal or a similar infrastructure to document best practices as they evolve and making them available for replication will ensure continuous improvement. Commitment to NASA programs may be built through coordinated and standardized training (perhaps through science-rich institutions) and by sharing what is learned widely.

NASA materials and resources tailored to informal education settings

NASA has a number of existing structures and products that could be expanded or tailored serve the IEC. NASA could offer reciprocal training between NASA content providers and informal educators around existing NASA education programs. This may lead to cooperative development or adaptation of products and methodology for informal education. Standard evaluation protocols should be developed and used to refine programs, document results and develop models and principles for implementation. Existing distance learning capabilities can be better used to connect people to provide mentoring opportunities. NASA should promote informal educators' use of Educational Resource Centers and development or adaptation of materials for the IEC.



Communication

Communication is a critical piece of the structure needed to support informal education. Networking, sharing, and training will succeed if supported by an effective communication infrastructure. Several groups recommended methods for NASA to build its capacity to communicate with the IEC:

- Create a cadre of NASA representatives, at local, regional, and national levels, who are tied into NASA and their informal science/youth development communities.
- Create that portal for information retrieval, posting, partnering and co-creating programs.
- Create a search engine on the web that increases access to relevant and reliable science information.
- Support communication and collaboration between different members of the IEC (museums, community-based orgs, etc.). Methods of connection include conference calls, informational meetings, and conferences. All of these should encourage "dreaming up new initiatives together."
- Support communication technologies, such as blogs and bulletin boards, to connect various segments of the IEC.
- Share working models for collaboration. Have partners that are working well together feed information and program models for effective collaboration back to both the IEC and NASA.

Conclusion

The analysis reveals several critical factors for success in this partnership as perceived by the two communities:

Continuity → stable structures, clear communication, and a commitment to build relationships and resources over time;

Access → to each other and to each other's resources and expertise;

Usability → resources that are or can be adapted, professional development designed for informal educators with diverse backgrounds, and a range of technology requirements;

Affiliation → both organizations can further their goals and benefit from an active partnership.

Based on the input from over 552 individual FY04 NEI participants, representing at least 314 institutions, the next steps of the NEI project have been developed in conjunction with the writing of this report. The four categories of NEI projects that will be considered for funding in FY05 include Professional Development Workshop Opportunities, STEM Teaching Tools and Products, Infrastructure Development Projects, and Partnerships for Sustainability. All NEI projects will be conducted by NASA Field Centers in partnership with members of the informal education community. NASA will continue to support the IEC through funding initiatives sponsored by the Informal Education Division and program support by informal education points of contact at the NASA Field Centers.

A Vision for NASA/IEC Collaboration

NASA and the IEC are connected through portals (searchable, downloadable, plug and play, uploadable), blogs, video conferencing, and lifelong learning portfolios for audiences, participation in collaborative projects

NASA and the IEC provide meaningful, life changing events. We create possibilities in the minds of those we serve – our neighbors, friends and colleagues.

NASA and the IEC listen to each other - Collaborating develop products and programs so they are responsive to communities needs, with reciprocal training opportunities –combining NASA content with IEC practical everyday experience of content delivery to a variety of audiences.

NASA collaborates with the IEC to make resources available - on our desktops – through broker/facilitator networks – at several levels of technology – through regional on and off site training - NASA TV.

The IEC supports clear understanding of core STEM content. Its members are connected to NASA mentors, and have clear communication channels with NASA personnel.

NASA and the IEC many ways to involve our communities – common programs, information our communities can use, local data and projects that make a difference

NASA and IEC combine efforts to reach common goals – promoting science literacy and broadening participation in STEM – through networks of certified ambassadors and products that have the NASA seal of approval.

NASA and the IEC know what works – we do ongoing evaluation as part of a larger systematic effort with common research questions, protocols and instruments

We are the pipeline – we know the audiences – we have the delivery systems- we inspire and support young people seeking to become a part of the STEM workforce.

Appendix

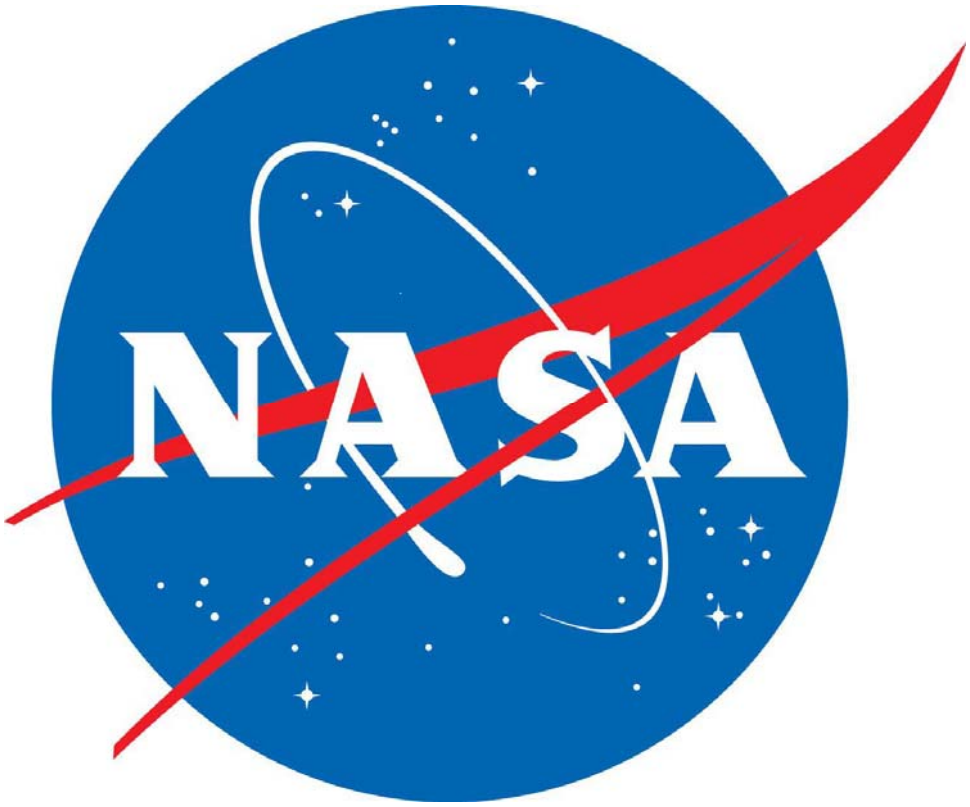
NEI Pilot Workshops: Participating Institutions

21st Century Community Learning Center
Adler Planetarium & Astronomy Museum
Adventure Science Center
AIM Clubs
American Association for the Advancement of Science
American Museum of Natural History
Arches National Park
Arizona Science Center
Atlanta Public Schools-After School Programs
Badlands National Park
Ball State University
Bishop Museum
Black Canyon NP/Curecanti NRA
Boston Museum of Science
Bowman Middle School
Brown Foundation
Bryce Canyon National Park
Canyon de Chelly National Monument
Carmel High School Planetarium
Center for Earth & Space Science Education at TERC
Center for Education Integrating Science, Mathematics, and Computing (CEISMC)
Chabot Space & Science Center
Challenger Center for Space Science Education
Challenger Learning Center @ Paducah
Challenger Learning Center at Kirby Smith Middle School
Challenger Learning Center of Indianapolis
Challenger Learning Center of Kansas
Challenger Learning Center, Louisiana Art & Science Museum
Christa McAuliffe Planetarium
Colburn Earth Science Museum
College of St. Catherine
Communities in Schools
Crafton Hills College
Crater Lake National Park
Craters of the Moon National Monument
Dakota County 4-H Federation
Death Valley National Park
Delaware North Parks & Resorts
Denver Museum of Nature & Science
Department of 4-H Youth Development, NCSU
Eastern 4-H Environmental Education Center
ECHO at the Leahy Center for Lake Champlain
Ecological Society of America
EdVenture Lab
Effigy Mounds National Monument
Exploratorium
Fernbank Science Center
Florida Space Authority
Florida Space Grant Consortium
Fort Bragg
Fort Monmouth Integrated Community Outreach Network
Friends of the Parks Foundation, Inc
GeoFusion
Geronimo Creek Observatory
Girl Scout Council of Colonial Coast
Golden Gate National Recreation Area
Haleakala National Park
Headwaters Science Center
Heinz Center
Henderson State University, Reynolds Planetarium
Highlands Museum and Discovery Center
Houston Museum of Natural Science
Imagination Station Science Museum
Infoage Science-History Center
Jackson Public Schools
John Day Fossil Bed National Monument
Kansas Cosmosphere and Space Center
Lassen Volcanic National Park
Lava Beds National Monument
Liberty Science Center
Louisville Science Center
Maryland Science Center
Media Arts, Inc.
Mississippi Science Partnership
Mitchell High School
Museum of Coastal Carolina's Ingram Planetarium
Museum of Natural History & Planetarium
NASA GISS
NASA Goddard Space Flight Center
NASA Headquarters
NASA Jet Propulsion Laboratory
NASA Johnson Space Center
NASA Kennedy Space Center
NASA Langley Research Center
NASA Marshall Space Flight Center
NASA Stennis Space Center
National Park Service
National Science Center, Inc.
NC State University
New England Aquarium
Nez Perce National Historic Park
North Carolina 4-H
North Carolina Department of Public Health
North Carolina Department of Public Instruction
North Carolina Museum of Natural Sciences
North Carolina National Guard
North Cascades National Park
Northwestern University
OMNIPLEX Science Museum
ORBIT Education, Inc.
Oregon Museum of Science & Industry
Orlando Science Center
Pacific West Regional Office: Seattle
Palouse Discovery Science Center
Peter F. Hurst Planetarium c/o Jackson High School
Pinnacles National Monument
Poage Elementary/Ashland Independent Schools
Pope Air Force Base
Pu'uhonua o Honaunau National Historical Park
Ralph Appelbaum Associates
Robeson Planetarium & Science Center
Roper Mountain Science Center Association
Russell C. Davis Planetarium
Ruth Patrick Science Education Center
Schiele Museum of Natural History
School for Environmental Studies
Science Center of Iowa
Science City @ Union Station Kansas City
Science Museum of Minnesota
Science Place
ScienCentral, Inc.
ScienceSouth
SciTech Hands on Museum
Society for Amateur Scientists
South Florida Science Museum
Space Center Houston
Space Coast Science Education Alliance
Space Telescope Science Institute
St. Louis Science Center
StormCenter Communications, Inc.
Strategic Air & Space Museum
Support Our Students
Tech Museum of Innovation
Tu Universo Television
Twin Cities Public Television
University of Alaska
University of Puerto Rico, Carolina Campus
University of Puerto Rico, Mayaguez Campus
University of Puerto Rico, Rio Piedras Campus
University of the Virgin Islands
Virginia Air & Space Center
Whiskey Town National Recreation Area
Woodson Planetarium, Horions Unlimited
WorldLink Media, Inc.
Wyalusing and Nelson Dewey State Park

NEI Focus Groups: Participating Institutions

4-H Youth Development
Academy of Natural Sciences
Adler Planetarium & Astronomy Museum
Adventure Science Ctr.
Alabama Cooperative Extension System
American Association for the Advancement of Science
American Museum of Natural History
Ardmore Avenue Elementary School
Arizona Science Ctr.
ArtReach
Avampato Discovery Museum
AVANCE
Bowling Green State University
Boys and Girls Club of Indianapolis
Breakaway Interactive
Brevard County Extension
Brownsburg Challenger Learning Ctr.
Buehler Challenger & Science Ctr.
Cabaret Chocolates
Capital Area Intermediate Unit
Carbon Lehigh IU #21
Carnegie Science Ctr.
Ctr. for Early Childhood Professional Development
Ctr. of Excellence for Remote & Medically Under-Served Areas
Chabot Space & Science Ctr.
Challenger Ctr. for Space Science Education
Challenger Ctr. Hawaii
Challenger Learning Ctr. at Kirby Smith Middle School
Challenger Learning Ctr. at University of Tennessee
Challenger Learning Ctr. at Wheeling Jesuit University
Challenger Learning Ctr. for Science and Technology
Challenger Learning Ctr. of Colorado Springs
Challenger Learning Ctr. of Dayton
Challenger Learning Ctr. of Indianapolis
Challenger Learning Ctr. of Kentucky
Challenger Learning Ctr. of Lucas County
Challenger Learning Ctr. of Maine
Challenger Learning Ctr. of Northwest Indiana
Challenger Learning Ctr. of San Antonio
Challenger Learning Ctr. of Tallahassee
Challenger Learning Ctr., St. Louis
Challenger Learning Ctr., Coca-Cola Space Science Ctr.
Challenger Learning Ctr., Columbia, SC
Challenger Learning Ctr., George Observatory Bra
Challenger Learning Ctr., Howard B. Owens Sci. Ctr.
Challenger Learning Ctr., Kalamazoo Valley Museum
Challenger Learning Ctr., Louisiana Art & Science Museum
Challenger Learning Ctr., Science City at Union Station
Chandra Science Ctr.
Chester Co. Intermediate Unit
Christa Corrigan McAuliffe Challenger Learning Ctr.
Cinematrix, Inc.
Cislunar Aerospace, Inc.
Clark Planetarium
Cleveland Co. Family YMCA
Cognitive Devices
Columbia University
COSI
Dana Berry Skyworks Digital
Delaware Co. Intermediate Unit
Delaware North Parks & Resorts
Denver Museum of Nature & Science
Department of 4-H Youth Development, NCSU
Don Davis Space Art
Drefuss Planetarium
Edinboro Univ. of Pennsylvania
EdVenture Group
Evans & Sutherland
Evansville Vanderburgh School Corp
Exploration Place
Explorit Science Ctr.
Family Charter School
Fernbank Science Ctr.
Franklin Institute
Georgia Southern University
Girl Scouts - Totem Council
Girls Incorporated of St. Louis
Glendale School District
Great Lakes Planetarium Association
Harvard-Smithsonian Ctr. for Astrophysics
Hilton Pond Ctr.
Home Run Pictures
Hook's Discovery and Learning Ctr.
Houston Museum of Natural Science
Inmaginove/Space.com
Installation Management Agency Southwest Region
Int'l Council of Air Shows
Int'l Museum of Art & Science
Iowa State University Extension
J.R. Fugett Middle School
Kansas Cosmosphere and Space Ctr.
Kansas State Univ., Dept. of 4-H Youth Development
Kingman Museum
Kirkpatrick Planetarium, Omniplex Science Museum
Last Frontier Council, Boy Scouts of America
Loch Ness Productions
LodeStar
Louisiana Art and Science Museum
Louisiana Dept. of Education
Louisiana State University
Lower Hudson Valley Challenger Learning Ctr.
Maas Digital LLC
MAEA Interactive Science Programs
MAGPI / Univ. of Pennsylvania
ManyOne Networks
Maryland Cooperative Extension Service
Maryland Science Ctr.
Maxis
Merced County Extension
Mid-Atlantic Planetarium Society
MIT/NOVA
Monroe-Cook & Associates
Mountain Plains Library Assoc.
NASA Ames Research Ctr.
NASA Glenn Research Ctr.
NASA Goddard Space Flight Ctr.
NASA Headquarters
NASA IVV Facility
NASA Jet Propulsion Laboratory
NASA Johnson Space Ctr.
NASA Langley Research Ctr.
NASA Mid-Atlantic Region Space Science Broker
NASA Specialized Ctr. of Research and Training
National Association for Interpretation
National Business Aviation Association
National Ctr. for Supercomputing Applications
National Optical Astronomy Observatory
National Park Service
National Park Service, Oklahoma City National Memorial
National Radio Astronomy
New Jersey Cooperative Extension Service
New York Hall of Science
Nierman Challenger Learning Ctr., Reuben H. Fleet Science Ctr.
North Carolina 4-H
North Carolina Space Grant
North Museum of Natural History & Science
NSSTC/AMSTEC
Office of Catholic Education of the Archdiocese of Philadelphia
Office of Information and Technology
Oklahoma Aeronautics Commission
Oklahoma Cooperative Extension Service
Oklahoma Technology Council
Orlando Science Ctr.
OSU Cooperative Extension Service
OU Sooner Flight Academy
Pacific Science Ctr.
Paragon Tech
Pegasus Productions
Penn Video Network
Phinney Ridge Kids
PIXAR Animation Studios
Polyhedron Learning Media
Purdue University
Quarks to Clusters
Reuben H. Fleet Science Ctr.
Riken Research Institute
Robeson Planetarium & Science Ctr.
School's Out Washington
Science Central in Fort Wayne, IN
Science City @ Union Station Kansas City
Science Communications Consultants
Science Museum of Minnesota
Science Works Hands-On Museum
Secret Level
SETI Institute
Shaker Heights High School
Sharpe Planetarium
Shedd Aquarium
Sky-Skan
Space Science Institute
Space Science Network Northwest
Space Telescope Science Institute
Spitz, Inc.
Spitzer Science Ctr.
St. Louis Science Ctr.
Starlight Productions, LLC
State 4-H Office, Ohio
Suffolk County Community College
Texas 4-H and Youth Development
The Elumenati, LLC
Twin Cities Public Television
Twist
University of California
University of Chicago
Univ. of Colorado Museum of Natural History
Univ. of Illinois, Dept. of Aerospace Engineering
University of Oklahoma
University of Oklahoma -- Senior Adult Services
Univ. of Oklahoma National Resource Ctr. for Youth Services
Univ. of Oklahoma, American Indian Institute
Univ. of Oklahoma, National Ctr. for Disability Services
University of Toledo
University of Washington
Utah State 4-H Office
Virginia Cooperative Extension Service
Visual Bandwidth
Westlake Schools Planetarium
Whitaker Ctr. for Science & the Arts
WLSC SMART Ctr.
WV Dept of Agriculture, Plant Industries

Explore. Discover. Understand.



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