To continue the legacy of scientific exploration, every generation must be inspired to learn what we know about our world and the Universe, and how we have come to know it.

it takes a community to educate a child... and a network of communities to reach a generation.
At a time when there is a great disparity in educational preparedness for students across America...

At a time when it should be the birthright of all students to an education that allows them to successfully enter the job markets of the 21st century...

At a time when America must inspire its next generation of scientists and engineers if we as a nation are to compete in the technology markets of the 21st century...

The National Center for Earth and Space Science Education (NCESSE) creates and oversees national programs addressing science, technology, engineering, and mathematics (STEM) education, with a focus on earth and space. Programs are designed to provide an authentic window on science as a human endeavor, and to inspire then educate.

A central objective of the Center’s programs is to help continue America’s legacy as a leader on the frontiers of...
Learning Community Model

Formal Education

- Programming for Students (grades preK-20)
- Professional Development for Pre- & In-service Educators (grades preK-13)

Informal Education

- Lead Organization within a Community (School District, University, Museum)
- Public Programs (families, adults, and children)
- Exhibitions and Related Programs

Distance Learning & Web-based Programs

Community-based Consortium of Organizations
Strategic, Systemic, Sustainable Support

We seek to engage communities in comprehensive educational programming:

• The breadth of the Center’s program capabilities allows a community to address its unique strategic needs in STEM education through programs tailored to that community.

• Programs are delivered systemically—providing audiences across entire school districts with experiences that are embedded at the curricular level and enhanced at home and in informal venues like museums and science centers.

• Content and resources are provided on an ongoing basis to ensure sustainable programs that can make a lasting difference.
Family Science Night
at the Smithsonian’s National Air and Space Museum

School field trip designed for family science learning

After hours in most visited museum on planet at Mall and U-H

Center-piece: performance by a researcher

Walking time, interactive galleries, IMAX film

Since it began in 1993, 139 programs have been held at the Museum, reaching 47,800 parents, students, and educators from 183 schools representing 13 area school districts.

Very significant assessment

2010-11 Supported by:

NASA District of Columbia Space Grant
NASA MESSENGER
NASA EPOXI
NCESSE Program Heritage—
Journey through the Universe
Journey through the Universe

A national community outreach program providing communities with diverse educational resources, including original programming, curriculum materials, and educator training delivered through a network of scientists and educators. We work with the community as a whole to support community-based learning.

Typical programming delivered to each community includes:

- Classroom presentations by space science researchers and educators to 4,000-10,000 grade K-13 students;
- Training for 100+ grade K-13 educators;
- Family events for 100-2,000 parents, students, and teachers.

A Foundation for Expanding and Deepening Our Work with Communities
Voyage
A celebration of what we know about our place in space … and that we can know it.

On the Web: http://ncesse.org/voyage

Voyage on the National Mall Photo-album: http://voyagesolarsystem.org/facebook/dc
Voyage National Program  

A space science education experience for an entire community—students, teachers, families, and the public—that uses the power of models to understand Earth’s place in the Solar System and the Sun’s place among the stars.

Elements:

- **Permanent installation of a replica of the Voyage one to 10-billion scale model Solar System exhibition on the National Mall in Washington, DC:**

  - a **seamless fusion of sculpture and science education:** approved by the U.S. Commission of Fine Arts and the National Capitol Planning Commission.

  - **13 to 15 anodized aluminum stanchions:** with model worlds laser-sculpted in 3-D inside crystal, and full color high resolution storyboards in porcelain enamel.

  - **a humbling experience:** the model worlds provide the true nature of our existence. All of humanity—over 6 billion souls—lives on a tiny, fragile planet Earth, as part of the Sun’s solar system, and the Sun, our star, is but one of countless stars.

  - **revealing that beauty had nothing to do with size:** in stark contrast to the tiny worlds, the full color storyboards provide an up close look at each world in compelling text and imagery.

  - **a tactile experience:** the Sun, planets, and their names are also provided in tactile relief for the vision impaired.
Voyage National Program

Elements continued:

• **Extensive suite of programs, a grade K-12 curriculum, and other resources, allowing the Voyage exhibition to be a focal point for sustainable and systemic community-wide science education.**

  • **Standards-based grade K-12 lesson packages** used before and after a tour of the exhibition, and robust enough to be adopted by a school district as some or all of the space science curriculum. Each year, the Center trains over 1,000 educators on the Voyage lessons. Click for web page

  • **Customized Outdoor Exploration Guide,** facilitating use of the exhibition as a laboratory for inquiry-based exploration of the Solar system.

• Through the Center’s **Journey through the Universe program:**

  • Suite of **professional development workshops** for grade K-12 educators. Click for web page

  • **Family and public programs** each for hundreds of attendees, based on award-winning programming conducted by the Center at the Smithsonian’s National Air and Space Museum for 17 years. Click for web page

  • **National Teams of scientists and engineers—serving as heroes and role models** visiting thousands of students across entire school districts—one classroom at a time. Click for web page

  • **A commitment to assessment** for all programming. Click for web page with protocols, analysis, and downloadable reports

*These resources define a Learning Community Model* for delivery of the Voyage National Program.
Voyage  A celebration of what we know about our place in space ... and that we can know it.

The Voyage Exhibition in Kansas City, MO

Opening Date: October 10-11, 2008

On the Web: http://ncesse.org/voyage

Houston Photo-album:
http://voyagesolarsystem.org/facebook/kc
Voyage  A celebration of what we know about our place in space ... and that we can know it.

The Voyage Exhibition at Space Center Houston
Opening Date: November 14, 2008

On the Web: http://ncesse.org/voyage

Houston Photo-album:
http://voyagesolarsystem.org/facebook/houston
Voyage  A celebration of what we know about our place in space ... and that we can know it.

The Voyage Exhibition in Corpus Christi, Texas
Opening Date: July 18-20, 2009

On the Web: http://ncesse.org/voyage

Corpus Christi Photo-album: http://voyagesolarsystem.org/facebook/cc
Voyage Grade K-12 Lessons–the Voyage Education Module

- Includes an Education Unit at four grade levels: lower elementary (K-2); upper elementary (3-4); middle (5-8); and high school (9-12).

- Each Unit contains lessons comprised of content overviews, pre-knowledge assessment, inquiry-based hands-on activities, assessment rubrics, resource listings, student worksheet masters, and answer keys.

- Lessons were developed from the ground up from national science education standards and benchmarks, and are comprehensive enough to be adopted by school districts as some, or in the case of grades 5-8, all of their space science curriculum.

- Lessons target core standards and benchmarks through inquiry-based, hands-on activities whose objective is deep conceptual understanding of both content and process.

- The lessons are meant to work in concert with a trip to a Voyage exhibition, serving as pre- and post-visit activities.
Outdoor Exploration Guide Customized to the Community

A visitors guide that can be made available at multiple visitor information sites across the community. Goals:

Visitor Orientation and Resources—

- an overview of the Voyage exhibition and its connection to Voyage on the National Mall
- a site map
- tips for touring
- approaches to tactile learning for the vision impaired
- information for teachers
- acknowledgment of local funders/partners
- URLs allowing the visitor to Continue the Voyage at home

Facilitate Inquiry-Based Learning—

- extend the exhibition experience by allowing the visitor to be the explorer, with challenges in the Guide for each stanchion.
- use Voyage as more than a passive exhibition—put it to work as an inquiry-based laboratory for Solar System exploration.

Added Customization by the Community—

- provide community the ability to insert a site-specific photograph and limited additional information.
Voyage Workshop in Corpus Christi significantly exceeds attendee expectations, even though attendees’ prior experiences with workshops is very positive:

Pre-Assessment Question: In general, I usually find workshops: (check all that apply)
Post-Assessment Question: I found this workshop to be: (check all that apply)
## Opening Event Educator Workshop Assessment

**Note about grading**—The bar is set high for Voyage workshops and programming. Pre- and post-workshop questionnaires ask respondents to rank various workshop attributes (below) on a scale of 1 to 4. These values are then translated to a “Grade” on a 0 to 100 scale. If all respondents give a particular attribute a 3 out of 4 (a reasonable ranking), the grade on the 100 scale is only a 66. NCESSE expects all grades to be 80 or higher.

<table>
<thead>
<tr>
<th>Attribute Ranking 1-4 Scale</th>
<th>Grade on 0-100 Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate the efficacy of the presenter(s) to:</td>
<td></td>
</tr>
<tr>
<td>• Present science content that provides a conceptual foundation for the lessons</td>
<td>3.9</td>
</tr>
<tr>
<td>• Model best teaching practices</td>
<td>3.7</td>
</tr>
<tr>
<td>• Present material in an understandable and grade-appropriate manner</td>
<td>3.7</td>
</tr>
<tr>
<td>• Present information in a dynamic and entertaining way</td>
<td>3.9</td>
</tr>
<tr>
<td>• Facilitate inquiry-based exploration by the audience</td>
<td>3.9</td>
</tr>
<tr>
<td>Rate the quality of the educational materials with regard to:</td>
<td></td>
</tr>
<tr>
<td>• Completeness in terms of your ability to effectively teach these lessons in your classroom</td>
<td>3.8</td>
</tr>
<tr>
<td>• Quality of their instructional design to facilitate effective and efficient lesson management</td>
<td>3.8</td>
</tr>
<tr>
<td>• Relevance to your curriculum</td>
<td>3.5</td>
</tr>
<tr>
<td>• Relevance to the state standards</td>
<td>3.6</td>
</tr>
<tr>
<td>• Ability to facilitate and support inquiry-based exploration in the classroom</td>
<td>3.8</td>
</tr>
<tr>
<td>Rate the quality of the workshop with regard to:</td>
<td></td>
</tr>
<tr>
<td>• Logistical preparation and management</td>
<td>3.8</td>
</tr>
<tr>
<td>• Overall general impression</td>
<td>4.0</td>
</tr>
</tbody>
</table>

**NOTE:** for full details on the assessment protocol employed, the data analysis, and how to interpret these data, please visit: [http://journeythroughtheuniverse.org/program_overview/po_as_ew.html](http://journeythroughtheuniverse.org/program_overview/po_as_ew.html)
MESSENGER Educator Fellows

NCESSE oversees the MESSENGER Educator Fellowship Program, and the development of curriculum packages, in support of NASA's MESSENGER spacecraft mission to the planet Mercury.

On August 3, 2004, NASA launched the MESSENGER spacecraft to Mercury, the second mission to the planet. Unlike its predecessor Mariner 10, which flew by Mercury in 1974 and 1975, MESSENGER will enter orbit in 2011 and begin a full year of observations. MESSENGER is destined to change our view of Mercury—and how our Solar System was born.

MESSENGER is a NASA Discovery Mission headed by the Carnegie Institution of Washington (CIW) and managed by the Johns Hopkins University Applied Physics Laboratory (APL). It was taken from idea to reality by a remarkable, inter-organizational team headed by Sean Solomon, Director of CIW's Department of Terrestrial Magnetism. Sub-teams for engineering, mission operations, science, and the suite of instruments aboard the spacecraft provide areas of concentration that make a space flight mission possible.

There is a dedicated team of organizations conducting education and public outreach (E/PO) activities in support of the mission—so that the human race can go along for the ride. The National Center for Earth and Space Science is an organizational member of the E/PO Team.

The Center oversees:

- The development of the grade 5-8 (middle school) and grade 9-12 (high school) units of the MESSENGER Education Modules—conceptually powerful grade K-12 compendia of lessons addressing Solar System science and engineering. These include the Voyage Education Module on Solar System science, and the Staying Cool Education Module on engineering. A Mission Design Module will be completed in Spring 2010.

- The MESSENGER Educator Fellowship Program, through which we recruit, train, and support a corps of 30 of the best science educators in the nation—the MESSENGER Fellows. The Fellows in turn train 3,000 teachers a year on the MESSENGER Education Modules, through professional development workshops they conduct across the nation.

Meet the MESSENGER Fellows

As of March 23, 2010, 14,537 grade K-12 teachers have been trained at 620 workshops conducted by the Fellows. The goal is to train 27,000 teachers over the mission lifetime, translating into experiences for over 1 million students.

- Delivery of Solar System content through the Center’s community initiatives, e.g., Journey through the Universe, and Family Science Night at the National Air and Space Museum, with participation by the MESSENGER Fellows and MESSENGER scientists and engineers.

Training for the MESSENGER Educator Fellows, Cocoa Beach, Florida, August 2004, during launch of the MESSENGER spacecraft. Click for Zoom and Details
Student Spaceflight Experiments Program (SSEP)
A program of the National Center for Earth and Space Science Education and NanoRacks, LLC

A New U.S. National STEM Initiative for Grades 5-14 to inspire the next generation of America’s scientists and engineers

• On-orbit REAL research experiences for pre-college (grades 5-12) & 2-year college students

• SSEP is about immersing and engaging students and their teachers in real science—on the high frontier—so that students are given the chance to BE scientists and experience science firsthand.

• We believe that SSEP is the first pre-college STEM education program that is both a U.S. national initiative and implemented as an on-orbit commercial space venture.

• SSEP is enabled through NanoRacks LLC, which is working in partnership with NASA under a Space Act Agreement as part of the utilization of the International Space Station as a National Laboratory.
Program Elements Provided to Each Participating Community:

A Reserved Experiment Slot Aboard the Space Shuttle: an experiment slot in a real research mini-laboratory flying on Endeavour (STS-134) or Atlantis (STS-135). Student experiments will be sharing the mini-lab with experiments from professional researchers.

A Local Experiment Design Competition in the Community:

Up to 3,200 grade 5-14 students in the competition

Benchmark: for STS-134, 16 communities engaging 20,000 students, 447 student team proposals; a 2-step review process de-selected to 16 experiments (one for each community), all moving on to NASA Flight Safety Review; all 16 passed NASA review and are now in payload integration phase.

A Suite of Resources for Teachers and Student Proposers: to provide a straightforward pathway for teachers to engage students in thinking about and designing an experiment suitable for spaceflight, and one constrained by the mini-lab and its operation in orbit.
The **Community Program**: community-wide engagement model for STEM education

- A SSEP blog just for *the* community, and written by students and teachers
- Flying a [Mission Patch](#) designed by students across the community, and returned after the flight
- Weekly Tweet-ups for students across your community with professional scientists and engineers
- Student Voices of Mission Control via Twitter
- Launch Meeting at KSC
- SSEP conference held in Washington, DC, likely NASM
- Team of scientists, engineers and educators traveling to the community for up to a week talking to hundreds to thousands of students one classroom at a time, family programming, and PD
SSEP on STS-134 is sponsored by 11 Space Grant Lead Institutions in the following States:

Connecticut: Shelton Public Schools (2,500 grade 7-12)
Florida: Broward County (1,200 grade 6-8)
Kentucky: Jefferson County (475 grade 9-12)
Louisiana: Zachary (710 grade 5-12)
Maryland: St. Mary’s County (1,830 grade 8-12)
Nebraska: Omaha Public Schools (2,090 grade 9-12, 1,920 grade 9-12)
New Mexico: Central Consolidated School District (300 grade 5-12)
North Carolina: Guilford County (3,700 grade 6-8)
Oregon: Portland (600 grade 6-8)
Texas: El Paso (970 grade 10-11 and grade 13-14)
Washington: Seattle (150 grade 11-12)
Student Spaceflight Experiments Program (SSEP)

A New U.S. National STEM Initiative for Grades 5-12
to inspire the next generation
of space scientists and spaceflight engineers

Current Opportunity: Student Experiments on STS-134
the Final Scheduled Flight of the Space Shuttle Program
the Flight of Space Shuttle Endeavour, February 26, 2011

NOTES TO READER:
To efficiently gain an understanding of the SSEP from this website, read the pages in the order listed in the navigation banner above: Home page (this page), SSEP Overview page, How to Participate page ...

Recent updates on this website are provided in this color text, reflecting News Posts on the SSEP Blog found in the column at right.

All teachers and students participating in SSEP are strongly encouraged to subscribe to the SSEP Blog, which serves as the primary source for program updates and news.

Current Resource Essay: for a look at Earth in a greater space, the nature of human exploration, and the role of teachers, read: The Nature of Our Existence

PARTNERS

National Center for Earth and Space Science Education
Nanoracks, LLC
Instrumentation Technology Associates

FROM THE SSEP BLOG

LATEST POPULAR COMMENTS TAGS
Voyage in the Year of the Solar System
NCESSE launching April 2011

Based on heritage of programming:

Upgrade to all storyboards and tour brochure for Voyage on the National Mall
For the millions of visitors to the Mall to see, already approved by the Smithsonian:

“A 2011 update of this exhibition’s content, in celebration of NASA’s Year of the Solar System, is provided by the National Center for Earth and Space Science Education and the NASA DC Space Grant Consortium. [NCESSE logo and DC Space Grant logo]”

In partnership with SAO:
NCESSE will travel the From Earth to the Solar System exhibition to all Voyage communities, and provide curricular connections to the Voyage exhibition

In partnership with ….. Space Grant Consortia?
In the spirit of Journey through the Universe, Family Science Night, and Voyage, we will send in teams of two to three NCESSE staff and Visiting Researchers from research organizations nationally to communities across the nation for 3 days of community engagement on Solar System exploration and science. Included: class visits to up to 2,000 students, family/public programming, and PD on Voyage lessons for unlimited number of teachers.

Program in DC already supported by the NASA DC Space Grant Consortium
Arthur C. Clarke Space Ambassadors

1,000 Citizens of the World advocating for the exploration of space, and engaging children, families, teachers, and the public through space education programs.

Do you have the right stuff to be a Space Ambassador?

FIND OUT MORE »

The Arthur C. Clarke Institute for Space Education is dedicated to delivering education programs world-wide which address our planet, its health, and our ability to venture beyond Earth and understand our place in a greater cosmos. It is with profound honor and a deep sense of purpose that in some small measure we help continue Sir Arthur C. Clarke’s legacy.

The Clarke Institute for Space Education is the international arm of the National Center for Earth and Space Science Education in the USA, which recognizes that all humanity is on a journey aboard spaceship Earth, and it should be the birthright for all our children to understand that the explorer lives within them.

Learn more about the Clarke Institute, and explore how you can be part of Sir Arthur’s legacy.

Search

Enter search keyword

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NEWS FROM THE BLOG

Arthur C. Clarke Institute Launch: June 1, 2010
Posted by admin on 24. Apr, 2010
Planer Earth Educator Fellows
Honoring Our Planet by Protecting It

Master Science Educators across the planet dedicated to training 10,000 teachers a year on Global Climate Change.

Become a Planet Earth Educator Fellow

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Arthur C. Clarke Institute for Space Education
P.O. Box 3068 Capitol Heights, MD 20743-3068
(301) 385-0770 (Telephone)
Hosted & Managed by: Drew Romans | DecisiveIt
Design by: Drew Romans & WooThemes
Voyage International Program

A replica of the Voyage scale model Solar System near the Smithsonian Institution on the National Mall in Washington, DC, for permanent placement in cities world-wide ... because the story of humanity’s existence on Earth in a greater space knows no national borders.

Explore a Voyage for your community.

FIND OUT MORE

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