

COMMUNITY PROGRAMMING AND EDUCATIONAL MATERIALS

The National Center for Earth and Space Science Education

The National Center for Earth and Space Science Education (NCESSSE; www.ncesse.usra.edu) is charged with conducting education and public outreach programs in the Earth and space sciences, and aeronautics and astronautics, to help ensure both a science literate public and a next generation of scientists and engineers. The Center is one of 15 national institutes and centers of the Universities Space Research Association (USRA; www.usra.edu).

The *Voyage Program* and *Journey through the Universe* are both Center initiatives with a 10-year heritage of activities—

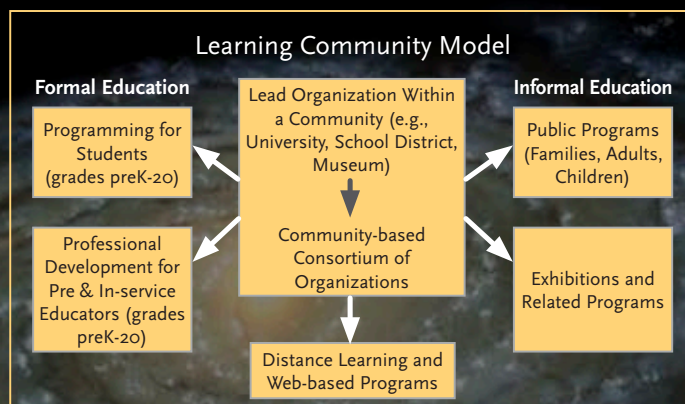
- *Journey through the Universe* (www.journeythroughtheuniverse.org): a science education initiative providing an entire community with programming, curricula, and ongoing resources in: Earth Systems Science; the exploration of space (addressing the Solar System, galaxy, and universe); the search for extraterrestrial life and intelligences; and engineering of spacecraft and space-based habitats. Much of the programming is conducted by a national team of scientists, engineers, and educators from research organizations nationally that travel to the community.
- *Voyage Program* (www.voyagesolarsystem.org): provides a community a *Voyage* scale model Solar System exhibition for permanent installation, together with a grade K-13 curriculum, tour brochures, activity guides used with the exhibition and at home, and ongoing access to educational resources—all addressing Solar System

science—for community-wide involvement. A community is also provided kick-off programming for educators and the public, and can obtain ongoing programming through *Journey through the Universe*.

The *Voyage Program*, when coupled with extended programming through *Journey through the Universe*—

- Embraces a community-wide learning model for students in grades K-20; educators across grades K-13; families, and the general public.
- Provides a wide array of program formats addressing both formal (e.g., classroom-based) and informal (e.g. museum/science center-based) education venues, through professional development for educators, student programs, public programs, exhibitions, and distance learning.
- Effectively bridges across science, technology, engineering, and mathematics (STEM) content.
- Provides a window on the nature of science and the lives of modern-day explorers, with special emphasis on not just what is known about our world and the universe but how it has come to be known. The embraced educational paradigm is *inspire... then educate*.

- Provides programming that is *strategic*, addressing the community's educational goals in STEM education; *systemic*, addressing entire school systems; and *sustainable*, providing content and resources on an ongoing basis.



Community Learning—The Center's Philosophy

The Center embraces as its core belief 'that 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'. To reach the next generation the Center engages entire communities—students, families, educators, and the public—through science education programs that provide multiple pathways for student learning. The vision is growing a national and international network of these 'learning communities' through which science education programs and resources can be delivered on a regular basis.

The Center is committed to ensuring that these programs reflect rich science and technology content through ongoing access to the research activities, and experiences of researchers, across USRA's association of 100 member universities; USRA's 14 other national institutes, centers, and program offices; and NASA through a Space Act Agreement now in place with NASA's Goddard Space Flight Center.

We believe that it takes a community to educate a child, and that it takes a network of communities to reach a generation.

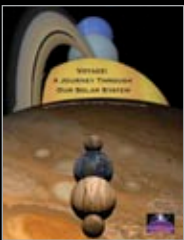
To become a *Voyage Community*, contact Stacy Hamel, Director, Voyage Exhibition Replication, National Center for Earth and Space Science Education at: 703-508-2898, shamel@usra.edu or visit www.voyagesolarsystem.org.



Voyage Education Materials and Programs—A Look at the Pedagogy

Provided with the *Voyage* exhibition—

Tour Brochures provide the public and school groups the ability to conduct self-guided tours through the exhibition. A separate **Activity Guide** promotes visitor interaction with the exhibition, using it as laboratory for exploration, and allowing powerful characteristics of the Solar System to be revealed *by the visitor*. The paradigm is visitor as explorer, and science education as an immersion experience.



Extending the paradigm to the classroom, the **Grade K-13 Voyage 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* the 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 also meant to work in concert with a trip to the exhibition, serving as pre- and post-visit activities. **Activities for Families** extend the experience to the home.



A **Workshop for Educators** (for up to 60 attendees) on all *Voyage* educational materials is conducted by a science educator/planetary scientist team that provides authentic expertise in both content and pedagogy. A **Presentation for Families and the Public** (for 200-2,000) is conducted by a researcher that is passionate about her/his research on the frontier and gifted at conveying that passion to audiences of all ages. The presentation is more of a ‘performance’, with the audience fully engaged in helping to tell the story.

Added resources are also provided on an ongoing basis: **New Voyage Lessons** as they are developed; web delivery of **Teachable Moments in the News** covering breaking stories in Solar System exploration packaged with lessons and online educator training; **Access to the Center’s Educators and Planetary Scientists**; and access to **Resources at the Program Web Site** including materials from other organizations and announcements of opportunity for teachers and students.

Extended programming with *Journey through the Universe*—

Communities can obtain sustained programming on-site, and via distance learning, through *Journey through the Universe*, including: more expansive educator professional development; family and public programs; and **Classroom Programs for 3,000-10,000 Grade K-20 Students**. The classroom programs are delivered by a team of researchers conducting typically 100-200 presentations during *Journey through the Universe Week*, each presentation a very personable and personal window on their life as a researcher. It is an approach revealing the very personal means by which researchers ask questions of the world, empower themselves to create a pathway to an answer, and hopefully bear witness to something new to the human race.

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Development and installation of the exhibition in Washington, DC, was a joint project of Challenger Center for Space Science Education, the Smithsonian Institution, and NASA. Replication and installation of the *Voyage* exhibition at sites nationally and internationally is a program of the National Center for Earth and Space Science Education (NCESSE; www.ncesse.usra.edu), Universities Space Research Association. *Voyage* was designed by Vincent Ciulla Design (www.ciulladesign.com).



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UNIVERSITIES SPACE
RESEARCH ASSOCIATION

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