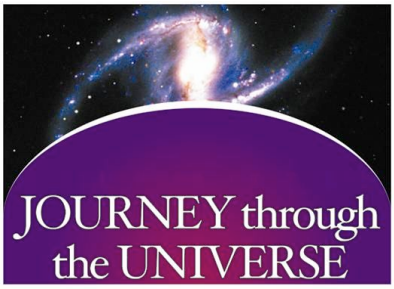
National Center
For Earth and Space Science Education

Universities Space Research Association

USRA

One-Page Summary—*Journey through the Universe*

http://journeythroughtheuniverse.org



Take your entire community—thousands of students, their teachers, their families, and the public—on a *Journey through the Universe*.

The National Center for Earth and Space Science Education offers the *Journey through the Universe* program to communities across the nation—to provide an authentic window on science as a human endeavor, using sustainable programming designed to both inspire…and educate.

Journey offers—

- ***Packages of lessons customizable to your standards*** *of teaching and learning*, and a diverse suite of ***training programs for your teachers.***
- ***Scientists and engineers from across the nation visiting thousands of your students—one classroom at a time—*** providing an authentic and very personal window on the process of scientific discovery, and serving as role models and heroes to the next generation.

Astrophysicist Dr. Timothy Livengood cooks up a comet at a family program in Hilo, Hawai'i, 2005.

- ***Programs designed for family learning,*** engaging parents in the education of their children, and launching families on their own personal journeys of discovery.
- ***A framework for partnership between school districts, science centers, universities, civic and business organizations, and the public—***all stakeholders in educational success at the local level.
- ***Programming designed for sustainability***, with ownership by the community's Local Team.
- ***Customizable assessment*** of all programming.
- ***National resources provided on an ongoing basis***.
- ***Pricing on a strictly cost recovery basis, and we can help you identify organizations in your area that might be interested in underwriting the program***.

What the human race knows about our world and the greater Universe is used to inspire the next generation of scientists and engineers through interactions with the current generation; give teachers the tools and training to conduct powerful lessons in the classroom that are deeply relevant to the science curriculum; and provide venues for family learning where parents and their children learn together.

Audiences: *Journey* programming is for ***grade K-12 students, their teachers, and their families,*** is fully customizable to your community's needs in space and Earth science education, and offers broad content. Programming can focus on a specific grade level(s), or be implemented K-12; and can be implemented across an entire school district, within one region of a district, or in rural areas across several school districts. It's your program, and you design it.

We would also be happy to work with you to craft a 'test-bed' program if you want to assess program success on a small scale.

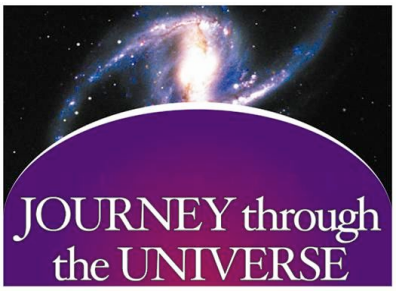
Contact: Dr. Harri Vanhala; 410-740-6241; hvanhala@usra.edu

National Center
For Earth and Space Science Education

Universities Space Research Association

Program Overview—*Journey through the Universe*

http://journeythroughtheuniverse.org



Journey through the Universe is a national science education initiative that uses the Earth and space sciences, and aeronautics and astronautics, to captivate entire communities, taking students, families, educators, and the public to the frontiers of exploration. Launched in 1999, *Journey through the Universe* provides a community with:

- highly customizable programming delivered by national teams of educators, scientists, and engineers from dozens of research organizations;
- compendia of grade K-13 lessons comprehensive enough to be adopted as some or all of a school district's Earth and space science curriculum; and
- ongoing access to educational resources and opportunities that might otherwise be unavailable.

Typical Annual Programming in a *Journey Through the Universe* Community

A National Team of educators, scientists, and engineers from national research organizations conduct:

- *50-150 classroom presentations to 1,500-4,500 grade preK-20 students, one classroom at a time.*
- *Professional development workshops for 10-20 master science teachers.*
- *Professional development workshops for 50-150 grade K-13 educators.*
- *One to three family/public events, each for 100-500 attendees.*

The program is overseen by the National Center for Earth and Space Science Education (NCESSE; http://ncesse.usra.edu) of the Universities Space Research Association (USRA; http://www.usra.edu).

Core Beliefs: *Journey though the Universe* is founded on three core beliefs that define—

Our Purpose:

We believe 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.

Our Pedagogy:

We believe that learners must see themselves in the stories we tell, and experience scientific exploration through their own involvement.

Our Approach to Programs:

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

Content: Curricula and resources are available 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. Curricula are customizable to community requirements.

National Goals: Help ensure a science-literate public and a next generation of scientists and engineers—both of which are of national importance in an age of high technology.

Pedagogy: *Journey through the Universe* is designed to provide 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. This approach reveals 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. Programs develop an understanding of the *process* of scientific inquiry, requiring program delivery teams of educators and researchers to seamlessly integrate process, content, and pedagogy.

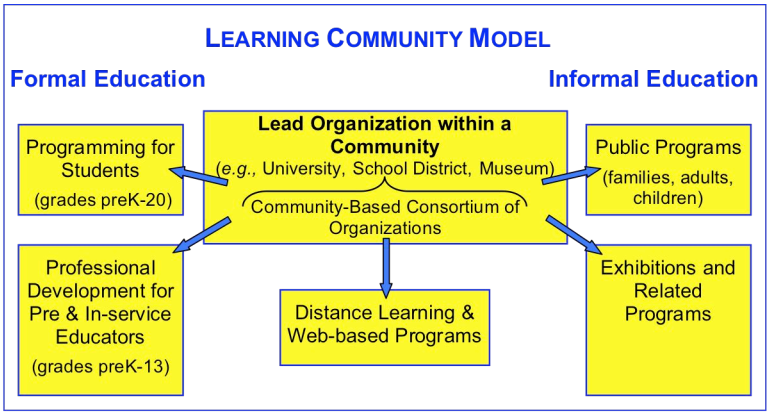
The embraced educational paradigm is—
inspire… then educate.

> ***At a time when*** *the No Child Left Behind Act places new emphasis on student achievement in science, leading school districts to enhance educator professional development, update the science curriculum, implement new assessment protocols, and find ways to get both students and teachers (particularly elementary school generalists) excited about, and comfortable with science….*
>
> ***At a time when*** *the nation recognizes that Science, Technology, Engineering, and Mathematics (STEM) education—at the state and local levels—must rise to the immediate challenges of creating a workforce capable of competing in 21st century science and technology global markets….*

Strategic, Systemic, and Sustainable Programming—to Create a *Learning Community:*

To reach the next generation *Journey through the Universe* embraces the concept of a ***Learning Community*** where an *entire* community is engaged through education programs that provide multiple pathways for student learning. The concept naturally grows from our core belief that it takes a community to educate a child.

Journey through the Universe programs serve educators and students in grades preK-20, and the public. A wide array of program formats addresses formal education venues (*e.g.*, classrooms) and informal venues (*e.g.* museums and science centers), through professional development for educators, student programs, public programs, exhibitions, and distance learning.



The Learning Community Model defines the variety of programs NCESSE is committed to delivering. Three criteria govern *how* these programs are to be delivered—

- Programs are **strategic**–addressing a community's unique education goals in STEM disciplines (science, technology, engineering, and mathematics). The breadth of NCESSE's program capabilities allows *Journey through the Universe to be tailored to the community*. Programming in each community is therefore unique, reflecting the needs and strengths of the 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.
- Programs are designed and implemented to be **sustainable**, providing programming, content, and resources on an ongoing basis, so a lasting difference can be achieved.

> ***Journey through the Universe has far exceeded our expectations during the past ten years. The full-scale sustainability of this program is clearly evidenced by the fact that our district has continued to use the "Journey" model while collaborating with local universities and scientists to present a week of focus on science.***
>
> **—Jim Sisney, Ed.D., Superintendent, Broken Arrow Public Schools, Oklahoma**

Journey through the Universe therefore provides exciting and curriculum-relevant content using a customizable array of programs for students in classrooms; professional development for pre- and in-service

educators; and public programs for families, adults, and children. *Journey through the Universe* can be enhanced with permanent exhibitions (*e.g.*, visit http://voyagesolarsystem.org), and other assets of the NCESSE.

When these diverse programs are delivered in concert, the result is truly a community-wide experience where the whole is far greater than the sum of the programmatic parts. This is realized at a personal level as parents and their children take a journey together, and parents become engaged in their children's education.

Community-wide program models have been developed and assessed over a wide range of environs, including: under-served rural communities with both large and small geographic footprints; inner-city urban areas with high minority populations; a multiple school district model; school district-led, science center-led, and university-led initiatives; a single grade level model across a large school system; and a comprehensive grade preK-20 approach in smaller school districts.

Programs Delivered by a National Team: *Journey through the Universe* programming is delivered by a National Team of engineers and scientists, and master science educators—the Visiting Researchers and Visiting Educators—from NCESSE and research organizations across the nation, including: NASA field centers, universities, and research companies. The engineers and scientists are passionate about their research on the frontier, and are selected through a national announcement of opportunity to ensure they are gifted at communicating their passion to audiences of all ages.

NASA Johnson Space Center engineer Dr. Brad Files speaks to a class in Menominee, MI, 2003.

These are also individuals that *choose* to set aside their research to travel to *your* community, because they feel that education is vitally important. Their host institutions feel the same way, and support their time with you. These engineers and scientists are role models and heroes for the next generation, and instill in audiences a sense of national pride in what individuals can aspire to achieve through education.

The prestige and caliber of the National Team provide incentives for community-wide collaboration on program planning, and extensive coverage by the media.

Success through Partnership with a Local Team: *Journey through the Universe* is realized through a sustained partnership between NCESSE and a local consortium—the Local Team—reflecting the diversity of your community, including K-12 school districts, informal science education organizations (*e.g.*, museum, planetarium, science center), civic and business groups and organizations, colleges and universities, and research organizations. *Journey through the Universe* provides a framework for partnership across an entire community.

A school district either provides the organizational leadership for the Local Team, or shares it with another institution such as a museum or university. The Local Team also includes a curriculum specialist(s) and master science educators from grade levels identified by the community as target audiences.

Sustainability is viewed as key to success, and a Local Team that can ensure local programming over the long term, using regularly provided national resources, is key to sustainability. The leadership of the Local Team must therefore demonstrate authority to conduct school district-wide programming, and access to the significant local human-power and other resources needed to carry out sustained programming.

Serving a National and International Network of Learning Communities: NCESSE is committed to growing and supporting a network of Learning Communities. Supporting a network whose members share common goals allows the Center to maximally leverage available resources, and also gives an individual community the ability to contribute to the greater network with their unique strengths, interests,

and assets. We are also committed to realizing the full potential of this network, characterized by the free flow of ideas, information, and programming *between* communities.

The Center will foster collaborations between communities through an annual meeting, teleconferences, and web environments where recipes for success and resources can be shared; distance learning opportunities and web-based lessons that encourage classes to work collaboratively at a distance; and opportunities for Local Team members to observe programming in other communities.

Journey through the Universe hands-on Educator Workshop in Midland / Odessa, Texas, 1996.

The Organization: The National Center for Earth and Space Science Education (NCESSE; ncesse.usra.edu) is one of 15 national Institutes, Centers, and Programs of the Universities Space Research Association (USRA; www.usra.edu). Incorporated in 1969 as a private nonprofit corporation under the auspices of the National Academy of Sciences, USRA is dedicated to research in the Earth and space sciences, and aeronautics and astronautics. USRA has an international membership of 101 colleges and universities, all having graduate programs in relevant disciplines. NCESSE is the only USRA Center dedicated to national—even international—education and public outreach.

A Content Provider Network: NCESSE is committed to ensuring that all of its programs, including *Journey through the Universe,* reflect rich science and technology content through ongoing access to the research activities, and experiences of researchers, across USRA's 101 member universities; USRA's 14 other national Institutes, Centers, and Programs; and NASA through a Space Act Agreement with Goddard Space Flight Center.

NCESSE education programs provide an effective framework for partnership with institutions nationally and internationally. For example, *Journey through the Universe* programming has been delivered by National Teams comprised of 114 scientists and engineers, and 9 educators, from 38 research institutions.

Assessment: NCESSE is committed to assessing the effectiveness of programming against the community's strategic goals and the basic requirements for *Journey through the Universe*; the impact to the community; the effectiveness of presenters; the quality of the educational materials used as the core program curriculum; and the effectiveness of the program coordination efforts of both the Local Team and program staff at NCESSE. Assessment reports for prior programming, and copies of the assessment tools, are available on request. Customized assessment is also available.

The evaluations from the teachers' workshops and classroom visits were outstanding. We have high school students who now dream of careers far beyond the norm for our area. Our high school Rockets for Schools program has now limited the program to Juniors and Seniors because of record interest.

—Dee Benjamin, Director, Dickinson-Iron-Menominee Mathematics Science and Technology Center, Michigan

Cost: Given the wide range of program options available to a community, program cost per year can only be calculated after a program is customized to a community's strategic needs and projected audiences.

Costs are calculated on a strictly full cost recovery basis, and fully detailed budgets are submitted to a community as part of a customized proposal package. **We can also help you identify organizations in your area that might be interested in underwriting the program.**

http://journeythroughtheuniverse.org
Contact: Dr. Harri Vanhala; 410-740-6241; hvanhala@usra.edu

National Center for Earth and Space Science Education
Universities Space Research Association
10211 Wincopin Circle, Suite 500, Columbia, MD 21044-3432
Phone: 410-740-6224, Fax: 410-730-1359