

The Solar System Radio Explorer Kiosk

Leveraging Other E/PO Programs for Greater Impact

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Abstract

The Solar System Radio Explorer Kiosk (SSREK) - a newly won small E/PO follow-on to a NASA/OSS research grant - is designed to leverage existing NASA E/PO projects and other education programs to enable a large return from a small investment. The SSREK project will create an interactive museum kiosk to engage and teach visitors about Jupiter and the Sun by learning what their low frequency radio bursts may be telling us about these worlds. This project will work with the network of radio observers and the archive of data obtained through the NASA-sponsored Radio Jove project. The SSREK project is partnering with the Maryland Science Center (MSC) as a test site for the SSREK. The MSC will enable us to ensure that this project meets the requirements of their museum environment. We are also partnering with the National Federation of the Blind (NFB) to help us enable museum visitors with visual impairments to share in the excitement of science and help these visitors recognize how other senses besides sight can be used to do science. Both the MSC and NFB will assist us in formative and summative evaluation of the project. All of the software and designs for the wheelchair-accessible arcade-style cabinet will be made available on the associated web site hosted at NASA/GSFC - further extending the reach of the project.

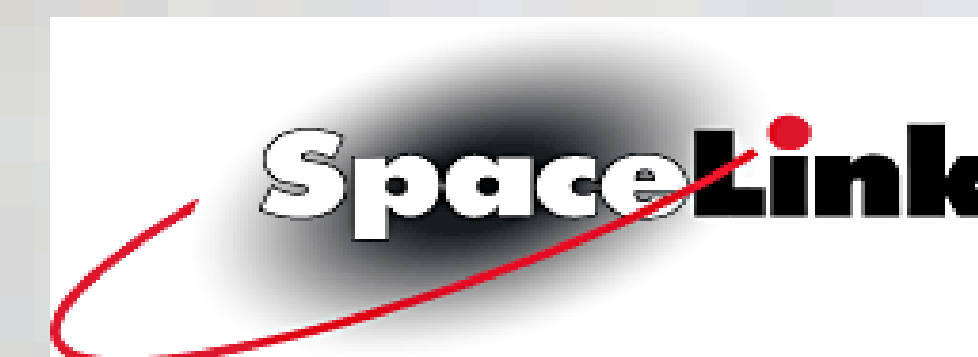
Our Grant

- We won a supplemental E/PO grant to a NASA OSS research grant
- Awarded in August, 2004 @ \$15k/yr for 3 years
Winning the Grant
- We had 90 days after the award letter of the NASA OSS research grant to proceed with an E/PO supplemental grant proposal
- We crafted a calendar to schedule our time and in two brainstorming sessions decided on a project idea.
- We contacted our NASA E/PO broker/facilitator for advice and to assist us in selecting E/PO partners.
- In preparing the proposal we made certain we were aligned with the NASA OSS E/PO goals and objectives and that we addressed the points described in the "Explanatory Guide to the NASA OSS E/PO Evaluation Criteria"
- Prior to submission, we selected a Red Team to provide an independent review of the proposal. The Red Team debriefing provided important feedback that greatly strengthened the proposal.

The Team

- Composed of space physicists, radio astronomers, programmers and visualization experts with strong interests in E/PO
- These scientists have long involvement with related E/PO programs including the well-established, NASA-supported Radio Jove project and INSPIRE project
- E/PO partners include the Director of the Space Link Update Center at Baltimore's Maryland Science Center and the Coordinator of Educational Programs of the Jernigan Institute at the National Federation of the Blind.

About our E/PO Partners



Radio Jove is a radio astronomy education project that teaches students and other interested individuals about Jupiter, the Sun and the scientific method through the construction and use of a radio receiver kit. Radio Jove also provides the opportunity to participate through online data streams from two observatories. This project provides the opportunity to take measurements, analyze and compare results with other team members and share these data through an online data archive.

The Maryland Science Center (MSC) in Baltimore, is a private, non-profit organization that serves more than half a million visitors a year. Its mission is to stimulate and cultivate awareness, interest, and understanding of science for all residents of and visitors to Maryland through exciting educational programs and exhibits, and to be a regional resource and a national model for science education. The MSC SpaceLink Update Center provides visitors with the latest research and discoveries in space science, astronomy, and aeronautics.

The National Federation of the Blind is the nation's largest and most influential organization of blind persons with over fifty thousand members. As a consumer and advocacy organization, the NFB is considered a leading force in the blindness field today. The NFB Jernigan Institute, in Baltimore, seeks to develop innovative education, technologies, products and services that help the world's blind to achieve independence. The Institute is working to establish the National Center for Blind Youth in Science, a clearinghouse of information related to nonvisual methods for participating in science and the contributions the blind can make to scientific endeavors. The first activities leading to the establishment of this center of excellence for blind youth in science have recently been completed. This program included the "Circle of Life" program which ran from July 18-24, and the "Rocket On!" camp which ran from August 15-21. These outstanding opportunities for blind youth to experience science in new ways and to do things from which they are generally excluded are just the beginning.



What do we want to do?

- Create an exhibit that teaches visitors:
 - About radio from Jupiter and the Sun, what these emissions are like and what they mean
 - That there are other ways to study the Universe than just through sight,
 - That they can pursue a career in science.
- Tell others in the E/PO community about our experiences and lessons learned.
- Make this exhibit available to other science centers, libraries, museums, and other venues.
- Create a website to provide more resources for visitors and to archive all plans and software for the kiosk design.

Who is our audience?

- Everyone. That is all science center visitors plus all web visitors. We especially want to reach out to those for whom science has been to varying degrees inaccessible namely those with visual or auditory impairments.
- We also will be sharing our experiences with the education and public outreach (E/PO) community.

How will we do this on our budget?

- We will leverage resources at NASA/GSFC which will host the web site and provide us access to software for rendering imagery and sounds
- While some of our work will be charged to the grant we will be volunteering much of our time
- Maryland Science Center (MSC) staff will be available for consultation during the design and building stages of the SSREK. MSC staff will also assist in the active dissemination of SSREK materials at science center meetings.
- National Federation of the Blind (NFB) staff will assist in selecting appropriate technologies to be incorporated into the kiosk that can most effectively address the needs of the blind while providing an engaging and interesting means of learning for everyone. The NFB will provide contacts who will serve as some of the beta testers of the kiosk.
- Both MSC and NFB will also help us to ensure that this project complies with ADA and Section 508 guidelines.
- MSC and NFB staff will provide this assistance free of charge.

How will we make it happen?

- Incorporate hardware and software technologies:
 - Sounds and narrations,
 - Tactile displays,
 - Vibrations for presenting radio bursts,
 - Captions synchronized to dialog,
 - Simple navigational controls,
 - Wheelchair accessibility to controls and display,
- With engaging science content and narration
 - Animated sequences of a dialog between a student training to become a "Solar System Radio Explorer" and scientists.
 - The dialog presents the science without rattling off facts and will help narrate the visuals on the screen.
 - The dialog will also be captioned.
 - There is lots of competition at the science center, what else can we do to engage visitors?
- Use live and pre-recorded data of radio bursts from Jupiter and the Sun.
 - A live data page will provide a stream of data from a radio telescope making observations of Jupiter or the Sun.
 - Both live and pre-recorded data will be displayed as a strip chart or color-coded spectrogram and will be sent to speakers and vibration transducers.
 - Other imagery will show the current Jupiter, Jovian moons, and Earth configuration. Can this be made more accessible?

Contact Information

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Websites

Radio Jove - <http://radiojove.gsfc.nasa.gov>

National Federation of the Blind - <http://www.nfb.org>

Maryland Science Center - <http://www.mdsci.org>