
# Voyages in Education and Public Outreach
# An Office of Space Science Newsletter

January 2001 Issue 1

Dear Colleague:

Welcome to the first issue of the NASA Office of Space Science (OSS) Education and Public Outreach (E/PO) Newsletter. This continuing newsletter will serve as a vehicle for sharing some of our many accomplishments in education and outreach with the larger space science research community and other interested individuals. We hope you will enjoy reading it.

OSS's traditional commitment to education has focused on graduate and postgraduate training. Seven years ago we extended this commitment to pre-college education and to contributing to the broad public understanding of science, mathematics, and technology. When we set off on this new course, there were a small number of isolated individual efforts underway within OSS affecting very small numbers of teachers and students. Today, a significant national program is underway with hundreds of activities now in place involving scientists in partnerships with dozens of educational organizations across the country and collectively reaching millions of people. It has taken much hard work by a large number of dedicated people in both the space science and education communities to get from there to here. The change has been truly remarkable.

The highlights presented in this newsletter are just the tip of the iceberg. A more complete picture will be given in the first annual OSS E/PO Report to be released early in 2001. We can all be proud of what has been accomplished to date and we want to do better. This is the space science community's E/PO program. Your involvement is important and we want to hear about what you've done. We'd like you to work with us to make all our efforts even better. Your suggestions are always welcome.

Jeffrey D. Rosendhal
Assistant Associate Administrator
For Education and Outreach
Office of Space Science
jeffrey.rosendhal@hq.nasa.gov

## On the Inside

Dear Colleague:

Over the past seven years the NASA Office of Space Science (OSS) has made Education and Public Outreach (E/PO) an integral element of all our flight missions and research programs. We took this step because we recognized that long-term support for the Space Science Program depends upon our ability to show our public sponsors why our program is important to them. Such support also depends upon our being able to demonstrate that space science can contribute in a tangible way to meeting broad public needs in critical areas such as education.

The OSS E/PO Strategic and Implementation Plans that we published some time ago have given us a comprehensive and robust framework for all our activities in this area. I encourage those of you who may not have done so to take a careful look at these plans. The approach that has been taken is clearly working. Our many accomplishments in E/PO—-illustrated in this newsletter—are becoming increasingly visible. Based on the comments and questions made to me in meetings with congressional staffs and during congressional hearings, our E/PO activities have already become an important part of the total justification for the public support of space science.

The results have been a credit both to OSS and to everyone in the space science and education communities who have been involved thus far in efforts to turn our plans into a reality. This is an area of the OSS program that I believe is important both for OSS and for the country. I am personally committed to its success. I strongly encourage all of you to be committed to its success as well.

Edward J. Weiler
Associate Administrator
for Space Science

***First Announcement***

OSS Education and Outreach Conference
September 12-14, 2001
Chicago
Look for More Details Soon!
For more information contact
vsimek@wppost.depaul.edu

## NASA's Exceptional Service Medal goes to Scientist - Educator

NASA Johnson Space Center Geochemist, Dr. Marilyn Lindstrom, was recently awarded NASA's Exceptional Service Medal for her work on telling the story of solar system exploration to educators, students and the public.


*Lindstrom and students.*

## AAS Honors Lebofsky

The AAS Division of Planetary Science(DPS) has awarded the Carl Sagan Medal for 2000 to Larry Lebofsky, University of Arizona. The Carl Sagan Medal was established by the DPS to recognize and honor outstanding communication by an active planetary scientist to the general public. It is awarded to scientists whose efforts have significantly contributed to a public understanding of, and enthusiasm for, planetary science. Lebofsky has been active in E/PO for over a decade and has received several NASA IDEAS grants to support outreach programs in his home state of Arizona. OSS offers it's congratulations to Dr. Lebofsky.

# New Exhibits


*The MarsQuest exhibit will be in Orlando for Spring 2001 and in Tucson for Summer 2001.*

## MarsQuest Exhibit Opens

*Space Science Institute*

A new 5000 square-foot traveling exhibition called **MarsQuest** premiered at the McWane Center in Birmingham, Alabama in September 2000, launching a 9-city, 3-year tour. The updateable exhibit and its associated education program will enable millions of Americans to share in the ongoing excitement of exploring Mars. The Space Science Institute (SSI) of Boulder, Colorado led the development of **MarsQuest** in collaboration with designers, artists, educators, and more than 20 Mars scientists. SSI's Dr. Paul Dusenbery is the project director, and scientist Dr. Steven Lee of the University of Colorado leads the science advisory group.

**MarsQuest** is organized around three locations on Mars: 1) Olympus Mons, the largest volcano in the Solar System; 2) Valles Marineris, a canyon as long as the United States is wide; and 3) Ares Vallis, the Pathfinder landing site. Each area makes comparisons between Mars and Earth, giving visitors a real sense of the Martian environment.

**MarsQuest** visitors encounter more than 20 interactive experiences, 4 life-size models, and dramatic murals of Martian landscapes. Visitors can send commands to maneuver a rover over a simulated Martian landscape among many other engaging opportunities. The project also includes a 30-minute planetarium show from Loch Ness Productions narrated by actor Patrick Stewart, best known as Captain Picard of the TV program "Star Trek, The Next Generation."

The **MarsQuest** Education Program conducts full-day workshops for host-site museum staff and teachers. The program is managed by SSI's Dr. Cherilynn Morrow, and she and Sheri Klug of Arizona State University are workshop co-facilitators. All host sites receive a kit of materials to support Mars-related educational programming for students of all ages. Dr. Lee also contributes public talks.

Over twenty scientists participated in the design, development, and dissemination of the project, including Dr. Todd Clancy who contributed key perspectives for the conceptual design of the exhibit. Todd's involvement is profiled on page 10. Scientists' contributions have also included ideas for exhibit interactives, accessing and processing the best Mars imagery for the murals and video presentations, editing panel text and the planetarium show script for science accuracy and currency, and contributing public lectures and workshop presentations.

The **MarsQuest** exhibition received major funding from the National Science Foundation and NASA. Mitsubishi Digital Electronics America, Inc., Hewlett-Packard Company, and CBS provided additional support. For more information on **MarsQuest**, see http://www.spacescience.org/. For the latest itinerary, see http://www.astc.org

## Hubble Space Telescope: New Views of the Universe

*Space Telescope Science Institute*

With the launch of the Hubble Space Telescope ten years ago, scientific knowledge of the universe has greatly expanded. With the opening of the 5,000 square foot traveling exhibition, ***Hubble Space Telescope: New Views of the Universe***, the wonder and excitement of Hubble's discoveries is now being shared by the public. The exhibition, developed by the Space Telescope Science Institute and the Smithsonian Traveling Exhibition Service, opened to wide acclaim in June 2000 at the Adler Planetarium and Astronomy Museum and will travel to major science museums and space centers throughout the country for the next four years. It is now on exhibit at Space Center Houston and will next be at the Strategic Air Command Museum in Ashland, Nebraska beginning February 3, 2001.

Visitors to ***New Views of the Universe*** explore the cosmos through the eyes of Hubble. Using activities, video, artifacts, and vivid Hubble images, they learn about the telescope's history, design and purpose, as well as gain a greater understanding of planets, stars, galaxies, and the universe. In addition, each venue receives a "discovery trunk" filled with education materials designed to augment the experience of the classroom visitor.

A large format poster book of the same title, written by Dr. Mark Voit of the Space Telescope Science Institute, has been released to accompany the exhibition. The book contains 60 illustrations with explanatory text and is available at booksellers nationwide.

A 2,000 square foot version of ***Hubble Space Telescope: New Views of the Universe*** opened in September 2000 at the Castle Museum in Saginaw, MI. This version was designed for smaller venues unable to accommodate the larger exhibition, and will also tour for the next four years. The exhibition will visit states such as Iowa and Nebraska, allowing a more rural population the opportunity to explore Hubble's wonders.

The Space Telescope Science Institute has developed a website in connection with this exhibit targeted toward the individual unable to experience the exhibition in person. The site is located at http://hstexhibit.stsci.edu and debuted in November 2000.

## Hubble Space Telescope Visitors Center Opens

*Space Telescope Science Institute*

In 1999, the Maryland Science Center (MSC) opened a permanent exhibit that features the Hubble Space Telescope and other NASA Space Science missions. MSC serves as the visitor's center for people interested in learning more about Hubble. Located at the Inner Harbor in Baltimore, MSC draws about 600,000 visitors per year. In the 4000 square feet of floor space devoted to the exhibit there are over 20 original hands-on activities, as well as videos, displays, and 3-dimensional models. Over 120 high-resolution images from Hubble are used throughout the exhibit. Astronomers from the Space Telescope Science Institute shared their expertise with MSC to ensure the scientific accuracy of the exhibit. Many of the picture captions and explanations made use of material already generated for Hubble press releases.

The Hubble exhibit is part of MSC's Outer Space Place theme, which also includes an exhibit about the ***Far Ultraviolet Spectroscopic Explorer.*** Science operations for both missions are conducted in Baltimore, so they have a local connection. Other synergistic exhibits now on display include one on asteroids and the results from NASA's NEAR mission and Space Weather (featured on page 5). In order to keep the information current, MSC operates a multimedia center called SpaceLink that provides regular updates on the latest results from a variety of NASA programs.


*Trish Pengra (STScI), Dr. Jeff Rosendhal (NASA), Matou Goodwin (Smithsonian Traveling Exhibition Service) and Dr. Paul Knappenberger (The Adler Planetarium) at Ribbon Cutting for the HST Visitors Center.*


*A novel partnership between the Space Science Institute and several Sun-Earth Connection missions produced the Space Weather Center traveling exhibit with funding from NASA and the NSF.*

## The Space Weather Center Exhibit Opens

*Space Science Institute*

The **Space Weather Center** is an interactive, 1000 square-foot traveling mini-exhibit developed by the Space Science Institute (SSI) of Boulder, CO in collaboration with NASA's Goddard Space Flight Center (GSFC) and Condit Exhibits, Inc. This exhibit shows visitors how space weather phenomena (disturbances in the Sun's atmosphere that affect the Earth environment) play a role in their everyday lives.

The **Space Weather Center** incorporates five engaging interactives (a plasmasphere, spinning magnet, aurora tube, and 2 video stations), vivid graphics of the Sun and aurorae, and a computer kiosk featuring near real-time data from NASA missions currently studying the Sun and near-Earth space environment.

Visitors to the **Space Weather Center** learn about topics such as solar cycles and space weather, the effects of Solar Maximum, and the electrical and magnetic changes that take place in space that affect people and equipment on Earth. The Space Weather Center also offers visitors information about recent discoveries and insight into the cause of the greatest light show on Earth – the aurora.

Many scientists contributed to the development of the **Space Weather Center** in partnership with educators and exhibit designers. Scientists' roles have included reviewing conceptual design and panel text, accessing and processing data for use in exhibit graphics and the updateable CD-ROM display, and giving public talks and presentations in teacher workshops.

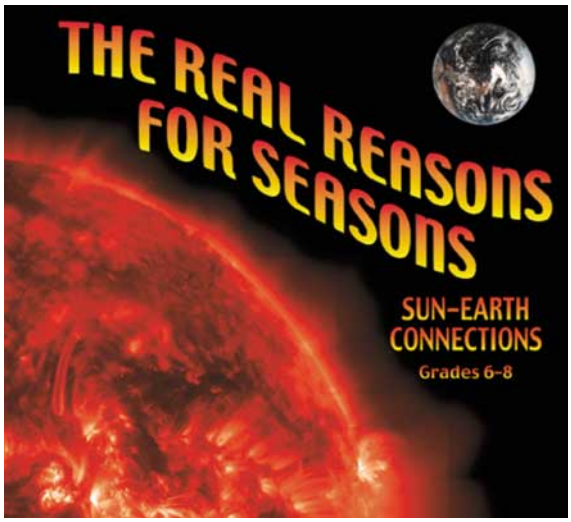
Museums hosting the exhibit receive educational and public relation materials, access to public talks and educator workshops, and opportunities for networking with other host museum sites. Both SSI and NASA GSFC maintain supporting websites: http://www.spacescience.org/SWOP/1.html and http://www-istp.gsfc.nasa.gov/exhibit.

Thus far the exhibit has been to Denver, Sacramento, and Baltimore, and will travel to NASA GSFC, Chicago and other venues in the coming year.


*A family enjoys the plasmasphere interactive during the exhibit's opening display at the Denver Museum of Nature and Science.*


*Denver teachers on an informational "scavenger hunt" at the exhibit as part of a full day educator workshop.*

# New Educational Products




## New GEMS Guide Available

*Sun-Earth Connection Educational Forum (SECEF)*

**The Real Reasons for Seasons: Sun-Earth Connections** is ready to join the award winning series of GEMS (Great Explorations in Math and Science) teacher guides. The guide is targeted for middle school teachers and is the first in the GEMS series to include an accompanying CD-ROM. Developed by the Sun-Earth Connection Education Forum, in collaboration with the Lawrence Hall of Science, the guide contains activities to help teachers dispel common misconceptions about Earth's seasons and other Sun-Earth connections. The CD-ROM contents include complementary materials featuring Sun-Earth Connection NASA resources. The *Seasons* GEMS guide will be distributed nationally through the existing network of GEMS sites, where training for local teachers will be provided. GEMS guides are also distributed through the National Science Teachers Association curriculum resource catalog. GEMS guides are extensively pilot-tested both locally and nationally, and are revised periodically to incorporate teacher comments, new teaching approaches, and up-to-date scientific discoveries. Over the past 10 years, GEMS has developed a network of over 10,000 educators nationwide who use the GEMS materials to meet their math and science instructional goals. For more information about the GEMS guides, visit the GEMS homepage at

http://lawrencehallofscience.org/GEMS/

## Chandra Introduces New Materials

*Universe Forum*

The Chandra X-ray Observatory has introduced a new suite of web-based educational materials. Classroom-ready and aligned with the National Science Education Standards and Project 2061 Benchmarks for Science Literacy, these investigations encompass the Electromagnetic Spectrum, Supernova Remnants, and Stars. Available as html and pdf files, a series of activities, demonstrations and performance tasks allow students to explore and apply science concepts while using the Chandra mission as a vehicle for learning.

Chandra X-ray Center (CXC) scientists, working with Donna Young of the Wright Center for Education at Tufts University compiled the initial material for the website. At a workshop conducted by the Maine Math and Science Alliance, six master science teachers refined the material into modules that were presented at the 15th Space Science Summer Workshop at the Wright Center. Thirty teachers from all over the country worked intensively with eight Chandra scientists to produce the final version provided on the CXC website. The group of thirty teachers is now involved with further classroom testing and evaluation. These teacher-scientist partnerships have created exciting classroom materials - see them at

http://chandra.harvard.edu/edu/formal/

## Product Registration

You can contact an OSS Educational Forum (Solar System Exploration, Sun-Earth Connections, Origins or Universe) for information on how to register your education and public outreach products in the new NASA Space Science Education Resource Directory which is at -

http://teachspacescience.stsci.edu

**Forum Websites**

http://www.jpl.nasa.gov/forum/
http://sunearth.gsfc.nasa.gov/
http://origins.stsci.edu/
http://cfa-www.harvard.edu/seuforum/

## Multisensory Space Science (MSS) Kit

*SERCH, the Southeast Regional Clearinghouse*

• 6% of the total US population of approximately 250,000,000 is hearing-impaired.

• 5% of the total US population is visually impaired.

• 10.8% of the total US population has a learning disability.

(Source: US Census, 1990; 1996-97 update; Heward, 1999)

SERCH, one of the NASA OSS Broker Facilitator groups, has supported development and testing of the **Multisensory Space Science Kit** which contains a set of instructional and reference materials that provide the foundation information for teaching planetary science and space exploration in formats designed for exceptional students in both regular and special needs educational environments. Hands-on interactive activities are blended with background information in a stimulating format. All of these exceptional students (young and old) are held to the same State and National math and science standards. The kit can help them achieve their goals.

The material in the kit is organized by topic, beginning with general information and continuing through specific study areas of planetary science and space exploration. Supplemental posters, videos and lithographs are either included or referenced where appropriate.

The materials provided in the **Multisensory Space Science Kit** have been tested and evaluated by Special Needs teachers and have been shown to be a valuable part of their curriculum. *"The multi-modal kit provides a solid and exciting base from which the students can learn their core curriculum (math, science, geography, technology),"* M. Skinner, C of C Professor. *"I see it as a lifesaver."* - a 1998 workshop attendee. The Virginia Department of Education has adopted this kit for use in all of their Special Needs classrooms and has supplied all 400 of their Special Education teachers with the kit and training in its use. An updated kit will be released this spring.

If you know of a student that might benefit from the kit or need more information , contact SERCH at 1-888-873-9475 and/or visit their website at: http://serch.cofc.edu/serch/

## Space Place Covers the Country

*Solar System Exploration Forum*

The **Space Place** actively engages the public in space exploration and Earth observation through a set of interlinked outreach activities that use diverse media to springboard off an anchor website. Monthly columns for children run in regional newspapers and magazines across the country including the *Los Angeles Times*, the *Denver Post*, the *Richmond Times-Dispatch*, the *Columbus Dispatch*, and the *Dallas Ft. Worth Star-Telegram*. Articles are also printed in such specialty publications as *Weekly Reader* and *Technology Teacher*. Hands-on activities like art competitions tied to mission launches, and a card game (with real strategy), showcasing the technology-driven missions of NASA's New Millennium Program, allow the **Space Place** to excite and educate a potential audience of tens of millions of kids and adults at the same time.

Through alliances with the Boys and Girls Clubs of America, the YWCA, and 144 museums, planetariums, and libraries in largely rural areas of the country, the **Space Place** outreach program makes a special effort to draw in audiences traditionally not reached by NASA. The program's partnership list is now expanding to include zoos and aquariums in a further effort to connect to the public in venues not traditionally used by NASA outreach. With a growing infrastructure of alliances providing a highly-leveraged mechanism for distributing its high-quality, informational products, **Space Place** is unique among NASA outreach efforts.

Involvement of the mission scientists and engineers has been essential to the success of **Space Place**. For example, Dr. Marc Rayman, manager of the Deep Space 1 mission, was one of the founding members of the **Space Place**, reviewing and creating many of the activities and fun facts for the Web site. His collaboration has been so integral, he even has an iconic namesake character on the site called 'Dr. Marc." Scientists and engineers from each project work closely with **Space Place** staff to create the final public products. The **Space Place** website is

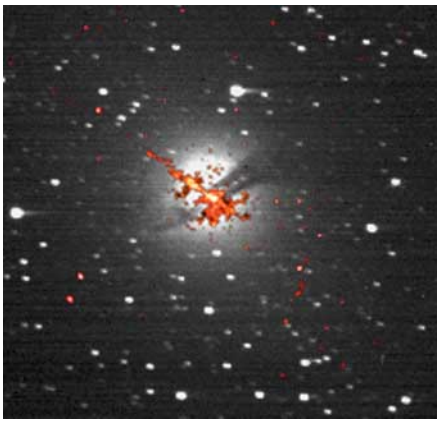
http://spaceplace.nasa.gov/

## Bringing NASA'S Space Science into the Classroom With Online Telescopes

*Universe Education Forum*

How do we bring the excitement of frontier space science into an already crowded classroom schedule? One approach, taken by the Universe Education Forum at the Smithsonian Astrophysical Observatory, is to partner space science missions with innovative new curricula that are already transforming the way science is taught. In the ***From the Ground Up***! curriculum, middle and high school students carry out authentic investigations by directly controlling a network of five online educational telescopes.

In their investigations on light, color, size and scale, motion, and other topics in physical science, students combine their own images of the sky with complementary images and data from NASA's space science missions. This summer, for example, the Chandra X-Ray Observatory's Mike Garcia and Kathy Lestition worked with a nationally selected group of teachers to develop an investigation on color and temperature. Three modules currently in production will be field-tested by teachers from January-April 2001. Thanks to NASA, the installation of a telescope this summer in the Southern Hemisphere now allows students to image the full range of objects imaged by space-based telescopes. Students' optical images of the galaxy Centaurus A come alive when married with Chandra's x-ray view of the galaxy's enormous black-hole-produced jets. For more information about how teachers can enroll, visit: http://mo-www.harvard.edu/MicroObservatory



Composite Image of Centarus A taken by a MicroObservatory Telescope with Chandra X Ray Telescope Overlay.

## Solar System Ambassadors Bring NASA Missions to the Public

*Solar System Exploration Forum*

The Solar System Ambassadors Program is a public outreach program using motivated volunteers across the nation to organize and conduct public events communicating exciting discoveries and plans in Solar System research, exploration and technology through nontraditional venues, e.g. community service clubs meetings, libraries, museums, planetariums, "star parties," mall displays. Last year, Ambassadors conducted about 600 events directly reaching more than 500,000 people in communities across the country.

In 2001, there will be 200 Ambassadors from almost all 50 states bringing the excitement of space to the public. Ambassadors are space enthusiasts, K-12 in-service educators, retirees, community college teachers, and other members of the general public, interested in providing greater service and inspiration to the public.

The Solar System Ambassadors Program is coordinated by the NASA Jet Propulsion Laboratory (JPL). Participating projects currently include Cassini, Galileo, STARDUST, Europa Orbiter, Pluto-Kuiper Express, Solar Probe, Genesis, Ulysses, Voyager, Mars missions, the Deep Space Network and the Discovery missions NEAR-Shoemaker and Deep Impact.

Each Ambassador participates in Internet based training sessions that provide interaction with space scientists, engineers and project team members. Training sessions provide Ambassadors with general background on each mission and specific mission milestones, such as launches, planetary flybys, first image returns, arrivals, and ongoing key discoveries. Additionally, projects provide videos, slide sets, booklets, pamphlets, posters, postcards, lithographs, on-line materials, resource links and information.

Integrating nationwide volunteers in a public-engagement program helps leverage project funding for education and outreach. At the same time, members of communities across the country become an extended part of each mission's team and an important interface between the space exploration community and the general public. Solar System Ambassador information - http://www.jpl.nasa.gov/ambassador/front.html

## Eclipse Webcasts - High Visibility for NASA's Sun-Earth Connection

*Sun-Earth Connection Education Forum (SECEF)*

It is unusual for a science website to draw ten million hits in a few hours, but that's just what happened in 1998 and 1999, during the total solar eclipse webcasts produced by NASA's Sun-Earth Connection Education Forum and the **Live @The Exploratorium** program. More than 300,000 Internet login participants and thousands of museum event visitors experienced the solar eclipse totality that was webcast from remote sites in Aruba in the Caribbean (1998) and Amasya, Turkey (1999). The programs used solar eclipses to draw attention to NASA's investigations of the active Sun and its effects on Earth.

The live museum events highlighted the work of several Sun-Earth Connection satellite missions: SOHO, TRACE, Yohkoh, and others. It also allowed the public a special opportunity to interact with scientists, in person and through Internet chat sessions. In 1999, eight museums nationwide picked up the feed of two webcasts—one originating from an Exploratorium ground crew in Turkey and the other from a Goddard Space Flight Center crew in the Black Sea. At the National Air and Space Museum and the Lawrence Hall of Science, several hundred Girl Scouts gathered in the early morning hours of August 11, 1999 to get a glimpse of totality via the webcasts. The event drew extensive media coverage both locally and nationally, and everyone who participated was rewarded with deeper knowledge of the Sun and about how space scientists conduct their research. Today, the eclipse website at the Exploratorium still draws a steady audience at http://www.exploratorium.edu/eclipse .

*At the Exploratorium, August 1999.*

## IDEAS: Small Efforts with Huge Returns

*Origins Forum*

What can you do with a team of educators and astronomers/space scientists, a good idea, and a little bit of money? In 1994, working with funding from the IDEAS program, Dr. Don York and his team from DuSable High School in Chicago turned $20,000 to fund a T1 Internet connection to an underserved/underrepresented community into a $200,000 grant from the Illinois State Board of Education. This grant enabled the team to broaden the program to network 12 additional schools, fund training and hardware support, and purchase additional computers. Today, the program is called the Chicago Public Schools/University of Chicago Internet Project (CUIP), a collaborative partnership between the University of Chicago, Chicago Public Schools (CPS) Department of Learning Technologies, and 29 Chicago public schools to enhance teaching and learning through the use of the Internet and other computer technologies.

In 1997, Dr. T. Gregory Guzik received a $9,998 grant to work with Louisiana State University, Southern University, the Recreation and Park Commission for the Parish of East Baton Rouge, and the Baton Rouge Astronomical Society to develop a new astronomical observatory for enhancing university level astronomy education and to provide a new form of science education/recreation for the public. Dr. Guzik wrote, "the IDEAS grant was a turning point in our group's Education and Public Outreach program. In particular, since the IDEAS project started we have had five new E/PO grants funded."

The IDEAS Grant Program has many other projects with similar results - small efforts with huge returns. One of the key highlights for a large portion of proposers and participants alike is the interaction they have with the scientists and educators. And based on the two examples above, it can be an experience that has a broad impact in both the education and science communities. For more information about IDEAS, please visit the Web site at http://ideas.stsci.edu.

## SCIENTISTS IN EDUCATION AND PUBLIC OUTREACH

*This profile is based on an interview of Dr. Todd Clancy about his involvement in the creation of a traveling science exhibition called MarsQuest. Todd is a scientist who supports education and public outreach (E/PO), but who does not want to compromise his primary research interests. The interview was conducted by Dr. Cheri Morrow at the Space Science Institute of Boulder, CO in September, 2000.*


*Todd Clancy in front of the MarsQuest poster at the Division of Planetary Sciences Meeting, October 2000.*

**Current professional position:**

I am a scientist with the Space Science Institute (SSI). I do research on the atmospheres of Earth, Mars, and Venus from my home (a North Carolina island).

**Description of Todd's E/PO role :**

I collaborated with SSI on a major Mars traveling exhibit called MarsQuest (see page 3 for a full MarsQuest article). Initially, I helped with the NSF proposal and conceptual design. After that, I served with the science advisory group, reviewing text or video segments, or answering questions to support the MarsQuest educator workshops.

**Comments on his time commitment:**

My MarsQuest involvement has all been voluntary — a public service in a sense. The proposal development required perhaps a month of my time all together. After that, my time contribution became much more limited. I'm not particularly focused on doing education and public outreach. I'm really a full time researcher – it's a very demanding job, more than 40 hours a week. I simply cannot afford the time and the dedication it takes to become a truly professional E/PO person. So my role in MarsQuest has been a very nice fit.

**His most valuable impact on MarsQuest:**

The overall theme of the exhibit was strongly influenced by my suggestions. It was my idea to view Mars as a wilderness — like a national or international park – an unspoiled natural preserve in which there are different regions to explore, such as there are in Yellowstone Park. The exhibit is now a reality, and although my involvement has been largely advisory, it would not exist if I had not been involved. That's very gratifying.

**Todd describes how he got involved:**

I happened to be at SSI when our director, Dr. Paul Dusenbery, was looking for a theme for his next big traveling exhibit project. He and I agreed that the upcoming series of missions to Mars would make an excellent focus.

**Todd's words of wisdom about E/PO:**

Keep an open mind about whether or not you will ever be involved in E/PO. It certainly wasn't on my radar. I had no intention of going that direction – nothing against it – it simply wasn't one of my ambitions. My experience with MarsQuest made me realize that I am capable of contributing, even though I didn't consider education and outreach one of my skills. So, when an E/PO opportunity comes along, give it a try!

# On the Horizon

## Passport to the Universe

*Universe Forum*

This spring, millions of students and teachers across the country will join researchers from the Chandra X-ray Observatory on a virtual field trip to the edges of space and time. Two new "Passport to Knowledge" TV specials, "Live from a Black Hole," and "Live from the Edge of Space and Time" will air March 6 and April 3, 2001. The programs will be supported by a variety of on-line activities and resources, including many created by Structure and Evolution of the Universe (SEU) missions. For more info, see: http://passporttoknowledge.com/universe/

## National Mall to host New Scale Model of the Solar System

*Challenger Center for Space Science Education*

The Challenger Center for Space Science Education, in collaboration with the Smithsonian Institution and NASA, is developing **Voyage**, a scale model solar system for the National Mall in Washington, D.C. Placed along a 600 meter path, this outdoor exhibition will portray the Sun, planets, and a dozen moons at one ten-billionth actual size. **Voyage** is meant to change visitor's perspectives of Earth's place in the solar system and the Sun's place among the stars. The exhibition is being designed so that it can be replicated and placed at dozens of sites around the globe. Groundbreaking is scheduled for Spring 2001.

## Some Upcoming Conferences in 2001

National Science Teacher Association
March 22-25
National Council of Teachers of Mathematics
April 4-7
American Geophysical Union
May 29- June 2

For more information on these and other conferences, see the OSS Conference Website at http://cass.jsc.nasa.gov/education/OSS/welcome.html

## Solar Events 2001

*Sun-Earth Connection Forum (SECEF)*

As we begin a new millennium and the Sun undergoes another solar maximum, the Sun-Earth Connection Education Forum (SECEF) is sponsoring a series of "Solar Events" during 2000-2001 to feature and celebrate the active Sun and its connection to our lives. In partnership with museums, educators, and space scientists around the country, SECEF is supporting a traveling Space Weather Center museum exhibit (page 5), a national "Sun-Earth Day," and an international total solar eclipse webcast from Southern Africa. Solar Events will allow a broad community to learn about NASA's SEC theme and its missions through high-visibility events. For example, "Sun-Earth Day," scheduled for April 27, 2001, will engage schools and classrooms nationwide. Teachers and students will get the opportunity to increase their awareness of the Sun-Earth connection through a Sun-Earth Day Education Kit, email mentoring, and online chat sessions with scientists. The event will be co-celebrated with Astronomy Day, the annual celebration of the Astronomical League (North America's amateur astronomy group) and will coincide with celebrations of the fifth anniversary of ESA and NASA's SOHO spacecraft. The June 21, 2001 total solar eclipse webcast from southern Africa will give science museums in the US and abroad the opportunity to host events for the public and special interest groups. "Eclipse 2001" will build on the successes of previous eclipse webcast events (see page 9). Eclipse 2001 will feature a live 30-minute downlink to science museums from the International Space Station (ISS), highlighting NASA's *Living with a Star* initiative by addressing the effects of the active Sun on ISS astronauts. To learn more about Solar Events access the website: http://solarevents.org/

There are many ways in which scientists can be involved in the solar events--from online chat sessions, to serving as an advisor, to giving live presentations at the museums. View more options and a sign-up form - http://www.museumeclipse.com/hosting/register.html

**Your participation can make a difference.**

## Tips for Scientists in Education and Public Outreach

Space scientists are becoming increasingly active in making key contributions to an impressive variety of high-impact projects in science education and public outreach (E/PO). The Fall 2000 meeting of AGU and the January 2001 joint meeting of the AAS and AAPT included unprecedented numbers of sessions related to scientist involvement in education at all levels. This continuing column will provide leads and suggestions in support of increased E/PO involvement of space scientists. Direct your ideas and comments about this column to camorrow@colorado.edu.

The OSS E/PO Support Network (i.e. Brokers and Forums) is developing a variety of resources for scientists engaging in EPO activities. These resources include workshops, websites, videos, CD-ROMs, presentations, white papers on key E/PO topics, and ideas/opportunities for E/PO involvement (both funded and voluntary). This column will highlight many of these resources in future issues. This time our tip is about the several E/PO workshops for scientists that are coming up in the new year:

- The joint AAS/AAPT meeting in January 2001 will host two 90-minute tutorials led by the Space Science Institute (SSI) Broker: 1) *Writing Winning EPO Supplements for NASA Sponsored Projects*; and 2) *Becoming Actively Involved in K-12 Education*. Contact camorrow@colorado.edu
- The DePaul Broker in Chicago will host a one-day education & outreach conference for scientists in the midwestern region on January 27 2001. Contact Lynn Narasimhan, cnarasim@condor.depaul.edu
- On the day before the Lunar and Planetary Science Conference (LPSC) in March, there will be a full-day workshop for scientists entitled: "*Getting Involved in Education and Public Outreach: Not Reinventing the Wheel*". Contact the LPI Broker, Pam Thompson, thompson@lpi.usra.edu
- The Space Science Institute plans to continue its annual 4-day workshop on Education for Scientists, Engineers, and EPO Managers. Dates in May 2001 are pending. Contact Susan Solari, solari@colorado.edu

## NASA Space Science Education Resource Directory Unveiled

NASA Headquarters announced the public availability of the **Space Science Education Resource Directory** via an official press release on October 2, 2000. The Resource Directory can be found at -

http://teachspacescience.stsci.edu

The directory provides easy access to a variety of on-line space science educational products and resources. Educators and scientists looking for proven materials can search by grade level, topics and format.

Some comments on the directory –

"What a great job! Really well done! A terrific resource in a very clear and usable format." – *Rachel Winheld, Coordinator for UC Berkeley Science Outreach Coalition*

"Wow, very nice Education Resource you guys at OSS unveiled. Very nice." —*Chuck Bueter, Great Lakes Planetarium Association member and astronomy teacher.*

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## FAST FACTS

In 2000 the OSS EPO program -

- produced over 100 educational products, most of which were targeted at K-12
- carried out nearly 200 educational programs that involved over 1500 individual events in all 50 states, the District of Columbia, and one U.S. Territory (Guam)

-- 65% are targeted at improving classroom education

--35% are outreach to the public or to the science community

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If you'd like to contribute to a future newsletter or have questions about getting involved with the NASA Office of Space Science Education and Public Outreach Program, please contact Larry Cooper, Editor
larrycooper@oai.org