SPACE SCIENCE
NATIONAL AERONAUTICS & SPACE ADMINISTRATION

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

September 2002 Issue 6

NASA Education and Public Outreach Conference

DePaul University

This June nearly 300 scientists and science educators gathered in Chicago for the first national NASA Space Science education and public outreach conference. The conference's goals were to strengthen and deepen nationwide education and public outreach efforts by NASA's Office of Space Science (OSS).

Dr. Edward J. Weiler, NASA's Associate Administrator for Space Science, opened the conference with a keynote address in which he stressed education as one of the three priorities of NASA's mission. "Enhancing the quality of science, mathematics and technology courses, particularly at the pre-college level, is key to accomplishing this goal," he stated.

Dr. Maria Alicia Lopez Freeman, executive director of the California Science Project and another conference keynote speaker, addressed issues of science and equity in urban schools. She presented results of a recent national survey of science and math educators that shows many teachers in these areas consider themselves to be less than competent in their subject matter. Freeman also said that although a large portion of current math, science and technology teachers is approaching retirement age, few trained replacements are in sight. In addition, although the number of minority students is rising rapidly, most of the teachers in these subjects are white.

Among other topics discussed at the conference were ways to better reach members of underserved communities, including people with special needs; the creation of professional development opportunities for educators; the establishment of national standards for programs; and better ways to access and disseminate current information from NASA Space Science missions.

Dr. Paul Knappenberger, President of the Adler Planetarium & Astronomy Museum spoke on "Issues in Informal Education"

On the Inside

"The space science discoveries are inspiring," says Lynn Narasimhan, director of DePaul's NASA Space Science Center for Education and Outreach. "We've seen amazing images from the Hubble Space Telescope, but a Next Generation Space Telescope is being built that will be able to peer even deeper into the universe, to better understand and evaluate its structure, perhaps to even help answer the question, "Are we alone." In addition, the Cassini spacecraft is nearing the Saturn system and will provide a wealth of new information about Saturn, its rings and its numerous moons." Such projects advance human knowledge - knowledge that needs to be shared, she said.

Conference Proceedings are being assembled and will be published later this fall. Specific information on obtaining a copy will be posted on the conference Web site at

http://analyzer.depaul.edu/ossconference/oss_program.html

Dr. Jeff Rosendhal, Director of OSS Education and Public Outreach, congratulates conference organizer, Dr. Carolyn Narasimhan of DePaul University.

Conference Perspectives

The Office of Space Science's Education and Public Outreach Conference 2002 was, for me, a unique experience. As a planetary scientist and educator, I have attended many science and science education conferences. The conference was a blend of presentations by keynote speakers, plenary panels, breakout sessions, and posters. This conference was unique in that it brought all of the OSS E/PO education stakeholders under one roof to discuss their common goal: to bring the excitement of space science to our children and the general public. The stakeholders included scientists, educators, and administrators from NASA, universities, K-12 schools, and museums and planetariums; people involved in both formal and informal education. To me, the most valuable part of the conference was the time that we were able to spend talking to people with diverse backgrounds and experiences. This occurred formally in the panel discussions and breakout sessions and informally during breaks. In these discussions, we were able to share ideas and concerns: Where should we concentrate our outreach efforts? What works and what can be improved upon? How can we work together more effectively in the future? I personally would like to thank Dr. Rosendhal and those who helped put this conference together. I would also like to thank everyone who came to the conference and contributed to what I hope is only the first of many more conferences where we can all share our experiences and expertise.

Larry Lebofsky, Senior Research Scientist, University of Arizona

Reflecting on the completion of the first (history in the making) OSS E/PO conference, I found myself energized, validated and hopeful. I was energized by the open dialogue and active listening of colleagues in the education and scientific communities in the round table discussions, and perhaps even more importantly in one on one or small group conversations. Validation of the important work of both communities came from the plenary speakers' focus on the common goal of building scientific literacy in the present and future generations. Finally, I was hopeful of the future of partnerships when George D. (Pinky) Nelson asked both communities to look at their realities, and challenged them to make contributions. The hard reality of the classroom, with only about 15 hours of time dedicated to space science made it imperative that NASA work with educators to increase their scientific knowledge and that educators transfer that knowledge into a rigorous curriculum that has depth of content and promotes scientific habits of mind.

Lyn Klosowski, Northwest Indiana Challenger Center, Hammond, IN

Updates

Space Place Continues to Expand

Nancy Leon, NASA JPL

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 from an anchor Web site. [For more information on *Space Place* see *Voyages*, January 2001 issue, http://spacescience.nasa.gov/education/news]

Space Place now has a total of 230 community partners - 79 museums; 50 planetariums; 43 libraries; 34 military bases; and 24 zoos and aquariums (Zoo and aquarium membership has surged since introduction last year.)

The monthly *Space Place* newspaper column now appears in 16 newspapers across the country. Seven of these papers serve Spanish language communities in Los Angeles, New York, San Jose/San Francisco, Washington DC, Philadelphia Monterey, and Charlotte. The combined circulation of these newspapers is nearly 350,000.

AMAZING SPACE

Office of Public Outreach, Space Telescope Science Institute

New York City public schools and Princeton University are among the 212 U.S. school districts and 126 colleges and universities using *Amazing Space* online curriculum support materials as an educational resource.

These preliminary results are from the first phase of an impact study on the use of *Amazing Space*, a suite of Web-based, interactive activities that includes data from NASA's Hubble Space Telescope. The activities are designed primarily for classroom use, from kindergarten through twelfth grade. The study shows educators are using the material in many ways. States and local school districts are linking *Amazing Space* to state education content standards. Schools are partnering and collaborating with private companies to disseminate *Amazing Space* activities. At the university level, courses are using *Amazing Space* to train teachers on the principles of integrating technology into the curriculum and are relating state education standards to selected *Amazing Space* activities on the Web at http://amazing-space.stsci.edu .

CD Replication and Distribution now available at NASA CORE

Dan Woods, NASA Headquarters

In a major step towards making space science materials more readily available, the Office of Space Science has helped NASA's Central Operation of Resources for Educators (CORE) [http://core.nasa.gov] acquire the capability to replicate and distribute education and outreach CD's. CORE now has the capability to reproduce and distribute all types of audio-visual education and outreach material (i.e. videos, slides, and CDs). E/PO products that are registered in the NASA Space Science Education Resource Directory [http://teachspacescience.stsci.edu] will be eligible for distribution through CORE. Forms and instructions are available at http://ossdev.stsci.edu/registry/. Questions may be directed to Carole Rest (crest@stsci.edu) or the OSS Education Forums:

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

ViewSpace

John Stoke, Space Telescope Science Institute

ViewSpace, a multimedia astronomy display for museums and planetariums, is now in use at over 100 institutions nationwide. [For more information on *ViewSpace* see *Voyages*, September 2001 issue, http://spacescience.nasa.gov/education/news] It is finding use in permanent installations, as well as occasional special events such as Astronomy Day programs. Two new *ViewSpace* segments for the summer 2002 CD release were "Hubble's New Eye" (about the Hubble Advanced Camera for Surveys) and "Sculptures In The Sky" (about planetary nebulae). The *ViewSpace* team, led by John Stoke of the Space Telescope Science Institute is currently working to expand *ViewSpace* in several areas including Internet "broadcasting" of content to increase the timeliness and diversity of programming and establishing a national network of two *ViewSpace* venues in each state. To get a copy of the *ViewSpace* CD, please contact John Stoke at stoke@stsci.edu.

Small E/PO Awards

NASA OSS is pleased to announce that final E/PO awards have been made for ROSS 2001-02. A total of 77 E/PO proposals were submitted in conjunction with new Parent Research Programs and 39 of those proposals were recommended for funding for a total of $654K. We have spent the past year making some significant revisions in the overall approach to the review and selection process and to date, these changes appear to have been effective. We greatly appreciate the input from the scientific community, the OSS Support Network, and the staff at NASA Headquaters who have contributed substantially to the overall improvement of the process.

IDEAS Awards

Heather Bradbury, Space Telescope Science Institute

Thirteeen proposals were recently selected for funding in the IDEAS Grant Program. A total of 53 proposal were submitted from 25 states and 1 U.S. territory, an increase of approximately 60% from 2000. The amount of funding awarded was over $425,000. Abstracts of the selected proposals are on the IDEAS Web site, http://ideas.stsci.edu.

The 2002 IDEAS Call for Proposals (CFP) has also been posted on the Web site. The CFP can be downloaded as either a MS Word or PDF file. The deadline to submit a proposal is Friday, 25 October 2002, 5 p.m. ET. Questions should be sent to ideas@stsci.edu.

International Planetarium Society Conference

Anita Sohus, NASA JPL

A contingent of Office of Space Science E/PO personnel participated in the International Planetarium Society's conference, held this summer at Exploration Place in Wichita, KS. The key objective of OSS participation was to expand the relationship with IPS and its regional affiliate organizations in the U.S. and to begin a discussion about how best to serve this diverse community of astronomers, educators, and storytellers.

OSS presence at the conference included a number of presentations and panel sessions, workshops for planetarians and local teachers, a new OSS exhibit and a portable dome to showcase *ViewSpace* [see article on page 3].

NEW MISSIONS

NASA recently selected two new Small Explorer Class Missions. As detailed below, each has an exciting E/PO program planned.

Aeronomy of Ice in the Mesosphere (AIM) E/PO

Dianne Robinson, Hampton University

The AIM mission will determine the causes of the highest altitude clouds in the Earth's atmosphere. James Russell, III of Hampton University, a Historically Black University in Hampton, Virginia, will lead AIM which is to be launched in 2006.

Dianne Robinson of Hampton University will lead the AIM E/PO program which will use the beautiful images of the Noctilucent Clouds (NLC), "clouds on the edge of space," to motivate interest, learning, and a deeper understanding of the issues surrounding changes in our atmosphere.

Included in the AIM E/PO will be two professional development, lead-educator workshops to be conducted in Alaska for teachers nationwide. The lead-educator workshops will focus on NLC science, data collection, national standards, and web-based NLC lessons. The AIM E/PO program will also include informal education and building public awareness by collaborating with WHRO Public Broadcasting Network, Virginia Air and Space Center, NASA CONNECT and the National Parks System to develop public exhibits and multimedia products.

See the AIM website for more information. http://www.hamptonu.edu/science/physics/CAS/AIM/aim.htmlCAS/aim/aim.html

Noctilucent Clouds
Credit & Copyright Oscar Van Der Velde
http://www.lightningwizard.com

Spectroscopy and Photometry of the Intergalactic Medium's Diffuse Radiation (SPIDR) E/PO

Nahide Craig, University of California, Berkeley

SPIDR is a mission to map the cosmic web of hot gas which spans the Universe. The PI is Dr. Supriya Chakrabarti of Boston University. The mission is scheduled to be launched in 2005.

The E/PO effort is being led by Dr. Nahide Craig of the University of California Berkeley in partnership with the Lawrence Hall of Science, the New Mexico History of Natural Science Museum in Albuquerque, Boston Museum of Science, NASA MSFC, National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE), the National Optical Astronomy Observatories (NOAO), and Cornerstone Evaluation Associates of Pittsburgh.

The SPIDER E/PO program will include:

• A new GEMS teacher's guide with the theme of "Cosmic Models" for grades 6-8. It will highlight key concepts of the mission's scientific work. Students will create models to visualize our galaxy, our Local Group, galaxies in the Virgo cluster, and clusters of galaxies.

• A GEMS Training Center will be launched at the New Mexico Museum of History of Natural Science

• SPIDR science will be included in a series of news presentations to be developed by the Boston Museum of Science's Current Science and Technology Center and in a series of web programs to be developed by NASA MSFC.

• SPIDR scientists will participate in annual NOBCChE conferences and their teacher professional workshops.

• E/PO segments for the SPIDR Web site.

For current information, please check the SPIDR web site, http://www.bu.edu/spidr

NASA OSS

Support Network Profiles

This is the first in a series of articles which will highlight contributions of the organizations of the NASA OSS E/PO Support Network. The 12 groups which make up the Support Network are involved in coordinating and integrating the OSS E/PO program. They provide a point of entry for individuals and organizations wishing to participate in the OSS E/PO program. A brochure describing the Support Network can be found at http://spacescience.nasa.gov/education/resources/ecosystem/brochure_low_res.pdf

Southeast Regional Clearinghouse (SERCH) Broker/Facilitator

Dr. Cassandra Runyon, SERCH

SERCH serves the Southeast region and is headquartered at the College of Charleston in Charleston, South Carolina. SERCH works closely with 14 NASA Space Grant consortia (AL, AR, DC, FL, GA, KY, LA, MD, MS, NC, PR, SC/VI, TN, & VA) and serves a population of more than 78 million, nearly one-third of which is minority.

The SERCH staff includes Dr. Cassandra Runyon, SERCH Director; Kathryn Guimond, Program Manager; Craig Anthony, Web/GIS Developer; and Wendy Weir, Office Assistant. Dr. Donald Walter and Dr. Linda Payne, Minority Program Coordinators, are located at South Carolina State University.

SERCH Team Members, Dr. Cass Runyon, Kathryn Guimond, and Craig Anthony.

In supporting OSS E/PO efforts, SERCH focuses on four areas of emphasis /expertise:

• GIS Internet Mapping Solutions – an online OSS Support Network web-based Resource Locator Tool that offers database management with query tools and data that includes NASA OSS E/PO venues, partnerships, and scientists.

• SERCH Education/Outreach - Educator training and mentoring; Mini-awards support scientist-educator partnerships; Conference Support, Girl Scouts

• Exceptional Needs – partnering scientists and OSS product developers with exceptional needs educators

• Minority Initiatives - Extensive network of partnerships throughout the Southeast and across the country with HBCU's, Hispanic Serving

Institutions, Other Minority Universities and predominately-minority attended K-12 schools.

Our strategies include working with our partners, finding out what **their** needs and goals are and working to address **their** needs, understanding the resources and limitations of the project and respecting the diversity and culture of our audiences. Lastly, we work closely with both the product developers and end-users to assure that the materials and resources are effective, scientifically correct and fun to use.

For more information on SERCH and SERCH programs visit the SERCH website

http://serch.cofc.edu/serch/index.htm

Educational Programs

Yellowstone National Park Offers the Public a Portal to Astrobiology

Catherine Tsairides, Director Ames Astrobiology Outreach, Lockheed Martin Ames Research Center

The NASA Astrobiology Institute (NAI) through its outreach office, along with the NASA Ames NAI team and its partners are working with Yellowstone National Park (YNP) on a long term, public engagement program that includes exhibits, literature, field experiences, educator workshops, and "fireside chats' with astrobiologists that will reach the three million visitors of all ages that experience YNP each year.

Understanding how life began on earth is a natural staring point for astrobiology. Yellowstone is providing insights into the origin and evolution of life and the potential for life to exist beyond Earth. Biochemical clues hint that early life might have lived in high-temperature environments, including hot springs. The park's hotsprings provide a glimpse into the nature of the early biosphere. Ancient spring alcoves on the flanks of Martian volcanoes invite comparisons with YNP, whose fossil-rich sinter spring deposits may, in turn, resemble deposits on Mars.

The NAI team is working with Yellowstone staff on several projects within the park including the development of ten exhibits that will illustrate astrobiology throughout the trails in Yellowstone. The team is also developing chapters on astrobiology and microbiology for the Yellowstone *Resources and Issues Guide* which is a training manual for the interpretive research staff used to develop hikes and talks. The Guide will be published and available for purchase from the gift stores throughout the park. It will also be available for virtual visitors through research libraries in the national park system, the Yellowstone National Park Web site and the NAI site [http://www.nai.arc.nasa.gov/].

Grand Prismatic Pool, Yellowstone National Park. Colorful algae mats thrive on the pool rim.

This summer, a team of teachers, geologists, planetary scientists, and astrobiologists were in Yellowstone National Park to investigate microbial communities that are thought to be modern analogs of some of the earliest life on Earth. *The Extremeties: Geology and Life in Yellowstone and Implications for Other Worlds* is a fieldtrip and workshop for teachers sponsored by The Lunar and Planetary Institute, NASA Office of Space Science, NASA Ames Research Center Astrobiology Team, and NASA Space Grant Consortia. The program focused on field experiences with the researchers and was complemented by classroom and laboratory activities at Montana State University

The team is also developing exhibit ideas to go into a planned new visitor center at Old Faithful geyser basin. This partnership with YNP is helping the general public to enhance their knowledge and skills and to access NASA research in astrobiology, including geology, microbiology, and space missions.

Special Need Resource Group - launched from Exceptional Space Science Materials for Exceptional Needs II Workshop.

Dr. Cass Runyon, Southeast Regional Clearinghouse

This past June, the Southeast Regional Clearinghouse (SERCH) hosted a 2nd workshop for

special needs teachers and NASA personnel who develop educational materials and exhibit resources. Attendance for the three-day workshop at the National Space Science and Technology Center in Huntsville, Alabama included 11 formal and informal educators from 10 states, 4 presenters, and 15 guests from NASA education centers, the South Carolina School for the Deaf and Blind, and corporate America. Workshop activities were taught 'disabilities-on', meaning that each participant worked through the lessons experiencing a variety of roles during the three-day workshop. The various disabilities simulated by the participants included: parapalegic, quadrapelegic, multiple motor disabilities, ADD/ADHD, varying degrees of visual and hearing impairments, and various verbal communication impairments.

Workshop participants work with tactile map of Vallis Marineris on Mars; part of the Mars Education Activities being developed by SSE/ASU. Photo by Jobi Cook.

As a result of this simulation, both the educators and education product developers gained a much greater awareness of the variety of needs an educator might be called to address. Recommendations for adaptations were discussed and tested wherever possible during the workshop. A summary report with suggestions for working with exceptional students on space science materials is being prepared based on feedback from the workshop participants. The report will also address the simulation and adaptation/modification needed for more severe motor disabilities that were not addressed in Huntsville.

Also, the group has formed, SNRG, (pronounced 'synergy'), or, the Special Needs Resource Group, to be a ready-resource for others developing and seeking assistance and/or guidance when working with persons with disabilities. The group's first task is to make recommendations and suggestions for adaptations for the education products that have gone through the OSS product review. To contact this group, please contact SERCH [888-873-9475 or serch@cofc.edu].

Journey through the Universe Program — An Opportunity for Scientists and Engineers to Make a Difference in Under-served Communities

Dr. Jeff Goldstein, Challenger Center for Space Science Education

In 1999 Challenger Center for Space Science Education launched *Journey through the Universe* (formerly Challenger Center's Window on the Universe program) — an initiative to establish a national network of under-served communities committed to sustainable community-wide science, mathematics and technology education. These are the communities that typically have limited access to local educational resources, or do not use them most effectively. *Journey through the Universe* was created to help respond to this need.

Currently funded by grants from NASA's Minority University Research in Education Division, and the Offices of Space Flight, Space Science, and Earth Science, *Journey through the Universe* uses research disciplines across all five NASA Enterprises to engage entire communities. The program also provides remarkable outreach opportunities for scientists and engineers working in disciplines relevant to NASA's Enterprises.

The Partnership: The success of *Journey through the Universe* owes much to the creation of a long-lasting partnership between Challenger Center and each participating community, and that community's ability to 'own' their program. Challenger Center provides diverse national resources to the communities, including: local programming for students and families, K-12 curriculum support materials, K-12 educator training, and ongoing support from Challenger Center staff scientists and educators in both content and pedagogical approaches in the classroom. The communities integrate these resources into their existing science, mathematics,

and technology education activities in both formal and informal science education venues. The programming resulting from this partnership is meant to reflect the strengths and capabilities of the community, and provide access to resources that would otherwise be unavailable.

Programming provided to each community includes a week-long celebration of learning — *Journey through the Universe Week* — conducted by a national team of researchers and engineers reflecting organizations from across the NASA R&D communities. During the week, training is provided for up to 350 K-12 educators, 4,000-8,000 K-12 students are visited in classrooms, and 2-4 Family Science Nights are held, each for 300-1,000 parents and their children.

Philosophy of Approach: The program is designed to gradually build a local infrastructure in a community — a Local Team — that can provide self-sustaining programming using national resources. This Team reflects the diversity of the community, including K-12 school districts, informal science education organizations, civic and business groups, colleges and universities, and research organizations. Sustainability is viewed as a key to success, and a deep commitment to assessment provides for ongoing evolution of every aspect of the program.

Family Science Night in Rio Rico, Arizona, February 2002. 1,500 parents, students, and educators attended the event, whichincluded dozens of family science stations. One of the concurrentsessions was a 'performance' by a space scientist, attended by 250. The National Team also conducted 87 class visits to 4,300 students.

The Current Network: *Journey through the Universe* reaches communities with limited space flight and Earth and space science education resources, or those where resources are not utilized community-wide. This includes, but is not limited to, communities in rural settings, as well as low-income populations in urban settings. Eight communities are part of the initial network:

Nogales, Arizona
Moscow, Idaho
Tuskegee, Alabama
Muncie, Indiana
Washington, DC
Marquette, Michigan
Labette County, Kansas
Broken Arrow, Oklahoma

Network growth of four communities per year is projected for the next three years. To learn more about the program and how you can participate please see the program Web site at http://www.challenger.org/jttu, or write John Hamel, program coordinator, at jhamel@challenger.org.

Miami's "Mission to Mars" Project Reaches out to Pre-service Teachers

Dr. Rita K. Voltmer, Miami University

This past academic year, over 200 students at Miami University in Oxford, Ohio, took part in an innovative program designed to stimulate interest in and encourage the study of space science among non-science majors. The effort specifically targeted students in the pre-service teaching program with the additional objective of developing increased confidence in their ability to teach space science concepts through early exposure to NASA space science educational materials and programs.

Miami's Mission to Mars (the 3-M) Project was funded by the IDEAS Grant Program [see IDEAS article on page 4] and the Ohio Space Grant Consortium. The project was modeled on the successful NASA Student Involvement Program [http://www.nsip.net] activity called "Design a Mission to Mars". The students were grouped into teams to develop proposals for science missions to explore Mars. They were provided with a wide range of space science resource information and access to space scientists. The team research proposals were reviewed by space scientists for both content and presentation quality. While the research reports were an important part of the student's course grade, there was additional incentive – the winning team would travel to JPL for additional exposure to the

Mars research science and education program.

Space scientists were instrumental in giving the project the credibility needed at the college level. Dr. Philip James of the University of Toledo, who has been involved in many NASA Mars projects, came to Miami University and presented an introductory lecture on Mars. NASA OSS supported the project by facilitating the participation of scientists to review and critique the student proposals. Scientists participating in the project were Dr. Philip James, Dr. Adolf Witt, and Dr. Karen Bjorkman of the Department of Physics and Astronomy at the University of Toledo, Dr. Steve Herbert, Department of Physics at Xavier University; Dr. Mike Sitko, Department of Physics at the University of Cincinnati; Dr. Andrew Layden, Department of Physics and Astronomy at Bowling Green State University; Dr. Eric Feigelson, Department of Astronomy and Astrophysics at the Pennsylvania State University and Diane Callahan, science teacher at Fairfield Middle School.

In May, the winning student team of Jessica Bigham, a foreign language education major from Napier, Illinois; Angela Rader, an early childhood major from Rawson, Ohio; Bryan Sisto, an English major from Columbus, Ohio; and Whitney Crawford, a business major from Granville, Ohio and faculty advisor Dr. Rita Voltmer traveled to NASA JPL for behind the scenes experiences and visits with scientists directly involved in NASA's Mars program. They had the opportunity to observe equipment and facilities they had only read about and listen to scientists describe the work they are doing regarding Mars. The students were truly impressed -

"Seeing an actual rover was amazing. It is something most people only hear about. When we were watching it climb over rocks in the Mars Rover Yard, I remember thinking, Wow, I am seeing what is actually going to be sent to Mars. I am watching what it is going to be doing on another planet."

3-M Team at the Rover Yard

Special thanks goes to Ms. Consuelo Gennaro who was instrumental in planning, organizing and hosting the visit and to JPL scientists Dr. John Callas, Mr. Tom Shain, Mr. Robert Brown, Dr. Deborah Bass, Ms. Nagin Cox, Dr. Issa Nesnas, Mr. Mehran Gangianpour, Dr. Terry Huntsberger. Mr. Shigeru Suzuki and other members of Dr. Eric De Jong's team for sharing their experience and enthusiasm with the students.

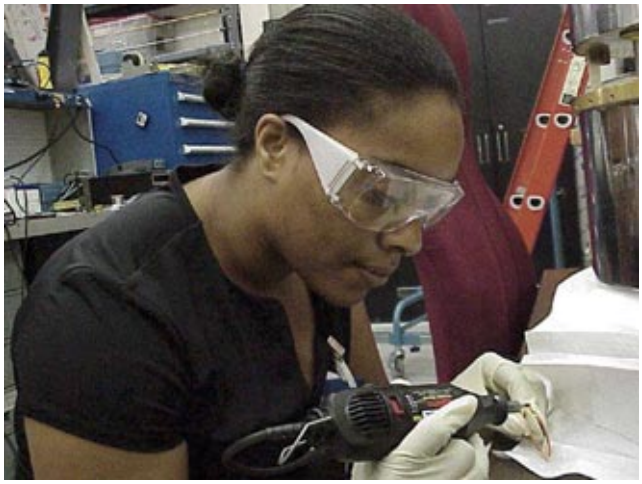
Based on the success of the program at Miami University, plans are being made to expand the project to other Universities and perhaps create a nationwide competition.

Enhancement of Space Science Research Program at South Carolina State University

Dr. Donald K. Walter, South Carolina State University

South Carolina State University (SCSU), a Historically Black College/University (HBCU), located in Orangeburg, South Carolina has implemented a number of space science programs with support from NASA. It was one of 15 schools to receive a Minority Initiative Partnership award from NASA OSS in 2001. [See *Voyages,* May 2001, http://spacescience.nasa.gov/education/news]. The SCSU project focuses on enhancements in four areas: student research, faculty research, curriculum development and K-12 outreach.

Student research in astrophysics: The award has enabled SCSU to develop, the Undergraduate Research Program in Astrophysics [URPA; see http://www.cnrt.scsu.edu/astro2002]. In the program, minority students with previous space science experience are paired with research scientists at NASA Goddard Space Flight Center (GSFC), Lawrence Livermore National Lab (LLNL), Kitt Peak National Observatory (KPNO) and the Planetary Science Institute (PSI). During the past two summers a total of eight students from minority institutions across the country have been supported through URPA. Their work has included solar physics research at GSFC, work at LLNL developing new CCD technology and studying light curves generated by the MACHO project, searching for asteroids at KPNO and PSI as well as studying stellar evolution of a dwarf elliptical galaxy while at KPNO. In the summer



Erica Lamar, a senior physics major at SCSU who has now graduated, is shown during the summer of 2001 when she worked with the Advanced Detector Group at the Lawrence Livermore National Laboratory developing new CCDs with astrophysical applications.

of 2002, Dr. Daniel Smith led a team of students who used Early Data Release from the Sloan Digital Sky Survey, to create multi-dimensional graphical plots and animations to depict the structure of the universe using *Mathematica* software.

Curriculum Development: Physics faculty member, Dr. Daniel Smith, has developed several new web-based space science curriculum activities including 2-D and 3-D simulations of the large scale structure and expansion of the Universe.

Faculty research: A new tenure-track position in astrophysics has been created. This brings to two the number of SCSU faculty members actively engaged in astrophysical research. New faculty research partnerships have been established with astronomers at GSFC and the University of South Carolina (USC). GSFC astronomer Ted Gull is working with a SCSU astronomer on a HST proposal, while the USC partnership has lead to the submission of a NASA EPSCoR proposal on the chemical evolution of galaxies. Although this second proposal was not funded, it established a faculty research relationship between the two schools with proposals in the planning stages to Space Grant, EPSCoR and HST.

K-12 Outreach: "Space Science for Teachers," an intensive one-week course for middle and high school teachers, was offered during the summers of 2001 and 2002. SCSU partnered with the Bamberg-Calhoun-Orangeburg Math/Science Hub, a teacher resource center that is part of the NSF-funded Statewide Systemic Initiative. Organized around the four OSS themes, this standards-based course provided science content, as well as hands-on activities for use in the classroom. Over 50 teacher applications were received in 2002 for only ten openings. The overwhelmingly positive response to this course was echoed in one teacher's evaluation of the program that stated "This is the best workshop I have ever attended!!"

As an outgrowth of participation in the MI program, a partnership has been developed with the College of Charleston. SCSU is now part of the SERCH Broker/Facilitator project [see article on page 5] promoting partnerships which increase participation of minority institutions in the field of space science.

The small, but active program at SCSU has been significantly enhanced through this OSS award. Research and education collaborations established under this program have positioned the University to continue making contributions to the field of space science for years to come.

Profiles of Scientists in Education and Public Outreach

contributed by Dr. Cherilynn Morrow and Christy Edwards, Space Science Institute – SSI

This profile is based on excerpts of a June 2002 interview with Dr. Rosaly Lopes-Gautier about her involvement in Education and Public Outreach (E/PO).

Current Professional position:

I'm a research scientist at the Jet Propulsion Laboratory. My research has focused on terrestrial and planetary volcanism, particularly Io and Mars. I am a member of the science team for the Near-infrared Mapping Spectrometer on Galileo. I use data from NIMS to detect active volcanism on Io and to study its character, global distribution, and variations with time. Io is the only place outside Earth where we see large-scale, active volcanism. It is a fascinating moon to observe and study.

Description of Rosaly's featured E/PO role:

I do a wide variety of E/PO activities, including teachers' workshops, public talks, and media. The one activity I will highlight here is being the science advisor for an educational video

about Io prepared by students and staff at the College of the Sequoias in California. The students, helped by staff, wrote the script and did the filming and graphics. My role was to provide initial ideas and to critique the material they prepared. It was a very enjoyable experience and I was impressed by how much effort the students and staff put into making the video.

Dr. Rosaly Lopes-Gautier
NASA JPL

How she got involved in the Io video:

I am a strong supporter of E/PO. It is both a good business practice (we need public support for our missions and our science) and a duty as a scientist supported by public funds. I consider myself extremely fortunate to be able to do work that I love, and I believe I have an obligation to share my work and the exciting results it brings with the people who pay for it. Most of the E/PO activities I get involved in are in response to requests. However, in the case of the Io video, I proposed the project to NASA for funds under the Jupiter System Data Analysis Program.

Comments on her time commitment:

As a science advisor, my involvement totaled about 4 weeks over 2 years, on a sporadic basis. A lot of the work was done remotely, for example, critiquing various versions of the script. I was helped by Bill Smythe, my Galileo colleague and Co-Investigator on the science proposal. Some of the work on the video was combined with other E/PO activities. We did some filming while I was lecturing at a teachers' workshop in Yellowstone National Park, which is an ideal place to discuss Io's volcanic activity. I did some critiquing of the video while giving talks at the College of the Sequoias. This activity was never a burden to my research, although I must admit that some of the work was done at home in my "spare" time.

Challenges to her E/PO involvement:

In general, the biggest challenge is money. As a JPL scientist I have to bring in money for my salary plus burden money to be able to pay for my time. A $10K grant (that also has to cover the costs of the E/PO project) hardly allows me to spend any time on a project. I do some work for the SSE Forum and I get some support from that. However, most of my efforts in E/PO, particularly in the "public relations" area (giving lectures, interviews, and so on), is done on a volunteer basis, though I do consider E/PO to be part of my duties as a scientist.

What she gets out of her participation in E/PO:

I have participated in E/PO since my graduate student days and have found great personal satisfaction from the involvement. The most rewarding aspect is to be able to inspire others, particularly young people. Outreach has always been an integral part of my science career and will continue to be so. I welcome opportunities for involvement and am very happy that more scientists now recognize the importance of E/PO.

Rosaly's words of wisdom about E/PO:

Find something you love and do it well. There are many different ways to become involved in E/PO and all can be personally rewarding. Look for opportunities that suit your personality and your talents. Every impact, small or large, is important. It's hard to measure the impact one has while doing E/PO. I have done many high-profile activities (press conferences, media interviews, and TV documentaries) but often it is the low-key activities that can bring us the largest rewards. Today's news may be forgotten tomorrow but the impact of inspiring a young person to pursue science as a career can be enormous and long lasting.

Educational Products

ASTRONOMY EDUCATION REVIEW: A NEW JOURNAL/MAGAZINE

Dr. Sidney Wolff, National Optical Astronomy Observatories and Dr. Andrew Fraknoi, Foothill College & Astronomical Society of the Pacific

A new journal and magazine is being started for those working in astronomy and space science education. Called **Astronomy Education Review (AER)**, the on-line journal will also become a repository of information on educational topics. Its web address is http://aer.noao.edu .

The model for the new publication is *Science* or *Nature*, in that AER will include not only research papers, but news reports, opinion pieces, and coverage of useful resources in education and outreach. There will be five sections in each issue:

- Refereed papers on research in astronomy education
- Short reports on innovative techniques, approaches, activities, and materials
- Annotated lists of useful resources
- Announcements of opportunities (employment, conferences, grants, etc.)
- Editorials, reviews, opinion pieces, and interactive discussions

AER will cover all five of the educational arenas where astronomy and space science education takes place: K-12, undergraduate, graduate, informal, and public outreach. A strong board of editors with members from each arena has been set up. Subscriptions are free and we expect to publish quarterly issues, with an email announcement to subscribers when an issue is ready. Each paper and article will be classified by topics and arena and will become part of a searchable database on the Web site.

The recent Decadal Survey in astrophysics strongly recommended such a journal and both the American Astronomical Society and the Astronomical Society of the Pacific have endorsed it. The journal is being sponsored by the National Optical Astronomy Observatories and NASA OSS during its start-up phase.

We welcome ideas, support, practical advice—and submissions—from everyone in the NASA OSS education community as we move forward with the project.

African Americans in Space Science Poster

Dr. Larry Cooper, Ohio Aerospace Institute

A new poster featuring profiles of five African-American space scientists has been released. The poster is based on a traveling exhibit created by Dr. Larry Cooper of OAI and Dr. Willie Mackey of NASA Glenn Research Center with funding from the NASA IDEAS program [see article on page 4], OAI and the Ohio Space Grant Consortium. An update to the exhibit and poster is underway and will debut at the AAS meeting in January 2003. Information on the poster and companion exhibit may be obtained at

http://www.osgc.org/Events.html#AfAmerican

On the Horizon

New Planetarium Show Coming

A new, updateable planetarium show, *Ringworld*, is slated for distribution in early 2003. It is being produced by Sullivan Presentations in Salt Lake City, UT, with support from the Cassini mission. For information, contact Alice Wessen at alice.s.wessen@jpl.nasa.gov .

NASA's Sun-Earth Days, 2003 to Feature New Science Specials

Two new science specials, *Auroras-Living With A Star* and *Live From The Aurora* will debut on Tuesday, February 11 and Tuesday, March 18, 2003 on participating PBS stations and NASA Television. Supporting the broadcasts will be teacher-tested hands-on activities and web resources connecting real world science to the National Science Education Standards.

Register your interest in participating and join the LIVE FROM THE AURORA email list to receive updated information about the project at http://passporttoknowledge.com/sun .

If you would like to receive an electronic copy of future newsletters, contribute an article or just have questions about getting involved with the NASA OSS E/PO Program, contact Larry Cooper, Editor, at lcooper1@hq.nasa.gov . Prior issues of *Voyages* are online at http://spacescience.nasa.gov/education/news .