The Spitzer Space Telescope
New Views of the Universe

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The Spitzer EPO Program

- Spitzer is part of the NASA Education structure, and is one of the NASA Origins missions. This puts us in constant communication with STScI, SOFIA, and the Astrobiology Institute. We also do our tracking and reporting through NEISS.

- Our strategic plan maps to both OSS and NASA goals. Are these changing? We’re not sure…

- Our EPO program focuses on:
  - Formal education
  - Informal education
  - Public Outreach
  - Involving Scientists in Education
  - Media Support (we work with the Public Affairs team at JPL)
Formal Education

Spitzer EPO’s formal education program aims to make a difference on a national scale. We have been a model for cross-program collaboration, both within and external to NASA. Major initiatives include:

• **Invisible Astronomy On-Line Course**
  
  Given as part of a Master’s Degree in Science Education at the U. of Arizona. The course will also be used for training SOFIA’s Airborne Ambassador Program. Over 400 teachers have taken the course, and two refereed papers about course design and evaluation have been published in Astronomy Education Review.

• **GEMS Guides**
  
  Produced by the Lawrence Hall of Science, these formal curriculum programs are used in over 500 schools. Spitzer has provided material for one, and plans another in conjunction with the Origins Forum.

• **Community College Initiative**
  
  This new program, done in collaboration with JPL’s Navigator Program and CAPER, has the goal of improving introductory astronomy education in community colleges, through both workshops and product development.
Center for Astronomy Education

“Teaching Excellence” Workshops

A series of two-and three-day interactive teaching excellence workshops that focus on the dilemmas astronomy teachers face, with practical solutions for big issues in curriculum, instruction, and assessment. More >>

Teaching Excellence
This Month's Strategy:
Everyone Says Lecturing Doesn't Work...Does That Mean I Should Never Do It? More >>

Ideas from Your Classrooms
Submit your own favorite teaching tips. More >>

Discussion Groups
Join a discussion with Astronomy faculty to explore what works and what doesn’t in the classroom. More >>

Useful Resource Sites

Faculty Resources
- Astronomy Picture of the Day (APOD)
- JPL Planetary Photojournal

Instructional Strategies
- Lecture Tutorials
- ASP Guide to Online Teaching Resources for Astro 101
- Contemporary Laboratory Experiences In Astronomy (CLEA)
- Nebraska Astronomy Applet Project
- Peer Instruction

Professional Organizations
- American Association of Physics Teachers (AAPT)
- Astronomical Society of the Pacific (ASP)
- American Astronomical Society (AAS)
- American Association of Community Colleges
- Conceptual Astronomy and Physics Education Research (CAFER) Team
- Society for College Science Teachers

Space Telescope Images... as only NASA can...
Formal Education, Cont.

- Learning about Light: Short course on the EM Spectrum

Courses are being given at regional and national science teacher meetings. A classroom-ready kit, as well as teacher guides, tests, and assessment activities was developed by Spitzer and SOFIA allowing teachers to easily detect and experiment with infrared light. You can buy the complete kit from the ASP catalog.
Formal Education, Cont.

Other programs include:

• Collaborations with the Challenger Center

• Appearances on the Young Astronaut broadcast, which reaches over 70,000 students, many of whom are minorities (also included in GED program).

• Spitzer product development
  
  • Two fully evaluated and tested educational modules using our Infrared Zoo and Infrared Yellowstone websites
  
  • New poster, videos, and lithos highlighting Spitzer’s discoveries
  
  • Expansion plans for the Ask an Astronomer website

• Classroom visits whenever we can!
Involving Teachers with Spitzer Data

There’s no substitute for real data, and real discoveries, and educators know this. But the challenge of making raw data into a meaningful educational experience is daunting.

Spitzer will be collaborating with the RBSE program, which has a well-established and successful program, to get teachers and students working with astronomers to conduct actual observations on Spitzer and other ground-based telescopes. 2-3 hours of DDT has been allocated for this purpose.
About RBSE

Research Based Science Education (RBSE) is an NSF-funded teacher and student enhancement program hosted by the NOAO. TLRBSE integrates the best pedagogical practices of Research Based Science Education with the process of mentoring.

Participants are provided training in astronomy content, pedagogy and leadership skills through:

• In-residence workshops at NOAO and the SSC
• An online distance learning program, for which graduate credit is available
• Mentoring support for beginning teachers by Teacher Leaders
• A cooperative partnership between Teacher Leaders and professional astronomers
• A professional community of educators involved with research based science education, linked by online discussion forums and face-to-face presence at professional meetings.
Informal Education

• ViewSpace

ViewSpace is a program subscribed to by over by ~ 100 planetariums and science centers, most of them smaller venues. The displays are designed to be constantly up-dateable, with new presentations every month or so. Spitzer has collaborated with STScI to produce one show on infrared astronomy. Another show is in development.

• PBS Series

The Spitzer EPO group has been involved with the production of a four-hour NOVA special about the Origins missions, set to air in late 2004. Tie-ins will be pursued with the museum exhibits.

• Girl Scouts

Spitzer conducted workshops at the national GSUSA leaders’ training conference, and will provide kits to girl scout groups, in collaboration with the Solar System education forum.
Spitzer EPO has been collaborated with the Origins forum in the production of a 4-hour NOVA special series about Origins.
Alien Earths Museum Exhibit

With major funding from the NSF, Spitzer and other Origins missions have collaborated with the Space Science Institute to develop a 3,000 sq. ft. traveling exhibit about the origins of stars, planets, and life. The first 3-year national tour will begin in early 2005, at the Lawrence Hall of Science, and will be managed by ASTC. Spitzer will be featured in displays on star and planet formation, and the exhibit will be updated to include new data.

Scientists are needed to participate in local activities like public talks and teacher workshops.
Informal Education, Cont.

• JPL Solar System Ambassadors
  Ambassadors in all 50 states and Puerto Rico reached over 3 million people in FY2003 with Spitzer materials. Yearly training sessions are conducted with the ambassadors.

• StarDate Radio Program
  Four radio programs about SIRTF were produced and broadcast on NPR in 2003, in both English and Spanish. Estimated audiences were over 12 million.

• Internet Initiatives
  Spitzer has designed and sponsored web science activities on Whyville (over 400,000 students did our activities in 2003) and SpacePlace.
Lizards are cold-blooded and their body temperatures are close to that of their environment. Notice the difference in temperature between the cool lizard and the warm human hand. The lizard is a bit warmer than room temperature due to heat from the hand.
"Why doesn't the moon fall down?"
Answered by Doris Daou of the SIRTF Science Center
Windows Media: 56k | Broadband
QuickTime 4.0: 56k | Broadband
QuickTime 6.0: Broadband
Credits

"Why does the moon look like it changes?"
Answered by Doris Daou of the SIRTF Science Center
Windows Media: 56k | Broadband
QuickTime 4.0: 56k | Broadband
QuickTime 6.0: Broadband
Credits | Awards

"What causes an eclipse of the moon?"
Answered by Doris Daou of the SIRTF Science Center
Windows Media: 56k | Broadband
QuickTime 4.0: 56k | Broadband
QuickTime 6.0: Broadband
Credits

"Why are solar eclipses only visible in some parts of the world?"
Answered by Dr. Susan Stolovy of the SIRTF Science Center
Involving the Public

• The Spitzer Naming Contest
  Over 7,000 entries received, 40% from foreign countries (Canadians won!)

• Public Events
  The JPL Open House, Von Karman Lecture, and other large events help us interact personally with the public.
Spitzer EPO works with the OST to represent the SSC at professional meetings like the AAS. There are usually educational workshops for teachers scheduled at the same time. Doris Daou is a member of the AAS taskforce to involve scientists in education.
Media Support

Spitzer EPO staff members are involved in public affairs activities, such as producing animations, researching background information for press releases, and talking to reporters. Our group also does the web-mastering for the public SSC site, and our proto-news site. We work closely with the JPL Media Affairs Office.
Images, Graphics, and Animations