

EDUCATIONAL OUTREACH

PUBLIC AFFAIRS AND EDUCATIONAL OUTREACH

NOAO-Trained Teachers to Observe with Spitzer

Douglas Isbell & Stephen Pompea

NOAO has teamed with the Spitzer Science Center (SSC) to offer a dozen graduates from NOAO's advanced teacher professional development program a unique chance to make research-quality observations with NASA's Spitzer Space Telescope.

Known as the "NASA Spitzer Space Telescope Observing Program for Students and Teachers," the project was germinated in a series of informal discussions that began in earnest at the January 2004 AAS meeting in Atlanta. Applications were solicited in September using the RBSE/TLRBSE list-serve, and twelve teachers from the NOAO Research Based Science Education (RBSE) and its successor, Teacher Leaders in Research Based Science Education (TLRBSE), were selected from 37 highly qualified applicants. Just a few weeks after their selection, the teachers got started with a kick-off workshop in Tucson from November 18–20.

"The Spitzer outreach team was interested because they know that Spitzer observing opportunities are a valuable resource, and they wanted to make the most out of the director's discretionary time reserved for educational outreach," says Stephen Pompea, an astronomer and the manager of science education at NOAO. "We saw a chance to offer another exciting and challenging research experience to our RBSE/TLBSE community, including the chance to work closely with some of the best infrared astronomers in the world."

Key staff members involved with the NOAO side of the program include Pompea, Steven Croft, Connie Walker from the NOAO educational outreach group; Don McCarthy of the University of Arizona; and Steve Howell, Jeremy Mould, and Steve Strom from the NOAO scientific staff, with more astronomers likely to be added. Doris Daou of the SSC outreach staff is managing the SSC side of the program, in coordination with SSC Director Thomas Soifer. SSC science staff will be involved as sponsors for each team of teachers. The SSC Observer Support Team will help the teachers in understanding the telescope and instrument capabilities, as well as in their observation planning stage.

"We wanted to bring the Spitzer Space Telescope mission to the classroom, and give this great opportunity to teachers and students from all over the country," Soifer said. "This effort is another example of how NASA and its projects help prepare the next generation of American scientists, and space scientists in particular."

Further teacher training and science observations planning sessions will occur at the January 2005 AAS meeting in San Diego, where the teachers will attend a planning workshop given by the SSC Observer Support Team. They also will be given the opportunity to meet with Spitzer scientists to learn more about the telescope, its different instruments, and possible science observation ideas. Once the observations are taken, the teachers will visit the SSC in Pasadena, California, to meet again with the Spitzer scientists and start working on the data. During this visit, they each will be accompanied by two students.

The RBSE/TLRBSE teachers selected for the Spitzer project are:

Jeff Adkins	Deer Valley High School	Antioch, CA
Howard Chun	Cranston High School	East Cranston, RI
Lauren Chapple	Traverse City East Junior High School	Traverse City, MI
Harlan Devore	Cape Fear High School	Fayetteville, NC
Anthony Maranto	Phillips Exeter Academy	Exeter, NH
Steve Rapp	Linwood Holton Governor's School	Abingdon, VA
Theresa Roelofsen	Bassick High School	Bridgeport, CT
Babs Sepulveda	Lincoln High School	Stockton, CA
Linda Stefaniak	Allentown High School	Allentown, NJ
Timothy Spuck	Oil City Area Sr. High School	Oil City, PA
Beth Thomas	East Middle School	Great Falls, MT
Cynthia Weehler	Luther Burbank High School	San Antonio, TX

Watch the TLRBSE Web page (www.noao.edu/outreach/tlrbe) for more program news.



ASTRO-Tucson Fall 2004 Workshop Largest Yet

Douglas Isbell & Connie Walker

The ninth annual training workshop for Project ASTRO-Tucson was held on 17–18 September 2004, again located in a handy meeting room at the University of Arizona (UA). It featured 70 registrants (with 66 attendees), including 33 teachers and 37 astronomer-partners, making it the largest-ever Tucson workshop and perhaps the largest in the history of the national ASTRO program.

Highlights of the workshop included a scale-model solar system demonstration on the UA student mall, a talk on different group learning styles and techniques by Janelle Bailey of the UA Conceptual Astronomy and Physics Education Research Team, a “kinesthetic astronomy” activity led by Mike Zawaski of the Space Science Institute in Boulder, and an inspirational talk on the solar system and its wonders by David Levy. A spectacular sunset at Kitt Peak was a harbinger of a mostly cloudy evening, but even less-than-ideal viewing conditions could not put a damper on the group’s enthusiasm.

“I came back from the workshop in Tucson flabbergasted!” said one written evaluation. “As an educator since 1990, I have been to many workshops, training seminars, et cetera, and have many times put together and presented information for educators. I have never been involved in such a well put-together and worthwhile training. I literally felt that every minute I spent at the workshop was invaluable and enriching.

“The activities had the potential to be intimidating (phases of the moon) but the way they were presented in conjunction with our astronomer was fun and interesting. I realized how many misconceptions I had about the solar system and greater universe, and these misunderstandings were [previously] carrying over into my instruction.”

To date, more than 360 teachers and astronomers have been trained by Project ASTRO-Tucson in the best methods to bring hands-on, astronomy-oriented activities into science classrooms. More than 6,400 students were directly impacted by ASTRO classroom visits this past year, with well over 150 active astronomer-teacher partnerships.



Attendees at the fall 2004 Project ASTRO-Tucson workshop observe and record the appearance and location of the setting sun, next to the SARA telescope.



ASTRO-Tucson project coordinator Connie Walker (second from right) leads a workshop activity on lunar phases, inside the pier of the Mayall 4-Meter Telescope.



The 2005 REU Program at the Kitt Peak National Observatory

Kenneth Mighell



Program. The KPNO REU program provides an exceptional opportunity for undergraduates considering a career in science to engage in substantive research activities with scientists working in the forefront of contemporary astrophysics.

Each REU student is hired as a full-time research assistant to work with one or more KPNO staff members on specific aspects of major on-going research projects at NOAO. As part of their research activities, these undergraduates gain observational experience with KPNO telescopes, and they develop expertise in astronomical data reduction and analysis. They also take part in a weekly lecture series

Each summer a group of talented college students come to Tucson to participate in astronomical research at Kitt Peak National Observatory (KPNO) under the sponsorship of the National Science Foundation (NSF) Research Experiences for Undergraduates (REU)

and a field trip to New Mexico to visit the National Solar Observatory at Sacramento Peak and the Very Large Array in Socorro. At the end of the summer, the students share their results with the Tucson astronomical community through a series of oral presentations. In addition, as part of their internship experience, all six of our 2004 REU participants will be presenting posters about their astronomical research projects at the January 2005 AAS meeting in San Diego.

We anticipate being able to support six REU positions during the summer of 2005. As required by the NSF, student participants must be citizens or permanent residents of the United States. The KPNO REU positions are full-time for 10 to 12 weeks between June and September, with a preferred starting date of early June. The salary is \$455 per week and additional funds are provided to cover travel to and from Tucson at the beginning and end of the summer.

Further information about the KPNO REU 2005 program, including the online application form, can be found at www.noao.edu/kpno/reu. Completed applications (including official transcripts, and two or three letters of recommendation) must be submitted to KPNO no later than 21 January 2005.



“Nebulosa Del Ojo De Gato”



This image of the Cat's Eye Nebula (NGC 6543) from the Advanced Camera for Surveys on the Hubble Space Telescope was the subject of a 9 September 2004 Hubble Heritage press release. The image reveals striking details about the bull's eye pattern of eleven or more concentric rings, or shells, around the central star. Each “ring” is actually the edge of a spherical bubble seen projected onto the sky.

Observations suggest that the central star in the nebula ejected its mass in a series of pulses at 1,500-year intervals. These convulsions created dust shells that each contain as much mass as all of the planets in our solar system.

This image was taken as part of a recent study by a team including Hugo Schwarz of Cerro Tololo Inter-American Observatory. The study suggests that such rings are much more common than previously thought, and indeed may be the rule rather than the exception.

Image credit: ESA, NASA, HEIC and the Hubble Heritage Team (STScI/AURA).