

V

I

E

W

PISGAH ASTRONOMICAL RESEARCH INSTITUTE

Volume 8 Number 1 Spring 2008

PARI featured at Astronomy Days in Raleigh



PARI was once again among the featured attractions at the NC Museum of Natural Sciences Astronomy Days in Raleigh. The annual event was the largest to date, with more than 15,000 people attending through the weekend.

The PARI exhibit was packed with visitors during the entire two days of Astronomy Days at the NC Museum of Natural Sciences in Raleigh.

The PARI exhibit area featured live remote access to our Smiley

radio telescope and many visitors got their first exposure to radio astronomy by doing what PARI does best: hands-on learning.

The PARI staff contingent included Don and Jo Cline, Michael Castelaz, Dave Clavier, Beth Harris and Christi Whitworth. Also making the trip were several Friends of PARI volunteers, including Liz Castelaz, Christine Operario and Chris Waldrup. Back at PARI, Ben Goldsmith, Chad McCall and Lamar Owen provided backup support and kept Smiley functioning flawlessly during the entire weekend.



PARI Science Educator Beth Harris stayed busy explaining science concepts to children during Astronomy Days.

Space Day and Homeschool Day schedule in May

Mark your calendars now for two of PARI's most popular public events. Our annual Space Day open house is scheduled Saturday, May 3. The spring Homeschool Day will be Friday, May 2. Details for both events will be posted at www.pari.edu.

PARI Calendar

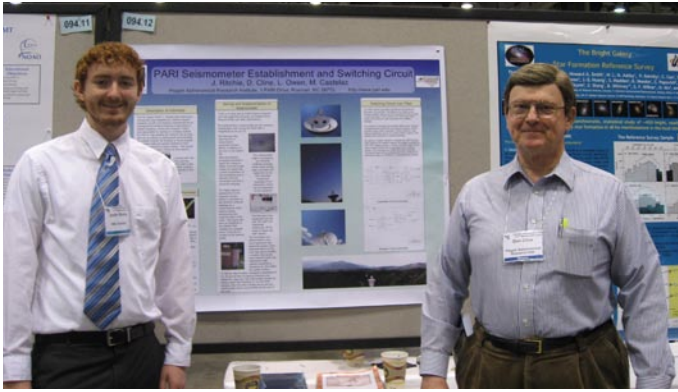
March 19	Brevard Middle School Career Day
April 11	Evening at PARI "Light Pollution"
May 2	Homeschool Day
May 3	Space Day
May 9	Evening at PARI "Meteorites"
May 10, 31	ROBOTS Professional Development Workshop
June 12 - 27	Duke TIP Summer Program
June 13	Evening at PARI



learning in their classrooms. Teachers came from the Research Triangle area, Morehead City, and Statesville.

Thanks to funding from the Z. Smith Reynolds Foundation, PARI was able to offer a School of Galactic Radio Astronomy (SGRA) workshop at the NC Museum of Natural Sciences in Raleigh. Here, PARI Science Educator Christi Whitworth explains a concept to one of the 20 teachers who became certified to use PARI's "Smiley" radio telescope for hands-on

PARI at AAS



PARI was well represented at the 211th meeting of the American Astronomical Society (AAS) in Austin, Texas. Here, Justin Ritchie and Don Cline are shown with Justin's poster describing the work he did last summer on PARI's seismometer. Justin is a student at UNC-Charlotte and the first recipient of the J. Donald Cline Space Grant Scholarship. Among other benefits, the scholarship provides Justin the opportunity to spend two summers working and studying at PARI, with trips to the AAS to report his findings. Also presenting papers at the AAS were Dr. Michael Castelaz, director of astronomical studies and education, and Michael Aubrey, the Sherri and Richard Austin Intern from UNC-Chapel Hill. They used photographic plates from the Astronomical Photographic Data Archive at PARI to study open star clusters.

Fall Homeschool Day



PARI's fall Homeschool Day was a full day on-campus experience for students being schooled at home. As part of their study of the Moon, students are shown here making craters like those observed on the lunar surface. They investigated crater formation by experimenting with angle, speed and size of falling objects. The next Homeschool Day is scheduled Friday, May 2. Visit www.pari.edu for details.

Grassroots Director's Meeting



PARI's Don Cline, Grassroots Executive Director Fran Nolan and PARI's Dave Clavier enjoy a lighter moment at the annual directors' retreat of the NC Grassroots Science Museums Collaborative. PARI is one of 30 members of the statewide collaborative and during the meeting discussed ways to make PARI's scientific instruments available for interactive displays at other museums.

Cisco/PARI Kenan Fellow Selected



Derek Dennis, an 8th grade teacher at Rugby Middle School in Hendersonville, has been selected as the first Cisco/PARI Kenan Fellow. Derek was selected during an interview process at PARI that involved Kirsten Weeks of Cisco Systems and PARI President Don Cline on campus, and used PARI's state-of-the-art teleconferencing capabilities to include participants from the Kenan Fellows Program. Shown on the monitor are Danielle Seneschal, assistant director of program operations and Valarie Brown-Schild, director of the Kenan Fellows Program. The Fellowship will provide funding and assistance for Derek to develop teacher aids that will allow teachers from across North Carolina to access PARI scientific instruments remotely for hands-on classroom learning.

The Calendar and Leap Year 2008

astronomer's corner

Dr. Bob Hayward, Astronomer/Educator

It's leap year once again, something that happens every four years, or does it? Let's start with a fact of nature: The Earth revolves in its orbit around the Sun once every 365.2422 days. Astronomer call this the Tropical Year.

The ancients were astute observers of the sky. Thus, the ancient Egyptians timed their year by the reappearance of the star Sothis whose rising in the early morning, called heliacal rising by astronomers, signaled the coming flood of the Nile. They noted the year was $365\frac{1}{4}$ days long. The Romans originally had a calendar named after gods and numbers and we still have remnants of that today. September, which comes from the Latin for seven, was the seventh month; October, after the Latin number eight, was the eighth month, etc. They then added January and February to the end of their calendar making 12 months. In 47 BC Julius Caesar developed the Julian Calendar where every fourth year February had 30 days. After his death the fifth month, Quintilius, was renamed Julius in his honor. Augustus Caesar later changed the sixth month from Sextilius to Augustus and took another day from poor February to make his month as long as Julius.

Now, fast forward to 1563 when King Charles IX of France decided that the year should begin near the celebration of the birth of Christ. So he changed the beginning of the year from March to January. Now, September, named after the Latin number seven, became the ninth month, etc.

With an extra day added for a leap year every fourth year, the average length of the calendar was 365.2500 days long. That's an error of 0.0078 days per year. By 1582 this amounted to an error of ten whole days and Pope Gregory XIII set up by decree what we now know as the Gregorian Calendar. Here are his rules for leap year:

- Years evenly divisible by 4 are leap years unless they are century years, i.e., years evenly divisible by 100.
- Century years are not leap years unless they are evenly divisible by 400.
- Years evenly divisible by 400 are leap years.

Thus, 1900 was not a leap year but 2000 was. And 2008 is a leap year since it is evenly divisible by 4 and is not a century year.

Oh, yes, a footnote to all this. In 1582 the Protestant countries did not go along with Pope Gregory's decree nor had they changed the beginning of the year to January 1. It wasn't until September 2, 1752 that those countries, including the American colonies, changed from the ancient Julian calendar to the Gregorian Calendar.

Bob Hayward's column is a regular feature of our newsletter and an extended version can be found online at www.pari.edu/programs/astronomers-corner/. For additional information, or if you'd like to ask Dr. Bob a question, e-mail askDrBob@pari.edu or, write Dr. Bob at One PARI Dr., Rosman, NC 28772.

Area students win PARI Astronomy Awards



*Shelby Bennett
Old Fort Elementary
Light Pollution*



*Vanessa Phuong
Fairview Elementary, Sylva
The All Amazing Albedo*



*Scott Dinsmore
Hendersonville High School
Does Magnetism Affect Plant Growth?*

PARI's Christi Whitworth and Dr. Michael Castelaz presented awards to three students for excellence in astronomy at the Western Regional Science Fair. PARI will also present Astronomy Awards at the Science Fair of North Carolina, in Raleigh.

PARI needs your help!

PARI is a public, not-for-profit foundation. Financially, we are dependent upon contributions and grants for our educational and research programs, and for the many operating expenses associated with maintaining the campus and our facilities.

If you have recently contributed, we thank you for your support. If not, please help support PARI and our mission with a contribution. PARI is a 501 c(3) organization and all donations are tax deductible to the full amount allowed by law.

A financial contribution automatically makes you a member of Friends of PARI. Membership levels and benefits include:

Student Member	\$10.	Member level for full time students. E-mail copy of the PARI Newsletter.
Associate Member	\$50.	Receive Quarterly Issues of the PARI Newsletter.
Member	\$100.	All of the above plus a PARI key chain with light.
Family Member	\$200.	For a family of 4, all of the above plus a PARI coffee mug. Use of the PARI Astronomy Library.
Supporter	\$500.	All of the above plus a PARI hat and a PARI lapel pin.
Mentor	\$1,000.	All of the above plus an invitation to one of the quarterly night astronomy sessions at PARI.
Advisor	\$2,000.	All of the above plus use of the Internet controlled remote optical imaging Space Observatory.
Benefactor	\$5,000.	All of the above plus "Guest Astronomer Program." Spend a day working with the astronomy staff, learning how to operate a radio telescope.

All donors at the level of \$5,000 and above will receive recognition on a plaque at PARI.

Please provide the requested information below and mail it with your contribution to:

Pisgah Astronomical Research Institute
One PARI Drive
Rosman, North Carolina 28772

Name: _____

Address: _____

City State Zip _____

email address _____



Pisgah Astronomical Research Institute

One PARI Drive, Rosman, NC 28772

Phone: (828)862-5554 Fax: (828)862-5877

Web: www.pari.edu



Don Cline	President	dcline@pari.edu
David Clavier, PhD	Vice President of Administration and Development	dclavier@pari.edu
Michael Castelaz, PhD	Director of Astronomical Studies and Education	mcastelaz@pari.edu
Bob Hayward, PhD	Astronomer/Educator	rhayward@pari.edu
Christi Whitworth	Science Educator	cwhitworth@pari.edu
Beth Snoke Harris	Science Educator	bharris@pari.edu
Lamar Owen	Chief Information Officer	lowen@pari.edu
Ben Goldsmith	Site Support Engineer	bgoldsmith@pari.edu
John Avant	Communications Director	javant@pari.edu
Ann Daves	Accountant & Assistant Treasurer	adaves@pari.edu
Thad McCall	Facilities Manager	tmccall@pari.edu
Derek Dennis	Cisco/PARI Kenan Fellow	ddennisl@pari.edu

The Pisgah Astronomical Research Institute (PARI) is a not-for-profit public foundation established in 1998. Located in the Pisgah Forest 30 miles southwest of Asheville, NC, the PARI campus is a dark sky location for astronomy and was selected in 1962 by NASA as the site for one of the first U.S. satellite tracking facilities. Today, the 200 acre campus houses radio and optical telescopes, earth science instruments, 30 buildings, a fulltime staff and all the infrastructure necessary to support STEM (science, technology, engineering and math) education and research. PARI offers educational programs at all levels, from K-12 through post-graduate research. The institute is affiliated with the 16-campus University of North Carolina system through PARSEC, a UNC Center hosted at PARI, and is a member of the NC Grassroots Museum Collaborative. For more information about PARI and its programs, visit www.pari.edu.

Newsletter via e-mail:

Help us help you. Get your PARI newsletter faster and in color by sending your e-mail address to:
newsletter@pari.edu