

V I E W

PISGAH ASTRONOMICAL RESEARCH INSTITUTE

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PARSEC Receives Federal Appropriation



Holding a "really big check," are Chancellor Mullen, PARI President Don Cline and Congressman Taylor.

PARSEC, the Center being established to facilitate usage of PARI resources by the University of North Carolina system, has received a \$1 million federal appropriation. The money will be used to help upgrade scientific instruments at PARI and help make PARI's resources available to students throughout the 16-campus UNC system.

The announcement was made at PARI by Congressman Charles Taylor, who said "this is a wonderful project for Western North Carolina. Students at UNC-Asheville and throughout the state will learn through the research underway here for years to come."

UNC-Asheville Chancellor Jim Mullen said "the improvements will allow PARSEC to meet the rapidly advancing requirements of world-class research. This offers a tremendous advantage to our students."

The news conference at PARI was well attended by area newspaper and television reporters, and coverage was extensive throughout Western North Carolina.

PARI Calendar

- May 30- June 2** 206th Meeting of the American Astronomical Society.
- June 6** The National Science Foundation sponsored IPSE program begins 2nd summer at PARI.
- June 11-12** Volunteer Weekend
- June 14** 2005 Southeastern Planetarium Association Conference in Atlanta.
- June 15** Pisgah Forest Institute summer teacher environmental education workshop at PARI.
- June 17** Public Evening at PARI
- June 19** Duke Talent Identification Program (TIP) Summer Field Study in Astronomy begins
- June 24** Raleigh Astronomy Club Meeting; Carolina Association of Planetarium Educators meeting.
- July 9** Volunteer Weekend
- July 15** Public Evening at PARI
- July 27** Pisgah Forest Institute workshop at PARI.
- July 30** School of Galactic Radio Astronomy workshop for high school teachers at PARI.
- August 6** Volunteer Weekend
- August 19** Public Evening at PARI
- September 10** Volunteer Weekend
- September 14** 117th Meeting of the Astronomical Society of the Pacific.
- September 16** Public Evening at PARI

For more information, please see the Events Calendar section on our website at www.pari.edu



In the PARI control room, Congressman Taylor and Don Cline enjoy a radio astronomy presentation by Rosman elementary school students.

Recent Happenings at PARI

Home School Day at PARI a Great Success!



About 70 students attended PARI's first Home School Day this spring. Here, part of the group attends an earth sciences session presented by PARI Technical Director Charles Osborne



During their campus visit, home school students had the opportunity to interact with radio and optical telescopes, a seismometer, cosmic ray detector and other scientific instruments.

Space Day at PARI Attracts Hundreds of Visitors



PARI's annual Space Day attracted several hundred visitors, and the weather was perfect for observing the sun through filtered solar telescopes.

UNC Council of Researchers Visits PARI



About 20 members of the University of North Carolina's Sponsored Programs and Research Council (SPARC) took an early spring tour of the PARI campus. Composed of representatives from the UNC Office of the President and each of the 16 UNC campuses, SPARC recommends policies to the University in matters relating to research and sponsored programs. In this photo, a portion of the group is shown in front of Building One, with one of PARI's two massive 26-meter radio telescopes in the background.

We all know how long a day is: 24 hours, the length of time from midnight to midnight. Right? But is the day exactly 24 hours in length each and every day of the year? Let's go back to the days of sailing ships when the day started with the captain's signal at noon. Someone, perhaps a midshipman, would be responsible for measuring when the Sun was exactly at its highest point above the horizon. The captain would then command, "Let it be noon." The officer of the deck would respond "Noon it is, Sir!" Then the glass would be turned for a new day to begin in the life of the ship.

Now as a thought experiment imagine we can see the Sun at this point along with a bright star exactly behind it. (We'll call it Bob's star!) The next day we gather on the deck to watch the noontime ritual. But today we notice that, when the Sun is at its highest point, it's not lined up with Bob's star as it was the day before. It's about 1° to the east of the star and perhaps a little above or below it. What's happened?

First, the Earth rotates on its axis once a day. That takes 24 hours. But, while the Earth is rotating, it is also revolving around the Sun. Because of this the Sun appears to move a little farther east in the sky each day. Since the Earth revolves 360° in its orbit in approximate $365\frac{1}{4}$ days, it moves just slightly less than 1° per day and, in our thought experiment, the Sun appeared to have moved about 1° to the east of Bob's star.

Second, the Earth revolves around the Sun in a plane, the plane of the Solar System, called the ecliptic. But the Earth's equator is tilted at an angle of $23\frac{1}{2}^\circ$ to the ecliptic. The result of this is that the Sun appears to move a bit north or south from day to day. If it were winter or spring the Sun would be moving northward on the ecliptic; if it were summer or fall it would be moving to the south. So, depending on the season of our observation the Sun would appear to be a slightly north or south of Bob's star.

On the first day of winter in late December the Sun is at its most southern point in the sky and the days (in the Northern Hemisphere) are the shortest. Then, as the Sun moves northward along the ecliptic, it rises farther to the north along the eastern horizon, reaches a higher point in the south at noon, and sets farther to the north along the western horizon. Each day its path across the sky becomes longer and daylight is longer. After the first day of summer in late June, the reverse takes place.

Finally, one more point. In all the above we have been talking about determining the length of the day from the Sun. That's fine for most people. But astronomers are interested in knowing the time by the stars. Suppose we used Bob's star to mark the point of noon instead of the Sun? Well, since it was about 1° to the west of the Sun, it would have reached its highest point in the south about 4 minutes before the Sun. The day measured by the star would have been only 23 hours 56 minutes long. This is the sidereal day! Each day a clock set to sidereal time will gain 4 minutes on solar time.

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.
Sponsor	\$200.	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:

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One PARI Drive
Rosman, North Carolina 28772

Name: _____

Address: _____

City State Zip _____

email address _____



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The Pisgah Astronomical Research Institute (PARI) is a not-for-profit public foundation established in 1998. Located in the Pisgah National Forest near Brevard, NC, the PARI campus is a dark sky location for astronomy and was selected in 1962 by NASA as the east coast tracking station for manned space flights. Today, the 200 acre campus houses radio telescopes, optical telescopes, 30 buildings, a full-time staff and all the infrastructure necessary to support astronomy education and research. PARI offers educational programs at all levels, from K-12 through post-graduate research, and is affiliated with the 16-campus University of North Carolina system through PARSEC, a UNC Center hosted at PARI. For more information about PARI and its programs visit:

www.pari.edu

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