

V I E W

PISGAH ASTRONOMICAL RESEARCH INSTITUTE

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PARI upgrades infrastructure, adds observatory.

To run a world-class facility you need a world-class facilities staff. PARI is blessed with such a staff, and kept it busy throughout the year with infrastructure upgrades that include a new observatory and a “face-lift” for our signature instruments, the massive 26-meter radio telescopes.

Installed this fall, the new West Optical Observatory features a state-of-the-art clamshell shipped to the PARI campus from Astrohaven, Inc., in British Columbia. The observatory houses a 16-inch DFM optical telescope that elevates remote optical observing to a new level at PARI. The observatory will be used by staff and visiting astronomers and become part of the international gamma ray burst observation network known as PROMPT.

Funded by a NASA grant to PARSEC, PARI special-ordered from California 125 gallons of high-reflectance microwave antenna coating, costing \$72 per gallon. After a bucket-truck upgrade that included installing a hydraulic system on the arm, Donnie Curto and Brad McCall spent two weeks repainting the surfaces of the two 26-meter (85ft) radio telescopes and “Smiley,” the 4.6 meter instrument used remotely by high school students.

Virtually all of the maintenance and facility work at PARI is done internally by a facility staff headed by Thad McCall, who has worked at the site throughout most of its history. Without the staff’s dedication and abilities, PARI simply could not function at the high level required for scientific research and education.



It took two weeks for two men to paint both 26-meter radio telescopes and “Smiley.”



The new West Optical observatory features a state-of-the-art clamshell and a 16-inch DFM telescope.

PARI Calendar

- Dec. 9** Space Science Lab Saturday Session
- Dec. 15** Evening at PARI
- Jan. 19** Evening at PARI
- Feb. 16** Evening at PARI
- Mar. 16** Evening at PARI
- Mar. 17-18** Volunteer Weekend

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

Barrier Maintenance Building dedicated



Mrs. Ardelia Barrier inspects a tractor with Facilities Manager Thad McCall during dedication ceremonies for the Barrier Maintenance Building. Mrs. Barrier and her husband, James, were honored for their many contributions to PARI and their unwavering support of PARI's mission.

Homeschool Day



The Fall Homeschool Day featured programs for grade levels from K-12 and attracted more than 150 parents and children. On a scale of 1-5, parents rated the program 4.87.

Friends of PARI honor supporters

PARI President Don Cline presents a Distinguished Supporter certificate to Dr. Steve Murray and Amanda Preston representing the Harvard-Smithsonian Center for Astrophysics, during the Friends of PARI



annual symposium. The symposium honored more than 20 individuals and institutions who have contributed significantly to PARI's programs in 2006. Friends of PARI is a group of volunteers dedicated to furthering PARI's science education initiatives by contributing program assistance, donations and financial assistance.

Cherokee Central H.S. visits

Physics, chemistry and physical science students from Cherokee High School toured the PARI campus, attended a presentation from an astronomer on "The Nature of Light" and saw a presentation of the night sky in PARI's StarLab Planetarium. The students were accompanied by their teacher, Ralph Patterson, and school principal Arlin Middleton.



PARI joins Grassroots Museum Collaborative

PARI has been selected as the newest member of the North Carolina Grassroots Science Museums Collaborative. The Grassroots Collaborative is a group of 28 science centers across North Carolina dedicated to improving public understanding of science and technology, and to enhancing science education in schools and communities throughout the state.

In announcing the selection, Dr. Fran Nolan, Executive Director, said "PARI is already a great asset to Western North Carolina and we are eager to incorporate PARI's scientific and educational capabilities into exhibits and programs at other member institutions throughout the state."

Whither Goest Thou, Pluto? Hie Thee Hence

astronomer's corner

Dr. Bob Hayward, Astronomer/Educator

And hie him home, at evening's close,
To sweet repast and calm repose.

Thomas Gray (1716-1771)

Ode on the Pleasure arising from Vicissitude

Ever since its discovery by Clyde Tombaugh in 1930 Pluto has been a planet. But wait! The IAU (International Astronomical Union) says it's not a planet but rather a "dwarf planet" which they say isn't a planet at all. And the IAU is the governing body of astronomers worldwide. Yet all the textbooks say Pluto is a planet. And PARI's StarLab cylinder includes it. Who's to say? What is this all about?

When Pluto was first discovered, it was the farthest body out there. It is bright enough that, assuming it is roughly as reflective as the Earth, it must be comparable in size to the classical planets. So in 1930 there was no problem calling it a "planet."

There are some peculiarities about Pluto, however. For one thing, its orbit is inclined 17° to the ecliptic, the plane of the Earth's orbit and, by general agreement, the entire solar system. No other planet's orbit is inclined to the ecliptic more than 7° (Mercury). And the shape of Pluto's orbit is nowhere near a circle. Its orbit is so non-circular that it actually comes closer to the Sun than Neptune for 20 years of each orbit.

Then studies showed that Pluto isn't really that big. The initial assumptions that it is only as reflective as the Earth were in error. It is made primarily of ice, like cometary bodies. This means its reflectivity or albedo is much higher which, in turn, means it doesn't have to be as large to be so bright. In fact, it was eventually determined to be smaller than the planet Mercury, the smallest of the classical planets, and even smaller than Earth's moon and several others. Should we really call this little wimp a planet?

Now, the rest of the story... In the last few years astronomers have discovered many similar objects beyond the distance of Neptune. These icy bodies inhabit a belt first hypothesized by the planetary astronomer Gerard P. Kuiper and are now dubbed Trans-Neptunian Objects (TNOs) or Kuiper Belt Objects (KBOs). While some of these were close to Pluto's size, they were all smaller until...In 2003 astronomers discovered 2003 UB313! This object, now called Eris after the goddess of warfare and strife, is larger than Pluto!

It soon became obvious that astronomers and the public as a whole needed a good definition of what is and what isn't deserving of the respected moniker of "planet." A committee was established to bring a proposal to the August 2006 IAU meeting in Prague. But that definition was not accepted by all present. The dynamicists argued that it didn't take into account how a planet moved and cleared out its orbital path around the Sun. Others argued that it shouldn't be limited to a definition of planets in our solar system since now some 200 planets have been discovered around other stars. The definition as modified on the floor of the IAU was passed on August 24. (For details go to <http://www.iau2006.org/mirror/www.iau.org/iau0603/index.html>.)

Meanwhile, astronomers and planetarians around the world have entered the discussion. Some argue for the IAU definition and accept the designation of Pluto as a "dwarf planet." Others argue that the definition is flawed and refuse to regard Pluto as anything less than a "planet." The IAU next meets in 2009 and Pluto will once again be in the spotlight. So, is Pluto a planet? Don't know! Wait until 2009.

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:

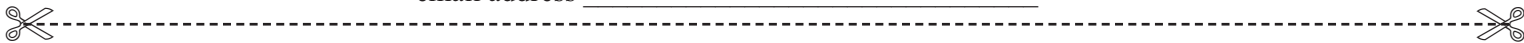
Student Member	\$10.	Member level for full time students. E-mail copy of the PARI Newsletter.
Associate Member	\$50.	Receive Quarterly Issues of the PARI Newsletter.
Member	\$100.	All of the above plus a PARI key chain with light.
Sponsor	\$200.	All of the above plus a PARI coffee mug. Use of the PARI 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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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 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.

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