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PISGAH ASTRONOMICAL RESEARCH INSTITUTE

Students, science and fun fill PARI's summer

The PARI campus hosted student groups the entire summer, the largest of which was the ROBOTS Symposium that attracted more than 180 sixth grade students and teachers from across the state.

ROBOTS is a program designed to reach minorities and under-represented sixth grade students and interest them in science and technology. The program is funded by a National Science Foundation grant and directed by the North Carolina Math Science Education Network. The students participated in summer-long activities at six college campuses throughout the state: Elizabeth City State University, Fayetteville State University, North Carolina State University, UNC - Chapel Hill, UNC - Charlotte and Winston-Salem State University.

During the summer the students learned to operate telescopes located at PARI remotely via the Internet and built robots. The program culminated with a trip to PARI and a spirited robot competition.

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Teams of sixth-graders from across the state built robots and raced them through a maze.



MSEN's Rita Fuller and Dr. Verna Holoman congratulate the winning team from UNC-Chapel Hill.

PARI Calendar

September 8, 15, 29	ROBOTS Workshops in Raleigh, Fayetteville and Winston Salem
September 15	Kids Day at the Transylvania Boys & Girls Club
September 21	Friends of PARI Annual Meeting and Symposium
September 22	PARI Board of Directors meeting
September 26	Henderson County SGRA Teacher Workshop
September 28	NC OPT-ED Alliance Day
October 4	Star Lab Community Presentations
October 16-17	Buncombe County SGRA Teacher Workshop
October 19	Evening at PARI
October 29	Transylvania County SGRA Teacher Workshop
November 1-3	National Astronomical Plate Preservation Workshop
November 16	Evening at PARI



Campus tours were on the agenda for each of the more than 180 sixth grade students and teachers attending the ROBOTS Symposium.

NC OPT-ED students on campus

As part of its partnership with NC OPT-ED, a statewide program designed to involve minority and under-represented students with science and technology, PARI continues to host groups of students and teachers. One group last summer included incoming freshmen at North Carolina Central University from the ITSSTEM program, who spent the weekend learning about opportunities for hands-on experience at PARI. On the right, the students listen as NC A&T intern Derrod Williams explains the work he did on the automatic roof controls for PARI's optical telescopes.



High velocity wind research

Atop PARI's Building 20, Clemson Professor Dr. John Meriwether and a team of students installed a Faby-Perot spectrometer. They are using the instrument remotely to measure high velocity winds 150 miles above the earth.



Public tours of PARI each Wednesday

Friends of PARI volunteers have developed a tour program open to the public each Wednesday afternoon at 2:00. Here, Donna Sanders, a volunteer docent guide, points out a campus feature to visitors. For more information about the tour program, contact Christi Whitworth at cwhitworth@pari.edu or 828-877-6348.



PARI featured on Charlotte TV program



Producer Mike Redding, left, interviews PARI President Don Cline for a feature segment on "Carolina Traveler," a TV show produced by WCNC Charlotte. A specific date has not been set, but the program is scheduled to air this fall.

PARI schedules teacher workshops

PARI's School of Galactic Radio Astronomy (SGRA) has scheduled fall teacher workshops in Transylvania, Buncombe and Henderson Counties. SGRA offers students in grades 8-12 a unique, hands-on, curriculum-aligned approach to astronomy. The 4-hour workshops provide teachers the fundamentals of radio astronomy and certify them to use PARI's Smiley radio telescope remotely via the Internet for classroom demonstrations and lab exercises. Interested teachers should contact Beth Harris at bharris@pari.edu or 828-877-6348.



Space Science Lab features hands-on learning

For the second summer PARI hosted the Space Science Lab, an opportunity for 30 under-represented high school students across western North Carolina to spend a week on campus in a structured learning program that continues through the school year. Supported by a grant from the Burroughs Wellcome Fund Student Science Enrichment Program, students develop skills in electronics, computer sciences, astronomy, physics and earth sciences. As part of the program, each student builds a radio receiver and uses it for solar observations and study.



During the Space Science Lab, Michael Youngdeer of Cherokee High School received special recognition from Chuck Higgins of MTSU and Jim Theimen of NASA Goddard Space Flight Center for being the recipient of the 1000th JOVE kit. John used the kit to build his own radio receiver, which he now uses at home for continued research.

A day of fun for children



Bottle rockets were a popular activity at PARI's first Space Science Day Camp, a day of fun designed for children age 10 and older. Here, a WLOS-TV (Asheville) cameraman records the action for a news feature.

Duke TIP (Talent Identification Program)



For the sixth consecutive summer PARI was selected as a host site for the Duke TIP (Talent Identification Program). The two-week session, entitled "Above and Beyond: Astronomy, Physics & Astrobiology," featured classes, hands-on projects, guest speakers and outings to the surrounding beauty of the Pisgah National Forest.



Evening at PARI draws record crowd

Evening at PARI, a monthly program open to the public, drew a record crowd of 90 people in July when Dr. Chuck Higgins presented "Capturing the Sun: Solar Radio Astronomy." An assistant professor of physics and astronomy at Middle Tennessee State University (MTSU), Dr. Higgins discussed recent discoveries about solar energy and explained how amateurs can study the sun. Each Evening at PARI program includes a presentation, a campus tour and observations using a PARI telescopes.



Summer Interns get hands-on experience

Sponsored by private citizens, companies and grants, a total of seven college interns spent the summer working and learning at PARI.



Shown with his sponsors, Joe and Karen Phillips, Derrod Williams was introduced to PARI last year while working on his senior engineering project at NC A&T.



Sponsored by Sherry and Rick Austin, Michael Aubrey assisted with ongoing PARI research involving open star clusters. Michael is a freshman at UNC-Chapel Hill.



Justin Ritchie, a UNC-Charlotte student, is the recipient of the J. Donald Cline astronomy scholarship through the NC Space Grant. Shown here with PARI President Don Cline, Justin will spend two summers doing research at PARI.



PARSEC, the University of North Carolina Center based at PARI, provided three summer interns: Josh Karpen, Root Kirbach and David Edwins, all students at UNC-Asheville. They are shown here with their advisors, Dr. David Moffett from Furman University and Drs. Brian Dennison and Chuck Bennett from UNC-Asheville.



Michael Mashburn, a Western Carolina University student, worked on campus as PARI's Summer IT Intern. Michael helped CIO Lamar Owen document PARI's existing network and plan the next phase of network upgrade. Michael performed numerous other tasks during the summer, including the configuration of 20 instrument PCs for Space Science Lab students who did not have PCs at home.

Star Words

astronomer's corner

Dr. Bob Hayward, Astronomer/Educator

At this time of the year one of the most prominent patterns in the sky is the Summer Triangle. Whenever I look at this, I can't help but think of words in the English language that come from the sky. For example, one you've probably seen come up on the television game show "Jeopardy" or in a scrabble game, is "What do we call a baby swan?" The answer is *cygnet* and this, of course, comes from the constellation of Cygnus the swan, one corner of the Summer Triangle. Another corner is marked by Aquila the eagle from which we derive the term *aquiline* as in "aquiline nose."

One of my favorites is the word *panic*. In trying to escape the monster Typhon the god Pan tried to change himself into a fish to swim away. But in his rush to escape he got the magic spell all wrong and ended up with the front half of a goat and only the tail of a fish as pictured in the constellation Capricorn. In other words, Pan *panicked*. Speaking of monsters, the constellation of Cetus is sometimes pictured as a sea monster but often as a whale. And what do we call the sea-going, air-breathing mammals like the whale and the porpoise? Why, *cetaceans*, of course!

What do we mean by a *herculean* task? A job that can be handled only by the likes of Hercules. From the constellation Coma Berenices or Queen Berenices hair, we get words such as *comb* and *comet*. There are two crowns in the sky, Corona Borealis the northern crown and Corona Australis the southern crown. Anyone who will wear a crown must have a *coronation*. And then there is the constellation of Virgo who represents Ceres the goddess of the harvest. We find the roots of *virgin*, *Virginia*, and *cereal* in this constellation.

Last, but not least, is the Moon or the goddess Luna. Besides the day of the week *Monday* we find the derivations of *lunar* and *lunatic*. And who can forget the old comic books and cartoons, *Looney Tunes*?

So the next time you go out to view the sky at night, take your high school English teacher with you. The two of you can have a great time together under the stars.

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.

PARI Personnel Updates



Ben Goldsmith, shown here with PARI President Don Cline, has been hired as site support engineer and given the responsibility of overseeing PARI's technical infrastructure. Ben, a 1980 graduate of Brevard High School, earned his B.S. in Computer Science from UNC-Asheville and his M.E. in Aerospace Engineering from the University of Colorado. He recently returned to the area after working for 13 years in Colorado.



After serving as PARI's technical director for the past seven years, Charles Osborne moved to Atlanta with his wife, Janice, to resume the consulting work he did prior to moving to Western North Carolina. Charles led the popular PARI volunteer program for several years and now is a distinguished Friend of PARI.



Joe Klumpp retired after working at the PARI site for much of the past five decades. Joe was instrumental in developing the technical infrastructure that is the life-blood of PARI's scientific operations and his legacy will live on through the work of the technical staff he mentored. Joe and his wife Carolyn are now enjoying life at the North Carolina coast.

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:

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Rosman, North Carolina 28772

Name: _____

Address: _____

City State Zip _____

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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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