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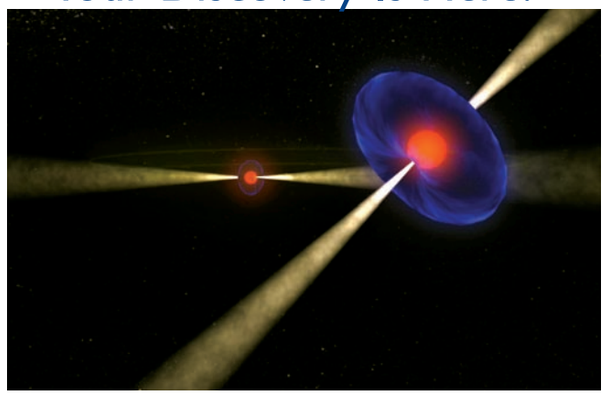
Your Discovery Is Here.



National Radio
Astronomy Observatory

Pulsar Search Collaboratory Brochure

Scientific Discovery • 21st Century Skills • STEM Careers

(Official White House Photo by Chuck Kennedy)

Lucas Bolyard, 2009 Pulsar Search Collaboratory participant and WV high school student, discovered an anomalous pulsar with the GBT, shown here with President Barack Obama and First Lady Michelle Obama during an astronomy event on the South Lawn of the White House, October 7, 2009. Participants include: Dr. John Holdren, Office of Science and Technology Policy; Caroline Moore, the youngest person to discover a supernova.

The National Radio Astronomy Observatory and West Virginia University cordially invite you and your students to collaborate with us in the grand adventure of scientific discovery!

How?
By joining the **Pulsar Search Collaboratory**. Students in school-based **Pulsar Search Collaboratory (PSC)** teams will:

- Gain first-hand experience in conducting scientific research
- Improve their 21st Century Skills, and
- Learn more about Science, Mathematics, Technology and Engineering (STEM) careers.

All while actually helping astronomers search the Galaxy for new pulsars!

Project Background

In summer of 2007, the world's largest fully steerable telescope was "immobilized" to enable NRAO to replace the track on which the 17 million pound structure rotates. Obviously, since the telescope couldn't pivot , the kinds of experiments that could be done were extremely limited.

But, an international group of scientists had an idea. They would use the telescope to survey the sky for new pulsars – rapidly rotating stellar corpses that emit radio waves. Over the summer, this team surveyed over 25% of the sky and amassed 130 TERABYTES of data.

That's where you come in. With mountains of data to explore, and new discoveries to be made, why not involve high school students?

And so, through a grant from the NSF and support from WV EPSCoR, the Pulsar Search Collaboratory was born!

Program Components

Overview

Scientists at NRAO and WVU will provide all of the training you need to help your students become valued members of the pulsar search team. We'll even provide guidance throughout the school year!

There are four components to the PSC:

- **Summer Professional Development.** Summer Institutes for 20 high school science teachers and 30 high school student leaders each year prepare you to become pulsar astronomers, and lead activities during the school year.
- **Academic Year Activities.** Teachers will introduce the PSC to their classes and complete hands-on activities. Students will then be invited to join the PSC. Student-mentors will lead PSC teams to conduct original research by analyzing data from the GBT.
- **Annual PSC Pulsar Seminar at WVU.** Student Teams will present their research, hear talks by professional astronomers, tour the STEM colleges within the University and participate in fun STEM related activities each spring at a PSC Seminar! Teachers and School Counselors will attend as well.
- **School Counselors Open House at NRAO.** Each year, School Counselors are invited to the NRAO for behind the scenes tours and talks from NRAO technical staff. Counselors will help us promote and maintain student interest in the PSC and Information Technology careers.

The Robert C. Byrd Green Bank Telescope.

2010 PSC Program

PSC Orientation For Teachers
May 23-24, Morgantown WV
and Teacher Institute
July 12-22, Green Bank, WV

If you are selected, you will participate in a 2-day orientation in Morgantown, and a 10-day institute at the National Radio Astronomy Observatory where you will work with astronomers and science educators to:

- Conduct research using the 40 Foot radio telescope and the world-class GBT.
- Learn astronomy content that meets West Virginia CSOs and National standards.
- Become expert in Information Technology tools that support collaboration among school-based PSC teams.
- Hunt for pulsars in PSC data
- Develop a scope and sequence of activities for the Student–leader Institute.

Student Leader Institute
July 25-31, Green Bank, WV

With help from PSC staff, our 20 participating teachers will take the reigns and provide 30 students with a six-day orientation to the PSC. These students will later become school based team leaders as each school creates a team to assist astronomers with their pulsar data analysis. You will select 1- 2 students from your school to participate.

2009 PSC students at the GBT controls.

Academic Year Activities
Let the discoveries begin! !

Teachers will lead the whole class in an initial set of background activities related to the PSC. Those students who find themselves interested in these activities will apply to join the PSC. We envision that about 5-10 students from each school will become full members. PSC members will have access to proprietary GBT data which are online at WVU. PSC data analysis can take place at any time and on any computer connected to the internet. Perhaps your PSC team will utilize club time at the school, the public library on the weekends, or their home computer. Communication between PSC team members, project staff and you will take place via a suite of online tools. See the Collaboratory website at http://collaboratory.nunet.net/

Capstone Seminar

Scientists communicate the results of their work by publishing articles and by presenting talks and posters at conferences. We will emulate this practice at our annual PSC Seminar which will be held in late spring (after the Westest is completed). PSC teams will present posters, hear talks from the experts, and tour WVU. This 3-day seminar will also give teachers and project staff a chance to discuss the PSC project and learn how to improve it!

Program Benefits

- Room and Board plus Stipends for Teachers ($100/day) in Green Bank, and at the PSC Seminar
- Travel and stipends for school counselors
- Six Hours of Graduate Credit (tuition deferred) for teachers through WVU
- 3 hours of undergraduate credit for PSC students who participate for at least one full year! (up to six credits for those who participate for more than one year!)
- A great feeling from helping students participate in real science

How to Apply:

Applying is easy and online! Go to http://www.gb.nrao.edu/epo/psc.shtml and click on the application link.
We do require a separate letter from your principal or supervisor which indicates support for you and your students to be released to attend the PSC Capstone Seminar.
Eligibility: High School teachers of Science or Mathematics are encouraged to apply. You do not need to have a background in astronomy to apply.

Deadline for applications
April 8, 2010

Questions? Contact:

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