WELCOME TO THE PULSAR SEARCH COLLABORATORY (PSC)

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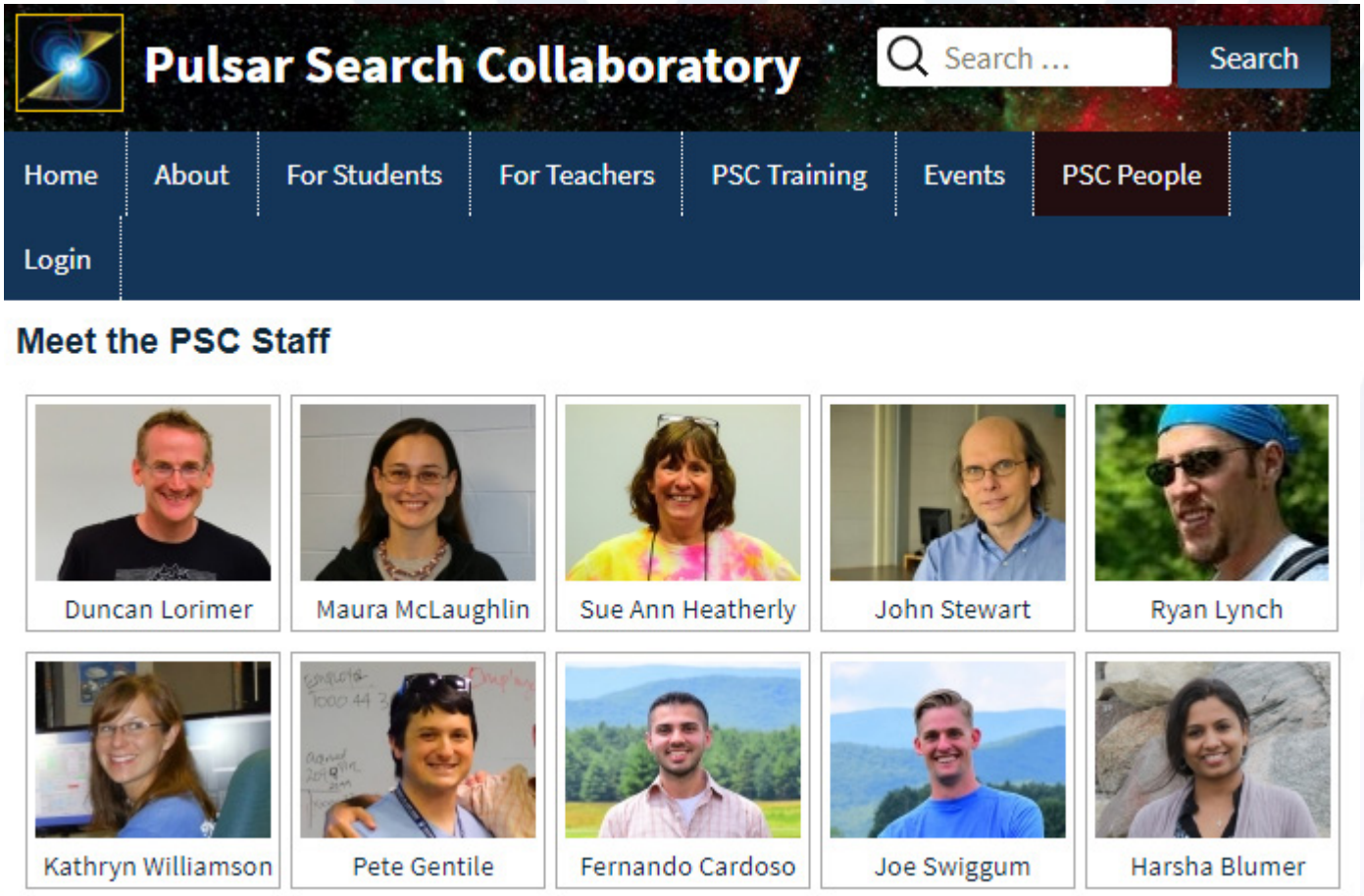
WHAT IS THE PSC?

The PSC is a citizen-science project directed toward middle and high school students to introduce them to radio astronomy and allow them to search for pulsars. The data analyzed is only available to the students so any scientific discovery belongs to the students. Discovering a pulsar is a significant scientific discovery.

WHO ARE WE?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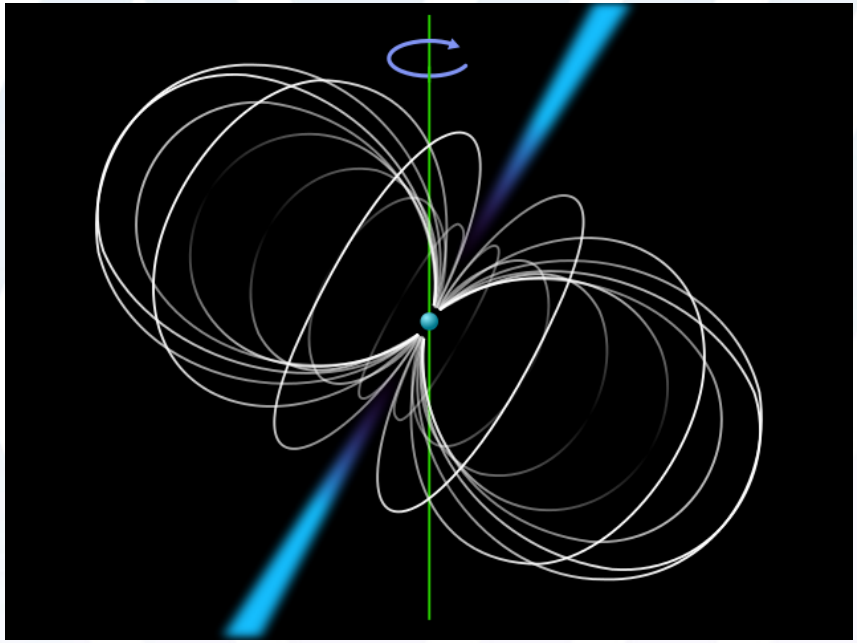
Meet the PSC Staff
Duncan Lorimer
Maura McLaughlin
Sue Ann Heatherly
John Stewart
Ryan Lynch
Kathryn Williamson
Pete Gentile
Fernando Cardoso
Joe Swiggum
Harsha Blumer

PROJECT LEADERS

- Science Lead
  - Maura McLaughlin – WVU Physics and Astronomy
  - Duncan Lorimer – WVU Physics and Astronomy
- Education and Program Lead
  - Sue Ann Heatherly – Green Bank Observatory
  - Harsha Blumer – WVU Physics and Astronomy
- Education Research Lead
  - John Stewart – WVU Physics and Astronomy

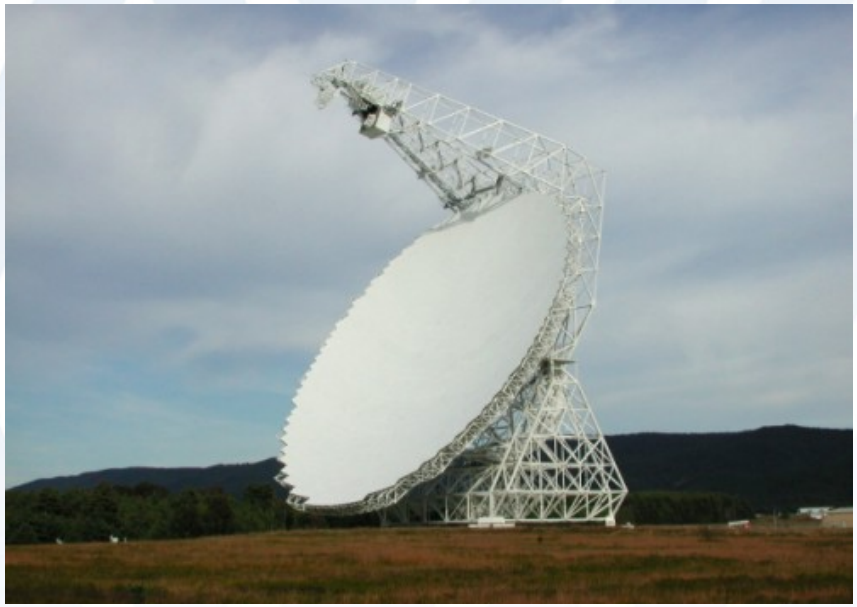
PULSARS

A pulsar is a rapidly spinning neutron star that emits intense busts of radio waves. Pulsars are rare and scientifically very important. Your students will learn all about pulsars and radio astronomy as part of the training provided by the PSC.



WHERE DOES THE DATA COME FROM?

- The Green Bank Telescope(GBT) in Green West Virginia. This is the world's largest (the size of two football fields) fully steerable radio telescope. Some PSC students and teachers will be invited to summer camp at the telescope.



HOW DOES IT WORK?

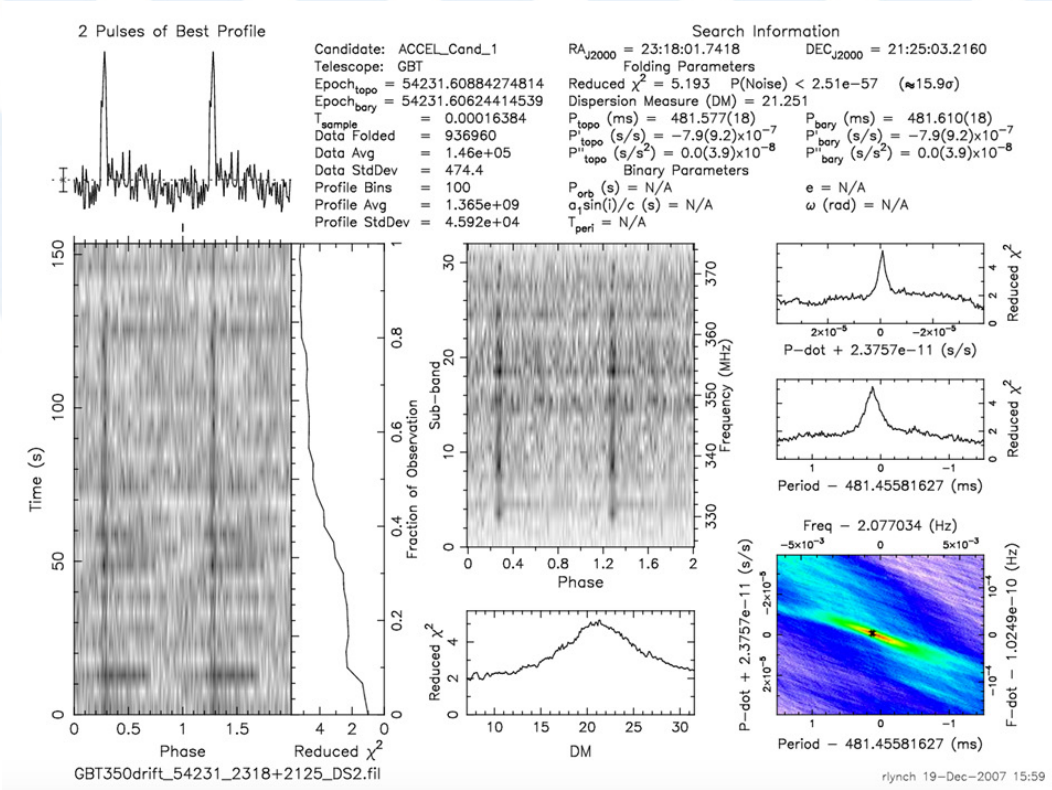
- You and your students will create an account with the PSC.
- They will complete six modules training them in radio astronomy, pulsar science, and data analysis skills needed to identify pulsars.
- They will complete two to four online tests to certify them as ready to search for pulsars.
- At that time, they will receive access to data taken at the GBT and can begin to try to discover new pulsars.
- If they discover a new pulsar, they will become co-authors on a scientific paper describing it.
- Some students and teachers will attend capstone events at local universities and summer camp at the GBT.

DISCOVERING PULSAR IS A BIG DEAL

- PSC student Lucas Bolyard at White House Star Party.
- Former President Obama is observing through the telescope.

WHAT DOES THE DATA LOOK LIKE?

- The data represents sophisticated cutting edge science. Graduate students present posters on similar data at scientific conferences and in papers.



HOW IS THE DATA ANALYZED?

Students are trained to interpret each dataset which requires an understanding of radio astronomy. They, then, rate multiple features of a plot as to how likely they represent a pulsar. If they find a likely candidate, they check it against a catalog of know pulsars. Multiple students analyze each plot. Periodically, the GBT will be used to collect additional data on strong candidates identified by PSC members to possibly confirm the discovery of a pulsar.

THE PSC IS TRANSFORMATIVE

The experience of working with complex scientific data and interacting with working scientists with the possibility of making a publishable scientific discovery opens a new world to some students. Maybe they really can be scientists.

PSC STUDENT QUOTES

- “You’re using the world as a lab, versus some type of simulation or the textbook. And discovering a star is incredible, it’s electrifying. I mean, it’s like, you discover something that nobody else has ever seen in the universe, and who has an opportunity to do that, you know, in day-to-day life?... I thought it was very exciting, but then as I was doing the data I kind of started figuring out that it’s not the discovery that’s the most important, it’s the process.” – Katya, Teenage Radio Wave Hunters
- “It’s kind of what motivated me to, like, actually go into physics. I think without it, without finding that [pulsar], or without even knowing about the program, I wouldn’t have gone to college for physics, or even probably science.” - Shay, little green men film

HOW TO USE THE PSC

- Teachers have used multiple instructional models to allow their students to participate in the PSC.
- The most common, and our suggested model, is to gather a number of interested students and form a PSC club. The club provides the collegial element that is very much a part of doing real science.
- It is also possible to integrate PSC activities as part of a science class or to have students participate independently without the routine support of a teacher.

GETTING HELP

- Astronomy questions should be posted to the discussion Forum on the PSC Wordpress Site.
- Questions about account and other nuts and bolts should be send to: PSC Help <pschelp@pulsarsearchcollaboratory.com>

QUESTIONS?