

National Radio
Astronomy
Observatory



**Big Bang?
Big Telescope**

Open Year Round!

Big Bang? Big Telescope!

*In fact, it's America's largest moving telescope.
See it and experience the invisible Universe at the
Green Bank Science Center in Pocahontas County.*



*Fun, Hands-on Science Center • Unique Gift Shop
and Cafe • Guided Tours Available • Near Snowshoe
Mountain Resort & Cass Scenic Railroad State Park*

304-456-2150
www.nrao.edu/VisitGB

Every day reveals exciting discoveries.

SCIENCE CENTER & TOUR HOURS

Winter & Spring

*November 1st through
Friday before Memorial Day*

Open Thursday – Monday*
10:00 a.m. — 6:00 p.m.

Starlight Cafe open
11:00 a.m. — 6:00 p.m.

Summer

*Memorial Day weekend
through Labor Day*

Open Daily
8:30 a.m. — 7:00 p.m.

Starlight Cafe open
11:00 a.m. — 7:00 p.m.

Winter & Spring Tours

11:00 a.m., 1:00 p.m.
& 3:00 p.m.

Fall

*Tuesday after Labor Day
through October*

Open Thursday – Monday
8:30 a.m. — 7:00 p.m.

Starlight Cafe open
11:00 a.m. — 7:00 p.m.

Summer & Fall Tours

at the top of each hour
9:00 a.m. — 6:00 p.m.

**CLOSED: Thanksgiving Day,
Friday after Thanksgiving,
Christmas Eve, Christmas Day,
New Years Eve, New Years Day,
and Easter Sunday*



Simple film cameras are welcome all over the NRAO site, but digital cameras, or 35mm cameras with advanced electronics, cannot be used near the telescopes. Digital cameras and other electronics create radio pollution which can ruin astronomers' data. We thank you for your understanding and for helping us provide quiet skies at Green Bank.



Green Bank Science Center

Come enjoy the Green Bank Science Center, featuring hands-on exhibits and displays that introduce you to the science of radio astronomy while you play. Discover what radio waves are, how the Green Bank Telescope works, and what radio astronomers are learning about the Universe.

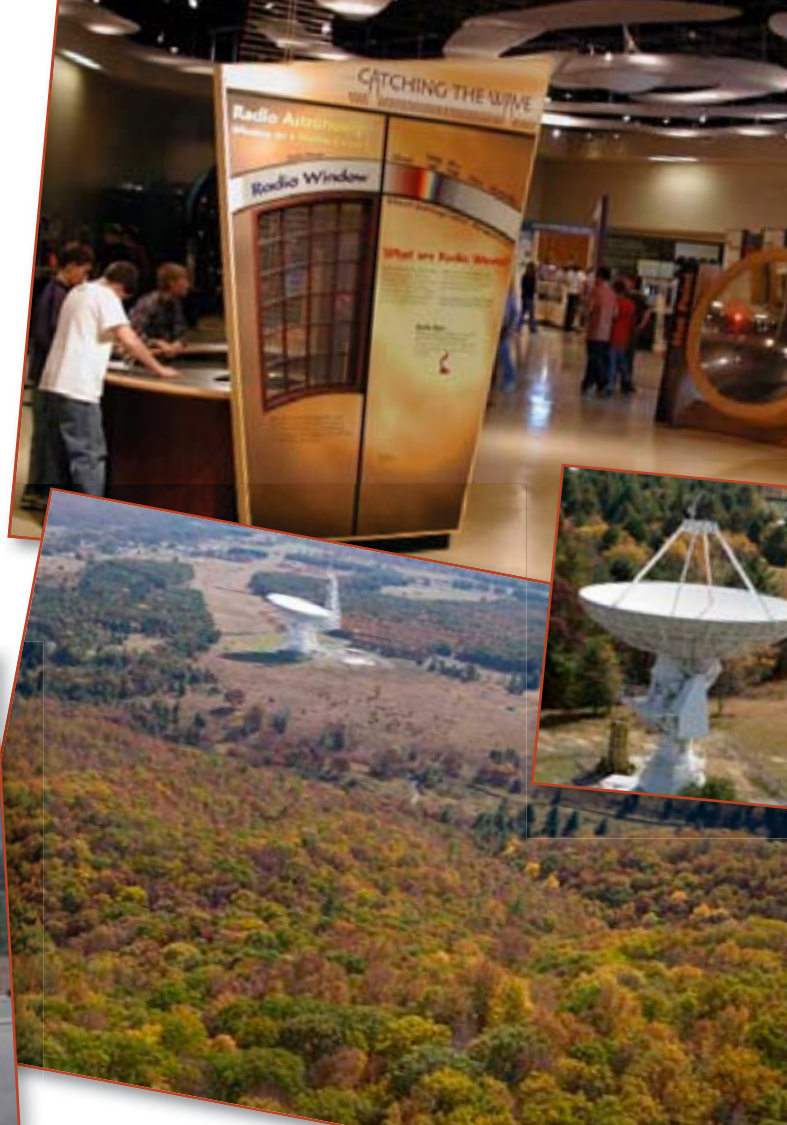
The Green Bank Science Center is the starting point for your guided tour of the National Radio Astronomy Observatory (NRAO) site. Browse the Galaxy Gift Shop or grab a bite to eat at the Starlight Cafe before or after your tour. The guided tour includes a final stop at the Robert C. Byrd Green Bank Telescope, the largest fully steerable radio telescope in the world!



Organized Group Tours

Motor Coach groups are welcome. Tours can be scheduled any day of the week. For your convenience, and to guarantee a guided tour, please make advance reservations. A \$3 fee per person is required for motor coach tours. Group meals also available.

School and scout groups are welcome. Tours can be scheduled any day of the week. We can tailor a program to your group. Tour reservations are free for organized school and scout groups, but please call in advance to make tour arrangements.



Informal groups are welcome. If your group is traveling by car, we will incorporate your group into the regularly scheduled public tours. If you have a group of 20 or more people, we appreciate knowing in advance.

For additional group details and reservations, contact the Green Bank NRAO tour director by calling (304) 456-2164 or email gbt-tours@nrao.edu.



For more information visit:
www.nrao.edu/VisitGB

GREEN BANK SCIENCE CENTER 2011 SPECIAL EVENTS



In addition to the great day to day exhibits and public tours, the Green Bank Science Center offers additional enhanced learning activities every month. Use the following calendar to plan your next enhanced visit to NRAO. All events and activities take place at the Green Bank Science Center.



Monthly Star Party & Themed Activities

The party begin at dusk, but themed activities begin at 2:30 p.m. and 4:30 p.m.

These events are FREE. No reservations required.

Get a personal introduction to the night sky. Join NRAO staff members on the Star Party Patio for evening observing with optical telescopes. Cloudy skies will cancel night sky viewing. On star party days a featured monthly activity will be offered to the public at 2:30 p.m. and 4:30 p.m. Activities last 30 – 60 minutes.



High Tech Thursdays

November through May

2nd Thursday of each month at 3:30 p.m.

June through October

2nd & 4th Thursday of each month at 3:30 p.m.

\$3 per person; reservations required.

Join us for a guided tour through parts of NRAO normally off limits to visitors, like lab areas where sensitive receivers are designed and built.

Space is limited to 15 participants per program.

Time: approximately 1 hour.



Star Lab Fridays

Every Friday at 2:00 p.m.

\$3 per person; reservations required.

Guests will gather under a planetarium balloon for a fascinating look at the night sky. Space is limited to 15 participants per program.

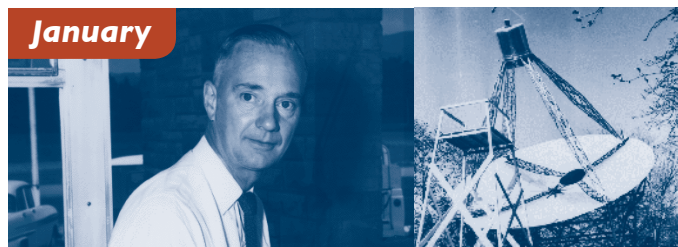
Time: approximately 1 hour.



**For event reservations call:
304-456-2150**

Dates subject to change without notice.

January



Explore how **Grote Reber** pioneered the field of **Radio Astronomy**.

7



Star Lab – 2:00 p.m. reservations required

8



Star Party & Telescope Clinic 4:30 p.m.

13



High Tech Tour – 3:30 p.m. reservations required

14



Star Lab – 2:00 p.m. reservations required

21



Star Lab – 2:00 p.m. reservations required

28



Star Lab – 2:00 p.m. reservations required

April



Credit: NASA

Marvel at the icy rings of Saturn as first mapped by Giovanni Domenico **Cassini**.

1



Star Lab – 2:00 p.m. reservations required

2



Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.

8



Star Lab – 2:00 p.m. reservations required

14



High Tech Tour – 3:30 p.m. reservations required

15



Star Lab – 2:00 p.m. reservations required

22



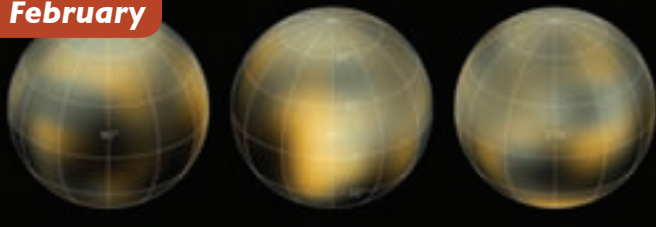
Star Lab – 2:00 p.m. reservations required

29






Star Lab – 2:00 p.m. reservations required

February



Credit: NASA, ESA, and Marc W. Buie

Hear about **Clyde Tombaugh** and his surprise discovery of **Pluto**.







- 4  Star Lab – 2:00 p.m. reservations required
- 5  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.
- 10  High Tech Tour – 3:30 p.m. reservations required
- 11  Star Lab – 2:00 p.m. reservations required
- 18  Star Lab – 2:00 p.m. reservations required
- 25  Star Lab – 2:00 p.m. reservations required

March



Credit: NASA

Become as fascinated by **Mars** as its most famous observer, **Percival Lowell**.







- 4  Star Lab – 2:00 p.m. reservations required
- 5  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.
- 10  High Tech Tour – 3:30 p.m. reservations required
- 11  Star Lab – 2:00 p.m. reservations required
- 18  Star Lab – 2:00 p.m. reservations required
- 25  Star Lab – 2:00 p.m. reservations required

May



Credit: NRAO/AUI & NOAO/AURA

Classify stars by their spectral rainbows, a discovery of **Annie Jump Cannon**.

- 6  Star Lab – 2:00 p.m. reservations required
- 7  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.
- 12  High Tech Tour – 3:30 p.m. reservations required
- 13  Star Lab – 2:00 p.m. reservations required
- 20  Star Lab – 2:00 p.m. reservations required
- 27  Star Lab – 2:00 p.m. reservations required

June

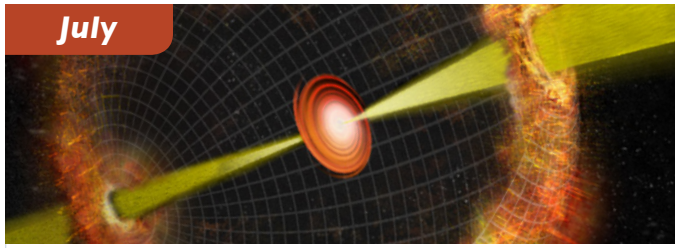


Credit: NRAO/AUI

Feel tiny in our huge **Milky Way Galaxy**, first measured by **Jan Oort**.









- 3  Star Lab – 2:00 p.m. reservations required
- 4  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.
- 9  High Tech Tour – 3:30 p.m. reservations required
- 10  Star Lab – 2:00 p.m. reservations required
- 17  Star Lab – 2:00 p.m. reservations required
- 23  High Tech Tour – 3:30 p.m. reservations required
- 24  Star Lab – 2:00 p.m. reservations required

July



Credit: NRAO, Bill Saxton

Discover the magnetic heartbeats of **pulsars** first recorded by **Jocelyn Bell Burnell**.

- 1  Star Lab – 2:00 p.m. reservations required
- 2  Star Quest Star Party www.greenbankstarquest.org
- 8  Star Lab – 2:00 p.m. reservations required
- 14  High Tech Tour – 3:30 p.m. reservations required
- 15  Star Lab – 2:00 p.m. reservations required
- 22  Star Lab – 2:00 p.m. reservations required
- 28  High Tech Tour – 3:30 p.m. reservations required
- 29  Star Lab – 2:00 p.m. reservations required

August



Reines, et al. NRAO/AUI/NSF, NASA

Behold **black holes** whose boundaries were first calculated by **Karl Swarzschild**.








- 5  Star Lab – 2:00 p.m. reservations required
- 11  High Tech Tour – 3:30 p.m. reservations required
- 12  Star Lab – 2:00 p.m. reservations required
- 19  Star Lab – 2:00 p.m. reservations required
- 25  High Tech Tour – 3:30 p.m. reservations required
- 26  Star Lab – 2:00 p.m. reservations required
- 27  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.

October

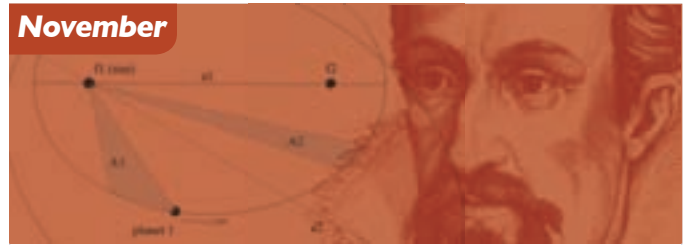


Credit: NASA, ESA, M. Jee & H. Ford

Tackle the concepts of **dark matter** with the enlightening work of **Vera Rubin**.

- 7  Star Lab – 2:00 p.m. reservations required
- 13  High Tech Tour – 3:30 p.m. reservations required
- 14  Star Lab – 2:00 p.m. reservations required
- 21  Star Lab – 2:00 p.m. reservations required
- 22  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.
- 27  High Tech Tour – 3:30 p.m. reservations required
- 28  Star Lab – 2:00 p.m. reservations required

November



Get your head around **Solar System orbits** as first calculated by **Johannes Kepler**.









- 4  Star Lab – 2:00 p.m. reservations required
- 10  High Tech Tour – 3:30 p.m. reservations required
- 11  Star Lab – 2:00 p.m. reservations required
- 18  Star Lab – 2:00 p.m. reservations required
- 26  Star Party & Themed Activity 2:30 p.m. & 4:30 p.m.

Dates and events subject to change without notice

September








GREEN BANK OPEN HOUSE SEPTEMBER 18

Wonder about **life on other worlds**
through the life of **Carl Sagan**.

- | | | |
|----|---|--|
| 2 |  | Star Lab – 2:00 p.m. reservations required |
| 8 |  | High Tech Tour – 3:30 p.m. reservations required |
| 9 |  | Star Lab – 2:00 p.m. reservations required |
| 16 |  | Star Lab – 2:00 p.m. reservations required |
| 22 |  | High Tech Tour – 3:30 p.m. reservations required |
| 23 |  | Star Lab – 2:00 p.m. reservations required |
| 24 |  | Star Party & Themed Activity 2:30 p.m. & 4:30 p.m. |
| 30 |  | Star Lab – 2:00 p.m. reservations required |

December

Renew your love of our **Moon** while seeing it
through the eyes of **Galileo**.

- | | | |
|----|---|--|
| 2 |  | Star Lab – 2:00 p.m. reservations required |
| 8 |  | High Tech Tour – 3:30 p.m. reservations required |
| 9 |  | Star Lab – 2:00 p.m. reservations required |
| 16 |  | Star Lab – 2:00 p.m. reservations required |
| 17 |  | Star Party & Themed Activity 2:30 p.m. & 4:30 p.m. |
| 23 |  | Star Lab – 2:00 p.m. reservations required |
| 30 |  | Star Lab – 2:00 p.m. reservations required |

Galaxy Gift Shop

The Galaxy Gift Shop offers a wide range of unique t-shirts and logo apparel & items, an assortment of science & astronomy books, star charts, science kits and educational toys. Celestial themed marbles, jewelry and hand-blown VV glass ornaments are just a few of the custom items guests will find in the gift shop. The Galaxy Gift Shop also features ORION telescopes, accessories and products.



VISIT OUR ONLINE STORE!

www.gb.nrao.edu/epo/gp/sc/ggs.html

Contact Galaxy Gift Shop: 304-456-2151

Starlight Cafe

The Starlight Cafe offers deli sandwiches & wraps, salads, hot dogs & burgers, nachos & soft pretzels, soft-serve ice cream treats and an assortment of snack foods.

Take advantage of our special menu and pricing for groups of 20 or more! Two week advance notice required. Contact our cafe manager for more information.

Starlight Cafe is open:

Winter & Spring Hours	11 am – 6pm	Thurs. – Mon.
Summer Hours	11 am – 7pm	Daily
Fall Hours	11 am – 7pm	Thurs. – Mon.

Contact Starlight Cafe:

304-456-2361

twarder@nrao.edu





Visit the Green Bank Telescope

National Radio Astronomy Observatory

GBT Fast Facts

- The telescope helps us learn about stars, galaxies and other objects in the Universe by collecting the radio waves they emit.
- The telescope is 485ft (148m) tall - taller than the Statue of Liberty and nearly as tall as the Washington Monument.
- It weighs 17 million lbs (7.7 million kg) - as much as 20 fully loaded Boeing 747s.
- Despite its weight, the GBT can be pointed with an accuracy of one arcsecond. That's equivalent to the width of a human hair seen from 66 feet (20m) away.
- The GBT's surface is made up of 2004 metal panels, and is almost 2.3 acres (8000m²) the same size of two football fields.
- The telescope works both night and day – the radio waves it collects are not drowned out by the sun.
- The telescope is designed to handle a great range of wave-lengths from 9ft (3m) long down to 1/8th inch (3mm).
- The telescope only receives signals from space, never sends them.

GPS coordinates

38d-25'-48.2"N

79d-49'-03.93"W



The National Radio Astronomy Observatory Green Bank is located in Pocahontas County on Route 92/28 about 25 miles north of Marlinton, 53 miles south of Elkins, and 65 miles west of Staunton, VA.