



National Radio  
Astronomy  
Observatory

## West Virginia's Space Place



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PERMIT NO. 1

**GREEN BANK SCIENCE CENTER**

# West Virginia's Space Place

*Visit our gigantic telescopes  
and hands-on astronomy  
exhibits in the heart of the  
National Radio Quiet Zone\**



[www.nrao.edu/VisitGB](http://www.nrao.edu/VisitGB)

**304-456-2150**

Check out the Green Bank Science Center  
on Facebook for updated events & specials!



## Planning Your Visit

**Every day  
reveals  
exciting  
discoveries.**

### Science Center & Tour Hours

#### **May 24 – Sept 1, 2014**

Open Daily; 8:30am-7:00pm  
Tours Hourly 9:00am-6:00pm

#### **Sept 2 – Oct 31, 2014**

Open Thursday-Monday; 8:30am-7:00pm  
Tours Hourly 9:00am-6:00pm

#### **Nov 1, 2014 – May 24, 2015\*\***

Open Thursday-Monday; 10:00am-6:00pm  
Tours 11:00am, 1:00pm & 3:00pm

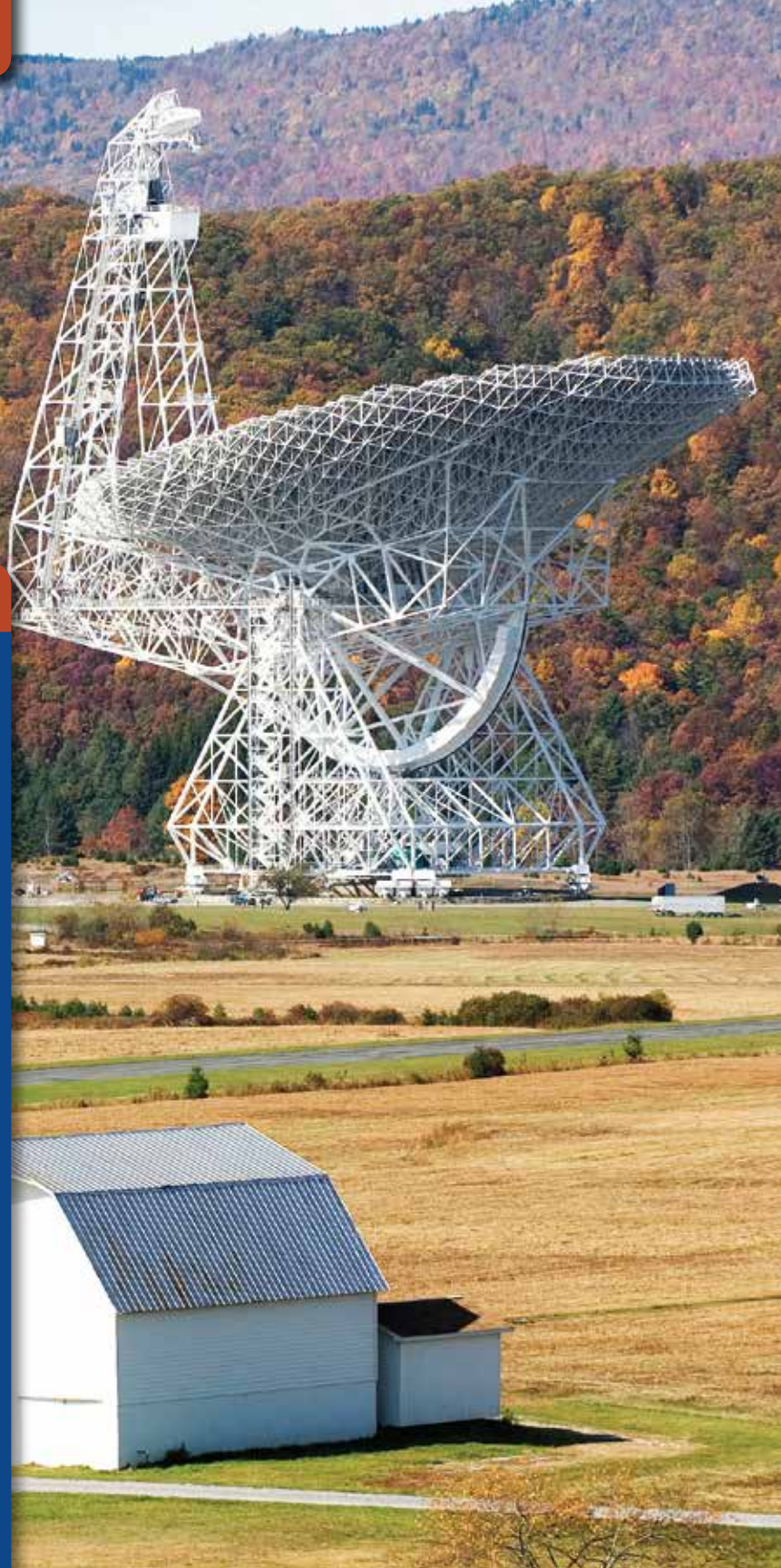
*\*\*Closed: 11/25 – 11/28 for Thanksgiving Holiday,  
12/23 – 12/25 for Christmas Holiday, 12/30 – 1/1 for  
New Years Holiday, and 4/20 for Easter Holiday*

### **Rates**

|                         |        |
|-------------------------|--------|
| Adult Pass (Ages 13-64) | \$6.00 |
| Youth Pass (Ages 7-12)  | \$3.50 |
| Children (6 & Under)    | Free   |
| Senior Pass (65 & Up)   | \$5.00 |

*Pocahontas County residents receive \$1 off regular rates.*

**Hours subject to change.  
In inclement weather, please  
call ahead at 304-456-2150.**





# Green Bank Science Center

The Green Bank Science Center is the starting point for your guided tour of the National Radio Astronomy Observatory (NRAO) site. Your personal guide will introduce you to the fascinating world of radio astronomy featuring science demonstrations and a short film about the world-class Robert C. Byrd Green Bank Telescope (GBT). Your tour continues with a bus excursion through our gates into the RFI-restricted Zone I for an up-close look at our telescopes from the pioneering instruments of the 1950s to the world's largest fully-steerable telescope, the GBT.

Your visit doesn't end with the tour. Plan to enjoy interactive exhibits and displays in our exhibit hall where you will discover what radio astronomers are learning about the universe. Admission to our exhibit hall is free and kid-friendly. Browse the Galaxy Gift Shop which features unique educational gifts and souvenirs. Before you leave, don't forget to have a bite to eat at the Starlight Café.



## 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) 456-2150 or email [gbt-tours@nrao.edu](mailto:gbt-tours@nrao.edu).

# GREEN BANK SCIENCE CENTER

## 2014 EVENT CALENDAR

In addition to the great day to day exhibits and public tours, the Green Bank Science Center offers additional enhanced learning activities every month. All events and activities take place at the Green Bank Science Center.



### Monthly Star Party

8pm May-Oct • 5pm Nov-April (Rain or Shine)

Once a month, NRAO staff will treat you to views of the night sky through optical telescopes. If it rains, don't worry. You are invited into our portable planetarium for a stellar presentation.

### High Tech Thursdays

Nov - May: 2nd Thursday at 3:30 p.m.

Jun - Oct: 2nd & 4th Thursdays at 3:30 p.m.

**\$3/person. Advance reservations strictly required, at least 48 hours before the tour. 15 participants max. No photography.**



A high-tech tour through telescope control rooms and engineering labs normally off-limits to the public. Federal regulations require that we pre-screen attendees age 18 and higher, who will need to provide their first name, middle initial, last name, birth date, and country of citizenship. Call 304-456-2150 for reservations. For more on our screening policy visit: <https://public.nrao.edu/screening>.



### 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. Program lasts approximately 1 hour.



### Family Science Lab

10am-12pm: 4/26, 7/19, 9/21, 11/15 & 1/10

**Free for everyone. Reservations appreciated.**

NRAO staff guide kids of all ages through fun-filled, hands-on science projects. We provide all materials. Each lab highlights a different science/engineering theme.

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

*Dates subject to change without notice.*

### April 2014

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    | 1  | 2  | 3  | 4  | 5  |
| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 |    |    |    |

### July 2014

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
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| 6  | 7  | 8  | 9  | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 31 |    |    |

### October 2014

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    | 1  | 2  | 3  | 4  |
| 5  | 6  | 7  | 8  | 9  | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 31 |    |

### January 2015

| S  | M  | T  | W  | T  | F  | S  |
|----|----|----|----|----|----|----|
|    |    |    |    | 1  | 2  | 3  |
| 4  | 5  | 6  | 7  | 8  | 9  | 10 |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 | 31 |

**SPECIAL EVENTS:** There are special events planned on the days highlighted with a star icon.

**PLEASE NOTE:** The Green Bank Science Center is closed on the days highlighted with a star icon.

| May 2014 |    |    |    |    |    |    |
|----------|----|----|----|----|----|----|
| S        | M  | T  | W  | T  | F  | S  |
|          |    |    |    | I  | 2  | 3  |
| 4        | 5  | 6  | 7  | T  | 9  | 10 |
| 11       | 12 | 13 | 14 | 15 | 16 | 17 |
| 18       | 19 | 20 | 21 | 22 | 23 | 24 |
| 25       | 26 | 27 | 28 | 29 | 30 | 31 |

| August 2014 |    |    |    |    |    |    |
|-------------|----|----|----|----|----|----|
| S           | M  | T  | W  | T  | F  | S  |
|             |    |    |    |    | 1  | 2  |
| 3           | 4  | 5  | 6  | 7  | 8  | 9  |
| 10          | 11 | 12 | 13 | T  | 15 | 16 |
| 17          | 18 | 19 | 20 | 21 | 22 | 23 |
| 24          | 25 | 26 | 27 | T  | 29 | 30 |

| November 2014 • TURKEY TROT 11/29 |    |    |    |    |    |    |
|-----------------------------------|----|----|----|----|----|----|
| S                                 | M  | T  | W  | T  | F  | S  |
|                                   |    |    |    |    |    | 1  |
| 2                                 | 3  | 4  | 5  | 6  | 7  | 8  |
| 9                                 | 10 | 11 | 12 | T  | 14 | 15 |
| 16                                | 17 | 18 | 19 | 20 | 21 | 22 |
| 23                                | 24 | 25 | 26 | 27 | 28 | 29 |

| February 2015 |    |    |    |    |    |    |
|---------------|----|----|----|----|----|----|
| S             | M  | T  | W  | T  | F  | S  |
| 1             | 2  | 3  | 4  | 5  | 6  | 7  |
| 8             | 9  | 10 | 11 | T  | 13 | 14 |
| 15            | 16 | 17 | 18 | 19 | 20 | 21 |
| 22            | 23 | 24 | 25 | 26 | 27 | 28 |

| June 2014 • SPACE RACE RUMPUS 6/13-15 |    |    |    |    |    |    |
|---------------------------------------|----|----|----|----|----|----|
| S                                     | M  | T  | W  | T  | F  | S  |
| 1                                     | 2  | 3  | 4  | 5  | 6  | 7  |
| 8                                     | 9  | 10 | 11 | T  | 13 | 14 |
| 15                                    | 16 | 17 | 18 | 19 | 20 | 21 |
| 22                                    | 23 | 24 | 25 | T  | 26 | 27 |
| 29                                    | 30 |    |    |    |    |    |

| September 2014 • OPEN HOUSE 9/21 |    |    |    |    |    |    |
|----------------------------------|----|----|----|----|----|----|
| S                                | M  | T  | W  | T  | F  | S  |
|                                  | 1  | 2  | 3  | 4  | 5  | 6  |
| 7                                | 8  | 9  | 10 | T  | 12 | 13 |
| 14                               | 15 | 16 | 17 | 18 | 19 | 20 |
| 21                               | 22 | 23 | 24 | T  | 26 | 27 |
| 28                               | 29 | 30 |    |    |    |    |

| December 2014 |    |    |    |    |    |    |
|---------------|----|----|----|----|----|----|
| S             | M  | T  | W  | T  | F  | S  |
|               | 1  | 2  | 3  | 4  | 5  | 6  |
| 7             | 8  | 9  | 10 | T  | 12 | 13 |
| 14            | 15 | 16 | 17 | 18 | 19 | 20 |
| 21            | 22 | 23 | 24 | 25 | 26 | 27 |
| 28            | 29 | 30 | 31 |    |    |    |

| March 2015 |    |    |    |    |    |    |
|------------|----|----|----|----|----|----|
| S          | M  | T  | W  | T  | F  | S  |
| 1          | 2  | 3  | 4  | 5  | 6  | 7  |
| 8          | 9  | 10 | 11 | T  | 13 | 14 |
| 15         | 16 | 17 | 18 | 19 | 20 | 21 |
| 22         | 23 | 24 | 25 | 26 | 27 | 28 |
| 29         | 30 | 31 |    |    |    |    |

highlighted in yellow. Please see the next page for more details and registration information.

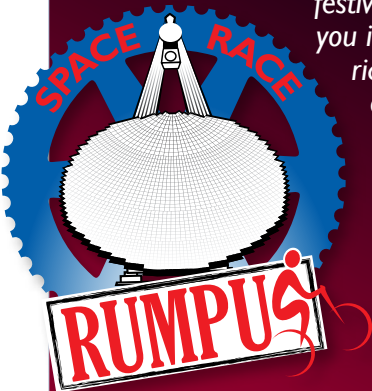
rs that are colored gray. Please check calendar and Science Center website, [www.nrao.edu/VisitGB](http://www.nrao.edu/VisitGB), before planning your visit. New Moon ● Full Moon ○



**Space Race Rumpus • June 13-15**

## Space Race Rumpus

Join us for a weekend-long cycling festival, where experts will guide you in fun mountain and road rides. Whether you are an experienced mountain biker or complete novice, there will be rides, races and cycling clinics for all ages and levels. The Rumpus also features star parties, bonfires, on-site camping and live music all three days!



**Registration is required!**

Find out more information at  
[www.gb.nrao.edu/rumpus](http://www.gb.nrao.edu/rumpus).

**Star Quest • June 25-28** ★★☆☆

## Join the Largest Optical & Radio Star Party in the Nation!

Enjoy optical and radio astronomy presentations, hands-on workshops and dark West Virginia skies. Learn to use a radio telescope! Fun activities for children too! The Green Bank Star Quest is sponsored by the Central Appalachian Astronomy Club.



For more information visit  
[www.greenbankstarquest.org](http://www.greenbankstarquest.org)

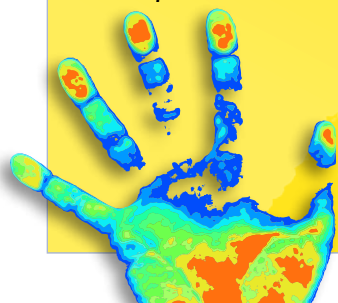
**Open House • September 21**

## Green Bank Open House & Family Science Day September 21 • 1 – 5pm

**Free Event!** No reservations required.



Where else can you... build and launch a rocket, test your engineering skills, play with liquid nitrogen, do fun science experiments, safely view the sun, and see some of the biggest telescopes in the whole world ALL IN ONE DAY? Public site tours will be available as well as rare peaks into the control room of the world's largest fully-steerable telescope!



**Turkey Trot • Nov 29**

## Green Bank Turkey Trot



Race starts at 1pm.  
Registration required.

Eat too much? You'll enjoy your punkin' pie a whole lot more if you run or walk the annual 5K/10K Green Bank Turkey Trot. The annual race affords spectacular views of some of the world's largest telescopes.

**Registration is required!**  
More information at  
[www.gb.nrao.edu/turkeytrot](http://www.gb.nrao.edu/turkeytrot)



## Train Ride to the Stars • Sep 20

Take the stargazing train ride of a lifetime! Board the historic Cheat Mountain Salamander for a night-time journey under our county's darkest skies. Learn fall constellations and look through telescopes run by Observatory staff. Bring a camping chair, flashlight, and jacket to enjoy the campfire and s'mores!

Departs Cheat Bridge 7pm  
Returns to Cheat Bridge 10pm

**Tickets available at**  
**mountainrailwv.com**



## Educational Field Trips

NRAO offers day field trips as well as overnight field trips for students K-16, Boy and Girl Scouts and clubs. Overnight students experience science first hand by completing research projects with a real radio telescope. Scouts can earn astronomy merit badges! More than just a tour, a field trip to the NRAO might just inspire your students to join the next generation of scientists and engineers.

Tours and activities free for organized school and Scout groups. **Registration is Required!**

For more information please visit  
[www.gb.nrao.edu/epofieldtrip.shtml](http://www.gb.nrao.edu/epofieldtrip.shtml)



## Galaxy Gift Shop

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

Contact the 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 | 11am – 6pm | Thurs. – Mon. |
| Summer Hours          | 11am – 7pm | Daily         |
| Fall Hours            | 11am – 7pm | Thurs. – Mon. |

Contact Starlight Cafe:  
**304-456-2361**  
[twarder@nrao.edu](mailto:twarder@nrao.edu)







# Visit the Green Bank Telescope

National Radio Astronomy Observatory

## GBT Fast Facts

- Working both day and night, 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 (8000m<sup>2</sup>) the same size of two football fields.
- 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 Quiet Zone is a 13,000 square mile-region of minimized radio signal interference established by the U.S. Government in 1958 to protect its radio dishes in West Virginia. [www.gb.nrao.edu/nrqz](http://www.gb.nrao.edu/nrqz)



The National Radio Astronomy Observatory is a facility of the National Science Foundation operated under cooperative agreement by Associated Universities, Inc.

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.