



# BACK BAY observer

The Official Newsletter of the Back Bay Amateur Astronomers  
P.O. Box 9877, Virginia Beach, VA 23450-9877

## EPHEMERALS may 2014

5/01, 7:30 pm  
BBAA Monthly Meeting  
TCC Campus, VA Beach  
Building J, Planetarium

5/02, 8:30 PM  
Garden Stars  
Norfolk Botanical Garden

5/10, 9:30 AM – 5:00 PM  
Astronomy Day  
Virginia Beach Central Library

5/13, 6:00 – 11:00 PM  
Boardwalk Astronomy  
VA Beach Boardwalk at 24th St.

5/23,  
Skywatch  
Northwest River Park

5/31  
Nightwatch  
Chippokes Plantation  
Surry, VA



## Looking Up!

*Editor's Note: This month's Looking Up column was written by BBAA Treasurer, Chuck Jagow.*

I joined the Back Bay Amateur Astronomers in January of 2003 after my bride nudged me into the hobby. I quickly progressed from a 70mm Meade ETX refractor to a 10" Meade LX-200GPS SCT, with a short excursion as the owner of a Meade ETX 125 somewhere in between.

I remember attending Skywatch events at the NWRP and listening to Ted, Dale, Kevin and a host of others explaining the night sky to the visitors. I would occasionally be able to point that SCT to a planet or the Ring Nebula (M57) or a bright galaxy such as M81/82. However, I was mortified at the thought of a visitor asking me a question about astronomy. I figured that I knew NOTHING that could be of value to anyone. I had listened to Ted spin tales of mythological creatures, gods and goddesses being cast into the heavens to watch down upon us mortals night after night. Legends of the Hunter, the Queen and Serpents. Not to mention bears, bunnies and twins hiding about in the sky. To say I was intimidated was an understatement of the worst kind.

Later that Spring Ted convinced me that I could do outreach, even with my limited GO-TO knowledge of the sky. He and Dale persuaded me to sign up to make a solar filter for my SCT. We had a grand solar filter workshop in Dale's man-cave and I made plans to attend Astronomy Day 2004 in April. The club's plan that year was to support Astronomy Day at three different Virginia Beach libraries: Central, Kempsville and the one at Nimmo Parkway. I volunteered for Nimmo, as I figured they would have the fewest visitors and I wouldn't look so bad.

[Continued on page 2](#)

<b>CONTENTS</b>	Ephemerals	1
	Looking Up	1
	Meeting Minutes	<a href="#">2</a>
	Observer's Corner	<a href="#">3</a>
	NASA Space Place	<a href="#">4</a>
	Diving into Outreach	<a href="#">5</a>
	RRRT Report	<a href="#">6</a>
	Calendar	<a href="#">8</a>

## Looking Up, continued from [page 1](#)

Astronomy Day came and I was at the Library ready to set up at 9:15 AM. By 9:30 George Reynolds was there as well as Dale Carey and about a half dozen other club members. I set up my SCT and eventually found the sun. I removed my finder scope AFTER the sun melted the crosshairs inside (the burning smell of plastic was my clue where the smoke was coming from).

I hoisted small children up so they could see the several small groupings of sunspots. I spouted as many facts as I could remember about the sun, including its diameter, how many Earths could fit across the face of it, how far away it was, how long light took to get from there to here. By the end of the day I learned that outreach was cool, and more than cool, it was rewarding.

Yeah, I didn't know everything, but I knew enough to be almost dangerous. My lovely bride,

What's Her Name (Karen I think) attended as well. She was "hooked" on Dale's 60mm hydrogen alpha filtered SolarScope. This paved the way for Karen's 2005 Mother's Day gift, a 60mm Solarscope of her very own.

Astronomy Day for 2014 will mark my 11th Astronomy Day with the BBAA. Why not let this Astronomy Day be your introduction to outreach? Come on out to the Central Library in Virginia Beach and have some fun. Even if you don't have a solar filter or telescope, come and see how easy it is and maybe you can experience folks having a personal WoW moment as they gaze at our closest star.

Astronomy Day is Saturday May 10th at the [Virginia Beach Central Library](#) located at 4100 Virginia Beach Blvd. If you come, I will show you what a solar funnel is, and perhaps I'll even put you to work manning it!

*Chuck Jagow*

## April 3, 2014 Meeting Minutes

The April 2014 meeting was called to order at 7:30 PM in the planetarium at TCC in Virginia Beach by President Jim Tallman. He announced that we will have guest speakers for the May and June meetings. In May, our guest speaker will be discussing research on the atmosphere of Mars, and in June the topic will be the AIM satellite and gravity waves.

**Members in attendance were:** Neill Alford, Kent Blackwell, Kenny Broun, Scott Cadwell, Mike Galvas, Mark Gerlach, Dean Giangregorio, Mary Giangregorio, Pete Goulart, Bill Holmes, Chuck Jagow, Chris Jarvis, Thomas Jarvis, Robyn Korn, Leigh Anne Lagoe, Curt Lambert, Kirk Leppert, Maya Ogaldez, Vincent Pendleton, Bill Powers, Bruce Powers, George Reynolds, Mark Roehm, Melvin Spruill Jr, Ron Shaneyfelt, Jim Tallman, and Mike Webster.

**Guests in attendance were:** Mark Oiler, Michael Prophet, Linda Reynolds, Frances Shaneyfelt, Roni Sharrett, John Tomzik, Chris Weller, and Chelsea Wendell.

**Treasurer's Report:** Chuck Jagow reported that there is \$1532.75 in the General Fund and \$2389.67 in the Scholarship Fund, for a total of \$3922.42.

### Calendar Items discussed at meeting:

- 4/21 - 4/22 - Lyrid Meteor Shower peaks
- 4/26 Nightwatch at Chippokes Plantation

- 5/1 - BBAA Club Meeting at TCC VB, 7:30 PM
- 5/2 - Garden Stars at Norfolk Botanical Gardens
- 5/10 - National Astronomy Day at the Virginia Beach Central Library, 9:30 AM - 5:00 PM
- 5/13 - Boardwalk Astronomy, 6 - 11:00 PM
- 5/23 - Skywatch at Northwest River Park
- 5/31 - Nightwatch at Chippokes Plantation Park

### New Business:

- Kent Blackwell announced that the East Coast Star Party in Coinjock, NC will be held the last weekend in May.
- Jim Tallman demonstrated a simple way to line up the SkyTracker using PCV pipe and a laser.
- Door Prize Drawing: Sky & Telescope Magazine awarded to guest John Tomzik. National Geographic *Beyond Our Galaxy* magazine rewarded to a youth guest.

### Planetarium Presentation:

- The formal meeting adjourned at 7:43 PM and Professor Kenny Broun presented the 3D planetarium show, "Dawn of the Space Age 3D," which documented human presence in space including Sputnik, Apollo, the International Space Station, and more.

### Minutes taken by Secretary Leigh Anne Lagoe

Note: Minutes were modified due to space constraints. Full minutes can be viewed at <http://backbayastro.org/minutes/2014-04-minutes.pdf>

# The Back Bay Amateur Astronomer's Observer

The BBAA Observer is published monthly; the monochrome version is mailed to members who do not have internet access. Members who do have Internet access can acquire the full color version on the Internet at <http://www.backbayastro.org/observer/newsletter.shtml>

Please submit articles and items of interest no later than the date of the monthly meeting in order to be in the next month's edition.

Please submit all items to:  
bbaa.newsletter@gmail.com or BBAA  
Observer, P.O. Box 9877, Virginia Beach, VA

**President**  
Jim Tallman  
president@backbayastro.org

**ALCOR**  
Bill McLean  
alcor@backbayastro.org

**Vice President**  
George Reynolds  
vp@backbayastro.org

**Librarian**  
Bill Newman  
billn59@verizon.net

**Treasurer**  
Chuck Jagow  
treasurer@backbayastro.org

**Scholarship Coordinator**  
Ben Loyola  
benito@loyola.com

**Secretary**  
Leigh Anne Lagoe  
secretary@backbayastro.org

**RRRT Coordinator**  
Lawrence "Bird" Taylor  
Lawrence.W.Taylor@nasa.gov

**Webmaster**  
Curt Lambert  
webmaster@backbayastro.org

**Newsletter Editor**  
Paul Tartabini  
bbaa.newsletter@gmail.com

## BBAA Meetings

The BBAA meet the first Thursday of every month except for July. While school is in session, we meet at the VA Beach TCC Campus. The **May 1, 2014** meeting will be held at TCC in Virginia Beach, Building J, Room JC-13 at 7:30 PM.

Directions available at [www.backbayastro.org](http://www.backbayastro.org).

## BBAA Internet Links

BBAA Website  
[www.backbayastro.org](http://www.backbayastro.org)

Yahoo! Groups  
[tech.groups.yahoo.com/group/backbayastro](http://tech.groups.yahoo.com/group/backbayastro)

BBAA Observer Newsletter  
[www.backbayastro.org/observer/newsletter.shtml](http://www.backbayastro.org/observer/newsletter.shtml)

## The Observer's Corner



*The eclipsed moon playing peek-a-boo with the clouds from Hampton, VA on April 15, 2014. Unfortunately, it was more peek, less view. Image by Bob Beuerlein.*

April 15, 2014 marked the first of four consecutive total lunar eclipses that will be visible in 2014-2015. Such a series is called a Tetrad, and if you are interested in the rarity of such phenomena, check out what [NASA has to say on the topic](#).

Sadly, skies were overcast in Hampton Roads in the early morning hours of April 15. Despite the clouds, BBAA members proved their mettle by staying up just in case. Fortunately, their efforts did not go unrewarded as occasional sucker holes allowed brief glimpses of the "blood" Moon.

BBAA member Bob Beuerlein was ready, and caught the dramatic image to the left from Gosnold's Hope Park in Hampton with AstroBuddies Bird Taylor and Mike Connally. As Bob tells it, "the Moon made several random appearances, and when it did, it did not disappoint."

## The Power of the Sun's Engines

By Dr. Ethan Siegel

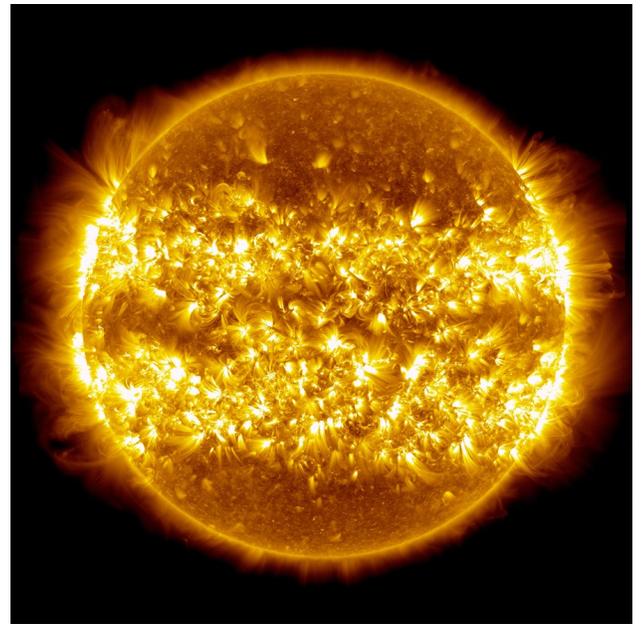
Here on Earth, the sun provides us with the vast majority of our energy, striking the top of the atmosphere with up to 1,000 Watts of power per square meter, albeit highly dependent on the sunlight's angle-of-incidence. But remember that the sun is a whopping 150 million kilometers away, and sends an equal amount of radiation in all directions; the Earth-facing direction is nothing special. Even considering sunspots, solar flares, and long-and-short term variations in solar irradiance, the sun's energy output is always constant to about one-part-in-1,000. All told, our parent star consistently outputs an estimated  $4 \times 10^{26}$  Watts of power; one *second* of the sun's emissions could power all the world's energy needs for over 700,000 years.

That's literally an astronomical amount of energy, and it comes about thanks to the hugeness of the sun. With a radius of 700,000 kilometers, it would take 109 Earths, lined up from end-to-end, just to go across the diameter of the sun once. Unlike our Earth, however, the sun is made up of around 70% hydrogen by mass, and it's the individual protons — or the nuclei of hydrogen atoms — that fuse together, eventually becoming helium-4 and releasing a tremendous amount of energy. All told, for every four protons that wind up becoming helium-4, a tiny bit of mass — just 0.7% of the original amount — gets converted into energy by  $E=mc^2$ , and that's where the sun's power originates.

You'd be correct in thinking that fusing roughly  $4 \times 10^{38}$  protons-per-second gives off a tremendous amount of energy, but remember that nuclear fusion occurs in a huge region of the sun: about the innermost quarter (in radius) is where 99% of it is actively taking place. So there might be  $4 \times 10^{26}$  Watts of power put out, but that's spread out over  $2.2 \times 10^{25}$  cubic meters, meaning the sun's energy output *per-unit-volume* is just 18 W / m<sup>3</sup>. Compare this to the average human being, whose basal

metabolic rate is equivalent to around 100 Watts, yet takes up just 0.06 cubic meters of space. In other words, **you emit 100 times as much energy-per-unit-volume as the sun!** It's only because the sun is so large and massive that its power is so great.

It's this slow process, releasing huge amounts of energy *per reaction* over an incredibly large volume, that has powered life on our world throughout its entire history. It may not appear so impressive if you look at just a tiny region, but — at least for our sun — that huge size really adds up.



*A composite of 25 images of the sun, showing solar outburst/activity over a 365 day period; NASA / Solar Dynamics Observatory / Atmospheric Imaging Assembly / S. Wiessinger; post-processing by E. Siegel.*

Check out these “10 Need-to-Know Things about the Sun”:

<http://solarsystem.nasa.gov/planets/profile.cfm?Object=Sun>

Kids can learn more about an intriguing solar mystery at NASA's Space Place:

<http://spaceplace.nasa.gov/sun-corona>



# Diving into Outreach

By Leigh Anne Lagoe

Last April I took the mere eighteen dollar leap, and joined the Back Bay Amateur Astronomers. I was warmly welcomed by email and immediately started looking into events. I had never been to a BBAA event, or any astronomy event for that matter. I was mostly seeking an opportunity to safely go out and view from darker skies, but what I found was far more gratifying.

In searching for events, I found Skywatch. Here was my opportunity to finally get out to darker skies! All I had to do was venture out to an unfamiliar, obscure park in the middle of the night to meet up with men I met online...

As a female traveling alone, I opted for a daytime event instead: Astronomy Day at the library. A public place during daylight hours was how I chose to check out the BBAA. I brought my kids, was greeted kindly by the members, and got a feel for the club and what they offered to the public... outreach.

Soon after I attended a monthly meeting and heard about Boardwalk Astronomy. This seemed like the perfect event for me to dip my toes into outreach, and without having to go to a dark park with strangers. Granted, the strangers were all kind, fun people, and I really wanted to get out to dark skies, but I still wasn't comfortable yet. The boardwalk is very public, close to home, and I only had to show easy targets like the moon and Saturn.

I was very nervous before my first outreach event. The other members had years, even decades, of experience. They discussed things like "seeing" and "transparency" and "magnitude 6 vs 5". While I knew what these things meant, I certainly was not experienced enough to make those kinds of accurate observations. I saw wires and cables hooked up to massive telescopes and I had no clue what any of it was. I found myself asking questions like, "What's a Telrad?" and "What does a dew heater do?" I am the go-to person for astronomy information among my family and friends. But in the BBAA, I'm in a position where I know very little in comparison to the much more experienced members. Not knowing as much as I thought I knew is certainly intimidating.

Despite my reservations, I decided to give it a try. I carefully planned for myself a calculated entrance into outreach, spending lots of time researching telescopes and objects. Well, I found out I didn't even need to. My feelings of inadequacy were quickly replaced with confidence the moment someone looked through my telescope. Most of the guests were just content to take a look and move on. Very rarely did anyone ask a difficult question, and I managed to be knowledgeable enough, despite my newness to the hobby. The experienced members weren't intimidating at all, but rather, helpful and encouraging.

Driving home from the boardwalk, I felt both relief and a rush. I had just shared the craters of the Moon with people that had never seen them before. I experienced excitement right along with the student viewing Saturn for the first time. I drove with a newfound sense of purpose. I could share the ever-inspiring universe with the general public and I did not need to be an expert.

So now, a year later, I have several Boardwalk Astronomy events, school events, and a couple of Skywatches under my belt. Yes, I finally went to the dark park in the middle of nowhere and it was not scary at all. In fact, it was a lot of fun. Members in the BBAA are eager to help and are no longer strangers to me. Those dark sites are the reason I joined the club, but really they are just one of the perks of being a member.

Now, every time I hear a "wow" from a guest, it's like reliving the first time I saw Jupiter's moons. I can only hope that with every "wow" some seeds of astronomical wonder are planted in the hearts of our guests. These guests and students may never go on to study astronomy, or even own a telescope... but maybe we can offer them enough inspiration so they at least look up in awe every time they walk out their door. What a wonderful feeling: "Bringing astronomy to the people of Hampton Roads." I know I still have a lot to learn, but I'm not waiting until I learn it all before diving in and sharing it with the public. It's far too much fun. My feet are good and wet, and I'm doing a cannonball into the pool of outreach!

# Journey to Fan Mountain

## Reawakening the Rapid Response Robotic Telescope (RRRT)

By Lawrence "Bird" Taylor



The Back Bay Amateur Astronomers is a partner with Norfolk State University (NSU) and the University of Virginia (UVA) in the operation, research, and educational outreach of the Rapid Response Robotic Telescope. Known by its acronym, the RRRT or triple R-T or "rrrrrrt" (like a pirate), lives up on Fan Mountain, which is about a half-an-hour south of Charlottesville.

The RRRT is a 24" [Ritchey-Chretien telescope](#) that is designed to be operated remotely, primarily for the study of transient events such as [Gamma Ray Burst \(GRB\)](#) [Optical Afterglows](#). BBAA has several members that have been very instrumental in the building, assembly, and initial operations of the facility. It was originally envisioned that, when not engaged in GRB work, the scope could be used by students and BBAA members for a variety of projects; however, the observatory has been in a state of hibernation over the last few years. A recent push to restart the facility has begun.

On April 19, Dr. Carlos Salgado, Professor of Physics and Astronomy at NSU and the Director of the RRRT, hosted a small group at Fan Mountain to check on the status of the facility as the first step of a renewed effort to bring the RRRT vision to life. I'd like to give a heart-felt thank you to Carlos for all of his time and focus in getting this great scope back online to do research.

We had a wonderfully successful day up on Fan Mountain with the RRRT. I left from Yorktown just before 9 AM with fellow AstroBuddy Mark Croom (lifelong amateur astronomer, president of the NASA Skywatchers Club and brand new BBAA member), and met up with Kunio and his party around 11:30 AM. After a quick lunch

we caravanned South on Rt. 29 and then trekked up the mountain following Carlos along several switchbacks, all the way to the peak. It was great getting back on Fan Mountain (it sure has been a while). The facility is a beautiful place situated in the Blue Ridge Mountains, with spectacular vistas all around.

A few minutes after we had parked we were joined by Kunio's team member, Chase Million, and then made our way to the RRRT Observatory. The 24" Ritchey-Chretien RRRT is an f/8, equatorial fork mount telescope that can be controlled locally or remotely in either interactive or script-controlled modes. The Observatory has a ground level warm room and is connected to a cylindrical walled structure that houses the RRRT. The telescope sits on a high mount and requires tall step ladders to access the cameras and other instruments as well as the clamshell dome.

A pair of computers control the opening and closing of the dome, execute scripts to point the scope at research targets, and autonomously select instruments for astroimaging, polarimetry and photometry for a range of transient events including GRB optical afterglows, compact stars, near-earth objects (NEOs), blazars, and searches for supernovae, exoplanets, and tidal streams around nearby galaxies.

Since the scope hadn't been run in over a year and we had heard vague reports of the computer being dead, our expectations were very low. Carlos sat down at the computer, powered it on, and it booted right up. Amazing!

[Continued on page 7](#)

## RRRT Trip, continued from [page 6](#)

Next, we did some telescope mount, clamshell dome, and general observatory inspection before powering up the mount. Surprisingly, we didn't have too many unwanted insect guests.

After the preflight checkout, Carlos activated the mount and oriented the telescope away from the South and the Sun. The telescope performed a nice smooth transition in both Right Ascension and Declination. Yee-haw! Next was the seamless opening of the clamshell: first the south half, and then the North half. No worries! We were a herd of very happy AstroBuddies.



The weather during the inspection was overcast with the Sun hidden behind haze and clouds. Since it was hours before Sunset and there was the chance that the sky might improve, Carlos offered us a tour of the rest of the Fan Mountain facilities: the guesthouse, the 40-inch Astrometric Reflector, the 31-inch Tinsley Reflector, and the 10-inch Astrograph Reflector. All of which are very special and very historic scopes. Everything looked great, and it was obvious that a Fan Mountain Open House was going to be held in only a couple of days. They are held each Spring and Fall. Check out this site for more information if you want to go:

[http://www.astro.virginia.edu/public\\_outreach/schedule.php](http://www.astro.virginia.edu/public_outreach/schedule.php)

After the tour we spent quite some time talking about future logistics and possible projects. We are all very optimistic about future citizen and educational science possibilities with the RRRT in the not too distant future. We totally realize that much work needs to be done, but as a first step, this was a fantastic visit.

Special thanks to NSU and UVA for supporting and facilitating this wonderful observatory. Personal thanks to all the AstroBuddies that took so much of their holiday weekend to check out the site and update the scope status.



With the slim possibility of the skies clearing enough to actually see anything, we all decided to head on down the mountain several hours before Sunset. But no worries, Mark and I had a great dinner in Richmond at Hardywood Park Craft Brewery. A perfect ending to a great day!

We are expecting to have another status trip in the next couple of weeks, with a couple of us watching over the operations in the RRRT Observatory while Dr. Salgado controls everything remotely from Hampton Roads. We will post updates in the BBAA Newsletter.

The working group of NSU, UVA, and BBAA has a Yahoo Group where we communicate and share information. Be sure to check it out:

<https://groups.yahoo.com/neo/groups/RRRT/info>





## May 2014

BBAA Events	Special Outreach	Astronomical Events
5/01 BBAA Monthly Meeting		5/07 First Quarter Moon
5/02 Garden Stars @ Norfolk Botanical Gardens	5/10 Astronomy Day VA Beach Central Library	5/14 Full Moon
5/23 Skywatch @ Northwest River Park	5/13 Boardwalk Astronomy, 24th St. VA Beach	5/21 Last Quarter Moon
		5/23-24 <a href="#">Meteor Storm from 209P/LINEAR</a>
5/31 Nightwatch @ Chippokes Plantation	5/29-31 East Coast Star Party Coinjock, NC	5/28 New Moon



### Sneak Peek into June

Thu 6/05/2014 BBAA Monthly Meeting, Plaza Middle School, 7:30 pm  
 Fri 6/06/2014 Garden Stars at Norfolk Botanical Gardens, 9:00 pm  
 Tue 6/10/2014 Boardwalk Astronomy, 24th St. VA Beach, 6:30 pm  
 Fri 6/20/2014 Skywatch at Northwest River Park  
 Sat 6/28/2014 Nightwatch at Chippokes State Park, Surry VA.