



# BACK BAY observer

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

## EPHEMERALS July 2013

07/21, 11:00 AM - 3:00 PM  
Annual Summer Picnic  
Northwest River Park  
(BBAA supplies the food)

07/23, Dusk - 11:00 pm  
Boardwalk Astronomy  
VA Beach Boardwalk at 24 St.

07/26  
Skywatch  
Northwest River Park

08/01, 7:30 pm  
BBAA Monthly Meeting  
Plaza Middle School, VA Beach  
KIVA Room

08/03  
Nightwatch  
Chippokes State Park  
Surry, VA



## Looking Up!

*Editor's Note: This month's Looking Up column was written by Observer Editor, Paul Tartabini. President Courtney Flonta will return as the regular author.*

What a quiet, lazy summer it has been, at least astronomy-wise! Frequent clouds and thunderstorms have kept me inside on more nights than I can remember this summer. Even the activity on BBAA's Yahoo Forum seems to have quieted for a spell. Oh yeah, and when's the last time we had a newsletter??? ;-)

Occasional lulls can be a good thing, I suppose. As I often tell my wife, "I'll sleep when it's cloudy." Well, let's just say I'm feeling well rested this summer.

Even so, I know I'm not alone when I say that going to bed at a decent hour is getting old. I look forward to the longer nights that are slowly approaching. With luck there will be plenty of clear ones. And if we're really lucky, they may be filled with the awe inspiring sight of Comet ISON. Let us hope.

What to do until then? Well, BBAA slows in the summer but it does not stop. Our annual picnic is only days away on **Sunday July 21, 2013** at Northwest River Park. Why not attend, enjoy the cookout, visit with astro buddies and share stories about your favorite hobby? Bring a solar scope. If you don't have one, no worries, someone will. That's the beauty of belonging to an astronomy club. And if you can't make it this year, be sure to come to one of our other upcoming events like Boardwalk Astronomy or Skywatch, or both!

Until next time, Clear Skies,

*Paul Tartabini*

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## Tackling the Really BIG Questions

By Diane K. Fisher

How does NASA get its ideas for new astronomy and astrophysics missions? It starts with a Decadal Survey by the National Research Council, sponsored by NASA, the National Science Foundation, and the Department of Energy. The last one, *New Worlds, New Horizons in Astronomy and Astrophysics* was completed in 2010.

The Decadal Survey defines the highest-priority research activities in the next decade for astronomy and astrophysics that will “set the nation firmly on the path to answering profound questions about the cosmos.” It defines space- and ground-based research activities in the large, midsize, and small budget categories. The recommended activities are meant to advance three science objectives:

- 1) Deepening understanding of how the first stars, galaxies, and black holes formed.
- 2) Locating the closest habitable Earth-like planets beyond the solar system for detailed study.
- 3) Using astronomical measurements to unravel the mysteries of gravity and probe fundamental physics.

For the 2012-2021 period, the highest-priority large mission recommended is the Wide-field Infrared Survey Telescope (WFIRST). It would orbit the second Lagrange point and perform wide-field imaging and slitless spectroscopic surveys of the near-infrared sky. It would settle essential questions in both exoplanet and dark energy research and would advance topics ranging from galaxy evolution to the study of objects within the galaxy and within the solar system.

Naturally, NASA's strategic response to the recommendations in the decadal survey must take budget constraints and uncertainties into account.

The goal is to begin building this mission in 2017, after the launch of the James Webb

Space Telescope. But this timeframe is not assured. Alternatively, a different, less ambitious mission that also address the Decadal Survey science objectives for WFIRST would remain a high priority.

The Astrophysics Division is also doing studies of moderate-sized missions, including: gravitational wave mission concepts that would advance some or all of the science objectives of the Laser Interferometer Space Antenna (LISA), but at lower cost; X-ray mission concepts to advance the science objectives of the International X-ray Observatory (IXO), but at lower cost; and mission concept studies of probe-class missions to advance the science of a planet characterization and imaging mission.



*Clusters of galaxies collide in this composite image of “Pandora’s Cluster.” Data (in red) from NASA’s Chandra X-ray Observatory show gas with temperatures of millions of degrees. Blue maps the total mass concentration (mostly dark matter) based on data from the Hubble Space Telescope (HST), the European Southern Observatory’s Very Large Telescope (VLT), and the Japanese Subaru telescope. Optical data from HST and VLT also show the constituent galaxies of the clusters. Such images begin to reveal the relationship between concentration of dark matter and the overall structure of the universe*

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

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## BBAA Meetings

The BBAA meet the first Thursday of every month except for July (when we have a picnic instead). The Picnic will be held at Northwest River Park on Sunday July 21 from 11am to 3 pm. Contact an officer if you want to come but did not sign up yet. The next meeting will be held on Aug. 1 at Plaza Middle School.

## 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)

## June 6, 2013 BBAA Meeting Minutes

The Meeting was held at Plaza Middle School.

### Those in attendance were:

Courtney Flonta, Benito Loyola, Mark Gerlach, Thomas Jarvis, Chris Jarvis, Chuck Jagow, Leigh Anne Lagoe, Kevin Swann, Jim Tallman, Pete Goulart, Bird Taylor, Bill Holmes, Dale Carey, Paul Tartabini, George Reynolds, George Curran, Chuck Dibbs, Katelyn Neese and Stacy Neese.

### Calendar:

- July 4 Thursday, No monthly meeting
- July 6 Saturday, Nightwatch @ Chippokes, 7:30PM
- July 10-14 Green Bank Star Quest

- July 12 Friday, Garden Stars @ Norfolk Botanical Gardens, 9PM
- July 19 Friday, Night Hike @ NWRP, 7PM
- July 21 Sunday, BBAA annual picnic @ NWRP 11AM-3PM (in lieu of monthly meeting).
- July 23 Tuesday, Boardwalk Astronomy, 2:30PM (rain date July 25 Thursday 2PM)
- July 24-27 ALCON 2013 Astronomical League's national convention, in Atlanta, GA
- July 26 Friday, Skywatch @ Northwest River State Park, Equestrian area, 7:30P M
- August 1 Thursday, monthly meeting @ Plaza Middle School, 7:30 PM

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## June Meeting Minutes, continued from page 3

- August 1 Thursday, monthly meeting @ Plaza Middle School, 7:30PM
- August 10 Saturday, Nightwatch @ Chippokes, 7:30PM
- August 12 Monday, moon watch @ Pungo-Blackwater Library, 6PM
- August 16 Friday, Garden Stars @ Norfolk Botanical Gardens, 8:30PM
- August 16 Friday, Night Hike @ NWRP, 7PM
- August 20 Tuesday, Boardwalk Astronomy, 2:30PM (rain date August 22 Thursday same time)

### Meeting Summary:

- Treasurer's Report was read.
- Secretary's report reading was waived.
- Visitor: George Curran.
- A Northwest River Park coordinator is needed. See Chuck Jagow.
- Acting as ALCOR representative, George Reynolds awarded Jim Tallman the AL Lunar Program award & the Outreach Program award.
- Nick Anderson (not present) also earned an award.
- The Scholarship committee, lead by Benito Loyola, awarded \$1500. to Katelyn Neese, a senior at Granby High School. He read her teacher's letter of recommendation. After

the award, she read her essay. She said she self-taught herself astronomy in Middle School due to her school not having any astronomy classes. Then she took a course on "universe.org". She plans to major in Theoretical Astrophysics at Princeton University, NJ.

- The other scholarship committee members are Bill McLean & Matt McLaughlin. The scoring was 30% GPA, 20% SAT, 10% teacher letter of recommendation, & 40% essay. 2014 scholarship amount will be set this Fall.

### Observing Reports:

- 5/18 VA Air & Space Center in Hampton, Club provided solar observing for the public but there were many clouds that day. Still, there were breaks in the cloud when sun spots could be viewed. Mark Gerlach and Thomas & Chris Jarvis attended.
- 5/31 NWRP had 5+ scopes for viewing. Cub Scouts & others attended.
- May's Boardwalk Astronomy was cancelled due to weather.
- This evening's raffle winner was Chuck Dibbs who won a book titled: Practical Skywatching.
- The meeting presentation was by VA beach Planetarium director Chuck Dibbs titled "Two Small Pieces of Glass" by NSF.

*Minutes taken by Kevin Swann*

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## BBAA Website Highlight: **Stargazing Tips**

Have you visited [BBAA's website](#) lately? Webmaster Nick Anderson does a fabulous job keeping the page filled with tons of useful astronomy information. A clickable index in the left hand margin makes navigating the site's abundant information a breeze.

4 One highlight worth checking out is the section entitled, "[Stargazing Tips.](#)" Here you'll find a multitude of information on the following topics:

- Observing Techniques

- Cleaning your mirror
- "Spotting" your primary mirror
- Cleaning your Schmidt Cassegrain Telescope (SCT)
- Collimation Basics
- Collimating the Schmidt Cassegrain Telescope
- Dealing with dew
- Polar alignment

Be sure to check this section out the next time you have an astronomy-related question!

# 2013 BBAA Scholarship Award | **Winning Essay**

By *Katelyn Neese*

I've had my eye on the stars ever since I was a kid. In elementary school it was a simple fascination, in middle school it grew into a pursuit for knowledge. Because my middle school didn't offer an astronomy class, I taught myself much of what I know today during this early time period. By the time I advanced to high school, even though I was pretty well versed in the subject, my quest never ceased. I branched to other aspects of physics, such as theoretical physics, but always remained grounded in astronomy. I've never given up that passion, and I never intend to. I was finally able to take an astronomy class in high school, joined the Back Bay Amateur Astronomers, and took part in multiple citizen scientist projects online at [Zooniverse.org](http://Zooniverse.org).

But perhaps the height of my experience with astronomy and astrophysics, so far, happened just earlier this year, when I was selected to attend the E.E. Just Symposium at Dartmouth College. I was among 20 other high school students from around the US selected to participate in this college event. I couldn't wait to go.

The presentation that intrigued me the most was given by Dr. Spergel, a theoretical

astrophysics professor from Princeton University. He lectured about dark matter and the inflation of the universe; about how even though we couldn't directly observe it, we knew what was going on. Pictures from large telescopes in Hawaii and Australia flashed across the screen as he lectured. While the other students around me were interested, I was fully engaged and taking notes. I couldn't get enough. This was where I wanted to be, in a lecture hall learning from an expert in the field. The whole experience reenergized my passion for the subject. The possibilities that raced through my mind that weekend were endless, and even when I returned home my excitement remained.

What's more was that Dr. Spergel is the perfect example of what I want to achieve with my college education. As a theoretical astrophysicist, I want to combine my passion for astronomy and the mysteries of what might be possible. I want to explore the entire universe, to see all that it has to offer with the telescopes and satellites available to me. I want to dig deeper into it than anyone has before. Astronomy is my passion; it's everything I want to know and everything I want to experience.



*Katelyn Neese receives her Scholarship Award check for \$1500 from Committee Chairman, Ben Loyola. Katelyn graduated from Granby High School and will attend Princeton in the Fall with plans to study Astrophysics. She has been an active member of BBAA for two years. Congratulations, Katelyn.!*

## Book Review | George Reynolds

### Peering through the “Big Eye” from Palomar

*First Light: The Search for the Edge of the Universe, by Richard Preston*

*(Random House, 275pp, \$17.93 new on Amazon)*

First Light is the lively story of the men and machines of the Palomar Observatory and its historic telescopes in southern California. The star of the tale is the huge 200-inch Hale telescope, which is still being used to probe the depths of the universe. The supporting cast is a litany of strange characters who don't sleep much, often staying up all night in an unheated dome in the frigid San Gabriel Mountains, watching stars go by on a TV screen.

Preston's book is arranged in four parts. Part one is all about “The Big Eye”, the 200-inch telescope envisioned and designed by George Ellery Hale, and the people who use and operate it. History comes alive as the author recounts the fascinating story of a telescope designed in the 1930s, put into service in the 1940s, and still in use and lovingly maintained today by handmade parts fabricated from castoff materials from dumpsters.

Inside its Pantheon-like dome, The Big Eye stands seven stories tall, an intricate balance of tons of metal struts and girders and glass, its massive fork mount floating on a thin layer of Flying Horse oil coating a huge horseshoe-shaped bearing. After the first attempt to cast the immense Pyrex mirror failed, a second attempt in 1934 at the Corning Glass Works in Corning, New York was successful. The glass was kept in the oven and allowed to cool ever so gradually over a period of ten months before it was encased in a steel protective box and shipped on a slow train to CalTech in Pasadena.

It took the next 12 years for a small army of men to polish the huge mirror, with a break for World War II when no work was done on it. The

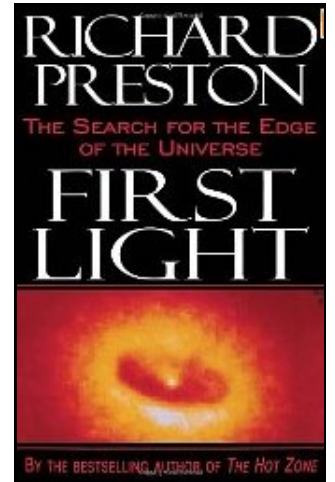
end result was a mirror so smooth that if it were enlarged to the size of the United States, the largest bump would be a mere four inches high. The final polishing was done literally by hand – with the thumbs of master opticians Melvin Johnson and Donald Hendrix. The mirror supports were designed by engineer Bruce Rule, who said, “We didn't give ninety-day guarantees, we built it for life.”

Part two is the story of Eugene and Carolyn Shoemaker and their search for asteroids and comets. They operated the cantankerous, spark-throwing 18-inch Schmidt telescope at Palomar, in a dome near the Big Eye. Preston tells of this conversation between Carolyn and Gene Shoemaker.

Carolyn: “A lot of astronomers call asteroids the vermin of the skies. Gene and I regard galaxies as the vermin of the skies.”

Gene: “There are far too d\*\*n many galaxies. Carolyn has nearly reported galaxies to the Minor Planet Center.”

Carolyn: They're confusing. The fainties can look like comets. I get so excited. Then I find out it's only a galaxy.”



## Book Review, continued from page 6

The third part of the book is an intriguing account of the “gadgeteers” who keep the Big Eye running and who devise arcane scientific instruments from spares and junk parts. Most of the parts for the Hale telescope, made in the ‘30s, were one of a kind. Replacements and enhancements must be fabricated from scratch, a job done by skillful and slightly daft geniuses like “the Jims” – Prof. James Gunn, the late Dr. James Westphal, and JPL’s James Janesick.. Jim Gunn has been called “Triple Threat” for he embodies the characteristics of all three types of astronomers: observer, theoretician, and tinkerer, or instrument-builder. He devised and fabricated the “4-shooter” camera used on the Big Eye, which takes four simultaneous images and knits them into a panorama. He and Jim Westphal designed the Wide Field/Planetary Camera (affectionately known as “Wiffpick” for its acronym WF/PC) for the Hubble Space Telescope. Gunn also built for the Hale telescope the Prime Focus Universal Extragalactic Instrument (PFUEI), known as “PfooeY”, especially when it fails to work.

Part four discusses the process of discovery involving Palomar astronomers and assistants.



*The Dome of the 200-inch Hale Telescope opening at dusk. The f3.3 reflector boasted the largest aperture of any optical telescope when it was built in 1948 and that remained so for 45 years. It is still used each night for a range of astronomical studies. The weather at Palomar Observatory allows for useful data collection nearly 300 nights per year. (released under the GNU Free Documentation License).*

Juan Carrasco, not a trained astronomer, is the senior night assistant, the man who operates the mighty Hale telescope. As the author humorously states, “nobody in their right mind would let an astronomer touch the controls of one of the most powerful telescopes on earth. Given half a chance, an astronomer would cleverly destroy the telescope.”

The patience needed for astronomy is emphasized in the search for quasars at the edge of the universe. Dr. Maarten Schmidt and his team had been searching for years with no success at all. By the end of the book they had found five.

No review can do this little book justice. The stories of the men and machines of Palomar is high drama. Like when a slight astigmatism was found in the mirror, four dime-store fishermen’s weights were attached to put seven ounces of pull on the glass, just enough to flatten the warp. That “kludge” saved three more years worth of lens polishing.

Every six months the mirror is removed from the telescope, inspected, and carefully washed with a mild Ivory soap solution. Once a year engineers strip off the aluminum coating and inspect the Pyrex glass itself. After a thorough cleaning, the 209-square-foot mirror is placed in a vacuum tank where aluminum is vaporized to recoat the mirror.

Though it was written twenty years ago and revised eleven years ago, this book, like the 200-inch telescope, will live on. Though it is no longer the largest, or best, or most advanced, the 200-inch Hale telescope still performs valuable scientific feats today. Just as the Big Eye has outlived those who created it, the characters in Preston’s must-read book will live on through his words. Jim Gunn, Juan Carrasco, Maarten Schmidt, the Shoemakers, and George Ellery Hale himself, who died 10 years before his dream saw its first light, will continue to inspire and amaze us as we read the tale of their efforts in *First Light*.



## July/August 2013

<b>BBAA Events</b>	<b>Special Outreach</b>	<b>Astronomical Events</b>
7/21 BBAA Summer Picnic		7/22 Full Moon
7/23 Boardwalk Astronomy		7/29 Last Quarter
7/26 SkyWatch @ Northwest River Park	8/12 Moonwatch @ Princess Anne Library	8/6 New Moon
		8/11 Perseids Peak
8/1 BBAA Monthly Meeting		8/14 First Quarter