BACK BAY OBSERVER

Mar 2019

The official newsletter of the Back Bay Amateur Astronomers

COMING UP

Mar 7 **BBAA Meeting**
7:30-9PM
TCC, Virginia Beach

Mar 8 **Cornwatch**
dusk-dawn
Cornland Park

Mar 9 **Cub Scout event**
7-9PM
Sleepy Hole Park

Mar 12 **Garden Stars**
7:30-9PM
Norfolk Botanical Gardens

Mar 13 **Red Mill Enrichment**
2:40-3:30PM
Red Mill Elementary

Mar 19 **Science Night**
6-8PM
Deep Creek Central Elem.

For more information, go to www.backbayastro.org/

Patrons of the Little Theatre of Virginia Beach, along with cast members of *Silent Sky* (a show about the work of Henrietta Leavitt) enjoy views of the Orion Nebula, star clusters, double stars, Hind's Crimson Star, and M81.

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LOOKING UP! *a message from the president*

Starting out this month's column I would like to thank all of the generous telescope donors we have had to the club. I recently picked up another great telescope from a past club member. If anyone knows of a school or scout pack that would like one, please let me know. The telescopes I have available would be best suited for a stationary setup, so please keep that in mind.

Now if we can get the weather to cooperate for March, I will be happy. As I'm writing this now, it appears that we will start off the year canceling the February Skywatch after having already canceled our monthly Saturday "Sun" day event as well. Not a great start.

Also, the City of Virginia Beach has made some changes this year to our Boardwalk Astronomy event. Due to how busy the schedule for the boardwalk has become, we will no longer have a rain make-up date on the following Thursday. So once again my fingers are crossed for better weather this year.

Continued on page 2

The BBAA is a member organization of the Astronomical League.

Check out this beautiful sequence of photographs by **Jim Tallman** taken during the January 2019 Total Lunar Eclipse.

How did he do that?

- Camera: ZWO ASI-174MC Color CCD imager
- Imaging Software: FireCapture 2.6
- Scope: Astro-tech 60mm refractor 360mm focal length
- Mount: IOptron Smart EQ Pro+ (GOTO)
- Image Details:
- Each final image (17) processed from a stack of 10 lights and stacked with Registax 6.
- Stacked images then processed with PixInsight 1.8, to calibrate color and intensity.
- Montage created with GIMP 2 (open source Photoshop), with mid eclipse image enlarged for center display.
- Image exposures ranged from 1/500s at onset to 3s from 2nd to 3rd contact

Looking Up! Cont'd

Now on to a more positive note. The club held two successful events for the patrons of the play "Silent Sky" at the Little Theatre of Virginia Beach, and each time received great feedback from the guests despite the light polluted skies. Also, some club members who attended a 4-H Space Camp event in Wakefield have been given permission to hold club events at the site (details pending). I didn't make it out there for the Space Camp but have been told that the skies are as dark as the Coinjock location. Depending on your location in Hampton Roads it appears to be roughly the same distance too. Speaking of Coinjock, the latest word from Kent Blackwell is that there will be no East Coast Star Party (ECSP) this spring because the park isn't scheduled to open until after Memorial Day. We have some events coming up in March that promise to have some large crowds so if you're looking to get your feet wet doing outreach please don't hesitate. Until then, keep looking up.

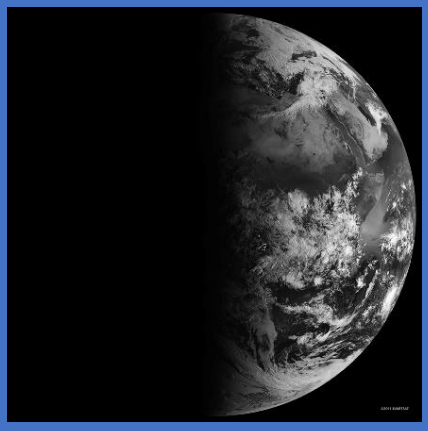
Shawn Loescher

Springtime Planet Party

By David Prosper

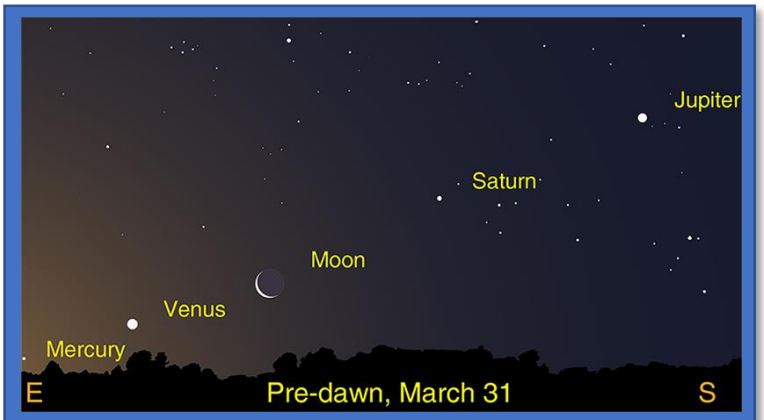
March brings longer days for Northern Hemisphere observers, especially by the time of the equinox**.** Early risers are treated to the majority of the bright planets dancing in the morning skies, with the Moon passing between them at the beginning and end of the month.

The **vernal equinox** occurs on **March 20**, marking the official beginning of spring for the Northern Hemisphere. Our Sun shines equally on the Northern and Southern Hemispheres during the moment of equinox, which is why the March and September equinoxes are the only times of the year when the Earth's north and south poles are simultaneously lit by sunlight. Exacting astronomers will note that the length of day and night on the equinox are not *precisely* equal; the date when they are closest to equal depends on your latitude, and may occur a few days earlier or later than the equinox itself. One complicating factor is that the Sun isn't a point light source, but a disc. Its edge is refracted by our atmosphere as it rises and sets, which adds several minutes of light to every day. The Sun doesn't neatly wink on and off at sunrise and sunset like a light bulb, and so there isn't a perfect split of day and night on the equinox - but it's very close!



Earth from orbit on the March equinox, as viewed by EUMETSAT. Notice how the terminator—the line between day and night—touches both the north and south poles. Additional information here: http://bit.ly/earthequinox

Image credit: NASA/Robert Simmon



The morning planets on March 31.
Image created with assistance from Stellarium

Ruddy **Mars** still shines in the west after sunset. Mars scoots across the early evening skies from Aries towards Taurus and meets the sparkling Pleiades star cluster by month's end.

March opens with the morning planets of **Jupiter**, **Saturn**, and **Venus** spread out over the southeastern horizon before sunrise. A crescent **Moon** comes very close to Saturn on the 1st and occults the ringed planet during the daytime. Lucky observers may be able to spot **Mercury** by the end of the month. March 31 opens with a beautiful set of planets and a crescent Moon strung diagonally across the early morning sky. Start with bright Jupiter, almost due south shortly before dawn. Then slide down and east towards Saturn, prominent but not nearly as bright as Jupiter. Continue east to the Moon, and then towards the beacon that is Venus, its gleam piercing through the early morning light. End with a challenge: can you find elusive Mercury above the eastern horizon? Binoculars may be needed to spot the closest planet to the Sun as it will be low and obscured by dawn's encroaching glow. What a way to close out March!

This article was distributed by
NASA Night Sky Network
Visit https://nightsky.jpl.nasa.gov/

Hind's Crimson Star

image by Chuck Jagow

By Richard Roberts

At our February meeting, Chuck Jagow described his observation of R Leporis, also known as Hind's Crimson Star. This star is an interesting star and a favorite of mine. R Leporis is a long period variable known as Mira star and one of the brightest, red carbon stars in the sky. R LEP would have spent most of its life as a very massive, bright blue star similar to Rigel. It's now a highly evolved star that is nearing the completion of its red giant (helium fusing) stage. R LEP's colossal stellar envelope is between 2 and 2.5 AU in radius. If the star was placed in our solar system, it would extend half-way to Jupiter. R LEP will soon begin to fuse higher mass elements in short order as it approaches the end of its life. Eventually, it will cast off its carbon rich envelope into the ether of space. This carbon will enrich the galactic dust clouds with the key element needed to produce organic molecules and thus life, as many long dead carbon stars did billions of years ago to enrich our own stellar birth cloud.

This particular star has been well observed by the American Association of Variable Star Observers (AAVSO) since its inception in 1911 and there are currently 23,058 observations for this star in the AAVSO database, most of which are visual. The light curve is a little erratic for a typical Mira star. R LEP's maximum brightness can be as high as 5.5 V and as low as 9.5 V. Similarly, the minimums can be as bright as 10 V and as dim as 12 V. These secondary periods have been noticed to run on a 40 year cycle.

R LEP also does not have a consistent period and you'll notice different periods are listed for the star in different places. R LEP's "meandering" period is not unusual for late stage Mira stars. Some late stage Mira's periods can meander by up to 5%. I downloaded 90 years of data and ran a program to determine how the star's period was changing over time. It varies about 2.2% in either direction off the mean and exhibits an approximately 50-year cycle in its period change which roughly coincides with its secondary magnitude variations.

The B-V band color index is +5.74, indicating an extremely red star. Many people claim R LEP appears redder when near its minimum brightness and more orange-red when at maximum, but I have not personally noticed this when observing the star. I ran a query on data from the AAVSO Photometric All-Sky Survey (APASS) for stars with a B-V color index greater than R LEP's. The search returned only nine stars. The star with the greatest B-V was V HYA

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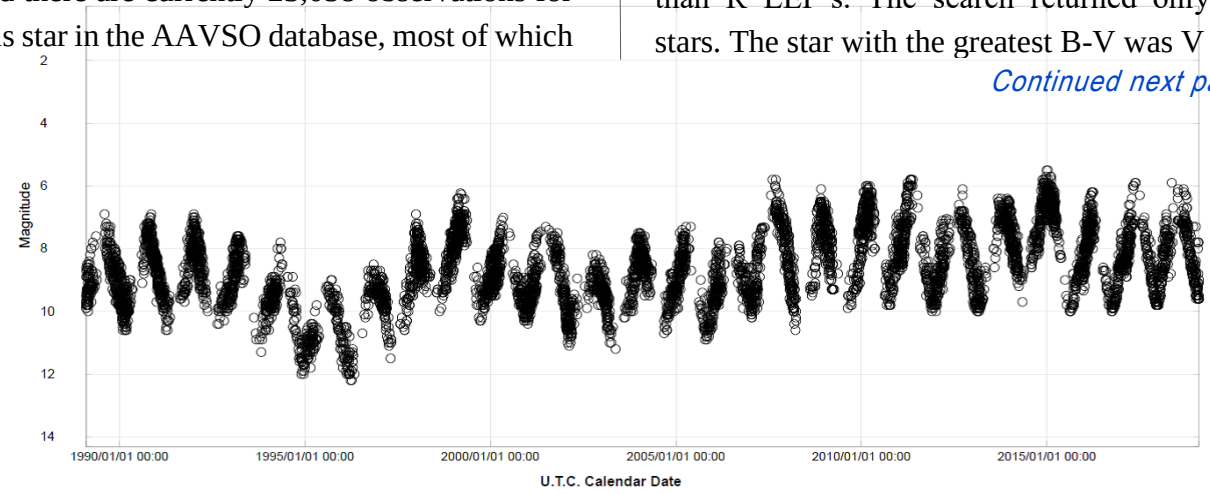
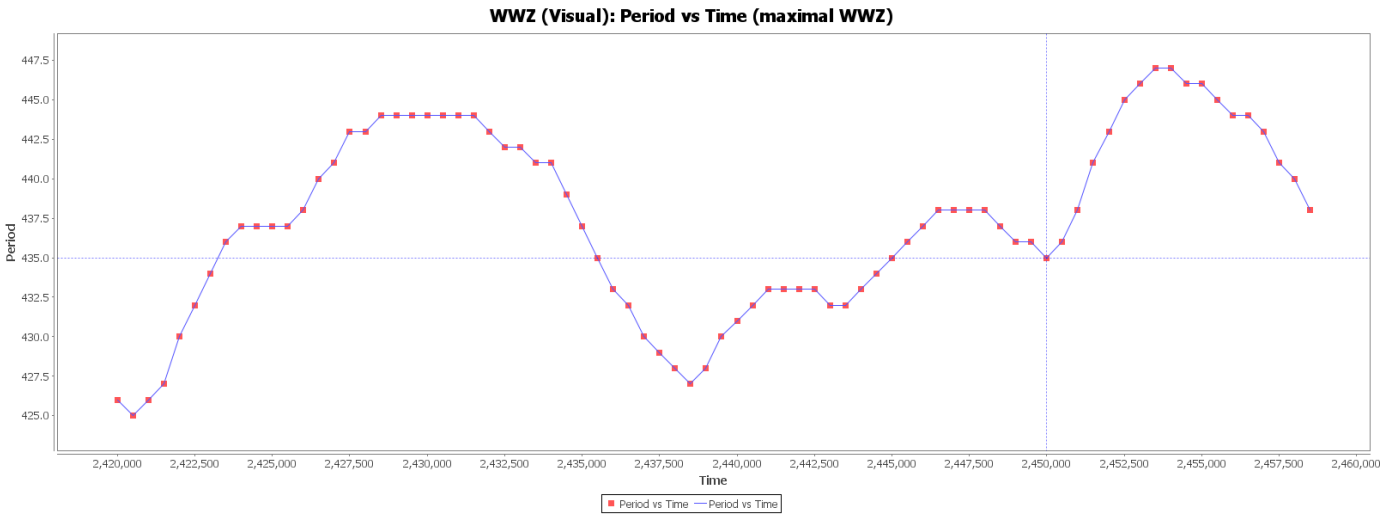


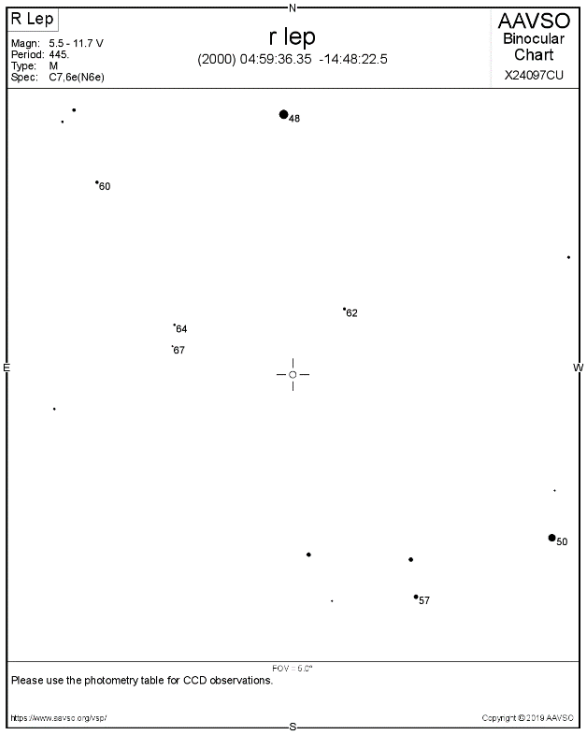
AAVSO Light Curve: **R LEP** 1989/02/08 *to* 2019/02/08

with a B-V of +6.46. V HYA is a late-stage carbon star similar to R LEP. It is also similarly bright with a range of 6 to 12.3 in V. R LEP is also extremely bright in the near infrared. It has a magnitude of 2.16 in the J-band (1.25 microns) and 0.88 in the H-band (1.65 microns). If we had infrared eyes, R LEP would be one of the brightest stars in the sky.

R LEP is directly south of Rigel and easy to locate. I find it difficult to accurately estimate the star's magnitude when it's near maximum brightness due to the lack of good comparison stars. With my lowest power eyepiece (40 mm), I have a 1 degree FOV. The only bright comparison star with 1 degree of R LEP is 7.4 and the next



brightest comparison star is 9.5. If I want to get a good estimate of when the star begins to brighten above 7th magnitude, I have 2 options. There is a 6.2 magnitude comparison star about 1.5 degrees to the northwest. I could print out a chart with a 2-degree FOV and slew back and forth between R LEP and the 6.2 comp star. I typically don't like to use stars I can't keep in the same field for comparison. This leaves option 2, using binoculars. Binoculars are a perfectly fine instrument for variable star observations and usually the best choice for bright stars in sparse star fields. To the right is a 5 degree binocular chart to estimate the star's magnitude when it's near maximum brightness.



Richard Roberts

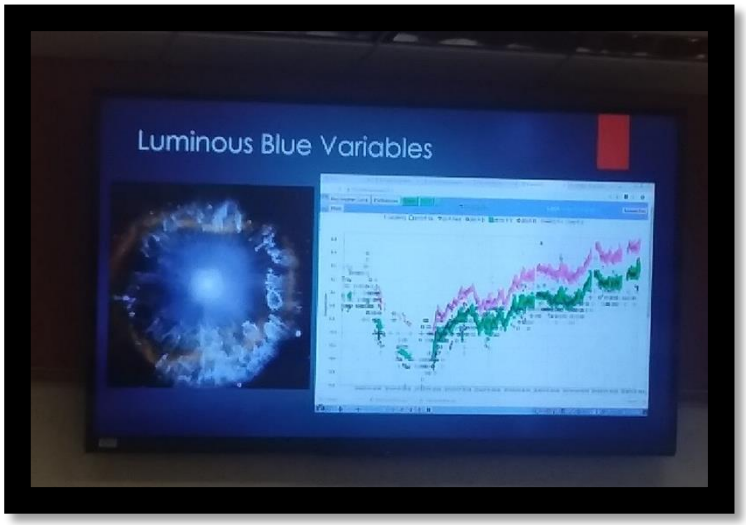
Rich has been fascinated by Astronomy since a child and hopes his 15 month old son develops a similar passion. He has a B.S. in Physics from Virginia Tech and a MBA from Averett University. After college, he served in the Navy as a submarine officer aboard USS MINNEAPOLIS-ST PAUL and a Liaison Officer for CJTF-HOA in Djibouti, Africa. He now works as an account executive in the building automation industry and spends clear nights visually recording variable star magnitudes with his 11" SCT in Carrollton, VA.

Club Meeting

We met for our monthly meeting on February 7th at TCC Virginia Beach.

After normal business, club member Richard Roberts treated us to a presentation on variable stars and how amateur astronomers can make real contributions to studying these bodies. He is even willing to help fellow club members get started with variable star observing and involvement with AAVSO.

Full meeting minutes are posted at http://backbayastro.org/documents.php



The Back Bay Amateur Astronomers meet on the first Thursday of each month from 7:30 – 9pm.

Typically, we meet at TCC Virginia Beach on the second floor of **Building J—the Science Building**, in room JC-11. (room may vary)

Occasionally, we meet at either TCC's planetarium on the first floor, or at the Plaza Middle School planetarium.

All meetings are free and open to the public. After normal business, there is usually a presentation.

Did you know?

The BBAA has Scholarship Opportunities

The BBAA scholarship program offers financial assistance to graduating high school seniors in our area that demonstrate an avid interest in astronomy. The BBAA awards two scholarships each year. A general $1,500.00 scholarship and the Georgie June Memorial Astronomy Scholarship for $500.00. Georgie June was a passionate amateur astronomer and longtime active member of the BBAA.

To apply, download our scholarship application form. If you would like to make a donation to our scholarship fund please go to the BBAA store and scroll down to the section marked "Donate to the BBAA Scholarship Fund".

2018 Scholarship Recipients, Zoe Waring and William Greer with Scholarship Committee Chairman, Ben Loyola

Making Large Dobs PORTABLE

By Jim Tallman

Like many in the club, I have a large Dobsonian telescope—an Orion 14" truss tube Go-To. Like other owners, I found that having to cart my scope in pieces to set it up in my yard every time I wanted to use it, to be a royal pain in the neck. The result was that I've had this scope for eight years now and I can count on one hand how many times I've actually set up in my yard! There had to be a better way to manage my scope and make it more readily usable, and that started my journey toward big-dob mobility.

In my quest I searched the web for purpose-built dob mobility solutions, where I found that Orion had once offered some kind of wheelie bar setup for the 16" dob, but it's no longer available. I also found a great looking dolly on the JMI site for $450—way too much for me to be able to justify the need. I then started looking for the *do-it-yourself* folks and found quite a few good ideas, even one that would let you tow your big dob behind your car, but none of the ideas were anything I wanted to use out-right. I ended up taking ideas for materials from several places and then designing my own transport system.

It would be a combination of both permanent (receivers) and removable (lift poles and wheelie bars) components, and while I applied this to a 14" dob, the design can be scaled up or down for larger and smaller dobs.

One of the best material ideas I found was to use both 1" and 1 ¼" square steel tubing, as it is strong, fairly lightweight, and is pre-drilled down its entire length. I chose this as my main building material, and since my design required me to permanently mount the lift pole and wheel receivers, I chose to use stainless steel nuts and bolts, large washers, and aluminum spacers to provide all of the mounting support for the permanent installation portion.

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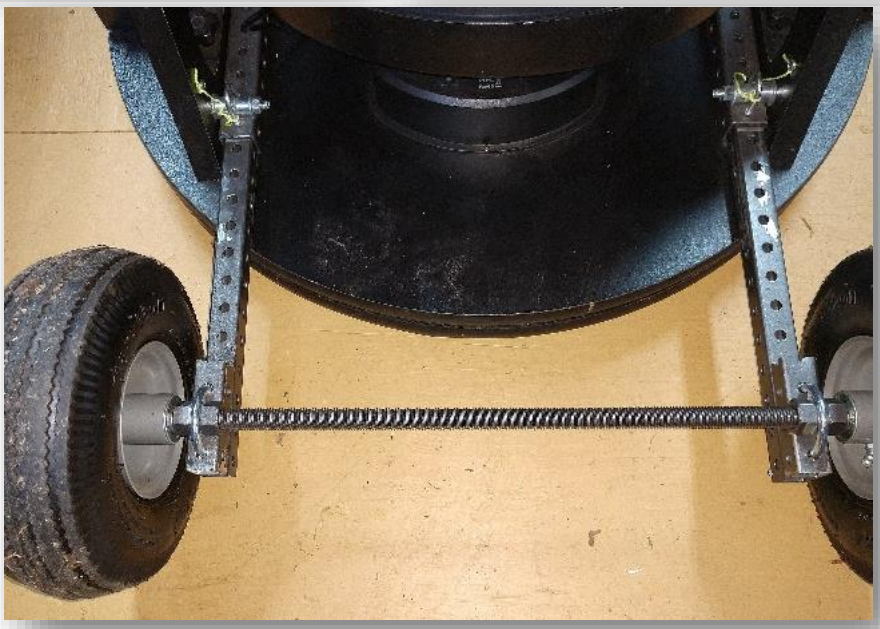
For the upper lift handle receivers, I applied just about the same thing that I did for the wheel receivers, but in this case, I was able to use the existing mount handles as support, and added support to prevent the receiver tubes from pivoting downwards.

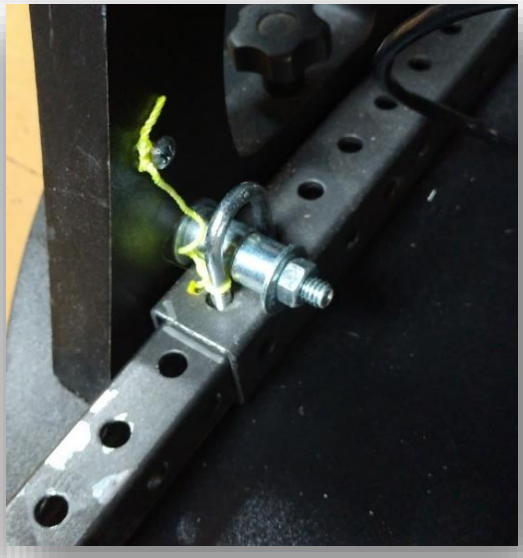
Next, I set to work on the removable wheelie bars. For the wheel assembly, I used the 1" square tube because it slides perfectly into the 1 ¼" receiving tubes. For the axle, I used a piece of 5/8" threaded bar with large stainless-steel nuts to provide a channel for the U-bolts. The U-bolts attached the axle rod to the wheelie bars on both sides, and prevented side to side movement. An extra piece of tube was added to the axle assembly to ensure that the wheels would not touch the ground unless the handles were lifted up. This lets me leave the wheels on the mount for those really short "take a peek" sessions, or take them off if I plan on using the scope for a while. The last to go on were the 10.5" pneumatic tires,



which really provide a smooth ride for the scope.

The handles themselves were the easiest part of the entire build. I only had to paint the 1" tube that I planned to use, and that was that.

For added safety, I used small U-bolts as safety pins to let me lock the wheelie bars and lift bars into place for movement. They are easy to insert and remove, and ensure that none of the receivers allow the inserted tubes to come out, unless I want them to.



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My first test run was a complete success, although I did have to make a small ramp to allow for a smooth transit in and out of my shed over the 2-inch drop at the threshold. For the first time since I've had the scope, I was able to just roll it outside, connect my battery and have a good time, and if it decides it is going to rain, I can roll it all inside in seconds.

So, for the price of steel tubing, wheels, and all of the assorted mounting hardware, I spent about $110 to make my dob mobile, and I had a day of fun using my tools. At that cost, it was money well spent. As I stated at the beginning of the article, you can apply this to any size dob. Scaling up really just means you might need more length of the 1 ¼" tubing for longer receivers. Scaling down can be done by changing the size of the tubing to maybe 1" and ¾" tubing, and shorter spacers like using two ½" spacers to help secure the receiver.

I had so much fun and now my dob is so much more accessible. Maybe this summer I'll make a trolley for the Losmandy G-11, because that beast is heavy and I'd sure like to be able to push the "easy" button when I have to set that up for imaging.

Jim Tallman is a life-long fan of astronomy. He really started getting involved in the hobby in 2010 after taking the astronomy class at TCC. It sparked his interest enough to buy his first telescope. From there, his interest expanded to include astrophotography.

As a member of the BBAA since 2010, Jim has held the positions of Treasurer, Vice President, and President.

In 2001, Jim retired from the Navy after 20 years as an electronics technician. Currently, he works as a cyber risk assessment analyst for the Navy.

The Back Bay Amateur Astronomers, Inc. is a 501(c)3 nonprofit organization dedicated to astronomy outreach.

We are a 100% volunteer-run organization that relies on our dedicated members to *"bring astronomy to the people of Hampton Roads."*

Anyone who has volunteered at one of our events can tell you that it is incredibly rewarding to show the moon to someone who has never seen it through a telescope. You never know who you'll inspire to become the next great astrophysicist, or at the very least, you may instill within someone a passion to look up to the sky.

Please help us achieve our mission and sign up to volunteer. **All experience levels welcome.**

See our monthly calendar for events.

Love of Astronomy was in the air

on Valentine's Day. The clouds kept many people away, but those who attended Garden Stars at the Norfolk Botanical Gardens were treated to an indoor presentation by George Reynolds about all those romantic objects in the sky. Visitors receieved astronomy handouts and red LED roses.

A ten-year-old associate member gets ready to show the moon and Venus at the 2015 Mt Trashmore Star Party.

BBAA member & NASA Solar System Ambassador, George Reynolds, gives a Valentine's Day presentation on a cloudy night.

The Back Bay Amateur Astronomers, Inc is a member organization of the Astronomical League.

We need someone to step up as our Astronomical League Correspondent (ALCOR).

This person would be responsible for looking over data submitted by BBAA members who are pursuing AL observing program awards. The ALCOR would simply verify that the member's data is accurate, and then submit to the Astronomical League. The ALCOR can also keep the club updated on AL news.

For more information, please contact Shawn Loescher at president@backbayastro.org.

Deep Creek Elementary has requested an event on the evening of our club meeting on March 7.

If you don't plan to attend the meeting, but would like to support this Science Night event in Chesapeake, please contact vp@backbayastro.org.

Every year millions of people, businesses and landmarks set aside an hour to host events, switch off their lights, and make noise for the Earth Hour movement. The BBAA will be setting up telescopes at First Landing State Park. Come join us! See calendar for details.

http://www.earthhour.org

Astronomers Without Borders

ONE PEOPLE + ONE SKY

Astronomers Without Borders is proud to host the fourth AstroArts contest.
Art is a fantastic way to share the excitement of astronomy. We can't wait to see what you'll submit to the contest!

The competition is open to to everyone of all ages.

"Colorful Journey of a Star from a Nebula" by Aavya Singh, Second Prize winner, teen category, GAM2018

For details go to:

https://astronomerswithoutborders.org/gam2019-programs/astroarts/4651-astroarts-contest.html

ALCon 2019

50th Anniversary
of the First Moon Landing

July 25-29

Kennedy Space Center and Southern Skies
Cruise to the Bahamas.

https://alcon2019.astroleague.org/

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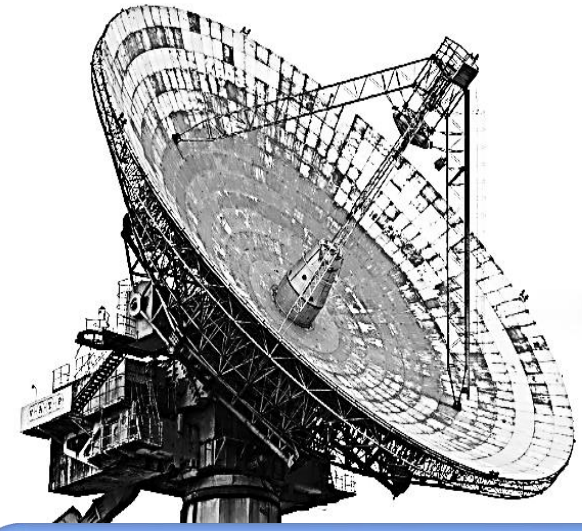
Secretary – Kayla Robinson: secretary@backbayastro.org



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Groups.yahoo.com/neo/groups/backbayastro/info

Tell us about it!

Whether you're a seasoned astro-photographer or a beginner enjoying your first view through a telescope, we'd love to hear about your experience at club events or doing astronomy-related activities on your own. Please submit your articles and/or photographs for publication in the Observer.

Email editor@backbayastro.org

Upcoming BBAA Events

March 2019

DATE	TIME	LOCATION	EVENT	DESCRIPTION
Mar 7	7:30-9PM	TCC VB Science Bldg, Rm JC11	**Monthly Club Meeting**	Club business (presentation TBD)
Mar 7	6-7:45PM	Deep Creek Elem, Chesapeake	**Science Night**	Grades K-5 viewing ** (see details below)
Mar 8	Dusk-dawn	Cornland Park, Chesapeake	**Cornwatch**	BBAA members-only observing
Mar 9	7-9PM	Sleepy Hole Park, Suffolk	**Night Under the Stars**	Cub scout viewing event. (with indoor presentation at 6:30)
Mar 10	**Daylight Saving Time begins**			
Mar 12	7:30-9PM	Norfolk Botanical Gardens	**Garden Stars**	Indoor presentation followed by outdoor viewing
Mar 13	2:40-3:30PM	Red Mill Elementary School	**Astronomy Enrichment**	Astronomy education/enrichment for elementary school kids
Mar 19	6-8PM	Deep Creek *Central* Elementary, Chesapeake	**Science Night**	Grades K-5 viewing event
Mar 21	6:30-8:45PM	Plaza Middle School	**Girl Scouts at the Planetarium**	Planetarium show followed by outdoor viewing
Mar 20	6-8PM	Nansemond-Suffolk Academy	**STEAM Night**	School viewing event
Mar 23	10AM-1PM	Elizabeth River Park	**Saturday "SUN"day**	Public solar viewing
Mar 23	7:30-11:30PM	Northwest River Park	**SKYWATCH**	Public viewing
Mar 30	8-9:30PM	First Landing State Park	**Earth Hour**	Public viewing

April

April 4	7:30-9PM	TCC VB Science Bldg, Rm JC11	**Monthly Club Meeting**	Club business (presentation TBD)
April 5	Dusk-dawn	Cornland Park, Chesapeake	**Cornwatch**	BBAA members-only observing
April 6-7	dusk-dawn	Chippokes Plantation State Park, Surry	**Nightwatch**	BBAA members-only observing

** March 7th Science night at Deep Creek Elementary: Event organizer understands that we may not be able to support this event because it is held on the same night as our club meeting. She would like to leave the invitation open to any BBAA member that might be able to set up a telescope for viewing. RSVP on the NSN and/or contact vp@backbayastro.org if you are able to attend.

Check for details and updates on our website
www.backbayastro.org
Click on our **event calendar**.