

# Bays Mountain Astronomy Club

☞ *Next Meeting: Mar. 2* ☞

SKYWARD

As an amateur astronomer, I always dread to see winter coming. I love to see all the hidden marvels of the night sky in January and February, but I for one am not dedicated enough to get out in the snow and freezing cold long enough to set my telescope up, much less doing some actual observing. There are usually so many obstacles to overcome that it's just not worth the trouble. This year however, we have had some amazing nights in Northeast Tennessee, and I have taken advantage of it as much as possible. We have also had some really nice activity on the sun lately and I have had a couple of opportunities to let kids at the local elementary schools do some solar viewing. Hopefully, we will have the same good fortune in March and April as we prepare to start our spring public StarWatches soon.

Unfortunately, I was unable to attend last month's meeting, but I was informed by other members that I had picked a bad one to miss. I was told that Dr. Henson delivered a very informative talk on polarized light. I did however have the opportunity to attend BoBfest this year at Gardner Webb University in North Carolina.



BY BRAD DUNN

There were several activities on the agenda including a presentation on extra-solar planets, William Herschel, research astronomy, seven mile ridge observatory, and building sun dials. We had five members of our club there and I saw several people that regularly attend StarFest. The next regional star party will be the Southern Star

Astronomical Convention on April 26th-29th.

The March meeting will be held at the observatory at Bays Mountain. We need to do a little "spring cleaning" in preparation for the upcoming StarWatches that will be starting on March 3rd. Since we have been doing this biannually, there shouldn't be too much work to get everything in tip top shape. It would be nice if we could clean the eyepieces this time, so if you have any cleaning supplies for optics, and the talent to use them, please bring them to the next meeting. This would be a great time to show some of the other members the proper way to clean optics. [Ed.: Please, no Brillo Pads...] After we get everything cleaned up, if weather permits, we can get a few scopes out

## Calendar

### Special Events

Apr. 28 Astronomy Day!

### SunWatch

Every Sat. & Sun., 3 - 3:30 p.m.,

Mar. - Oct., weather permitting.

BMACers are always welcome to help.

### StarWatch

7 p.m.: Mar. 3 & 10

8 p.m.: Mar. 17, 24 & 31

8:30 p.m.: Apr. 7, 14, 21, & 28

BMACers need to arrive 30 min. early to set up.

### BMAC Meetings

7 p.m., Observatory

Mar. 2 Observatory cleaning and observing  
- bring your rags and elbow grease.

7 p.m., Discovery Theater

Apr. 6 Topic TBA.

and observe a little while. Until then, clear skies!

*EYE TO THE SKY**BY BOB SMITH*

This month's "Eye to the Sky" article is from Terry Alford.

March is certainly one of the best months we have had for planet watchers in a long time! Mercury reaches greatest elongation in the western sky on March 4th and will be magnitude -0.5. Be sure to study it with your scope early in the month because within a week it will fade to +1.9 magnitude and will be much more difficult to find in twilight.

Venus dominates the high western sky. Already it is obviously brighter than nearby Jupiter. At the start of the month, Venus is -4.3 magnitude while mighty Jupiter is "only" -2.2 mag. Through a telescope, Venus shows a gibbous disk. That disk will grow thinner but much larger through the month. By the middle of the month (March 12th-14th) Venus and Jupiter will be only 3° apart. A very striking duo. Both Venus and Jupiter can cast a shadow so with their combined light there may be a rare photo opportunity so get your camera ready. On March 26th, Venus reaches it's greatest elongation above the Sun. Try to catch Venus in daylight or even twilight and use a #47 violet filter with your scope to see if any cloud details are visible. This spring is the best show by Venus in eight years.

Jupiter gets smaller and fainter throughout the month as it and the Earth are more separated. The major belts and the four brightest moons are still visible with a modest telescope. Take a good look at Ol' Jove while you can because it will soon be invisible in the evening sky.

Mars is at opposition on March 3rd. In early February, we were

observing it with an 8-inch Schmidt-Cassegrain telescope at the ETSU observatory. Even though it was low in the east, a polar cap and some surface markings were visible. This is not a particularly good apparition of Mars as the maximum diameter of the planet only reaches 13.9" wide, but still observe it when you can! It is easy to find. Just look for the big red non-blinking "star" in southern Leo. At mag -1.2 (early in the month) it easily outshines Regulus.

Saturn is rapidly moving towards opposition on April 15th. Early in March, it rises about 4 hours after sunset but that changes by the end of the month when the ringed planet rises only about an hour after sunset. Saturn is always a delight to view through a telescope. Let it get about 45° or more high and use as much magnification as seeing conditions will allow. Even a 6-inch scope will show Titan, Saturn's largest moon. It is interesting to contemplate that just maybe there could be some form of primordial life on that moon.

The Moon is full on March 7th. On the following Sunday we get to turn our clocks and planispheres back an hour due to the arrival of Daylight Saving Time. I don't know about you, but I wish we would leave the clock ALONE! One way or the other but...well enough of that rant. Anyway, the second and third full weeks of the month will be prime time for deep sky observing. Messier Marathon, anyone? Catch the late winter jewels and those spring galaxies in one night.

Speaking of Spring, the March equinox arrives on March 20th. The way this Winter has been so mild, it seems like Spring has already arrived. About 10 days ago, a neighbor

mowed his grass and I may have to do that also very soon. With the price of gas going up, I may have to let a nearby farmer let his cows graze in the yard a day or two each week. Oops, going outside to observe and stepping into cow droppings is not a good idea.

In short, we are slowly moving into warmer temperatures and some good observing opportunities. Galaxies galore, globular clusters arising and planets are a preponderance. If you are up late one March night and have a good southern horizon, try to find and observe the Centaurus A galaxy and the Omega Centauri globular cluster. Or is Omega a small galaxy? Inquiring minds want to know!

Clear dark skies!

## STAR STUFF

BY TERRY ALFORD

## Star Stuff by Bob Smith

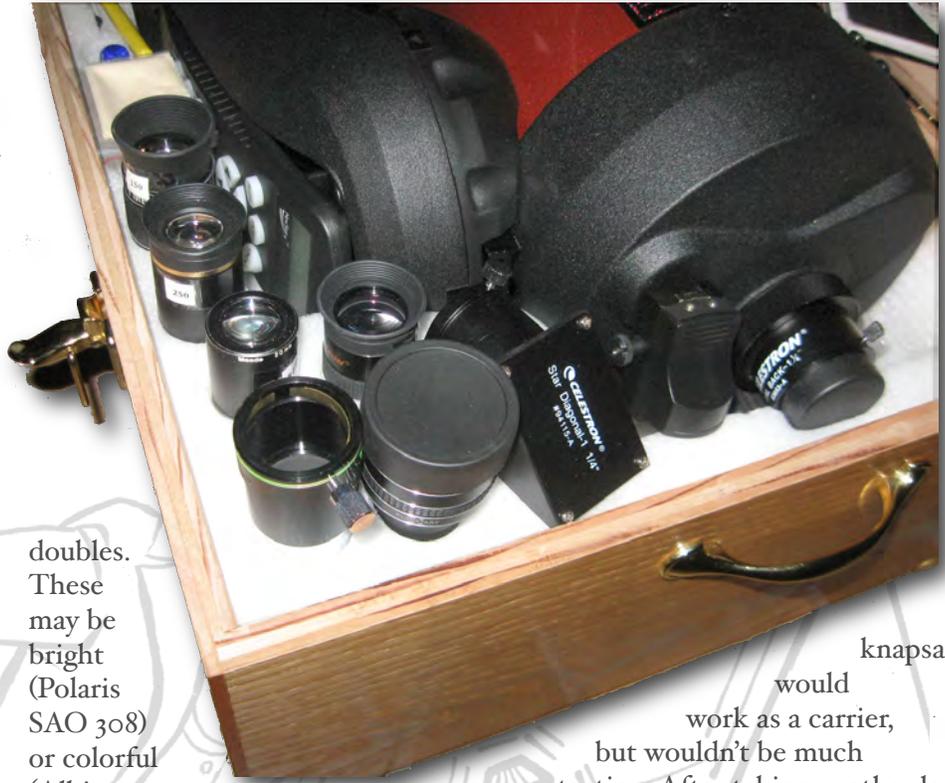
I'm going to take another shot at the equipment side of our hobby this month. I need to put down just a few more words about my (almost) new GOTO telescope. I purchased a Celestron Nexstar 6" Schmidt-Cassegrain over a year ago and am still learning all of the ins and outs of its operation. As I've said the best part of the whole experience is that I can now align the scope and just push a few buttons to locate other objects in the night sky. With the new Celestron SkyProdigy device as part of the package, the telescope even self-aligns.

I generally observe the planets and moon as well as the sun through a Baader filter. The  $f/10$  optics give lots of magnification with whatever eyepiece I use and this really helps with fine detail on Jupiter, Mars and the moon. A big drawback to an  $f/10$  system is that dim objects are even dimmer and harder to observe. As I mentioned last month, the bright galaxies M81 and M82 are difficult. Through my 6"  $f/5$  Newtonian, they are both very easy to locate in a dark sky and are both in the same field of view.

I've become more interested in double stars with my new scope and enjoy tracking down these varied targets. A problem arises in that with the Celestron system, you must know and input the stars' SAO number. This is a catalogue of the 258996 brightest stars in the sky made by the Smithsonian Astrophysical Observatory. Luckily, a dedicated amateur named Michael Swanson has gone over the list and picked out the best 2566 pairs of

doubles. These may be bright (Polaris SAO 308) or colorful (Albireo SAO 87301) or historical (61 Cygnus SAO 70919). Finding these doubles does require the observer to have all these lists handy and/or to pre-plan what targets you want to search. Pre-planning isn't such a bad idea and I always learn something new about the intended targets as I plan for the night.

One of my intentions when I bought the scope was to have a fairly compact package that could be packed quickly and be hauled to a dark sky site or Bays Mountain for StarWatch programs with a minimum of fuss. The tube/drive arm and drive/base came packed in a double thick cardboard box that contained a polyethylene foam cradle with cutouts for the parts. I knew the box would last a while but would soon get pretty dilapidated. A bag or



knapsack would work as a carrier, but wouldn't be much protection. After taking another look at the foam, I decided to make a carrying case out of oak plywood with the packing foam inside to protect the telescope and drive.

I first had to measure the foam protection and decide how high the box needed to be to clear the scope and finder and anything else I would need in the case. Since the scope, eyepieces and printed material (star charts, moon map, various lists, a book or two) would weigh 25 or so pounds, I reasoned that  $1/4$ " plywood was too light and  $3/4$ " was too heavy. After making a full size drawing (a necessity in my opinion) all six sides were cut out of the  $1/2$ " plywood on my table saw and dry fitted to make sure the dimensions were right.

*(Continued on page 6)*

## HAPPY BIRTHDAY GERARD MERCATOR

BY ROBIN BYRNE

This month, we celebrate the life of a man whose name is almost synonymous with maps. Gerard Mercator (originally Gerard de Kremer) was born to Hubert and Emerentia Kremer in Rupelmonde, in what is now Belgium, on March 5, 1512. Gerard's father was a farmer and shoemaker, neither of which provided much wealth for the family. However, Gerard's uncle, Gisbert, was a priest, and had the connections to help his nephew. Gerard's early education was in public school, learning Latin, religion and mathematics. Meanwhile, the Lutheran reformation was creating social and economic upheaval all around. The financial strain on Gerard's father led to an early death, when Gerard was only 15 years old. Uncle Gisbert stepped in and became the guardian of his nephew.

Gisbert wanted Gerard to be well educated, so in 1527, he sent Gerard to the Netherlands to attend school. It was while there that Gerard's mother died, and he decided to change his name. The name "Kremer" means "merchant" in German, the Latin equivalent is "Mercator." Gerard chose to Latinize his name and became Gerardus Mercator de Rupelmonde. On August 29, 1530, Mercator entered the University of Louvain, where the teachings of Aristotle dominated the curriculum. He graduated with a Master's Degree, but chose not to pursue anything higher, having become disillusioned with Aristotle's philosophy - a heretical point of view. Later, he wrote, "But when I saw that Moses'

version of the Genesis of the world did not fit sufficiently in many ways with Aristotle and the rest of philosophers, I began to have doubts about the truth of all philosophers." During this time, Mercator traveled extensively, which began his interest in world geography.

In 1534, Mercator returned to



Louvain

and began studying mathematics with Gemma Frisius, with an emphasis on how it applies to geography and astronomy. At the same time, he was learning engraving and instrument-making from Gaspard Van der Heyden. To earn an income, Mercator worked as a math tutor at the university and by making and selling mathematical instruments. It was in collaboration with Frisius and Van der Heyden that Mercator was involved in making his

first terrestrial globe, where Mercator's contribution was engraving the brass plates.

In 1536, Mercator married Barbara Schelleken. A year later, their first child, Arnold was born. Ultimately, they had a total of three sons and three daughters.

It was in 1537 that Mercator, without collaboration, created his own first map, which was of Palestine. More maps followed. Mercator also, during this time, learned to write in italic script, which was ideal for copper engravings used to print maps. He became so skilled in this form of writing, that mercator published a how-to book about italic script writing. Mercator dreamed of producing a world map comprised of detailed, individual maps for each region. In 1540, he began working on a map of Europe. One of the problems with mapmaking was conflicting data about world geography. One of the sources of error came from sailors assuming that a steady compass heading correlated to a straight line.

Instead, they were really following a curved line, called a rhumb line. The globe Mercator produced in 1541 was the first to include rhumb lines.

Mercator's earlier disillusionment with Aristotle, whose teachings became inextricably intertwined with the Catholic Church, ultimately led to his uncertainty about Catholicism and an inclination toward Protestantism.

*(Continued on page 6)*

## NASA SPACE PLACE

**The Hidden Power of Sea Salt, Revealed****By Dauna Coulter**

Last year, when NASA launched the Aquarius/SAC-D satellite carrying the first sensor for measuring sea salt from space, scientists expected the measurements to have unparalleled sensitivity. Yet the fine details it's revealing about ocean saltiness are surprising even the Aquarius team.

"We have just four months of data, but we're already seeing very rich detail in surface salinity patterns," says principal investigator Gary Lagerloef of Earth & Space Research in Seattle. "We're finding that Aquarius can monitor even small scale changes such as specific river outflow and its influence on the ocean."

Using one of the most sensitive microwave radiometers ever built, Aquarius can sense as little as 0.2 parts salt to 1,000 parts water. That's about like a dash of salt in a gallon jug of water.

"You wouldn't even taste it," says Lagerloef. "Yet Aquarius can detect that amount from 408 miles above the Earth. And it's working even better than expected."



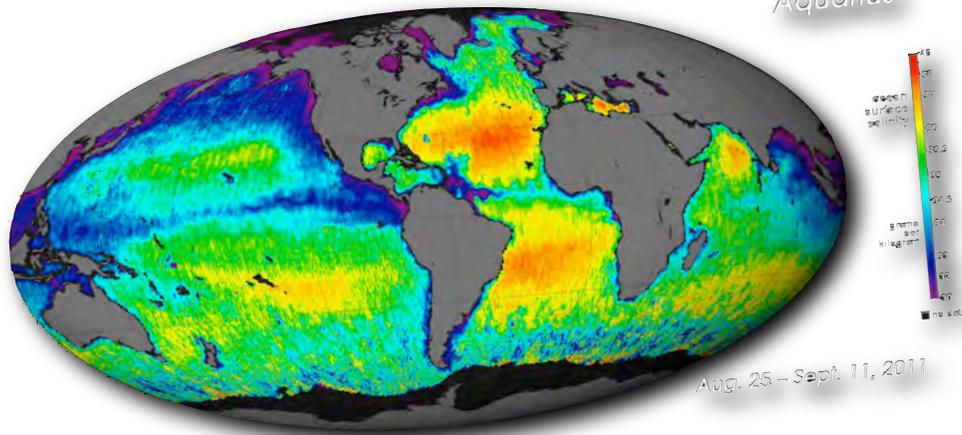
Salinity is critical because it changes the density of surface seawater, and density controls the ocean currents that move heat around our planet. A good example is the Gulf Stream, which carries heat to higher latitudes and moderates the climate.

"When variations in density divert ocean currents, weather patterns like temperature and rainfall are affected. In turn, precipitation and evaporation, and fresh water

the ocean. An accurate picture of the ocean's salinity will help scientists better understand the profound ocean/atmosphere coupling that determines climate variability.

"Ocean salinity has been changing," says Lagerloef. "Decades of data from ships and buoys tell us so. Some ocean regions are seeing an increase in salinity, which means more fresh water is being lost through evaporation. Other areas are getting more rainfall and therefore lower salinity. We don't know why.

We just know something fundamental is going on in the water cycle." With Aquarius's comprehensive look at global salinity, scientists will have more clues to put it all together. Aquarius has collected as many sea surface



*Aquarius produced this map of global ocean salinity. It is a composite of the first two and a half weeks of data. Yellow and red represent areas of higher salinity, with blues and purples indicating areas of lower salinity.*

from river outflow and melt ice determine salinity. It's an intricately connected cycle."

The atmosphere is the ocean's partner. The freshwater exchange between the atmosphere and the ocean dominates the global water cycle. Seventy-eight percent of global rainfall occurs over the ocean, and 85 percent of global evaporation is from

salinity measurements in the first few months as the entire 125-year historical record from ships and buoys.

"By this time next year, we'll have met two of our goals: a new global map of annual average salinity and a better understanding of the seasonal cycles that determine climate."

Stay tuned for the salty results. Read more about the Aquarius mission at [aquarius.nasa.gov](http://aquarius.nasa.gov).

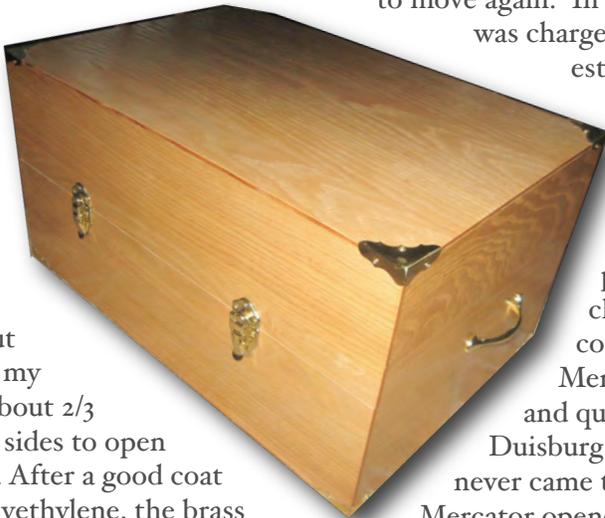
*(Continued on page 7)*

## MISCELLANEOUS

**Star Stuff****by Terry Alford***(continued from page 3)*

I used a router to form a rabbit around all the edges to give the edges a better look and also to make a much larger area to glue. Using regular yellow wood glue, the sides then the top and bottom were glued and clamped/strapped together to dry. This

produced a wooden box 11 X 15 X 22 inches. Then I carefully cut the box on my table saw about 2/3 way up the sides to open up the box. After a good coat of clear polyethylene, the brass hinges, carrying handles and corner protectors were installed. Using part of the packing material I have a well protected carrying case that should last for many years. Now when I travel with the scope I only have to grab the box, the leg set and my external battery to go observing.

**Happy Birthday****by Robin Byrne***(continued from page 4)*

In 1544, Mercator was arrested and found guilty of heresy, based upon his Protestant leanings, and his "suspicious" travels around the world. While others who had been arrested and charged at the same time had sentences that included

being burnt at the stake, beheading and being buried alive, Mercator had the amazingly light penalty of 7 months in jail. His release was likely aided by intervention from the University of Louvain. However, his criminal record took its toll on his finances - criminals were usually required to pay for their time in prison.

This was Mercator's motivation to move again. In 1552, Cassander was charged with

establishing a

university in Duisburg.

He contacted

Mercator and

offered him a

position as the

chair of

cosmography.

Mercator accepted

and quickly moved to

Duisburg. The university

never came to fruition, but

Mercator opened a

cartographic shop, and was soon making maps again. In 1554,

Mercator completed a large (5.3 foot

X 4.3 foot) map of Europe, which

incorporated a new projection

system developed by Johannes

Stabius. The quality of the map

established Mercator as a

preeminent mapmaker and ensured a

successful career. For once,

Mercator was financially secure. As

his reputation grew, Mercator

enjoyed many benefits, including, in

1564, being named Court

Cosmographer to Duke Wilhelm.

It was in 1569 that the name

"Mercator" would forever be

associated with the making of maps.

Mercator developed the idea of

**Regular Contributors****BRAD DUNN**

Brad is the current chair of the club and a member since 2007. During the day, he runs Dunn Professional Billing and Dunn Construction.

**BOB SMITH**

Bob is a founding member of BMAC, since 1980. He has also served as chair many times over the years. He currently works at Pioneer Industrial Sales.

**TERRY ALFORD**

Terry is also a founding member since 1980 and has been chair many times, as well. He has worked as an astronomy lab instructor at ETSU since 2001 and is also the sole proprietor of Celestial Woodworks.

**ROBIN BYRNE**

Robin has been writing the science history column since 1992 and was chair in 1997. She is an Associate Professor of Astronomy & Physics at Northeast State Community College (NSCC).

**ADAM THANZ**

Adam has been the Editor for almost all of the years since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

drawing a map such that all lines of latitude and longitude would be straight and at right angles to each other. He produced a wall map of the world, which he titled "New and more complete representation of the terrestrial globe properly for its use in navigation." This was the first time a "Mercator projection" was used. This representation was most useful to sailors, who could follow the straight lines of latitude and longitude using celestial navigation methods.

Another of Mercator's contributions to mapmaking was using the word "atlas" to describe a collection of maps. Mercator's reasoning for the name choice was "...to honour the Titan Atlas, King of Mauritanis, a learned philosopher, mathematician, and astronomer." Although not the first to publish an atlas, Mercator did begin work on one in 1578, which included corrections to maps first published by Ptolemy. His goal was to put in one place all of his detailed maps, in order to represent the entire world. It took several decades to complete, with the later sections produced by Mercator's son, Rumold.

Mercator was also one of the first to develop a method to mass produce globes. He broke the map into 12 sections, drawn on tapering gores. These were cut out and affixed to the globe, with circular pieces attached at the two poles. Many modern globes are still made using this same technique.

In 1590, Mercator had the first of 3 strokes that would debilitate him. Although partially recovered from his first stroke, and able to do some limited work, a second stroke in 1593 left him almost completely unable to speak. A third stroke in 1594 marked

the coming of the end. Gerard Mercator died December 2, 1594 in Duisburg.

Gerard Mercator's name will live on as a way of describing how a map is made. He will also live on in the form of an asteroid named after him: 4798 Mercator. Whether looking through an atlas, gazing at a globe, or studying a flat map, we encounter Mercator's legacy on a regular basis. Take a moment to reflect on this man who changed how we picture the world.

References:

Gerardus Mercator - Wikipedia  
[http://en.wikipedia.org/wiki/Gerardus\\_Mercator](http://en.wikipedia.org/wiki/Gerardus_Mercator)

Gerard Mercator  
<http://www.nndb.com/people/636/000038522/>

Mercator\_Gerardus biography by J. J. O'Connor and E. F. Robertson  
[http://www-history.mcs-st-and.ac.uk/Biographies/Mercator\\_Gerardus.html](http://www-history.mcs-st-and.ac.uk/Biographies/Mercator_Gerardus.html)

## Space Place

*(continued from page 5)*

Other NASA oceanography missions are Jason-1 (studying ocean surface topography), Jason-2 (follow-on to Jason-1), Jason-3 (follow-on to Jason-2, planned for launch in 2014), and Seawinds on the QuikSCAT satellite (measures wind speeds over the entire ocean). The GRACE mission (Gravity Recovery and Climate Experiment), among its other gravitational field studies, monitors fresh water supplies underground. All these missions, including Aquarius, are sponsors of a fun and educational ocean game for kids called "Go with the Flow" at [spaceplace.nasa.gov/ocean-currents](http://spaceplace.nasa.gov/ocean-currents).

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*Institute of Technology, under a contract, with the National Aeronautics and Space Administration.*

## TSSP 2012

The Cumberland Astronomical Society, Astronomy in the Parks Society, Dyer Observatory and Fall Creek Falls State Park will be hosting the Tennessee Spring Star Party 2012 on April 20-22 at Fall Creek Falls State Park in Pikeville, Tennessee.

As in the past, TSSP 2012 is free to attend and registration is not required. All are welcome to attend and are responsible for their food and lodging.

Fall Creek Falls is offering a star party package for those wishing to stay at the inn. Campsites are also available.

Call 1-800-250-8610 for reservations. Ask for the star party package for rooms at the inn.

There will be all night observing Friday and Saturday night on the observing field (observers are permitted to nap in their vehicles, but camping on the observing field is not permitted)

We will have a hospitality/warming tent on the observing field with warm beverages and snacks provided.

During the day on Saturday, there will be free programs offered in the Cascade Room. This year's speakers are: Terry Alford-"Useful astro accessories you can make from wood"

Bob Smith-"Sky cameras and all sky camera network"

Rocky Alvey-"Music from the stars"

Paul Lewis-"The solar system, from the sun to Pluto"

Tom Murdic-"Astro imaging primer"

There will be vendors set up in the lobby at the inn as well as a swap table.

Dyer Observatory will have their portable planetarium set up in the lobby of the inn. Show times will be posted.

<http://tn.gov/environment/parks/FallCreekFalls/>

For more information contact Lloyd Watkins - [watkinslk@comcast.net](mailto:watkinslk@comcast.net)

Allen Ball - [tnscooper@gmail.com](mailto:tnscooper@gmail.com)

# The Bays Mountain Astronomy Club



Find out more at our website:

[www.baysmountain.com](http://www.baysmountain.com)

Edited by Adam Thanz:

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## Dues:

The Bays Mountain Astronomy Club requires annual dues for membership. It covers 12 months and is renewable at any time.

## Rates:

\$12 /person/year

\$4 /additional family member

If you are a Park Association member, a 50% reduction in fees is applied.

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Apple logo Made on a Mac!

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853 Bays Mountain Park Road  
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