

Bays Mountain Astronomy Club

☞ *Next Meeting: June 1* ☞

SKYWARD

Astronomy Day was great this year as usual. Thanks to all the club members who helped make this year's event a success. We had several displays set up in the Discovery Theater for the visitors to look at and club members on hand to answer questions. Several people came to the sun scope workshop and we built 10 super solar viewers. We then went out to the observatory to try them out. Along with the scopes we built, we had five other solar telescopes for the public to view the sun with. Terry and Paul both had their Lunt H-alpha scopes along with a couple other filtered scopes. Bob gave a talk to the public about using household items such as "pop tart" wrappers and cd's to use as filters to safely observe the sun. [Ed.: Sorry, these are not safe to use for solar viewing. It is the wrong kind of material.] Jason also gave a talk on how to use the Stellarium planetarium program on his computer. The last presentation of the evening was given by Paul Lewis in the planetarium, and as always, was action packed and full of information.

At the April meeting, Adam went over the procedures for making the



solar scope for the members who could not be at Astronomy Day. We also agreed on July 14 as the date for the annual picnic and decided that it would again be held at the gazebo area at Natural Tunnel State Park. The location of the Transit of Venus public observing event will be at ETSU. Please see the additional article in this newsletter for details. We are still expecting a very large crowd of people, so we would appreciate it if you could arrive early to help with parking and setting up the solar scopes. Even if you do not have a scope with a solar filter, we need you to man additional scopes that ETSU and other BMAC members bring. We will have all the info on the location and discuss this event further at the June meeting.

George Privon will be the speaker for the June meeting. I have not heard a response on what the topic will be yet, but will let you know soon. Also, the election will be held for club chair. William Troxel has graciously put his name into the hat. We can accept nominations during the meeting as well if you are interested in running. Until we meet again, clear skies!

BY BRAD DUNN

Calendar

Special Events

- June 5 Venus Transit at ETSU! BMACers need to show up at 4 p.m. to set up.
- July 14 BMAC Picnic at Natural Tunnel at the gazebo, 6 p.m. Bring a dish to share and a chair to sit on.

SunWatch

- Every Sat. & Sun., 3 - 3:30 p.m.,
Mar. - Oct., weather permitting.
BMACers are always welcome to help.

BMAC Meetings

- 7 p.m., Discovery Theater
- June 1 George Privon will speak on a fascinating topic. VT details. BMAC elections will occur.
- Aug. 3 Topic TBA.

EYE TO THE SKY

BY BOB SMITH

June and July are always tough times for the amateur astronomer. The longer days make for correspondingly shorter nights and it's sometimes 11:00 p.m. before the sky really becomes dark enough for observing. Well, this month one of the most notable observing targets occurs in broad daylight.

On June 5th, our closest neighbor Venus crosses the face of the setting Sun for the second time this century. Beginning just after 6:00 p.m. local time, the inky black dot of Venus will begin its transit and will complete the journey until about 1:00 a.m. local time on the 6th. The Sun, of course, sets about 8:45 p.m. so Venus won't be quite half way in its journey across the Sun as the pair sink behind our East Tennessee ridge line. If you haven't been watching the Sun lately, get your solar filter adjusted and practice watching the Sun to be ready for the show on Tuesday the 5th. A public observing is scheduled and we need all members who are available to help out. Remembering the huge crowds we had at the early morning transit back in 2004, we could be overwhelmed if the weather is good. I'm sure there will be media interest leading up to the event and that will only mean more folks showing up to observe. I can't wait.

Use the Sun's location against the horizon at sunset to locate another celestial visitor toward the end of the month. Tiny Mercury puts on a really good show in the western evening sky starting around the 10th. The innermost planet will be almost 10° above the horizon and magnitude -1 at this time and should be pretty easy to spot with a clear horizon. A sweep with binoculars will definitely pick up the bright planet. If your

telescope is handy, a glance at Mercury will show a 5 arcsecond disk which is almost totally illuminated. The planet continues to rise through the end of the month when it is 26° from the Sun. By the first of July, the tiny planet is slightly larger in the telescope but a little less than half illuminated and magnitude 0.4. It will quickly slide from its position through the first week of July and back to the morning sky.

Our friend Mars is on the move through the month of June. It is high in the sky and a little to the southwest at the start of the month but is moving eastward against the background stars. It began last month fairly close to Regulus in Leo. Notice how far it has traveled in the last month—from southern Leo over into Virgo by the end of June. Its distance from Earth is increasing and this shows in the telescope with the face of the planet dropping below 5 arcseconds across. Mars ends the month at around magnitude 0.8. The waxing crescent Moon passes a little over 5° south of Mars on the 26th.

Getting back to Venus, it will quickly bounce back into the morning sky after its meeting with the Sun on June 5th and should be visible in the pre-dawn sky after about the 10th. Venus is lower but fairly close to Jupiter which has also just returned to the morning sky. The morning of June 17th finds bright Jupiter, the thin crescent Moon, Venus and the Hyades forming a beautiful string of light above the eastern horizon. This will be a perfect setting for a photo if you're an early riser.

A partial lunar eclipse occurs the morning of June 4th but we will only get a glimpse at the beginning of the

eclipse around 6:00 a.m. local time. If the morning is clear, you may be able to follow the shadow of the Earth sliding across the Moon through a pair of binoculars even after sunrise.

Summer solstice is June 20th this year at 7:09 p.m. EDT.

STAR STUFF

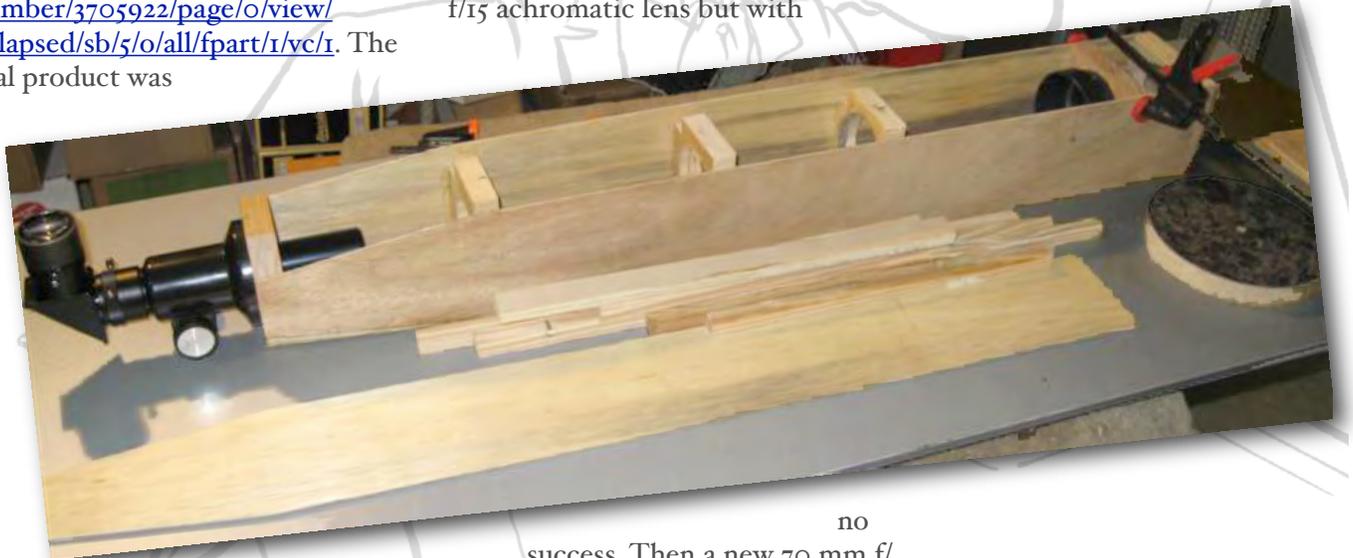
BY TERRY ALFORD

A little over a year ago, a guy on the Cloudy Nights ATM forum started describing his new build. The ATMer, Jerry Oltion, decided to “scale up” an existing telescope design, the venerable Edmund AstroScan. Jerry's goal was to double the size of the Astroscan. He put a lot of time, effort and thought in crafting a complete scope with an 8-in primary mirror and making it look exactly like the old AstroScan. The forum thread can be found here: <http://www.cloudynights.com/ubbthreads/showflat.php/Cat/o/Number/3705922/page/o/view/collapsed/sb/5/o/all/fpart/1/vc/1>. The final product was

refractor on a Dobsonian-style mount. I used the book as a guide in my early ATMing days to make several 6-inch and 10-inch Dobs. The refractor project looked pretty neat but once having a 6-inch f/8 refractor and realizing how big it really was I did not want an f/15. Then, “BINGO,” why not scale down a telescope? Why not build a refractor like the one in the book but at one-half the scale? It should be a simple project and not very expensive. Plus, it would be light and easy to mount.

For a while, I looked for a 3-inch f/15 achromatic lens but with

access to the optics. This project is not very difficult and should be finished soon. Originally, I was going to build the tripod from the book, also scaled down. But now I am leaning towards using an existing tripod. Decisions, decisions.



really cool! In fact, this scope project was the feature of last September's issue of Sky & Telescope's ATM column.

This got me thinking about a new scope project. I have had two AstroScans over the years and did not want to even try to duplicate what Jerry had done. Instead, I decided to build another one of the scopes in Richard Berry's mid 1980's book “Build Your Own Telescope.” It describes in great detail how to make four reflectors from four to ten inches in aperture and a six inch f/15

no success. Then a new 70 mm f/13 Celestron lens in a cell popped up on CloudyNights.com classifieds at a great price. I bought it and started making plans for a scope that was scaled down to about 45% of the original size.

The photo shows where the project is today. I used 1/8-in plywood for the scope walls and common 3/4-in pine for the baffles. The piece holding the focuser is red oak. So far everything is just glued together but the final iteration will have the top screwed on to allow

HAPPY BOOK REVIEW

BY ROBIN BYRNE

The Construction of the Heavens: William Herschel's Cosmology by Michael Hoskins

If you are like me, when you think of William Herschel, you think of a purely observational astronomer. However, after reading "The Construction of the Heavens" by Michael Hoskins, I have discovered that there was much more to Herschel than I originally thought.

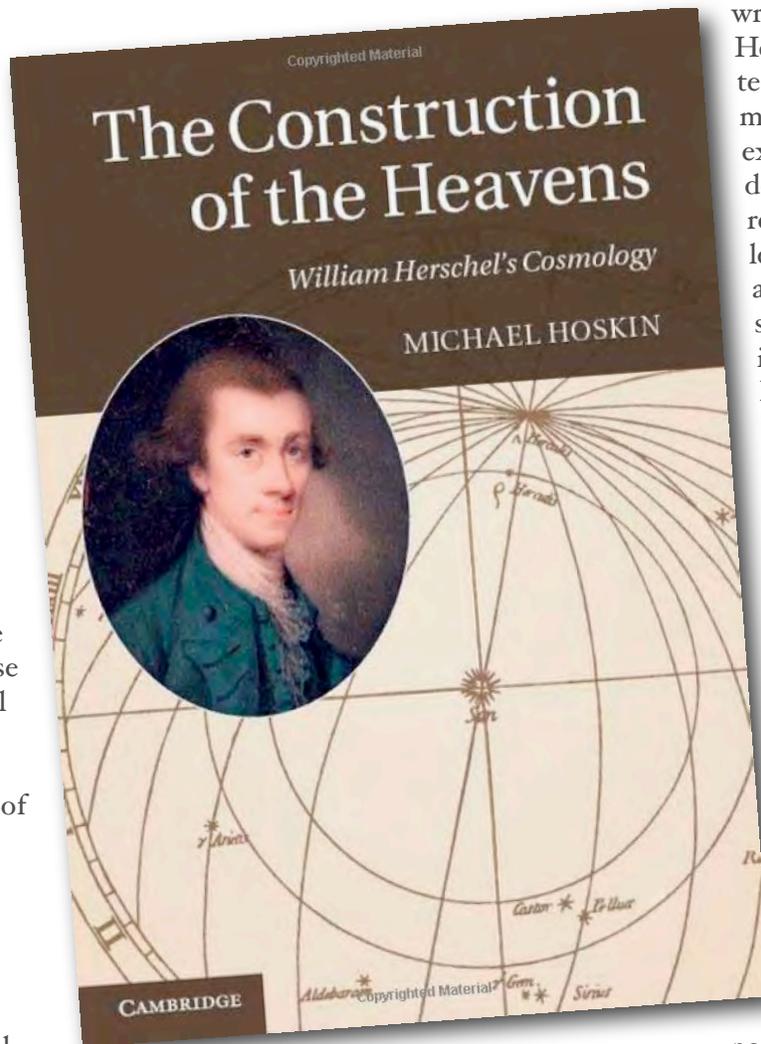
The book itself is divided into two parts. The first section provides a brief biography of Herschel, but primarily focuses on his astronomical research. The second half of the book is a sampling of papers Herschel wrote from 1783 - 1814. From the biography, you get a glimpse of Herschel's observational side, with mentions of his discovery of Uranus, large telescopes, and catalogues of celestial wonders found in the night sky. This is the side of Herschel that most readily comes to mind.

The remainder of the book exposed me to new insights regarding Herschel. His interest in cataloging deep sky objects went beyond purely amassing a collection of discoveries. Herschel was trying to understand the nature of the universe. His quest for ever larger telescopes was more than "aperture fever." Herschel was hoping to resolve these objects with

greater clarity in order to better understand what he was observing. He reasoned, at first, that all nebulae would resolve into collections of stars, if only he could see them in more detail. However, he later decided that some

and life of stars. Surprisingly close to the truth, in some cases.

While the book covers a very interesting subject, I was slightly disappointed by Hoskin's writing style. In particular, when summarizing Herschel's writings, Hoskins chose to use Herschel's original terminology, rather than more current wording. As an example, when Herschel described his telescopes, he referenced them by their length, rather than their aperture, as is the modern standard. Rather than including their apertures, Hoskins perpetuated Herschel's style and primarily included only the length. In another instance, Herschel explains why stars in a cluster don't all gravitationally coalesce due to "projectile forces" keeping them in motion. Once again, Hoskins duplicates this strangely archaic terminology, instead of a more accurate description of the stars' motions. Reading Herschel's original papers, on the other hand, was fascinating. Although



nebulae were composed of some substance other than stars, although he could not understand what would make them glow. This discovery led Herschel to conclude that the objects he catalogued, from nebulae to star clusters, were representing various stages in the development

not reproduced in their entirety (some of the papers were originally over 100 pages in length), each one helps to illuminate Herschel's thought processes. It was also interesting to see which ideas required extensive explanations,

(Continued on page 6)

NASA SPACE PLACE

Thank Goodness for Magnetism

By Dr. Tony Phillips

Only 93 million miles from Earth, a certain G-type star is beginning to act up. Every 11 years or so, the solar cycle brings a period of high solar activity. Giant islands of magnetism—"sunspots"—break through the stellar surface in increasing numbers. Sometimes they erupt like a billion atomic bombs going off at once, producing intense flares of X-rays and UV radiation, and hurling massive clouds of plasma toward Earth. This is happening right now. Only a few years ago the Sun was in a state of deep quiet, but as 2012 unfolds, the pendulum is swinging. Strong flares are becoming commonplace as sunspots once again pepper the solar disk. Fortunately, Earth is defended from solar storms by a strong, global magnetic field.

In March 2012, those defenses were tested.

At the very beginning of the month, a remarkable sunspot appeared on the Sun's eastern limb. AR1429, as experts called it, was an angry-looking region almost as wide as the planet Jupiter. Almost as soon as it appeared, it began to erupt. During the period March 2nd to 15th, it rotated across the solar disk

and fired off more than 50 flares. Three of those eruptions were X-class flares, the most powerful kind.

As the eruptions continued almost non-stop, Earth's magnetic field was buffeted by coronal mass ejections or "CMEs." One of those clouds hit Earth's magnetosphere so hard, our planet's magnetic field was sharply compressed, leaving geosynchronous satellites on the outside looking in. For a while, the spacecraft

enough energy in three days alone (March 7-10) to power every residence in New York City for two years. Bright auroras circled both poles, and Northern Lights spilled across the Canadian border into the lower 48 states. Luminous sheets of red and green were sighted as far south as Nebraska.

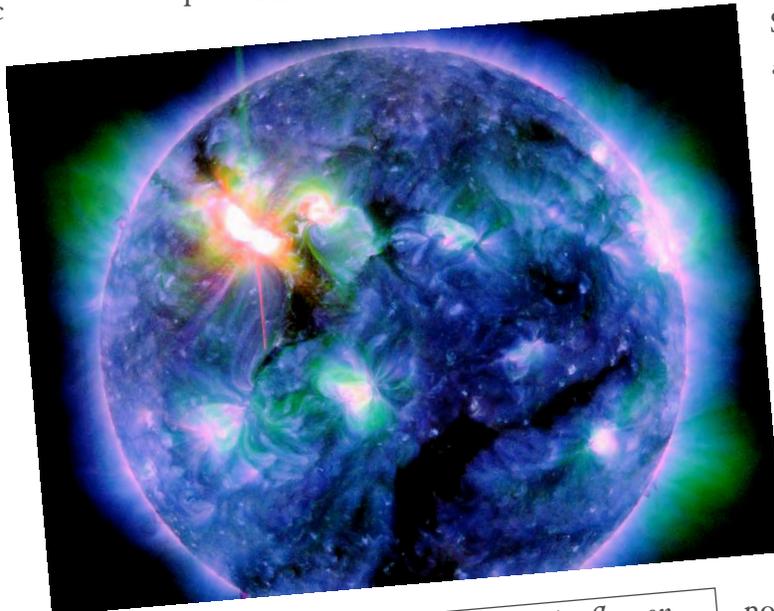
When all was said and done, the defenses held—no harm done.

This wasn't the strongest solar storm in recorded history—not by a long shot. That distinction goes to the Carrington Event of September 1859 when geomagnetic activity set telegraph offices on fire and sparked auroras over Mexico, Florida, and Tahiti. Even with that in mind, however, March 2012 was remarkable. It makes you wonder, what if? What if Earth didn't have a magnetic field to fend off CMEs and deflect the most energetic particles from the Sun.

The answer might lie on Mars. The red planet has no global magnetic field and as a result its atmosphere has been stripped away over time by CMEs and other gusts of solar wind. At least that's what many researchers believe.

Today, Mars is a desiccated and apparently lifeless wasteland. Only 93 million miles from Earth, a G-type star is acting up. Thank goodness for magnetism.

(Continued on page 6)



Multiple-wavelength view of X5.4 solar flare on March 6, captured by the Solar Dynamics Observatory (SDO) in multiple wavelengths (94, 193, 335 angstroms). Credit: NASA/SDO/AIA

were directly exposed to solar wind plasma.

Charged particles propelled by the blasts swirled around Earth, producing the strongest radiation storm in almost 10 years. When those particles rained down on the upper atmosphere, they dumped

MISCELLANEOUS

Happy Birthday

by Robin Byrne

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rather than being considered common knowledge. Something as simple as concluding that stars in a cluster are truly associated with each other in space, rather than being a random alignment of disparate bodies, required an extensive statistical analysis to support the conclusion.

All in all, If you enjoy the historical development of ideas in astronomy, and don't mind slogging through some difficult reading, you will likely appreciate "The Construction of the Heavens" by Michael Hoskins.

The Construction of the Heavens: William Herschel's Cosmology, Michael Hoskins, Cambridge University Press, ISBN 978-1-107-01838-9

NASA Space Place

(continued from page 5)

With your inner and outer children, read, watch, and listen in to "Super Star Meets the Plucky Planet," a rhyming and animated conversation between the Sun and Earth, at <http://spaceplace.nasa.gov/story-superstar>.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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

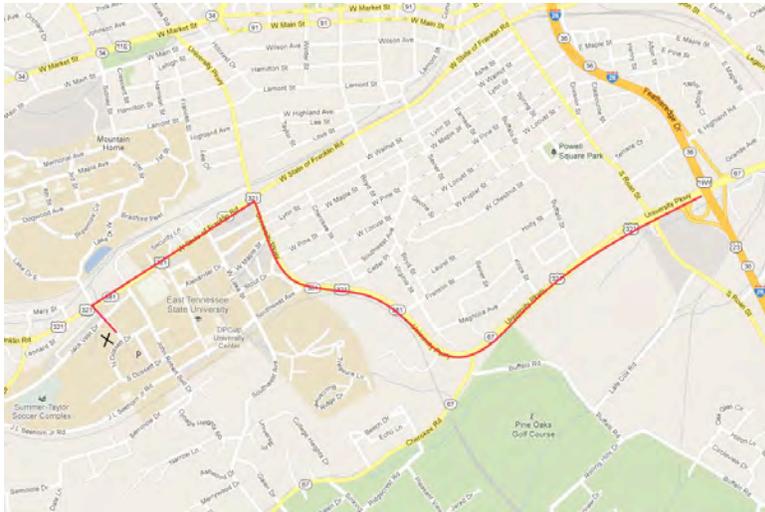


Adam has been the Editor for almost all of the years since 1992. He is the Planetarium Director at Bays Mountain Park as well as an astronomy adjunct for NSCC.

Transit of Venus - Observing Session

BMACers are needed for this rare and wonderful event. It will occur on Tuesday, June 5, 2012. Public access will start at 5:30 p.m. But, BMACers are asked to arrive at 4 p.m. so as to set up equipment, move their cars to an alternate parking area after unloading, help with placing signs and warning tape, and more.

If you have a telescope(s) with a **PROPER** solar filter, then please bring it. If you have more than one, please bring them as well. If you don't have a scope with a solar filter, please come anyway so as to man the extra scopes other BMACers and ETSU Astro Dept. brings. We are expecting thousands of people. The more scopes, the easier it will be to handle the crowd. This is our chance to really do a great job to help promote the club and astronomy. If you have a scope with a tripod, please have a piece of cardboard or wood under the feet to not make a hole in the field. There will be bathrooms and water fountains nearby, but please



bring your own food, drinks, chair, and sun protection like a hat and sunscreen. If the weather holds and folks are still around, we will all stay later to view Mars and Saturn. Everything will end by 10 p.m.

Telescopes will be set up on the athletic fields located on the West

end of the ETSU campus just North of the Basler Center for Physical Activity. Please see the maps.

Transit Details:
6:04 p.m. - Transit begins
6:22 p.m. - Venus completely within the disk of the Sun
8:45 p.m. - Sunset
Please note that in the event of inclement weather or heavily overcast skies preventing the Sun to be seen, the

event will be cancelled. For more information about the event contact the ETSU Department of Physics & Astronomy at (423) 439-6906 or Bays Mountain Park at (423) 229-9447.

Directions:

From Interstate 26 (I-26):

Take exit 24 for US321/TN-67

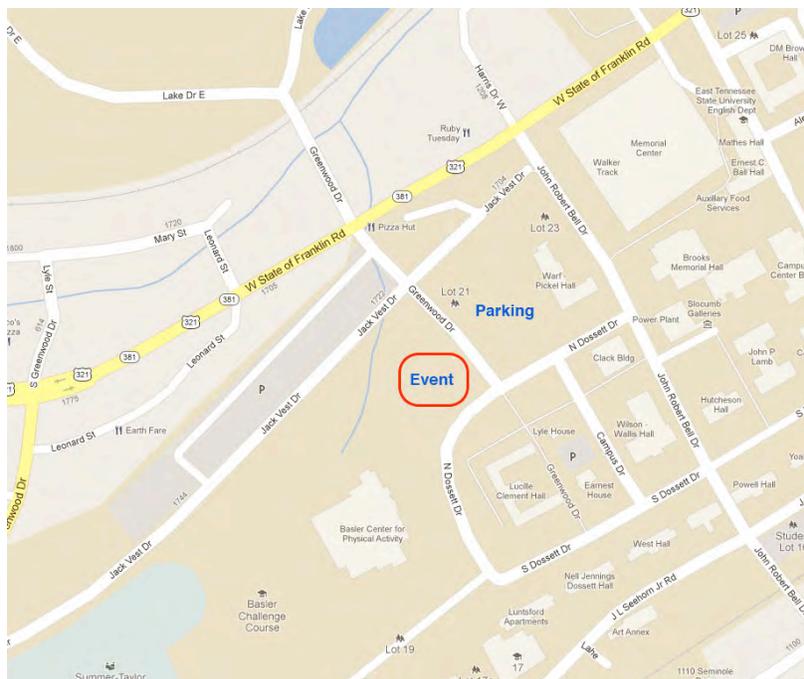
At the end of the exit ramp, Turn left onto University Pkwy.

Turn left onto W. State of Franklin Rd.

Turn left onto Greenwood Dr.

Cross Jack Vest Dr., public parking is on the left and the observing is on the field to the right.

Note to BMACers, we will be parking in the lot that is north of the observing field to free up as much space as possible for the public.



The Bays Mountain Astronomy Club



Find out more at our website:

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.

 Made on a Mac!

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Aug. 3 Topic TBA.

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853 Bays Mountain Park Road
Kingsport, TN 37660