

Bays Mountain Astronomy Club

☞ *Next Meeting: Mar. 4* ☞

SKYWARD

We had another very interesting talk last month about the reversal of the earth's magnetic field by Dr. Michael Whitelaw from ETSU. He explained the processes that will take place as the polarity change gets nearer, and put to rest some of the myths and misconceptions that surround this event.

If your scope's are anything like mine, they haven't seen a lot of action the past couple of months due to the cold weather. I love to observe during the winter months, but sometimes it's just too cold to justify getting all of your gear out. I have spent the past two months waiting on warmer weather and now it's here. The skies are a real treat this time of year for observing. It's cold enough for the skies to be crystal clear but warm enough to be enjoyable, so get out there, dust off those scopes, and look up!

Speaking of dusting off the scopes, instead of having a speaker at the march meeting, we are going to have a cleaning day in preparation for the spring observing. We have tried to clean the dome walls several times in the past but I think we need to just put a fresh coat of paint this



time. I bought a new paint made by Dry Lock that will help control the mold that we have battled in the past. When we move all the equipment outside to paint the walls, we can clean it all as we put it back inside. This will probably take a little more time, so I will be there early. If a couple other members could get there early to help me move some stuff, that would be great! We should probably start at 6:30, so if we get done extra early, maybe we can do a little observing. Please bring rags, brooms, etc. and some elbow grease to get the observatories spiffy! Until then, take advantage of these beautiful February nights and look up! Clear skies!!

BY BRAD DUNN

Calendar

Special Events

May 7 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. 5 & 12

8 p.m.: Mar. 19 & 26

8:30 p.m.: Apr. 2, 9, 16, 23, & 30

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

BMAC Meetings

6:30 p.m., Observatory

Mar. 4 Observatory cleaning fun.

7 p.m., Discovery Theater

Apr. 1 J. Kelly Smith from ETSU will speak on solar radio astronomy.

EYE TO THE SKY

BY BOB SMITH

The early spring observing season opens with a few planets in the evening sky and even more in the morning sky. This should provide us with lots of observing opportunities at our StarWatches if the weather cooperates. Also this month we have conjunctions, asteroids and space dust in the line up.

The observing season for Jupiter is just about over. The “King of Planets” is sinking lower in the west each evening. The magnitude -2.1 giant begins the month still fairly high in the southwest, but by the end of March Old Jove will sink out of sight. Use the first few weeks of the month to study the planet and its collection of moons.

Around the middle of the month, we can use Jupiter as a brilliant pointer to another planet—tiny Mercury. The innermost planet will spring into the evening sky by around the 10th if you have a clear horizon. At magnitude -1.3 it should be bright enough to spy through the haze near the horizon and located just below Jupiter, but you might have to use binoculars to initially pick up Mercury. As the middle of the month approaches, Mercury will rise even higher and eventually stand over Jupiter. The duo spends the middle of March within a couple of degrees of each other. Mercury continues to rise until its greatest elongation on March 22nd when it is well over 10 degrees above the horizon and about magnitude -0.3. This same day the disk of the planet shows a respectable 7" face that is just about half lit. Also by this date, the MESSENGER spacecraft should be safely in orbit around the innermost planet. Launched from Florida in 2004, the vehicle will

provide us with a wealth of detail about Mercury and its environment over the next year. Be sure to check out the NASA website toward the end of the month.

Saturn is slowly returning to the evening sky and rises at sunset by late March. The rings are gradually opening more to our line of sight making it easier to spot the Cassini division which splits the ring system. The bright moon Titan is easy to find as it loops around the “Ringed World” sitting north of Saturn on March 8th and 24th. It is found south of the planet on March 16th and April 1st. Spend some time with Saturn and Titan and also try to spot the three 10th magnitude moons Tethys, Dione and Rhea. Consult a chart or the internet for their location before observing so you can be sure of the moon's positions and not confuse them with any dim stars in the area.

As we move into the early morning hours, Venus continues to dominate the pre-dawn scene although not quite as high as past months. I was really surprised in February at how high Venus appeared on the few clear cold mornings I observed. It rises well before the Sun and is still quite high in early March but begins to lose some altitude as the month progresses. By the end of March, Venus is beginning to retreat faster toward the Sun and is only visible for maybe a half hour before Old Sol appears. On March 1st, a thin crescent Moon is located just 5° to Venus' left. Then again on the 31st, the crescent Moon is the same distance from Venus and slightly higher. If you're up early either of those mornings try a photo of the

dynamic duo. Sit your digital camera on a tripod or sturdy support. Turn off the flash and slowly depress the button. If you have timer control, try a few shots up to about 10 seconds. And be sure to include a foreground object for reference.

On clear evenings or pre-dawn mornings be sure to look for the Zodiacal light stabbing up into a dark sky from the Sun's location just under the horizon. This time of year, the plane of the Solar System is turned almost perpendicular to the Earth's horizon and the ghostly light is most pronounced. I have seen it many times in the west at sunset (in a dark sky) shining all the way up to the Pleiades. It's a very subtle sight somewhat like seeing the Milky Way in a slightly light polluted sky or maybe through thin haze.

I've been reporting the past few months on bright asteroids visible in our night skies. This month we have two 9th magnitude space rocks visible from sunset till well after midnight. Asteroid 3 Juno and 20 Massalia both reach opposition this month and are found in southeastern Leo within about 5° of each other. Juno will sail about a half a degree south of Sigma (σ) Leonis on March 22nd and 23rd. Massalia is less than a tenth of a degree south of Tau (τ) Leonis on the 23rd. Let's hope for clear skies that Wednesday. Maybe we can catch both on the same night. You need to make a quick sketch (or photo) of the area then look again the next night to confirm which point of light is the asteroid. Asteroid 3 Juno was found on September 1, 1804 and named for the highest of Roman goddesses. It has

(continued on page 6)

STAR STUFF

BY TERRY ALFORD

My first ATM (Amateur Telescope Making) project 30 years ago was making an equatorial mount out of commonly available galvanized pipe fittings. It turned out to be a pretty decent mount (wish I still had it or even a pic of it... sigh) and it cost a fraction of the price of a new EQ mount capable of handling an 8-in f/6 Newtonian.

This day that I had been looking for a lathe to make eyepieces and other telescope parts. "What size lathe do you need?" he asked. I replied that I wanted a smallish tabletop model no more than two ft. long. "Let me show you something" he said.

One day back in the mid-80's, a couple and the man's father moved into the house next door. It wasn't very long before the father and I

started having friendly conversations. He was a retired machinist and told some interesting stories. I mentioned to him

We walked into his basement. On a shelf was a small box. I thought, surely there can't be a lathe in there! He opened the box and inside was an unused Unimat SL miniature lathe. I had read about these and they were highly endorsed by hobbyists such as model makers and even craftsmen such as watch repairmen. This lathe would turn cylinders up to two inches and even more with some adapters. This lathe would clearly satisfy my ATMing needs but these puppies were expensive, costing around \$400 in

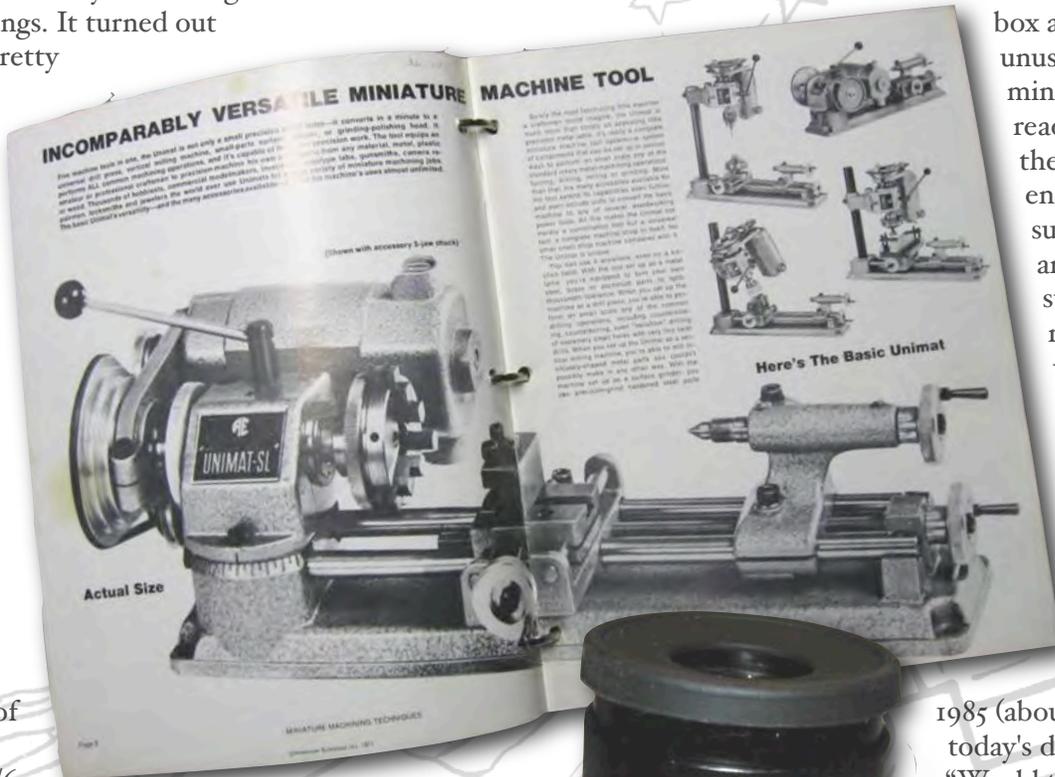
1985 (about twice that in today's dollars).

"Would this work for you?" he asked. "Certainly", I replied, "but I can't afford one of those." He explained that he had taken the Unimat in as partial trade for a job 10 years earlier. He had no need for it and would I consider buying it for \$100.

SOLD!

This little lathe has been a tremendous source of satisfaction for me helping make all kinds of eyepieces, adapters and various telescope parts. It has also been helpful in making many toys for my

(continued on page 6)



*HAPPY BIRTHDAY URANUS**BY ROBIN BYRNE*

This month we celebrate the discovery of a planet whose name has been the “butt” of many jokes over the years. Because it is barely visible to the naked eye, under ideal conditions, Uranus had been observed many times throughout history, although considered a star rather than a planet. The first recorded sighting was by John Flamsteed in 1690, at which time he designated it 34 Tauri, considering it merely a star in Taurus.

It wasn't until Sir William Herschel observed it, that the nature of this object began to be understood. On the evening of March 13, 1781, William Herschel first spied an object in his telescope that he thought must be a comet. As he observed it at various magnifications, he knew it couldn't be a star, since, unlike a star, it showed a disk at higher magnifications. Four nights later, observing this “comet” again, he noticed that it had moved relative to the background stars, confirming his suspicions that it was a comet.

While Herschel was reluctant to call this new object a “planet,” others were not. After Herschel notified Nevil Maskelyn, the Astronomer Royal, Maskelyn observed that it had no coma or tail, like a comet, and thought it was more like a planet. Anders Johan Lexell, a Russian astronomer, computed the orbit, and found it to be closer to a circular orbit, like the planets, than the more typically elliptical orbits associated with comets. Similarly, Johann Bode in Germany felt the orbit was more like that of a planet. While others more readily accepted this new planet, it took Herschel two years to

conclude that it was, indeed, a planet. At a distance from the Sun of roughly twice that of Saturn, this discovery effectively doubled the size of the known Solar System!

In recognition of his achievement, King George III gave Herschel an annual stipend of 200 Pounds, and encouraged Herschel to move to Windsor, so that the royal family could observe this object



through Herschel's telescopes. Meanwhile, Maskelyn felt that Herschel, as the rightful discoverer, should be given the honor of naming this new planet. In repayment for the King's generosity, Herschel proposed the name *Georgium Sidus*, literally, George's Star. In addition to acknowledging his new benefactor, Herschel also thought that the name should correspond with the era of discovery. Just as the planet names from antiquity say something about the time in which they were named, this name would forever identify this planet's discovery with the reign of King George III. However, outside

of those in England, most astronomers around the world were not happy about one country's monarch being singled out. Other suggestions included naming it Herschel (suggested by Lalande) and Neptune (Prosperin's proposal). It was Bode who suggested Uranus, after the Greek god of the sky. In mythology, Saturn is the father of Jupiter, and Uranus is the father of Saturn. One of Bode's colleagues, Martin Klaproth, was so enamored with this name, that he used it to name a new element he had discovered: uranium. Interestingly, this is the only planet whose name is derived from its Greek origin rather than from the Roman version. Bode's suggestion won universal favor, and was adopted by most countries immediately, although it wasn't until 1850 that England finally recognized this name over the one honoring King George.

Most of what we know about Uranus comes from the January 1986 Voyager 2 fly-by, which was our only up-close encounter with this planet to date. We now know that Uranus and Neptune both have an internal structure that is composed of a rocky core, an outer layer of hydrogen and helium gasses, and is dominated by an internal layer of water, ammonia and methane ices, giving them a sub-classification as “Ice Giants.” However, the “ice” is actually more of the consistency of a hot, dense fluid due to the immense pressures in the planets' interiors. Because this layer is electrically conductive, and likely the source of Uranus' magnetic field, it is sometimes referred to as a water-ammonia ocean.

(continued on page 6)

NASA SPACE PLACE

Thank Goodness the Sun is Single**By Trudy E. Bell**

It's a good thing the Sun is single. According to new research, Sun-like stars in close double-star systems "can be okay for a few billion years—but then they go bad," says Jeremy Drake of the Harvard-Smithsonian Astrophysical Observatory in Cambridge, Mass.

How bad? According to data from NASA's Spitzer Space Telescope, close binary stars can destroy their planets along with any life. Drake and four colleagues reported the results in the September 10, 2010 issue of *The Astrophysical Journal Letters*.

Our Sun, about 864,000 miles across, rotates on its axis once in 24.5 days. "Three billion years ago, roughly when bacteria evolved on Earth, the Sun rotated in only 5 days," explains Drake. Its rotation rate has been gradually slowing because the solar wind gets tangled up in the solar magnetic field, and acts as a brake.

But some sun-like stars occur in close pairs only a few million miles apart. That's only about five times the diameter of each star—so close the stars are gravitationally distorted. They are actually elongated toward

each other. They also interact tidally, keeping just one face toward the other, as the Moon does toward Earth.

Such a close binary is "a built-in time bomb," Drake declares.

The continuous loss of mass from the two stars via solar wind carries away some of the double-star system's angular momentum, causing the two stars to spiral inward toward each

interact magnetically very violently, shooting out monster flares."

Worst of all, the decreasing distance between the two stars "changes the gravitational resonances of the planetary system," Drake continued, destabilizing the orbits of any planets circling the pair. Planets may be so strongly perturbed they are sent into collision paths. As they repeatedly slam into each other, they shatter into red-hot asteroid-sized bodies, killing any life. In as short as a century, the repeated collisions pulverize the planets into a ring of warm dust.

The infrared glow from this pulverized debris is what Spitzer has seen in some self-destructing star systems. Drake and his colleagues now want to examine a much bigger sample of binaries to see just how bad double star systems really are.

They're already sure of one thing: "We're glad the Sun is single!"

Read more about these findings at the NASA Spitzer site at

www.spitzer.caltech.edu/news/1182-ssc2010-07-Pulverized-Planet-Dust-May-Lie-Around-Double-Stars.

For kids, the Spitzer Concentration game shows a big collection of memorable (if you're good at the game) images from the Spitzer Space Telescope. Visit spaceplace.nasa.gov/en/kids/spitzer/concentration/.

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



Planetary collisions such as shown in this artist's rendering could be quite common in binary star systems where the stars are very close.

other, orbiting faster and faster as the distance shrinks. When each star's rotation period on its axis is the same as its orbital period around the other, the pair effectively rotates as a single body in just 3 or 4 days.

Then, watch out! Such fast spinning intensifies the magnetic dynamo inside each star. The stars "generate bigger, stronger 'star spots' 5 to 10 percent the size of the star—so big they can be detected from Earth," Drake says. "The stars also

MISCELLANEOUS

Eye to the Sky**by Bob Smith***(continued from page 2)*

one of the most eccentric orbits of any of the main belt asteroids and measures about 180 X 120 miles in diameter. Asteroid 20 Massalia is much smaller—a very irregular 90 miles in diameter and was discovered in September 1852.

The Earth's Vernal Equinox occurs this year on March 20 at exactly 7:21 p.m. EDT. This marks the crossing of the Celestial Equator by the Sun and the start of spring in the northern hemisphere. Full Moon was on the 19th so this makes Easter much later than it has been in the past few years. The next Full Moon is April 18th and Easter falls on April 24th.

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

kids, grandkids and even for the Marine's Toys for Tots program. Even though it is a little on the small side it will turn PVC, wood and even soft metals with precision.

It is difficult to say how many projects have been turned on that lathe or how much money I have saved by making many things instead of buying them. Example: last December I decided to order Orion's 7.2-21.5mm zoom eyepiece for dedicated use in my new Lunt solar scope. The eyepiece was on sale for \$150 and free shipping. I placed the order and was notified a few days later it was on back order until mid January. Hmmm. There was a very nice zoom eyepiece on my little used 60mm ED spotting scope. I wonder.... Yep, the zoom eyepiece

unthreaded from the spotting scope and with an adapter I made with the lathe it works great in the solar scope. I made some measurements and guess what? The spotting scope's focal length range was 7.2-21.5mm! The order for the Orion zoom eyepiece was canceled rather rapidly.

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

The lovely blue color of Uranus is due to clouds composed primarily of methane ices. During the Voyager 2 fly-by, the cloud tops showed virtually no distinct features. Unfortunately, this is because of Uranus' unusual seasons. Being tilted a little over 90 degrees relative to the plane of its 84-year orbit, the polar regions experience 42 years of darkness, followed by 42 years of sunlight. The fly-by was during midsummer for the pole facing the Sun. As such, with such a constant weather condition, not much activity was taking place. More recently, as Uranus has been in the fall/spring season, Hubble images indicate an increase in the development of cloud features.

How did Uranus get such an unusual tilt? It is widely believed that all the planets formed with axes roughly vertical relative to the plane of their orbit, and that any significant tilt must be due to a collision with a large protoplanet in the distant past. Until recently, that was the only explanation given. However, Gwenael Boue' and Jacques Laskar at the Paris Observatory have developed another model for Uranus' odd tilt. They have shown that it could instead be due to a large moon, whose gravity caused Uranus to

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.

wobble (much as our moon is responsible for Earth's 26,000 year precessional wobble). Over millions of years, the wobble would continue to be exaggerated, until it reached the current extreme. If that is true, where is the moon today? In the realm of the giant planets, it is possible for a passing planet to disrupt, or even steal, another planet's moons. If such a large protoplanet ventured near to Uranus, the moon could have been removed from the Solar System entirely.

While that recent study was concerned with Uranus' tilt, another recent study looked at the planet's interior. Up to 10% of Uranus' interior is composed of carbon under high pressure, which we usually think of as diamonds. What was not known about it until recently had to do with how diamonds behave at their melting point. Melting diamonds is not easy due to two facts: diamonds melt at extremely high temperatures, and, once melted, it reverts to graphite. In order to maintain a true diamond during the entire process, scientists had to melt it under extremely high pressure conditions, like those found in the interiors of the giant planets. What they discovered is that diamonds have something in common with water: the solid state has a lower density than the liquid state. For the vast majority of materials, the solid is more dense, and would sink. However, just as ice floats on water, solid diamonds float on top of liquid diamond. This strange characteristic in the behavior of diamonds may provide a clue as to why the magnetic field of Uranus is tilted so much relative to the axis of rotation.

Enigmatic since its discovery, Uranus continues to amaze and

surprise us with new possibilities. Although not currently well-placed for observing, this summer Uranus will grace our morning skies. Easily visible in a pair of binoculars or a small telescope, try to find this little blue dot. And if you'd like even more of a challenge, once spotted, see if you can pick it out naked-eye. Who knows? Maybe if you had been an ancient astronomer, this distant planet may have been known about all along!

References:

Uranus - Wikipedia

<http://en.wikipedia.org/wiki/Uranus>

Uranus

Diamond Oceans Possible on Uranus, Neptune: Discovery News
Eric Bland

<http://news.discovery.com/space/diamond-oceans-jupiter-uranus.html>

Has the Mystery of Uranus' Tilt Been Solved?: Discovery News

Ian O'Neill

<http://news.discovery.com/space/has-the-mystery-of-uranus-tilt-been-solved.html>

ALCON 2011

Dear Fellow Astro-League Members:

As you may know ALCON 2011 will be happening this year from Wednesday June 29th through the Night of Saturday July 2nd 2011 at Bryce Canyon National Park. This year ALCON will be co-hosted by the Astronomy League, the Salt Lake Astronomical Society and Bryce Canyon National Park. We are very excited about this particular ALCON because of the location and focus on observing at one of the darkest skies in the lower 48. We have an outstanding line-up of speakers, events, sponsors and vendors including John Dobson, Carolyn Shoemaker and others, hands on demonstrations, a live feed remote telescope for imaging and southern hemisphere site viewing, a Star-B-Q dinner and much more. Please see the ALCON page for the latest line-up of speakers.

<http://alcon.astroleague.org/>

We also have a commitment from Orion Telescopes to bring one of their Monster Dobs for us to look through, we are all looking forward to getting a view through one of these monsters. So far we have two observing sites secured, one will be a traditional Public Star Party with the park public, often from all around the world, attending in conjunction with Bryce Canyon's Annual Astronomy Festival as well as a separate site dedicated to just observing for ALCON attendees only. Both sites are very dark, the public usually departs the public site by midnight leaving the field for us till sunrise. During the day we will have speakers, a swap meet, vendors and of course Bryce Canyon National Park, one of the most stunningly beautiful spots on Earth and one of the oldest National Parks in the National Parks system.

As you can imagine this is a great location for an ALCON. As such our initial block of 100 reserved hotel rooms at Ruby's Inn has sold out even before we actively advertised the event. We have never seen an ALCON get this level of response this early on, this ALCON is truly going to be special. Ruby's Inn has agreed to open more rooms at our special rate but they will not last long. Please let your club members know that if they are considering attending they should act quickly, I don't know how long these rooms will last at the discounted rate of about \$71.25 per night plus tax. We cannot guarantee our special rate will last. These rooms usually go for quite a bit more. Ruby's Inn will be the center of all our non-observing events and is a full service resort located at the mouth of Bryce Canyon.

There are additional accommodations available in the area if Ruby's completely fills as well as camping and RV sites for those that prefer RV'ing and camping. If you have members interested in attending please act quickly. Registration for ALCON will be open shortly, however we encourage you to get your accommodations set now. Bryce Canyon is a very popular Park and will likely fill.

We hope to see you at this year's ALCON. If you have additional questions please don't hesitate to contact us. Please see the ALCON page for additional information regarding the event as well as travel information about getting to Bryce.

<http://alcon.astroleague.org/accommodations>

<http://www.nps.gov/brca/index.htm>

<http://slas.us/>

Clear Skies,
Robert L. Taylor
ALCON 2011 Publicity Committee
Chair

The Bays Mountain Astronomy Club



Find out more at our website:

www.baysmountain.com

Edited by Adam Thanz:

thanz@ci.kingsport.tn.us

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.

Calendar

Special Events

May 7 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. 5 & 12

8 p.m.: Mar. 19 & 26

8:30 p.m.: Apr. 2, 9, 16, 23, & 30

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

BMAC Meetings

6:30 p.m., Observatory

Mar. 4 Observatory cleaning fun.

7 p.m., Discovery Theater

Apr. 1 J. Kelly Smith from ETSU will speak on solar radio astronomy.

 Made on a Mac!

Bays Mountain Astronomy Club
853 Bays Mountain Park Road
Kingsport, TN 37660