

The newsletter of the Barnard Seyfert Astronomical Society, PO Box 150713, Nashville, TN 37215-0713

Upcoming Events

Board of Directors Meeting

March 7th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

April 4th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

March 21st at the Cumberland Valley Girl Scout Council Building – 7:30 pm

April 18th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Star Parties

March 17th – BSAS Public Star Party at Long Hunter State Park - 8-10 pm

March 24th – Messier Marathon at Spot Observatory (alt date April 21st)

March 30th – BSAS Public Star Party at Bowie Nature Center (Fairview) 8-10 pm

March 31st – BSAS Public Star Party at Adventure Science Center 8:30 - 9:30 pm

April 28th – BSAS Public Star Party at Edwin Warner Park - 8-10 pm

In this issue:

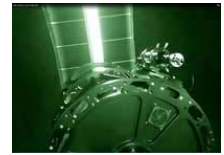
President's Message	1
Observing Highlights	2
Happy Birthday Gerard Mercator	3
Board Meeting Minutes	4
Monthly Meeting Minutes	5
The Sounds of Empty Space	6
Member Activities	7
About Our Organization	8



Monthly Membership Meeting

Wednesday, March 21, 2012

Cumberland Valley Girl Scout Council Building
7:30 pm



Astrophotographer and former BSAS president **Mark Manner** will be giving us an overview of Montgomery Bell Academy's Long Mountain Observatory located near McMinnville, Tennessee.



From The President

Springtime at BSAS

Having survived another winter's worth of (moderately) cold weather, we can now all look forward to warmer evenings and a season full of BSAS activities! We have not one or two but four star parties coming up this month:

A public star party on March 17th at Long Hunter State Park at 8PM. This is a moderately dark site and we should have good viewing, with only a waning crescent moon to contend with.

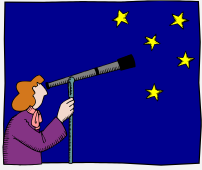
Our annual Messier Marathon event on March 24th at Mark Manner's Spot Observatory at 8PM. This is a pretty dark site (with only a very thin crescent moon that evening), so it should be a great opportunity for BSAS members to chase down lots of the 109 Messier objects! Try to get there well before sunset so you can catch a view of the earliest-setting objects. Maybe some of you can bring your larger dobsonian 'scopes and narrowband filters to help hunt down these faint fuzzies? Hint, hint...

A public star party on March 30th at Bowie Nature Park (in Fairview) at 8PM. This is a golden opportunity to provide members of the public a great view of the showplace objects. Mars in particular will be well-positioned high in the sky that evening, but using dobs to "chase" tiny Mars at high magnifications is challenging at best (trust me). So, if you have a portable 'scope with a tracking mount, please bring it! We'll have a half-moon that night, too, which is perfect for showing the public views of crisply-defined details along the lunar terminator.

Another public star party the very next night at the Adventure Science Center at 8PM. Light pollution is more of a concern at this location, but we can still give the public some great views of Mars and Luna.

And that's just March. But what comes next, you ask? Of course, our monthly meetings during April and May, plus two star parties scheduled each month. We'll hopefully also join the Cumberland Astronomical Society for a star party sometime in May or June, likely at the CAS' dark sky site at Bledsoe State Park, a bit to the northwest of Nashville. This was a moderately dark site when we last joined the CAS for a joint star party there about seven years ago, so please bring those big dobs and SCT's out!

Continued on Page 2



"The greatest enemy of knowledge is not ignorance, it is the illusion of knowledge."

Stephen Hawking
1942 -

FREE TELESCOPES!

Yes, you did read that correctly. The BSAS Equipment & Facilities Committee has free telescopes ranging in size from 2.6" to 8" that current members can actually have to use for up to 60 days at a time.

We also have some other items in the loaner program such as a photometer, H-alpha solar telescope, educational CDs, tapes, DVDs, and books.

Some restrictions apply, and a waiting list may be applicable in some cases. The BSAS Equipment Committee will not be held responsible for lost sleep or other problems arising from use of this excellent astronomy gear.

For information on what equipment is currently available, contact Lonnie Puterbaugh at (615) 661-9540.

Observing Highlights

all times listed are Central Standard Time

LUNAR PHASES

March 2012

03/01 FIRST Quarter
03/08 FULL Moon
03/15 LAST Quarter
03/22 NEW Moon
03/30 FIRST Quarter

April 2012

04/06 FULL Moon
04/13 LAST Quarter
04/21 NEW Moon
04/29 FIRST Quarter

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Galaxies:
M81, M82

Open Clusters:
M41, M44, M46, M47, M48, M50,
M67, M93

From the President, cont.

On June 5th, we have a very special public star party in honor of the transit of Venus across the sun; the star party runs from 4PM to 6:30PM. For all of you reading this message, I regret to say that this will almost certainly be your last chance to view a Venus transit—the next one won't come until December of 2117! Those of you with appropriate solar filters (not the kind that thread onto eyepieces!) and H-alpha 'scopes, please bring'em. I suspect media coverage the week before will help ensure a strong turnout by the public, so we'll likely need every 'scope we can get.

Later in June, we're going to try something new—a "telescope clinic." The concept is that for an hour or so before our scheduled public star party on June 23rd, we'll invite both BSAS members and the general public to bring their telescopes in for a "checkup." We'll re-collimate any 'scopes that need it, realign finderscopes, and even provide flocking paper to knock down glare and provide better views through smaller 'scopes. Please bring laser collimators and artificial stars that evening if you have them, as well as jeweler's screwdrivers! This is a great opportunity to get more 'scope owners out under the night sky and to show them what their 'scopes are really capable of, and perhaps for the BSAS to add some new members too. We'll plan to repeat the clinic at our August 11th public star party at Edwin Warner Park. Please thank Curt for suggesting the idea of a 'scope clinic!

I look forward to seeing all of you out under the stars again soon!

Clear skies to all,

John Harrington
President

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 here 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. 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 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

Gerard Mercator
<http://www.nndb.com/people/636/00038522/>

Mercator_Gerardus biography by J. J. O'Connor and E. F. Robertson

http://www-history.mcs.st-and.ac.uk/Biographies/Mercator_Gerardus.html



Image: Wikipedia

Board Meeting Minutes – February 1, 2012

Melissa Lanz, Board Member

The board of directors of the Barnard-Seyfert Astronomical Society (BSAS) met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on February 1, 2012. Board members John Harrington, Joe Boyd, Spencer Buckner, Steve Cobb, Bob Norling, Bill Griswold, Melissa Lanz, Theo Wellington, and Kris McCall were present. A quorum being present, President John Harrington called the meeting to order at 7:44, and reported the Public Star Party on Jan. 28th was a success.

John reported that the paperwork from the auction is nowhere to be found. Lawrence Wallis wanted to follow up on a controller that was up for auction, but not sold, since the one he bought didn't work. John and Curt are trying to help him find another one.

Past-President Dr. Spencer Buckner moved to approve the minutes from the BSAS Membership Meeting in December and January. Steve seconded.

Treasurer Bob Norling reported we have \$2,119.38 in our regular account, and \$457.85 in our equipment account.

President John Harrington announced the upcoming Star parties:

- On February 18th, a public day time Star Party will be held at the Bowie Nature Park in Fairview.
- A private Star Party will be held that same evening at mile marker 434.5 on the Natchez Trace.
- On February 25th, a public Star Party will be held at Shelby Bottoms Nature Center.

The following topics were discussed:

Equipment: The Loaner equipment mostly isn't being used. An Inventory was done 6 or 7 years ago. John asked us to remind him to tell the membership about the loaner equipment. The board agreed an online list of equipment would be helpful, and Equipment other than telescopes would be useful. We have an SSP photometer, an 8 in dob, and a Smith-Cassegrain. It would be nice to have a provision for members to sell personal astronomy equipment on our website. That would also be an enhancement to our newsletter. That would add value by providing a member privilege before the advertisement goes to the yahoo group, tn-astronomy.

Newsletter: We used to run photos in the Eclipse – our BSAS members could submit their photos. We need an Editor, and Jason Martin, a new member, expressed an interest. John is going to contact him.

Door Prize: We have a spare Otwell calendar. It will be given free to the first paid new member.

Joint Star Party with the CAS: Jack Stearman is the new CAS President. They have their star parties off Gallatin Highway 25, in the direction of Clarksville - about 25 minutes from Green Hills. We can send a delegation to the CAS meeting. They meet on the 3rd Thursday.

Dyer Observatory Meeting: John talked to Rocky about having one meeting a year at Dyer Observatory. Rocky is open to the idea. So far, the most likely times would be January or February. Ice could be a problem.

April 28th - National Astronomy Day: The Country Music Marathon is also on April 28th, and that closes roads and ties up traffic, and is hard to compete with for news time. We have a public star party at Edwin Warner Park that evening. Kris McCall announced the Adventure Science Center (ASC) is not making plans for National Astronomy Day, but is instead focusing on the June 2nd Transit of Venus preparation.

June 2nd and June 5th ASC Celebration: Venus transit starts at 5. ASC has a great view of the northwestern horizon. The celebration will focus on the sun on Saturday. Theo is building a safe solar viewer – instructions are on the Transitofvenus.org web-site. They will observe from the ASC on Tuesday evening. BSAS help would be appreciated on June 2nd and 5th. Joe moved that we add June 2nd as an additional event, time undecided, and Curt seconded. Sunset on the 5th will be around 8. The transit of Venus will be streamed from several cities. The Moon phase app shows a full moon on the 4th, and it rises at 9:01.

August 2017 Eclipse: Viewing NW of Hopkinsville, 12 to 15 miles

Facebook: Santos put together a Facebook site. Theo and Curt have authority to update the Facebook site. Theo has been posting when something happens. We need to mention Facebook in the Eclipse.

BSAS Website: Drew has found a new website host. They will put up a nice site for us, and it will save us money. They needed a letter on our letterhead asking for it. John Harrington designed a BSAS letterhead, and the board approved. Drew is happy to do the website, but he needs us to feed him the content. We could handout information about our website and Facebook page at star parties. Kris McCall noted that the parks like and can use any pictures we take of crowds and telescopes in the park.

Twitter feed: ASC tweets the star parties, and other astronomy news.

2012 Program List: Kris needs a detailed program list for 2012, to publish in the Dark Sky issue.

Dark Skies: A church contested the East Nashville Ordinance about light going onto someone else's property. Planning Commission would know what to do. Joe Boyd will ask.

Steve Cobb moved we adjourn, and the meeting adjourned at 8:40.

OFFICERS

John Harrington
President

Joe Boyd
Vice-President

Bob Rice
Secretary

Bob Norling
Treasurer

Directors at Large

Steve Cobb
Bill Griswold
Melissa Lanz
Kris McCall
Curt Porter
Theo Wellington

Steve Wheeler
Newsletter Editor
wsw261@hotmail.com

**Monthly meetings
are held at:**

**The Cumberland Valley
Girl Scout
Council Building**

**4522 Granny White Pike
Nashville, TN 37204**

Monthly Meeting Minutes – February 15, 2012

Melissa Lanz, Board Member

The Barnard-Seyfert Astronomical Society Monthly Membership Meeting for February was held at the Cumberland Valley Girl Scout Council Building at 7:30 p.m. on February 15th. President John Harrington called the meeting to order at 7:40 P.M. Sixteen members and four guests were present.

President John Harrington welcomed the visitors and asked them to introduce themselves.

Treasurer Bob Norling reported that we have \$2,046.14 in our regular account, and \$698.41 in our equipment account.

John announced the following upcoming Star Parties (to be held, if weather permits):

- On February 18th, a public day time Star Party will be held at the Bowie Nature Park in Fairview. There is a map on the web site.
- A private Star Party will be held that same evening at mile marker 435.5 on the Natchez Trace.
- On February 25th, a public Star Party will be held at Shelby Bottoms Nature Center.
- On March 17th, a public Star Party will be held at Long Hunter State Park from 8 to 10 p.m.
- On March 24th, the Messier Marathon will be held at Mark Manner's Spot Observatory – Inclement weather back-up date is April 21st.
- On March 30th, a public Star Party will be held at the Bowie Nature Park in Fairview from 8 to 10 p.m.
- On March 31st, a public Star Party will be held at the Adventure Science Center from 8 to 10 p.m.

John reported that Jack Stearman, President of the Cumberland Astronomical Society, is inviting us to a joint star party at their site after the Spring Tennessee Star Party, which is the weekend of April 20-22nd. Details are being finalized now, and it will most likely be the last week in April or the 1st of May.

John thanked Steve Wheeler for serving as Editor for the past four years, and announced we have a potential volunteer editor of the Eclipse.

John announced that the BSAS has a Facebook page that contains news articles and updates and comments on Star Parties. We can access the Facebook page by typing in the entire name "Barnard Seyfert Astronomical Society."

John reported that efforts were underway to reschedule our planned speaker for the evening, Dr. Joshua Pepper. John then announced the evening's program topic – "What's Up? Winter/Spring 2012" - to be given by members Dr. Terry Reeves and Steve Wheeler.

Steve Wheeler focused on spring-time night sky objects that can be seen with binoculars:

Auriga has open clusters M36, M37, and M38, Taurus the Bull, The Pleiades – most well-known star cluster, 440 light years distant, is beautiful in binoculars or telescope, Hyades – 2nd closest open cluster, 150 light years away, Orion Nebula, M42 and M43, Gemini, with Castor and Pollux at the head, M35 open cluster, and M44 – the Beehive Cluster or Praesepe (Latin for manger) – is an open cluster in the constellation Cancer.

Terry spoke on spring-time telescope targets:

Venus – up in the West, Mars – red – in Leo, Saturn – will rise in the West during our star party; rings have been edge on, but are at more of an angle in spring, Crab Nebula, Orion Nebula, Lepus the Hare (constellation), M79 – Globular cluster, Messier Open Clusters – M41, M46, M47, M50, M93, Monoceros, the Unicorn (constellation), NGC 2264 – Christmas Tree Cluster in Monoceros, Rosette Nebula, Gemini, the twins, and the Eskimo Nebula (NGC 2392), also known as the Clownface Nebula, Leo the Lion, Ursa Major – M81 and M82 – galaxies you can show even from light polluted skies, and M51 – the Whirlpool Galaxy.

Since there was no additional business to discuss, the meeting was adjourned.

BSAS Affiliations

The Astronomical League
<http://www.astroleague.org/>



The Night Sky Network
<http://nightsky.jpl.nasa.gov/>



International Dark Sky Association
<http://www.darksky.org/>



The Planet in the Machine

By Diane K. Fisher and Tony Phillips
Space Place Partners Article

The story goes that a butterfly flapping its wings in Brazil can, over time, cause a tornado in Kansas. The “butterfly effect” is a common term to evoke the complexity of interdependent variables affecting weather around the globe. It alludes to the notion that small changes in initial conditions can cause wildly varying outcomes.

Now imagine millions of butterflies flapping their wings. And flies and crickets and birds. Now you understand why weather is so complex.

All kidding aside, insects are not in control. The real “butterfly effect” is driven by, for example, global winds and ocean currents, polar ice (melting and freezing), clouds and rain, and blowing desert dust. All these things interact with one another in bewilderingly complicated ways.

And then there’s the human race. If a butterfly can cause a tornado, what can humans cause with their boundlessly reckless disturbances of initial conditions?

Understanding how it all fits together is a relatively new field called Earth system science. Earth system scientists work on building and fine-tuning mathematical models (computer programs) that describe the complex inter-relationships of Earth’s carbon, water, energy, and trace gases as they are exchanged between the terrestrial biosphere and the atmosphere. Ultimately, they hope to understand Earth as an integrated system, and model changes in climate over the next 50-100 years. The better the models, the more accurate and detailed will be the image in the crystal ball.

NASA’s Earth System Science program provides real-world data for these models via a swarm of Earth-observing satellites. The satellites, which go by names like Terra and Aqua, keep an eye on Earth’s land, biosphere, atmosphere, clouds, ice, and oceans. The data they collect are crucial to the modeling efforts.

Some models aim to predict short-term effects—in other words, weather. They may become part of severe weather warning systems and actually save lives. Other models aim to predict long-term effects—or climate. But, long-term predictions are much more difficult and much less likely to be believed by the general population, since only time can actually prove or disprove their validity. After all, small errors become large errors as the model is left to run into the future. However, as the models are further validated with near- and longer-term data, and as different models converge on a common scenario, they become more and more trustworthy to show us the future while we can still do something about it—we hope.

For a listing and more information on each of NASA’s (and their partners’) Earth data-gathering missions, visit science.nasa.gov/missions/earth.html. Kids can get an easy introduction to Earth system science and play Earthy word games at <http://spaceplace.nasa.gov/ecosphere>.



CloudSat is one of the Earth-observing satellites collecting data that will help develop and refine atmospheric circulation models and other types of weather and climate models.

CloudSat’s unique radar system reads the vertical structure of clouds, including liquid water and ice content, and how clouds affect the distribution of the Sun’s energy in the atmosphere. See animation of this data simulation at:

www.nasa.gov/mission_pages/calipso/multimedia/cloud_calip_mm.html

BSAS members **Bob Rice** and **Chuck Schlemm** participate in a daytime outreach activity at Bowie Nature Park in Fairview, TN.



Become a Member of the BSAS!

Download and print the Application for membership from www.bsasnashville.com (Adobe® Acrobat Reader® required).

Then fill it out and bring it to the next monthly meeting or mail it along with your first year's membership dues to:

BSAS
P.O. Box 150713
Nashville, TN 37215-0713

Annual dues, which include membership in the BSAS and Astronomical League, and subscriptions to their newsletters, are:

- \$20** Individual
- \$30** Family
- \$15** Senior (+65)
- \$25** Senior Family (+65)
- \$12** Student*

* To qualify, you must be enrolled full time in an accredited institution or home schooled.

All memberships have a vote in BSAS elections and other membership votes,

Also included are subscriptions to the BSAS and Astronomical League newsletters.

IMPORTANT DUES INFORMATION

To find the expiration date for your current membership, visit our web site at <http://www.bsasnashville.com> and click the Renewals link.

There will be a two month grace period before any member's name is removed from the current distribution list.



We're on the Web!

See us at:

www.bsasnashville.com

[BSAS on Facebook](#)

About Our Organization

Organized in 1928, the Barnard-Seyfert Astronomical Society is an association of amateur and professional astronomers who have joined to share our knowledge and our love of the sky.

The BSAS meets on the third Thursday of each month at the Adventure Science Center in Nashville. Experienced members or guest speakers talk about some aspect of astronomy or observing. Subjects range from how the universe first formed to how to build your own telescope. The meetings are informal and time is allotted for fellowship. You do not have to be a member to attend the meetings.

Membership entitles you to subscriptions to *Astronomy and Sky & Telescope* at reduced rates; the club's newsletter, the *Eclipse*, is sent to members monthly. BSAS members also receive membership in the Astronomical League, receiving their quarterly newsletter, the *Reflector*, discounts on all astronomical books, and many other benefits.

In addition to the meetings, BSAS also sponsors many public events, such as star parties and Astronomy Day; we go into the schools on occasion to hold star parties for the children and their parents. Often the public star parties are centered on a special astronomical event, such as a lunar eclipse or a planetary opposition.

Most information about BSAS and our activities may be found at www.bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Joe Boyd at (615) 386-3134.

**BARNARD-SEYFERT
ASTRONOMICAL SOCIETY**
PO BOX 150713
NASHVILLE, TN 37215-0713

