The ECLIPSE

August 2010
Volume 3, Issue 8

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

Upcoming Events

Board of Directors Meeting

August 5th at the Cumberland Valley Girl Scout Council Building – 7:30 pm

September 2nd at the Cumberland Valley Girl Scout Council Building – 7:30 pm

Membership Meeting

August 19th at the Adventure Science Center – 7:30 pm

September 16th at the Adventure Science Center – 7:30 pm

Star Parties

August 7th - BSAS Annual Picnic and Private Star Party at the home of Mark & Anne Manner – 4pm

August 14th - BSAS Public Star Party at Warner Park Special Events Field - 8:30-10:30 pm

September 11th - BSAS Private Star Party at Natchez Trace mile marker 435.5

September 17th - BSAS Public Star Party at Bells Bend Outdoor Center - 8:00-10:00 pm

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Monthly Membership Meeting

Thursday, August 19, 2010
Adventure Science Center
7:30 pm

Does the end of the Mayan "Long Count Calendar" predict an apocalyptic end to our planet on December 21, 2012? **Santos López**, former BSAS president and amateur Mayan researcher, will explain facts about Mayan history and culture, their astonishing astronomical discoveries, and the link between 80's New Age beliefs and the current hysteria about the meaning of 2012.

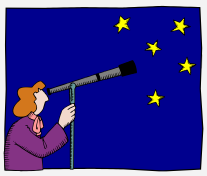
From The President

Greetings from your BSAS president. With temperatures expected to be near 100° during the first week of August, the Dog Days of Summer are definitely here. The expression "Dog Days of Summer" comes from ancient times when people thought that the star Sirius (the Dog Star), the brightest star in our skies, actually put out enough heat to make it hotter during the months when it rises at about the same time as our Sun. The Romans would even sacrifice a brown dog to appease the wrath of Sirius. Seems to me that sacrificing a dog would only make the Dog Star madder but then I'm not Roman so what do I know.

I want to thank Dr. Eric Klumpe for his excellent talk at the July public meeting. The MTSU Uranidrome (sorry I got it wrong in the July newsletter) is a fascinating site and I was very interested in hearing how Dr. Klumpe uses it in his astronomy classes, labs and public nights. The addition of the telescopic observatory equipped with a video camera and big screen monitors make an excellent complement to the naked eye Uranidrome. I especially want to thank Dr. Klumpe for taking a break during his talk to allow the audience an opportunity to go outside and view an ISS pass over Nashville. I know how disrupting to a speaker it can be to interrupt a talk but Dr. Klumpe seemed to fit it right in with his presentation. He was most kind and gracious in letting us see the brightest ISS pass I have ever witnessed.

I want to be sure everyone knows about our annual BSAS picnic Saturday August 7 starting at around 4pm. We normally have the picnic in June but delayed it this year due to the May floods and the damage they caused. The event is a pot-luck affair held at Mark Manor's Spot Observatory (www.spotastro.com) near the Bucksnort exit 152 on I-40. Mark and Ann Manor have a beautiful spread about 50 miles west of Nashville and they have graciously invited us out for our annual picnic. The skies at Spot Observatory are some of the darkest around so don't forget to bring a telescope. The event is primarily about fellowship among BSAS members, though, so come on out even if the skies aren't great. Just remember to bring food and/or drink (non-alcoholic, please) to share.

Continued on Page 2



"If there is anything that can bind the heavenly mind of man to this dreary exile of our earthly home and can reconcile us with our fate so that one can enjoy living — then it is verily the enjoyment of the mathematical sciences and astronomy."

Johannes Kepler
1571-1630

Observing Highlights

all times listed are Central Standard Time

LUNAR PHASES

August 2010

08/03 LAST Quarter
08/10 NEW Moon
08/16 FIRST Quarter
08/24 FULL Moon

September 2010

09/01 LAST Quarter
09/08 NEW Moon
09/15 FIRST Quarter
09/23 FULL Moon

OBJECTS VISIBLE THIS MONTH

Messier Objects:

Open Clusters: M6, M7, M21, M23

Nebulae: M8, M20, M23

Globulars: M9, M10, M12, M19, M62, M107

Perseid meteor shower – August 12-13

From the President, cont.

We also have a public star party on the evening of Saturday August 14th at the Warner Park special events field beginning at 8:30pm. If you are going to bring a telescope you will want to arrive early to get set-up before the public arrives. The Warner park events are usually well attended so plan on coming out to help even if you don't bring a 'scope.

Finally, 2012 IS THE END OF THE WORLD!!! At least that's what the fear mongers would have us believe. Our own Santos Lopes, former BSAS president, will be giving us a talk entitled "Apocalypse 2012? Debunking the Mayan Myth of the End of the World". Santos, in addition to being an amateur astronomer, is an amateur Mayan researcher and he will give us the facts concerning the Mayan long count calendar and the end of the world apocalypse predictions. His insights into the Mayan history, culture and astonishing astronomical discoveries should help us all answer those questions that always seem to come up at our public star parties. The meeting is Thursday August 19 at the Adventure Science Center so don't miss it or you may be doomed to an apocalyptic ending.

Dr. Spencer Buckner
President

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.

Happy Birthday Enceladus

by Robin Byrne

This month we honor discoveries, both old and new, about one of Saturn's moons. William Herschel, looking through his 16.5 cm telescope in 1787, saw a faint object near Saturn, but didn't recognize what it was. It wasn't until he had a larger (1.2 meter) telescope that his omission would be recognized. A few years after his first observation, during a ring crossing (when Saturn's rings presented themselves edge-on to Earth) did Herschel take advantage of this orientation. The evening of August 28, 1789, Herschel looked at Saturn once again, but this time he realized that the faint (11.7 magnitude) dot was one of Saturn's moons. The naming of this, and other Saturnian moons, didn't occur until 1847, when Herschel's son, John, published a book about his southern hemisphere observations. In this book, he proposed names for seven of Saturn's moons. The names come from the mythology concerning Saturn, who in the Greek tradition was Cronus, the leader of the Titans. Enceladus was one of the Titans.

Prior to spacecraft visiting the outer planets, all that was known about Enceladus were its mass, orbital characteristics, reflectivity, and preliminary estimates of its composition. In 1980, Voyager 1 flew past this tiny (500 km diameter) moon and opened up a new era of discovery. It was found that the orbit of Enceladus places it in the densest part of the E ring. This discovery led to speculation that there was a connection between this moon and ring. It was also found to be in a 2:1 orbital resonance with the moon Dione, where Enceladus orbits twice for every one of Dione's circuits of Saturn. The following year, Voyager 2 got a closer look at this moon and found the terrain to range from very old and cratered to surprisingly young and crater-free, as well as deformed regions indicating tectonic activity. But how could such a small body have the kind of geologic activity associated with a young surface?

Because of the intriguing questions surrounding Enceladus, when Cassini went into orbit around Saturn in 2004, this small moon was on the list of objects to be studied in more detail. The first close flybys occurred in 2005. One of the more important discoveries was that Enceladus had geysers, shooting plumes of salt water up from an internal heat source, all concentrated in the southern polar region. Suddenly the young terrain started to make sense. Enceladus is geologically active due to a combination of radioactive decay of internal materials and tidal forces from Saturn and Dione heating its interior. Some of the material being ejected by these eruptions is then incorporated into the E ring, helping to explain the source of this part of Saturn's ring system. The rest of the ejected water ice falls back to the surface, coating the moon with fresh ice, giving it one of the most reflective (and young) surfaces in the solar system. Meanwhile, the presence of liquid salt water makes Enceladus, along with Europa, another prime candidate for life elsewhere in our solar system.

Other types of geologic features and activity were also imaged by Cassini. Some of the craters show evidence of a slow, viscous movement of the ice which deforms the craters. How fast this deformation occurs depends on the temperature of the ice. The colder and harder the ice, the longer the process takes. Currently, it is not known whether the process on Enceladus is slow or fast, although some models are consistent with a hard surface and slow process. Another type of feature found were rifts, caused by tectonic forces cracking and splitting the moon's surface. A variety of grooved terrains have also been observed. These are thought to be due to shear forces stressing the icy crust of Enceladus. In the south polar region are other deformed regions, including features called "tiger stripes," due to their dark and light repeating pattern. The lighter portions of the stripes are composed of fresh water ice, while the darker regions appear to be composed of material that may contain organic compounds not found anywhere else on the moon. The presence of organic compounds adds to the speculation about life on this small satellite. There may even be an ocean of water beneath the surface, similar to what is thought to be found on Europa.

But why is the south polar region of Enceladus so different from the rest of the moon? An article published in 2010 attempts to explain what is happening. Internal radioactive decay of rocks produces heat, which warms the internal ice to a balmy 32˚F. This "warm" ice periodically floats toward the surface, where it is a chilly -316 ˚F. The "cold" ice sinks back into the moon's interior. If this process occurs for about 10 million years, followed by 100 million -1 billion years of inactivity, the model creates features that match those found on Enceladus. Additionally, this convective cycle accounts for the high amount of heat released from this part of the moon.

As is often the case with discoveries, the more we find, the more questions we have. Enceladus is a good example of this process. The first questions after its discovery were: "What is it made of?" and "What does it look like?" After Voyager, we pondered: "What made those different features?" and "Why are some regions so young?" Now we have such questions as: "Is there life on Enceladus?" and "Why is the convective process dominant only in the south polar region?" With each new journey we will learn more, and uncover more unknowns. With Saturn still well-placed for observing, and the rings mostly edge-on, now is a good time to try to pick out this faint speck and think of your own questions about this tiny enigma called Enceladus.

References:

Enceladus (moon) - Wikipedia
http://en.wikipedia.org/wiki/Enceladus_(moon)

NASA - NASA's Cassini Discovers Potential Liquid Water on Enceladus
http://www.nasa.gov/mission_pages/cassini/media/cassini-20060309.html

As the crust turns: Cassini data show Enceladus in motion
http://www.sciencedaily.com/releases/2010/01/100112141400.htm

Board Meeting Minutes – July 1, 2010

Bob Rice, Secretary

The board of directors of the Barnard-Seyfert Astronomical Society met in regular session at the Cumberland Valley Girl Scout Council Building in Nashville, Tennessee on July 1, 2010. A sign-in sheet was passed around in lieu of a roll call. Board members Dr. Spencer Buckner, JanaRuth Ford, Dr. Donna Hummell, Bob Norling, Dr. Terry Reeves, and Bob Rice were present. Board members Tony Campbell, Bill Griswold, Santos Lopez, Kris McCall, Curt Porter, and Theo Wellington were absent. BSAS member Heinrich Tischler also attended as a guest. A quorum being present, President Dr. Spencer Buckner called the meeting to order at 7:46 P.M.

Treasurer Bob Norling reported that the Society had $2,209.01 in its regular checking account and $145.04 in its equipment savings account. Mr. Norling explained that the savings account had been reduced by $5.00 due to a dormant account fee applied by the bank and that he would contact them about having this reversed. Mr. Norling also passed around an illustrated announcement detailing Kalmbach Publishing Company's Deep Space Mysteries calendar for 2011.

Dr. Spencer Buckner announced these upcoming star parties and events:

- Jul 10 – Private star party at mile marker 435.5 on the Natchez Trace Parkway
- Jul 17 – Public star party from 8:30 – 10:30 P.M. at Longhunter State Park
- Aug 07 – BSAS Annual Potluck Picnic at Mark Manner's Spot Observatory
- Aug 14 – Public star party at the Warner Parks from 8:30 to 10:30 P.M

Dr. Buckner also announced that Dr. Eric Klumpe of Middle Tennessee State University would give an update on the university's Uranidrome naked-eye observatory as the program for the July 15, 2010 membership meeting. In addition, he announced that BSAS board member Santos Lopez would give a presentation on "Debunking The 2012 Rumor and Other Bad Mayan Astronomy" at the August 19, 2010 membership meeting.

Dr. Donna Hummell handed out draft copies of the BSAS' new public information brochure for the board's inspection. Besides containing more current information, this draft was also less wordy so that it could be printed as a tri-fold thus reducing printing costs. The board also liked the more legible 13-point Tahoma print font. Dr. Spencer Buckner suggested that the board's selection of a new cover photo be postponed until the August meeting since the website link for members' contest submissions was still being set up. Dr. Terry Reeves noted that Bill Griswold had located approximately 100 copies of the old brochure that could still be used in the interim. Heinrich Tischler volunteered to investigate printing costs for the new brochure at Kinkos.

Heinrich Tischler reported that he was setting up a BSAS Facebook account that should be in operation after July 15. He also stated that he had established a BSAS email account at BSAS.Nashville @ yahoo.com.

Dr. Terry Reeves noted that Dudley Pitts would be moving soon and suggested that BSAS historical materials currently in his possession should be collected and moved to another location. Several board members pointed out that a number of books and periodicals – many donated by Gary Yarnall and the late Powell Hall's family – that constituted the BSAS' library were also in different locations. Dr. Spencer Buckner suggested that these should be inventoried and possibly moved to the Adventure Science Center (ASC) if storage space was available there; he stated that he would contact ASC officials about doing this. Dr. Terry Reeves noted that he had some of the BSAS' library materials at his home and suggested that other items might also be stored there at least temporarily. Jana Ruth Ford suggested that the board canvass the BSAS membership to see if anyone might be interested in serving as the Society's historian; the board agreed that this should be done. Heinrich Tischler volunteered to contact the Nashville Public Library about possibly housing some of these materials.

Since there was no further business to discuss, President Dr. Spencer Buckner declared the meeting to be adjourned at 8:35 P.M.

Monthly Meeting Minutes – July 15, 2010

Bob Rice, Secretary

President Dr. Spencer Buckner called the meeting to order at 7:32 P.M. in the Adventure Science Center (ASC) and welcomed new members and visitors. Treasurer Bob Norling reported that the BSAS had $2,364.01 in its regular bank account and $150.03 in its equipment account. Dr. Buckner announced these upcoming events and star parties:

- Jul 17 - Public star party at Long Hunter State Park @ 8:30 P.M.
- Aug 07 - BSAS Annual Membership Picnic at Mark Manner's Spot Observatory
- Aug 14 - Public Star Party at the Warner Parks from 8:30 to 10:30 P.M.

Dr. Spencer Buckner announced that the BSAS' website was not yet ready to receive members' submissions of their astro-images in the contest to select a new cover photo for the club's revised public information brochure. However, he explained that this feature should be active within the next several weeks. Dr. Buckner also announced that BSAS board member Santos Lopez would give a presentation on "Debunking The 2012 Rumor" at the August 19, 2010 membership meeting. Chuck Schlemm presented letters of recognition and $25.00 Cracker Barrel gift certificates from the Hillmont Camp management to BSAS volunteers who provided telescopes for a recent star party at the camp. As Dr. Buckner bemusedly commented, sometimes being a volunteer does reap rewards! Lastly, Dr. Buckner announced that the International Space Station (ISS) was scheduled to fly overhead at approximately 8:23 P.M. and asked our speaker for the evening, Dr. Eric Klumpe, if we could break briefly during his presentation to go outside to observe it. Dr. Klumpe graciously assented.

Dr. Spencer Buckner then formally introduced Dr. Eric Klumpe, Professor of Physics and Astronomy at Middle Tennessee State University (MTSU), who gave an update on the university's Uranidrome naked-eye observatory and the telescopically equipped Classical Observatory. Dr. Klumpe first described the Uranidrome - derived from the Greek words "urani" for sky and "drome" meaning a place or, in other words, a place to watch the sky. This series of 12 concrete pillars is each uniquely designed to allow students to perform very practical observational experiments such as measuring the longitude and latitude of the MTSU campus, determining the earth's orbital period, and calculating the Earth's rotational period (or length of day) among others. Following a short break to observe the ISS, Dr. Klumpe then described the newer and more traditional Classical Observatory that is equipped with a 16 inch Schmidt Cassegrain telescope. However, unlike most similarly equipped observatories, this one uses Charge Coupled Device (CCD) cameras instead of eyepieces to project the images onto two 61 inch flat panel plasma displays so that many people can simultaneously see what is being observed instead of having to queue up to peer through an eyepiece. Both the Uranidrome and the Classical Observatory are used for teaching courses at MTSU. Following his presentation, Dr. Klumpe kindly answered a number of questions from the audience.

Since there was no additional business to discuss, Dr. Buckner declared the meeting to be adjourned at 9:12 P.M.

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 Sun Can Still Remind Us Who's Boss

Space Place Partners Article, July 2010

Grab your cell phone and take a good long look. It's indispensible, right? It tells time, surfs the web, keeps track of your appointments and, by the way, also makes phone calls. Modern people can hardly live without one. One good solar flare could knock it all out.

"In the 21st century, we're increasingly dependent on technology," points out Tom Bogdan, director of NOAA's Space Weather Prediction Center in Boulder, Colorado. "This makes solar activity an important part of our daily lives."
Indeed, bad space weather can knock out power systems, telecommunications, financial and emergency services—basically, anything that needs electronics to work. That's why NOAA is building a new fleet of "space weather stations," the GOES-R satellites. "GOES-R will bring our existing fleet of weather satellites into the 21st century," says Bogdan. "They're designed to monitor not only Earth weather, but space weather as well."

NOAA's existing fleet of Geostationary Operational Environmental Satellites (GOES) already includes some space weather capabilities: solar ultraviolet and X-ray telescopes, a magnetometer and energetic particle sensors. GOES-R will improve upon these instruments and add important new sensors to the mix.
One of Bogdan's favorites is a particle detector named "MPS-Low," which specializes in sensing low-energy (30 ev – 30 keV) particles from the sun.

Who cares about low-energy particles? It turns out they can be as troublesome as their high-energy counterparts. Protons and other atomic nuclei accelerated to the highest energies by solar flares can penetrate a satellite's exterior surface, causing all kinds of problems when they reach internal electronics. Low-energy particles, particularly electrons, can't penetrate so deeply. Instead, they do their damage on the outside.

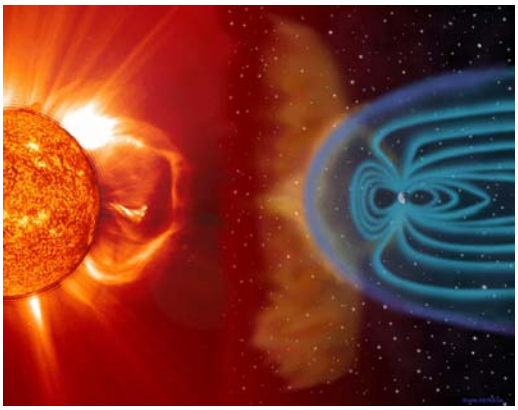
As Bogdan explains, "Low-energy particles can build up on the surfaces of spacecraft, creating a mist of charge. As voltages increase, sparks and arcs can zap electronics—or emit radio pulses that can be misinterpreted by onboard computers as a command."

The Galaxy 15 communications satellite stopped working during a solar wind storm in April 2010, and many researchers believe low-energy particles are to blame. GOES-R will be able to monitor this population of particles and alert operators when it's time to shut down sensitive systems. "This is something new GOES-R will do for us," says Bogdan.

The GOES-R magnetometer is also a step ahead. It will sample our planet's magnetic field four times faster than its predecessors, sensing vibrations that previous GOES satellites might have missed. Among other things, this will help forecasters anticipate the buildup of geomagnetic storms.

And then there are the pictures. GOES–R will beam back striking images of the sun at X-ray and extreme UV wavelengths. These are parts of the electromagnetic spectrum where solar flares and other eruptions make themselves known with bright flashes of high-energy radiation. GOES-R will pinpoint the flashes and identify their sources, allowing forecasters to quickly assess whether or not Earth is in the "line of fire." They might also be able to answer the question, Is my cell phone about to stop working?

The first GOES-R satellite is scheduled for launch in 2015. Check www.goes-r.gov for updates. Space weather comes down to Earth in the clear and fun explanation for young people on SciJinks, http://scijinks.gov/space-weather-and-us.



In spite of Earth's protective magnetosphere, solar storms can wreak havoc with Earth satellites and other expensive electronics on the ground.

Member Contributions

Messier 76 – The Little Dumbbell Nebula
Image: Mark Manner

NGC 650/651, the Little Dumbbell Planetary Nebula in Perseus, was discovered in 1780, and added to the Messier catalog shortly thereafter as M76. Also sometimes referred to as the Barbell Nebula, Butterfly Nebula or Cork Nebula. The exact distance to M76 is in dispute, ranging from 1,500 light years to as many as 15,000.

Mark Manner
Spot Observatory

Note: this image was published in the August 2010 issue of Astronomy magazine.

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

On your Eclipse mailing label is the expiration date for your current membership. There will be a two month grace period before any member's name is removed from the current mailing list.

We're on the Web!
See us at:
www.bsasnashville.com

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 Dr. Spencer Buckner at (931) 221-6241.

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