

The ECLIPSE

October
2014

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:

October 15, 2014, 7:30 pm
Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Program Topic:

*Light Pollution and the
International Dark Sky
Association*

In this Issue:

President's Message	1
Observing Highlights	2
Happy Birthday Kepler's Supernova by Robin Byrne	3
Board Meeting Minutes September 3, 2014	6
Membership Meeting Minutes September 17, 2014	7
Membership Information	8

From the President:

October already! I hope some of you had a chance to enjoy the clear skies we had in the middle of last week, sadly didn't last until the Bowie star party. If any of you took a nice image, please send it to the newsletter eclipse@bsasnashville.com. We'd love to feature member work.

Saturday October 4 is Astronomy Day nationwide. The Astronomical League promotes two dates each year to bring astronomy to the public in a big way. So clubs and science centers often have special events, and here in Nashville the Adventure Science Center will host an Astronomy Day celebration. There will be special demonstrations throughout the day, and if the weather *will* cooperate, a star party outside in the evening. If you are interested, there are opportunities to volunteer on behalf of BSAS! The ASC would like a few people to staff tables inside during the day. It's fun, easy, no experience necessary. For those of you interested in Dark Sky / Light Pollution issues, there will be a table for this as well. Please contact me (tmwellington@comcast.net) or Kris McCall (krismcCall@adventuresci.org) directly. The day events are rain or shine, so come on out!

We'll be looking for a few good men - and women - to serve on the BSAS Board. Please consider having a voice in the direction of the club as well as helping to organize and plan our meetings and events!



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Observing Highlights October and November

Globular Clusters

M56, M71, M55, M75,
M15, M2, M72, M30

Open Clusters

M11 (*Wild Duck*), M26,
M73, M29, M39, M52

Nebulae

M57 (*Ring*), NGC 6543 (*Cat's Eye*),
NGC6826 (*Blinking*),
M27 (*Dumbbell*),
NGC7000 (*North America*),
IC5146 (*Cocoon*), NGC7293 (*Helix*)

Asterisms

Cr399 (*Coat Hanger*)

Multiple Star Systems

Double-Double (*Epsilon Lyrae*)
Albireo (*Beta Cygni*)
Gamma Delphini

Variable Stars

Mu Cephei (*Herschel's Garnet Star*)

Upcoming Star Parties

Sat 10/4 7:30 - 9:30 pm	Adventure Science Center
Sat 10/18	Private Star Party Natchez Trace Parkway mile marker 433.5
Sat 11/1 7:00 - 9:00 pm	Shelby Bottoms Nature Center
Sat 11/14 7:00 - 9:00 pm	Bells Bend Outdoor Center
Sat 11/21 7:00 - 9:00 pm	Bowie Nature Park (Fairview)



Oct 23
Nov 22



Oct 1
Nov 29



Oct 8
Nov 6



Oct 15
Nov 14

Happy Birthday Kepler's Supernova by Robin Byrne

This month we celebrate the last time people on Earth observed a naked eye supernova in our own galaxy. On the night of October 9, 1604, several people looked up at the night sky and noticed something in the constellation of Ophiuchus that had not been there the night before. Among those who spotted it was J. Brunowski in Prague. Brunowski notified his friend, Johannes Kepler, who, at the time, was working for Emperor Rudolph II at the imperial court. Eight nights later, Kepler began studying this object, and would continue to do so for the following year. In 1606, Kepler wrote a book about his observations, titled "On the new star in Ophiucus' foot." This book would forever tie Kepler's name to the supernova.

When it was first spotted, the supernova was similar in brightness to Mars. As it brightened, it outshone everything in the night sky, other than the Moon and Venus. It is estimated to have reached a brightest magnitude between -2.25 and -2.5, and for more than three weeks it could be seen during the day. In November, it disappeared behind the Sun, but reappeared in the sky the following January, when Kepler found it still to be brighter than Antares. The supernova continued to be observable by naked eye until March 1606, for a grand total of 18 months of visibility. This was the last supernova observed in the Milky Way to date.

The remaining nebula, in addition to being called Kepler's Supernova Remnant and SN 1604, is also known as 3C 358 (for its radio signal) and G4.5+6.8 (in the supernova remnant catalog by David Green). The remnant has been studied extensively. In

1941, using the 100-inch Mount Wilson telescope, the remnant was found to be 40 arc seconds across with a brightness of 19th magnitude. The first estimate of its distance was made by Burnham, who assumed an absolute magnitude of -16, which gave a distance of no more than 20,000 lightyears.

More recently, in 2012, the Chandra X-Ray Telescope peered at the remnant for 8 days. These observations confirmed that the explosion was due to a Type Ia supernova. This type of superova occurs when a white dwarf's mass is pushed over its limit of stability, causing a catastrophic implosion of the stellar corpse. Chandra also found that the shape of the remnant is being affected by material that it is running into. The northern edge has a bright arc of x-ray emissions, indicating a region of gas and dust interacting with the expanding remnant. Two possibilities could explain this: either the original star was moving in that direction prior to explosion and the motion continues, or there is a dense cloud of material to the North. Which explanation is correct can have an effect on our estimates for the remnant's distance. If it is due to the remnant's direction of motion, the distance estimate changes to 23,000 lightyears. If it is a dense cloud of material, the distance is in the range of 16,000 - 20,000 lightyears. Additionally, the Chandra data show a larger than expected amount of iron in the spectrum. This implies the supernova was much more energetic than originally thought. Obviously, there is still much to learn about this object.

For 410 years, astronomers have been waiting for the chance to see another

From the President, continued from page 1

Did anyone get some new gear recently? Like it? Write a review for the *Eclipse!* We would love to hear what members are doing and share information.

Don't forget the two upcoming eclipses this month... although we don't get to see all of either, it's always fun to watch the Moon and Sun as they align in our sky. Lunar Eclipse on October 8th: partial phase begins at 4:15am, total at 5:25 - 6:24am. Sunrise that day is 6:48am. At the next new Moon on October 23 we have a partial Solar Eclipse beginning at 4:51pm, maximum at 5:52, setting while still partially eclipsed at 6:01pm. Go dig out the solar glasses left from the Transit of Venus to safely look. Remember that you should NEVER look directly at the Sun. Partial eclipses are often missed because there is no visual dimming of sunlight, so make a pinhole projection to show your friends the Moon blocking part of the Sun.

You may have seen a few of us sporting classy BSAS t-shirts at meetings and star parties... you can own one for yourself! See me at a monthly meeting if you are interested, \$10.

Our friend Monique Johnson from far east Tennessee at Pickett State Park is planning on attending the next meeting, she will have more information about going out to the group camp in March, and also an invite to a New Year's Eve star party and hike.

Clear skies,

Theo Wellington

**Next BSAS meeting
October 15, 2014, 7:30 pm
Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike**

*Program topic: "Light Pollution and the
International Dark Sky Association" - Joe Boyd*

Kepler's Supernova, continued from page 3

supernova in our own galaxy, but, so far, to no avail. We have observed plenty of supernovas in other galaxies, including the 1987 supernova in the Large Magellanic Cloud, but nothing close to home. How amazing it would be to see something in the sky so bright that you could read by its light at night and still see it in the daytime sky. Meanwhile, we at least have the opportunity to continue to study the remnants of past supernovas and enjoy the new discoveries surrounding objects like Kepler's Supernova.

References:

Kepler's Supernova - Wikipedia

en.wikipedia.org/wiki/Kepler's_Supernova

SN 1604, Kepler's Supernova

spider.seds.org/spider/Vars/sn1604.html

Chandra :: Photo Album :: Kepler's Supernova Remnant

chandra.harvard.edu/photo/2012/kepler/

Hubble Sees Spiral in Serpens

This effect, caused by the uneven distribution of matter (including dark matter) throughout the Universe, has been explored via surveys such as the Hubble Medium Deep Survey. Dark matter is one of the great mysteries in cosmology. It behaves very differently from ordinary matter as it does not emit or absorb light or other forms of electromagnetic energy – hence the term "dark."

Even though we cannot observe dark matter directly, we know it exists. One prominent piece of evidence for the existence of this mysterious matter is known as the "galaxy rotation problem." Galaxies rotate at such speeds and in such a way that ordinary matter alone – the stuff we see – would not be able to hold them together. The amount of mass that is "missing" visibly is dark matter, which is thought to make up some 27 percent of the total contents of the Universe, with dark energy and normal matter making up the rest. PGC 55493 has been studied in connection with an effect known as cosmic shearing. This is a weak gravitational lensing effect that creates tiny distortions in images of distant galaxies.



European Space Agency

[ESA/Hubble & NASA](#), Acknowledgement: Judy Schmidt

**Barnard-Seyfert Astronomical Society
Minutes of the Regular Meeting of the Board of Directors
Held On Wednesday, September 3, 2014**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held September 3, 2014, at the Girl Scouts of Middle Tennessee, 4522 Granny White Pike, Nashville, TN 37204. Present were Joe Boyd, Steve Cobb, Bud Hamblen, Kris McCall, Bob Norling and Theo Wellington, constituting a quorum. The meeting was called to order at 7:30 PM by President Theo Wellington. Treasurer Bob Norling reported that there was \$1,708.26 in the regular account and \$1,729.12 in the equipment account. Bob Norling moved adoption of the minutes from the August board meeting, Steve Cobb seconded and the minutes were adopted as printed in the September, 2014, edition of the Eclipse.

A \$200 donation was received from Camp Idyllwild, where John Walker did outreach for the camp attendees. Thanks to John for his efforts.

Bob Norling suggested that a gift of appreciation be given Mary Hance, who wrote a nice column on the society for the August 21, 2014, edition of the Tennessean newspaper. Theo Wellington said she would look for something suitable. Steve Cobb moved that the society award a gift of appreciation to Mary Hance in recognition of the newspaper story, Bob Norling seconded and the motion was carried unanimously.

The board discussed a proposal from SLOOH for the society to promote subscriptions to the SLOOH automated telescopes. Kris McCall moved that the society not promote SLOOH. Steve Cobb seconded and the board voted unanimously not to promote SLOOH.

Respectfully submitted,

Bud Hamblen, Secretary

Send your great amateur
astrophotos to:
eclipse@bsasnashville.com

**Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, September 17, 2014**

The Barnard-Seyfert Astronomical Society held its monthly membership meeting for January at the Girl Scouts of Middle Tennessee, 4522 Granny White Pike, Nashville, Tennessee, on Wednesday, September 17, 2014. 14 members and 3 guests signed in. President Theo Wellington called the meeting to order at 7:42 PM. Theo Wellington ask for a motion to adopt the minutes of the membership meeting as published in the September, 2014, issue of the *Eclipse*. Bob Norling so moved, Spencer Buckner seconded, and the minutes were adopted by unanimous voice vote. Bob Norling reported that there were \$1,708.26 in the regular account and \$1,729.12 in the equipment account.

Dr Terry Reeves and Gary Eaton presented “What's Up” in the Fall Sky. Terry Reeves told how to find several celestial objects visible in binoculars and small telescopes, and Gary Eaton described interesting astronomical events that will happen this Fall.

There being no further business the meeting was adjourned.

Respectfully submitted,

Bud Hamblen, Secretary



6 Day-old Moon

Drew Gilmore
September 29, 2014

4 in reflector with
Orion StarShoot Solar
System Color Imaging
Camera

Become a Member of BSAS!

Visit bsasnashville.com to download and print an application for membership.

All memberships have a vote in BSAS elections and other membership votes. Also included are subscriptions to the BSAS and Astronomical League newsletters.

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:

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

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

You can check the status of your membership at bsasnashville.com.

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

About BSAS

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 Wednesday of each month at the Cumberland Valley Girl Scout Building at the intersection of Granny White Pike and Harding Place 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 bsasnashville.com. If you need more information, write to us at info@bsasnashville.com or call Theo Wellington at (615) 300-3044.

Free Telescope Offer!

Did someone say free telescope? 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. A waiting list is 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 info@bsasnashville.com.