The ECLIPSE

January 2018

The Newsletter of the Barnard-Seyfert Astronomical Society

Next Membership Meeting:
January 17, 2018, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

Topic: How to Use Your Telescope

Details on page 9

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Barnard-Seyfert Astronomical Society
bsasnashville.com

From the President

Greetings,

Happy New Year! 2017 is now behind us and 2018 lies ahead. I must admit to having a penchant for setting goals this time of year, usually involving personal finances and fitness. But hey those don't usually work out too well. Sound familiar? Well, this year, I decided to set some astronomy related goals. These should be more fun and more achievable too. Here are a few you might consider as well.

Watch a super blue moon eclipse. Set an early alarm before going to bed on January 30 and rise early enough on the 31st to view the partial lunar eclipse. You would have to travel to see a total eclipse, but we should be able to see some reddish color just before moonset.

See a planetary alignment. On March 7-8 view Saturn, Mars and Jupiter will form an interesting alignment in the night sky with the moon nearby.

Participate in a Messier Marathon. Yep, it will probably require staying up all night one evening this spring, but it will be well worth the effort. If you do, I hope you set a personal best for viewing the most Messier objects in the same night. BSAS is planning to host a Messier Marathon on Saturday March 17th so that might be your best chance.

Telescope need cleaning or collimation? Give your telescope (and eye pieces) a good cleaning and tune-up. Not sure how? One of our spring member meeting programs will explain how to do just that.

See Mars at its best since 2013. This July, use the close proximity of Mars to observe its white polar caps and dark surface features. With a large enough telescope,

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BSAS
Barnard-Seyfert Astronomical Society

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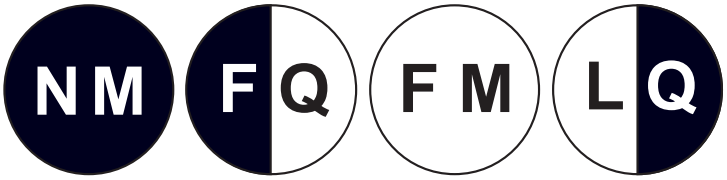
This image, captured by the NASA/ESA Hubble Space Telescope's Wide Field Camera 3 (WFC3), shows a galaxy named UGC 6093. As can be easily seen, UGC 6093 is something known as a barred spiral galaxy — it has beautiful arms that swirl outwards from a bar slicing through the galaxy's centre. It is classified as an active galaxy, which means that it hosts an active galactic nucleus, or AGN: a compact region at a galaxy's centre within which material is dragged towards a supermassive black hole. As this black hole devours the surrounding matter it emits intense radiation, causing it to shine brightly.
Credit: ESA/Hubble & NASA

Upcoming Star Parties

Saturday 1/13	Private Star Party Natchez Trace Parkway mile marker 435.3
Friday 1/19 6:30 pm to 8:30 pm	Public Star Party Bells Bend Outdoor Center
Saturday 2/17	Private Star Party Natchez Trace Parkway mile marker 412 (Water Valley Overlook)
Saturday 2/24 6:30 pm to 8:30 pm	Public Star Party Edwin Warner Park



Jan 16
Feb 15

Jan 24
Feb 23

Jan 1, 31
Mar 1

Jan 8
Feb 7

Book Review: Margaret and the Moon
by Robin Byrne

For this book review, I'm doing something different and reviewing a children's book. Margaret and the Moon: How Margaret Hamilton Saved the First Lunar Landing by Dean Robbins and illustrated by Lucy Knisley is targeted to children ages 4 - 8, though this 53 year old also enjoyed reading it.

This is the true story of Margaret Hamilton. It begins with her childhood and love of solving problems, from insects to music and all points in between. The book also shows how, despite growing up in the 1930's and 40's, she was willing to break gender stereotypes, even playing on the all-boys baseball team.

Mathematics was her true love, though. From simple arithmetic to algebra to calculus, she always enjoyed the challenge of solving problems. Then she discovered the world of computers and transferred her love of problem solving to writing computer code. She even coined the new title for the work she did: Software Engineer. Some of her earliest programs began with basic arithmetic, but built up to tracking airplanes through clouds, and using computer software to predict the weather.

In 1964, Margaret joined NASA to write computer code to help land men on the Moon. Her code not only dealt with the expected events of the lunar trip, but she also built into the software contingency plans for when things didn't go as planned. Moving up through the ranks, Margaret became Director of Software Programming for Project Apollo. Her code was first used for Apollo 8, but it was Apollo 11 that really put her software to the test. During the Apollo 11 landing, there was a problem with the computer - it became overloaded with too much happening at once. However, Margaret had a simple fix already written into the code that allowed the computer to ignore everything but the landing. The rest, as they say, is history.

This book tells a great story and should be particularly inspirational for young girls.

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Margaret and the Moon, continued

Some of the vocabulary may be above the level of the youngest children being targeted, but that can provide an opportunity for conversations between the child and parent. The illustrations by Lucy Knisley are enchanting. At the end of the book are actual photographs of Margaret Hamilton, some of which were clearly used as the source for the drawings.

Whether you are a big kid who enjoys reading about the unsung heroes of the space program, or you have a young person in your life who you want to help inspire, Margaret and the Moon is the book for you.

References:

Margaret and the Moon: How Margaret Hamilton Saved the First Lunar Landing by Dean Robbins, illustrated by Lucy Knisley; Alfred A. Knopf 2017.

A riot of colour and light dances through this peculiarly shaped galaxy, NGC 5256. Its smoke-like plumes are flung out in all directions and the bright core illuminates the chaotic regions of gas and dust swirling through the galaxy's centre. Its odd structure is due to the fact that this is not one galaxy, but two — in the process of a galactic collision.

Image credit: NASA, ESA

DEEP SKY DAZE
by Mike Benson

Full winter is upon us with the arrival of January's strange weather, which can range from warm to frigid and from crystal clear to completely overcast. If clear, it will probably be due to a fast moving high, with stars twinkling like Santa's eyes. The rest of the time it will most likely be cloudy and threatening either rain or snow (or both). Just do the best we can with what we get, I guess.

On those clear nights, however, mid-evening finds the Summer Triangle all but gone from the sky. Only Deneb remains, low in the northwest. The Milky Way soars from the tail of the Swan, between faint Lacerta and Cepheus, through Cassiopeia and Perseus to Auriga with bright, golden Capella hovering over us near the zenith. Continuing toward the southeastern horizon, the arm of the galaxy stretches through the feet of the Twins, between the Small Dog and mighty Orion (from whence this arm of the Milky Way derives its name), through Monoceros and the eastern edge of Puppis (the stern of the great ship, Argos, which sails the southern firmament), meeting the horizon at Pyxis, Argos' compass. In the northeast and the southwest we find the dark reaches of intergalactic space as we peer up and down through the thin disc of our home galaxy to the realm where galaxies appear to cluster, away from the clutter of nearby stars and other debris of the Milky Way.

But it is relatively nearby stars, and the masses of gas and dust from which they are born, that dominate the night at this time of year. There are also a number of remains of stars which have variously ended their days, from spectacular supernovae to beautiful planetary nebulae.

The evening of January 12 offers us a unique opportunity. **Algol (β Perseus)** is the quintessential eclipsing binary star. Every two days and almost 21 hours the primary is covered by the secondary for around 10 hours. The dimming is most obvious in the four hours surrounding the peak of the eclipse. During the eclipse Algol dims from 2.1 magnitude to 3.4. So, while not an unusual occurrence, most of the time it does not happen in prime viewing time often. On the 12th the peak of the eclipse will be at 8:45 CST. Hopefully we will have clear nights on the 11th and 12th. Catch it on the 11th to see it at its brightest and on the 12th as soon as it gets dark look again and, watch it fade over the next couple of hours. As the evening progresses, keep checking back and watch Algol brighten again.

During January there are eight Messier objects between 4 and 6 hours R.A., the portion of the sky closest to the meridian in the hours just after the end of twilight. They include three each of open clusters and diffuse nebulae, a globular cluster and the remnant of the supernova of 1054 A.D.

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DEEP SKY DAZE, continued

The most spectacular, of course, is **M-42 (NGC 1976)**, discernible to the naked eye, interesting in binoculars, and spectacular in telescopes, offering much at any level of magnification. Take your time with the Orion Nebula; the combination of stars and nebulosity is the finest you will find in the northern hemisphere and can only be matched by that surrounding Eta Carinae (which will be observable at the Winter Star Party in the Florida Keys). Incidentally, **M-43 (NGC 1982)** is the irregularly shaped bit of glowing gas and dust just north and east of the Trapezium in M-42, across the dark lane. Depending on your scope's aperture and on seeing conditions, M-43 may appear like a comma.

M-78

Less spectacular, but still an easy object, is **M-78 (NGC 2068)**. At 8th magnitude, this irregular nebula includes a pair of stars which power the nebula. It is located about 1° east and 2° north of Alnitak, the most southerly and easterly of Orion's belt stars. While you're in Orion, try an object that's a little more difficult—**NGC 2022**. This planetary nebula is listed at 12th magnitude and is located about a degree SE of the three stars that represent the hunter's head. It is about 20" in diameter, about 75% the angular diameter of Mars at its very best apparitions. The nebula exhibits little detail other than its somewhat fuzzy edges. The 14th magnitude central star needs at least 10 inches of aperture to resolve it. A nebular or light pollution rejection filter helps a lot to increase the contrast. Once found, you have one of the Herschel 400 objects.

Continuing northward another 13° or so, and a bit west, you'll find **ζ Tauri**, which marks the tip of the more southerly horn of the Bull. This star is located not too far from the boundaries with Gemini and Auriga. About a degree NW of Zeta is **M-1 (NGC 1952)**, an oval shaped 8.4 magnitude blob of nebulosity about 4' x 6'. We've all seen the great photographs of the Crab Nebula with its glowing tendrils, but in most scopes, these just aren't visible to the eye. Larger scopes will display considerable mottling, but the rest of us will have to make do. A really great night, with both transparency and steady seeing, will permit extra magnification and some detail will become obvious in a 6-8 inch instrument, but it takes a really great night.

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DEEP SKY DAZE, continued

The next few open clusters will require a good star chart to sort out, because the area is filled with nebulosity and stellar nurseries. If you have a telescope that can lock in R.A., loosen the declination and shift north, into Auriga. You'll enter the Wheel asterism between β and θ (the opposite side of the circle of the chariot's wheel from the asterism called "The Kids"). Continue until you nearly split the difference between β and θ in a shallow triangle. You should find 6th magnitude **M-36 (NGC 1960)** nearly in the center of the field of view of an ocular giving 50-100X. This cluster is only about 12' in diameter and fairly sparse, but it's pretty.

M-36

Move west about a degree and a shade north to find **NGC 1931**, a small combination emission/reflection nebula with a couple of faint stars either embedded in or superimposed on the nebulosity. Once again, a Sky Glow filter will help, if you have one. Shift to about 50X and head north about 1.5 fields and you'll find **M-38 (NGC 1912)** a bit west of center. It's just a little smaller than a lunar diameter at similar magnification. Like M-36, it's sparse and more spread out. About 0.5° SSW is **NGC 1907**. Small and dense, it packs perhaps a dozen and a half, faint stars in a diameter less than 10', and you've got another Herschel object. Pretty easy, huh?

M-38

And here's another Herschel bonus. Continue north until you're about 6.5° south and a field of view east of Capella. I overlooked this open cluster (**NGC 1857**) at 50X, but got a clear view at 100X. Fairly rich and compressed, it has a bright central star.

Now we have to backtrack to M-36. From there drop SE a bit over 3° and we're on top of **M-37**

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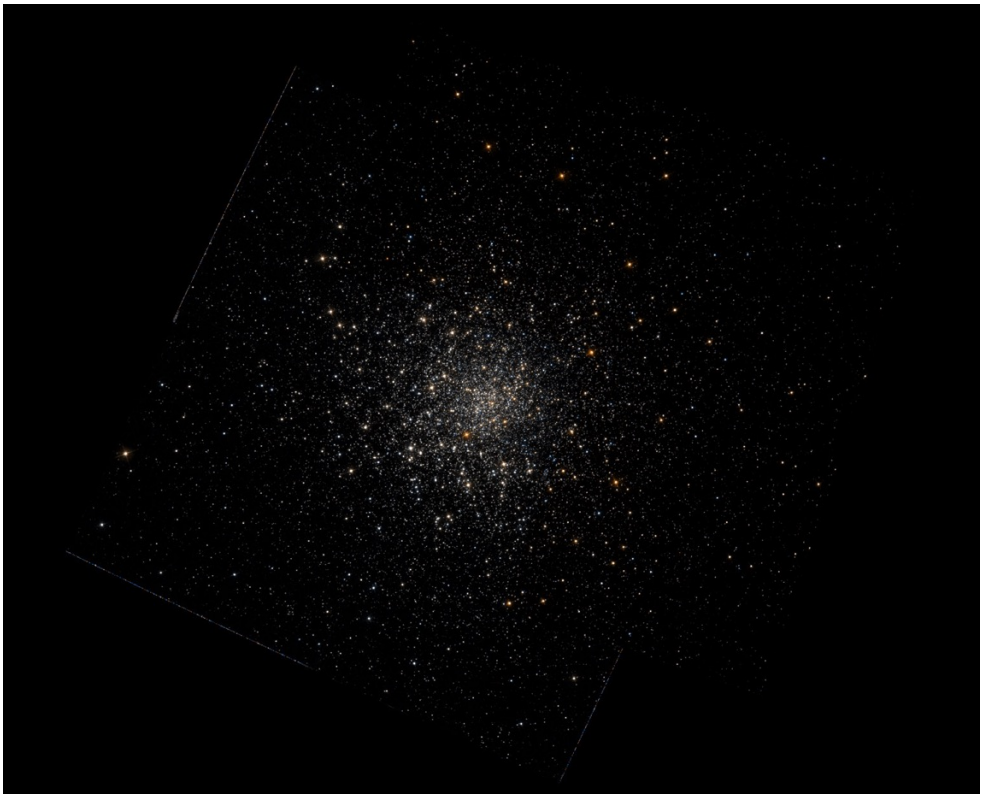
DEEP SKY DAZE, continued

(NGC 2099), a beautiful, dense cluster of about 150 stars, spread evenly across 24'. A 50X ocular is quite enough for this one. There is a dark gap in the stars at the SW edge of the grouping. This is a real showpiece. As a matter of interest, you will again be about midway between ß and θ, M-37 forming the apex of a shallow triangle on the outside of the pentagon of stars that form Auriga's wheel.



M-79

For our final object, let's drop south of Orion, into Lepus. Split the R.A. difference between M-42 and Rigel, keeping α and ß Leporis just to the east. **M-79 (NGC 1904)**, the only globular cluster in our winter sky, is about 4.5° SSW of ß, almost directly on a line extended south from α through ß. Once you find it use some power. It should fill about half of a 200X field. Note that it brightens considerably toward the center and that the central brightness is off center to the south. Being some 50,000 light years away, there is not a lot of resolution in 8-10" scopes, but a good night should allow some resolution of stars around the edge of the cluster, which actually holds about 90,000 stars in a diameter of about 110 light years.
I hope Santa was good to everyone and that you have a great month of viewing. Peace!

Image credits:

M-78 ESO/Igor Chekalin

M-36 Ole Nielsen

M-38 Ole Nielsen

M-79 Hubble Legacy Archive

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held On Wednesday, December 6, 2017.

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held December 6, 2017, in the board room at the Girl Scouts Center, 4522 Granny White Pike, Nashville, TN 37204. Present were Mike Benson, Spencer Buckner, Gary Eaton, Drew Gilmore, Tom Guss, Bud Hamblen, Keith Rainey and guest Lonnie Puterbaugh. A quorum being present, the meeting was called to order at 7:30 PM. Gary asked for a motion to approve the minutes of the November 1, 2017, meeting. Spencer so moved, Mike seconded, and the minutes were approved without discussion, by an unanimous voice vote. Todd Nannie will be filling in for Tom Guss as treasurer for the first half of 2018. Keith reported that there were about 140 members.

Lonnie reported on the status of equipment owned by the club and his presentation for the December general meeting. He suggested that short introductions be made at the beginning of star parties for the benefit of attendees. There was discussion about holding a cloudy night indoor session where suitable facilities were available at the site when a star party needed to be cancelled because of weather. Adventure Science Center management had indicated that they may be open to hosting a BSAS meeting at the Sudekum Planetarium. We would need to make the meeting beneficial to the ASC. Long Hunter State Park was mentioned as a possible site for the Messiar Marathon. It was suggested to ask Terry Reeves whether he wanted to do a “What’s Up” for the February general meeting.

There being no further business, Gary asked for a motion to adjourn. Mike so moved, Spencer seconded, and the meeting was adjourned at 9 PM.

Respectfully submitted,

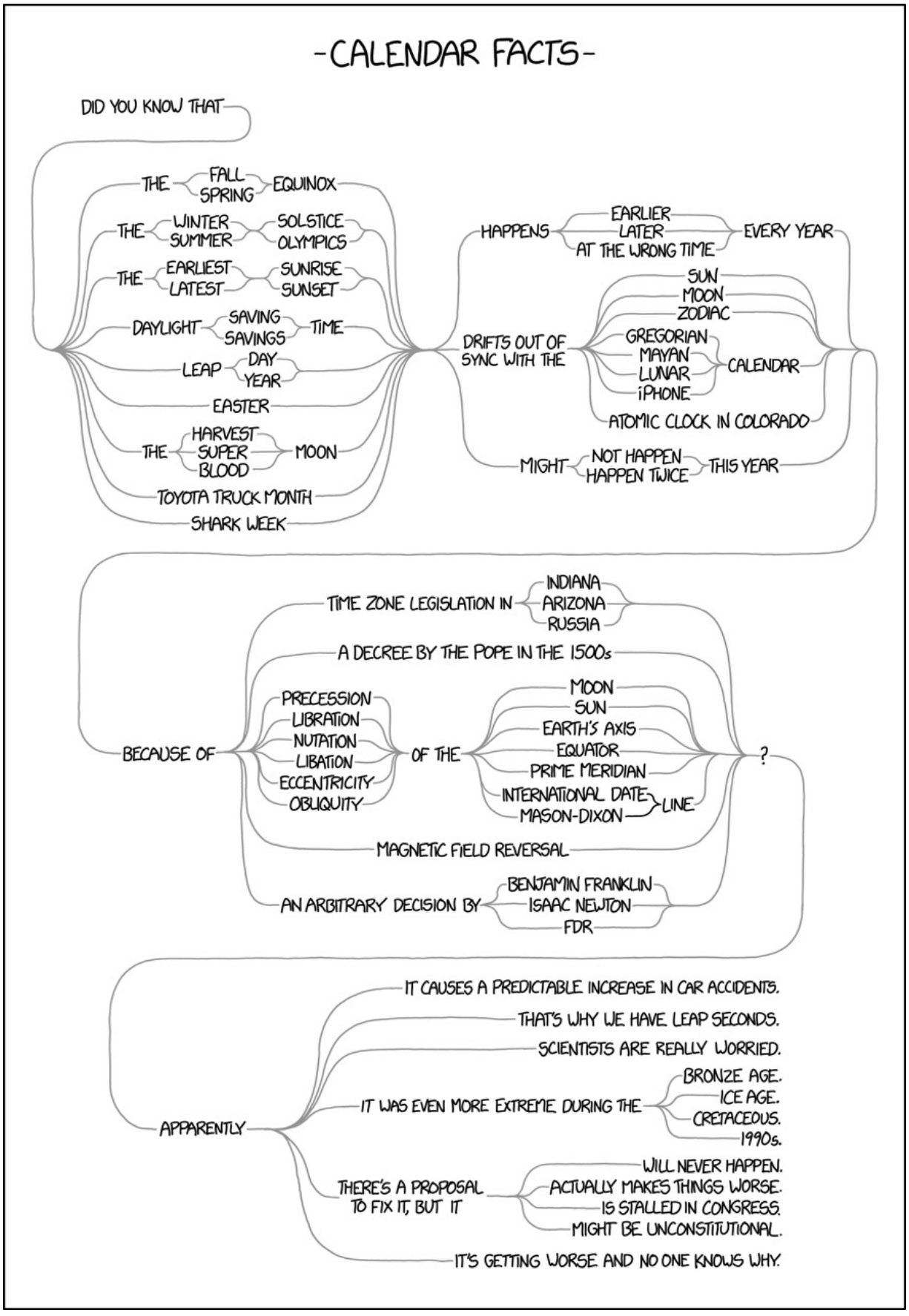
Bud Hamblen
Secretary

Next BSAS meeting
January 17, 2018, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

The January meeting of the Barnard-Seyfert Astronomical Society will focus on how to use a telescope and other astronomical gadgets. Whether you just received a telescope for Christmas or have one gathering dust in the closet, bring it to the meeting for some one on one instruction! Be sure to bring the manual and other parts that came with your telescope, if they’re available.If you plan on bringing a telescope to the meeting, let us know beforehand by emailing your name along with the brand and model of the telescope to info@bsasnashville.com. This way, we’ll be prepared to assist you.

xkcd


-CALENDAR FACTS-
DID YOU KNOW THAT
THE FALL/SPRING EQUINOX
THE WINTER/SUMMER SOLSTICE/OLYMPICS
THE EARLIEST/LATEST SUNRISE/SUNSET
DAYLIGHT SAVING/SAVINGS TIME
LEAP DAY/YEAR
EASTER
THE HARVEST/SUPER/BLOOD MOON
TOYOTA TRUCK MONTH
SHARK WEEK
HAPPENS EARLIER/LATER/AT THE WRONG TIME EVERY YEAR
DRIFTS OUT OF SYNC WITH THE SUN/MOON/ZODIAC/GREGORIAN/MAYAN/LUNAR/iPHONE CALENDAR/ATOMIC CLOCK IN COLORADO
MIGHT NOT HAPPEN/HAPPEN TWICE THIS YEAR
BECAUSE OF PRECESSION/LIBRATION/NUTATION/LIBATION/ECCENTRICITY/OBLIQUITY OF THE MOON/SUN/EARTH'S AXIS/EQUATOR/PRIME MERIDIAN/INTERNATIONAL DATE LINE/MASON-DIXON LINE ?
TIME ZONE LEGISLATION IN INDIANA/ARIZONA/RUSSIA
A DECREE BY THE POPE IN THE 1500s
MAGNETIC FIELD REVERSAL
AN ARBITRARY DECISION BY BENJAMIN FRANKLIN/ISAAC NEWTON/FDR
APPARENTLY
IT CAUSES A PREDICTABLE INCREASE IN CAR ACCIDENTS.
THAT'S WHY WE HAVE LEAP SECONDS.
SCIENTISTS ARE REALLY WORRIED.
IT WAS EVEN MORE EXTREME DURING THE BRONZE AGE./ICE AGE./CRETACEOUS./1990s.
THERE'S A PROPOSAL TO FIX IT, BUT IT WILL NEVER HAPPEN./ACTUALLY MAKES THINGS WORSE./IS STALLED IN CONGRESS./MIGHT BE UNCONSTITUTIONAL.
IT'S GETTING WORSE AND NO ONE KNOWS WHY.

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held On Wednesday, December 20, 2017.

The Barnard-Seyfert Astronomical Society held its annual pot-luck dinner and monthly meeting at Glendale United Methodist Church, 900 Glendale Lane, Nashville, Tennessee, on Wednesday, December 20, 2017. 46 members and guests signed in. Guests included Martha Boyd Littlehill, daughter of long-time member Joe Boyd, her husband Rich Littlehill and their daughter Alice Littlehill.

The dinner began at 7:00 PM [many thanks to those whose brought food]. Gary Eaton called the meeting to order at 7:30 PM. Gary asked for a motion to approve the minutes of the November 15, 2017, meeting as printed in the December, 2017, issue of the Eclipse, and the minutes were adopted without discussion by a unanimous voice vote. Tom Guss reported that there was $6,749.18 in the checking account and $4,156.51 in the savings account. Keith Rainey reported that there were 146 members.

The club board for 2018 was constituted as follows:

Gary Eaton, President
Keith Rainey, Vice-president
Tom Guss, Treasurer
Bud Hamblen, Secretary
Theo Wellington, ex-officio
Mike Benson, Director
Spencer Buckner, Director
Drew Gilmore, Director
K. C. Katalbas, Director
Johana Koehane, Director
Todd Nannie, Director

Gary announced upcoming star parties: private star party on January 13 at Natchez Trace mile marker 435.3, public event on January 19 at Bells Bend Outdoor Center from 6:30-8:30 PM, private star party February 17 at Natchez Trace mile marker 412 (Water Valley Overlook), and public event at Edwin Warner Park Special Events Field from 6:30-8:30 PM.

Lonnie Puterbaugh presented “The Return of the Red Planet: Mars Insights.”

There being no further business the meeting was adjourned at about 9:20 PM.

Respectfully submitted,

Bud Hamblen

Secretary

From the President, continued

you might be able to catch a glimpse of the two moons of Mars (Phobos and Deimos).

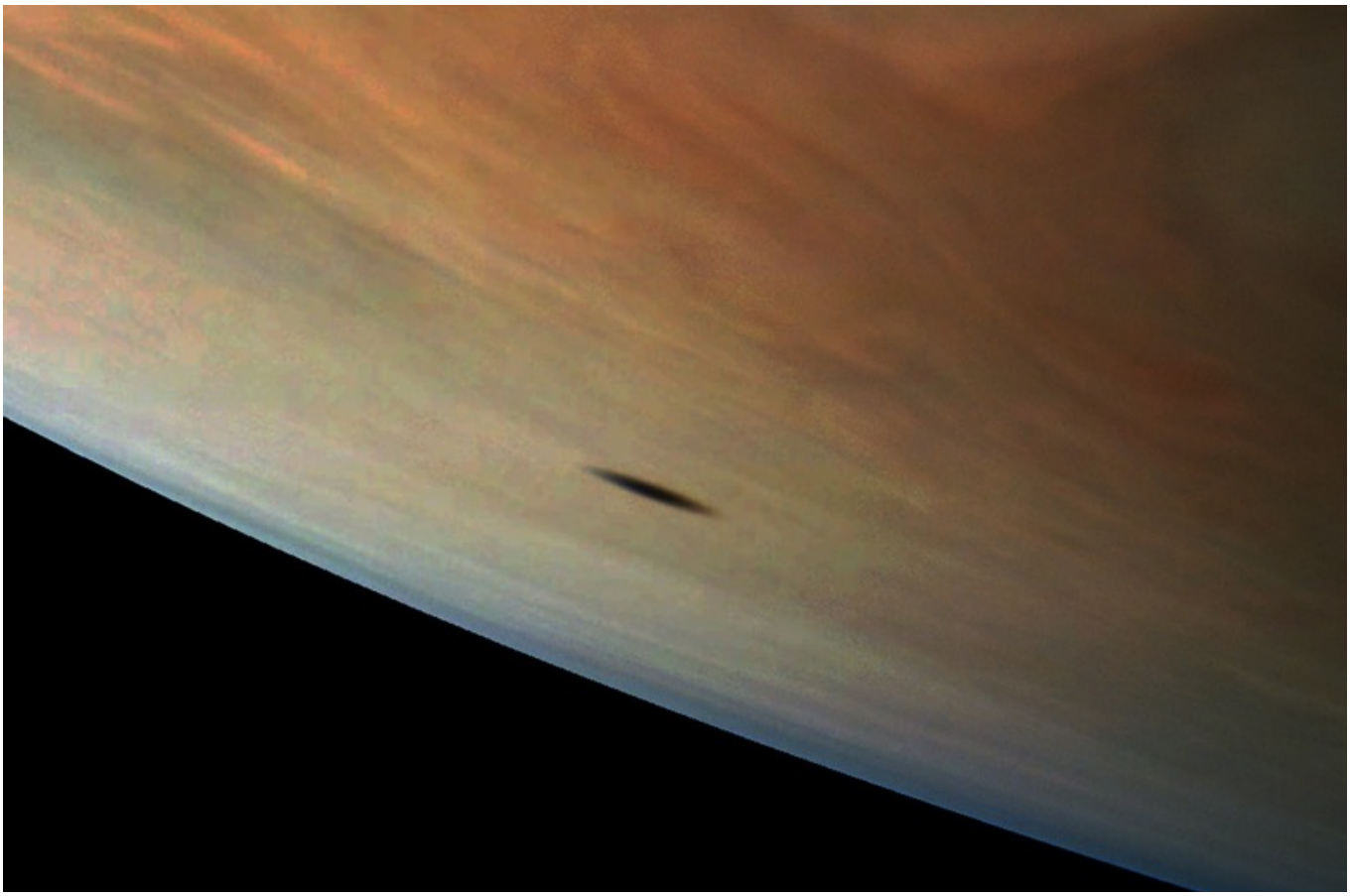
Watch a meteor shower. This August, the Perceid meteor showers should put on an outstanding show with a moonless night. The Orionids in October the Leonids in November and the Geminids in December are other options.

Select one constellation, learn all about it and memorize all the bright stars and objects to view. I enjoy viewing Sagittarius each summer and plan to spend time on it again in 2018.

Hunt down a comet. We all know comet predications are not too reliable, but hopefully comet 46P/Wirtanen will be bright enough to see with your naked eyes this December.

Well, whatever your goals for 2018, I wish you much success.

Gary Eaton



Juno Captures Amalthea's Shadow on Jupiter
Image Credits: NASA/JPL-Caltech/SwRI/MSSS/Gerald Eichstädt

Barnard-Seyfert Astronomical Society

Become a Member of BSAS! Visit bsasnashville.com to join online.

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

Annual dues:

Regular: $25
Family: $35
Senior/Senior family: $20
Student:* $15

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

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.

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.