The ECLIPSE

The Newsletter of the Barnard-Seyfert Astronomical Society

October 2023

BSAS
Barnard-Seyfert Astronomical Society

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Contact BSAS officers at
bsasnashville.com/contact
Or email info@bsasnashville.com

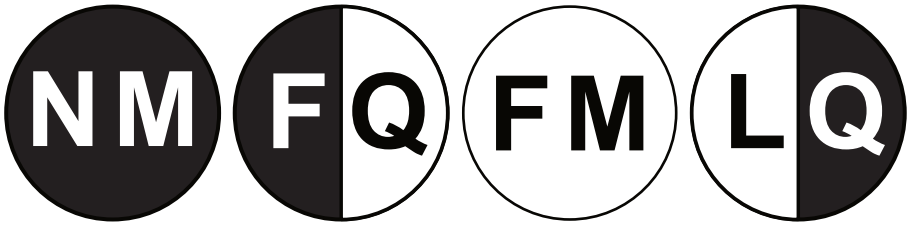
After years of anticipation and hard work by NASA's OSIRIS-REx (Origins, Spectral Interpretation, Resource Identification and Security – Regolith Explorer) team, a capsule of rocks and dust collected from asteroid Bennu finally is on Earth. It landed at 8:52 a.m. MDT (10:52 a.m. EDT) on September 24, in a targeted area of the Department of Defense's Utah Test and Training Range near Salt Lake City.

Within an hour and a half, the capsule was transported by helicopter to a temporary clean room set up in a hangar on the training range, where it now is connected to a continuous flow of nitrogen.

The returned samples collected from Bennu will help scientists worldwide make discoveries to better understand planet formation and the origin of organics and water that led to life on Earth, as well as benefit all of humanity by learning more about potentially hazardous asteroids. Credits: NASA/Keegan Barber

On the Cover: NASA's James Webb Space Telescope's high resolution, near-infrared look at Herbig-Haro 211 reveals exquisite detail of the outflow of a young star, an infantile analogue of our Sun. Herbig-Haro objects are formed when stellar winds or jets of gas spewing from newborn stars form shock waves colliding with nearby gas and dust at high speeds

The image showcases a series of bow shocks to the southeast (lower-left) and northwest (upper-right) as well as the narrow bipolar jet that powers them in unprecedented detail. Molecules excited by the turbulent conditions, including molecular hydrogen, carbon monoxide and silicon monoxide, emit infrared light, collected by Webb, that map out the structure of the outflows. ESA/Webb, NASA, CSA, Tom Ray (Dublin)



Oct 14
Nov 13

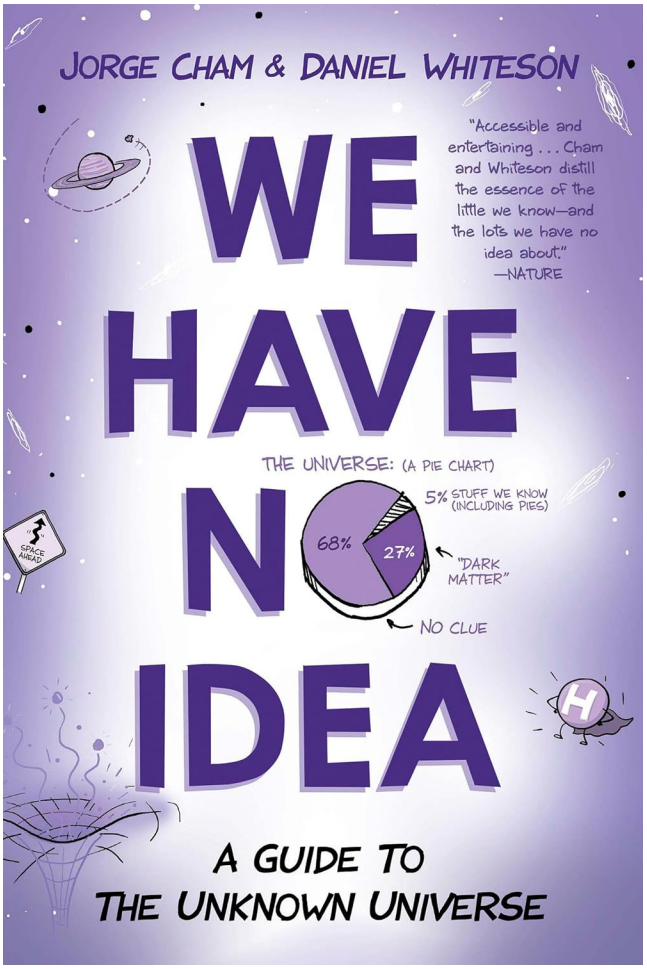
Oct 21
Nov 20

Oct 28
Nov 27

Oct 6
Nov 5

Book Review: We Have No Idea
reviewed by Robin Byrne

When I came across a book titled We Have No Idea: A Guide To The Unknown Universe, I knew I had to read it. Written by Daniel Whiteson, a particle physicist from the University of California at Irvine, and illustrated by Jorge Cham, the creator of PHD Comics, this book is filled with great information, while managing to be entertaining, at the same time.



The entire book is devoted to topics that are still being studied, are not yet fully understood, and are at the heart of some of the most interesting questions currently being asked. Among the questions discussed are: what is dark matter, what is dark energy, what is mass, why does gravity behave differently from the other forces, what is space, what is time, how many dimensions are there, where did all the antimatter go, how big is the universe, and many more. The short answer to all of the questions asked in the book is, “We have no idea.”

Of course, if that answer were entirely true, there wouldn’t be much left to write. In each chapter, we learn about what is currently known, what we think we know, or, at least, what we have observed. Then we are taken on a journey of how we might one day be able to figure out the answer, and what some possible answers could be.

The writing style is very readable and fun. Humor is used quite a bit, causing the reader to grin while simultaneously trying to wrap their brain around some complex concepts. The illustrations by Cham add another level of humor, while also helping to break the chapters into manageable parts and providing a chance to process what was just read.

As I read this book, it occurred to me that it would make a great source for a lecture series all about the things we don’t understand. TED Talk anyone?

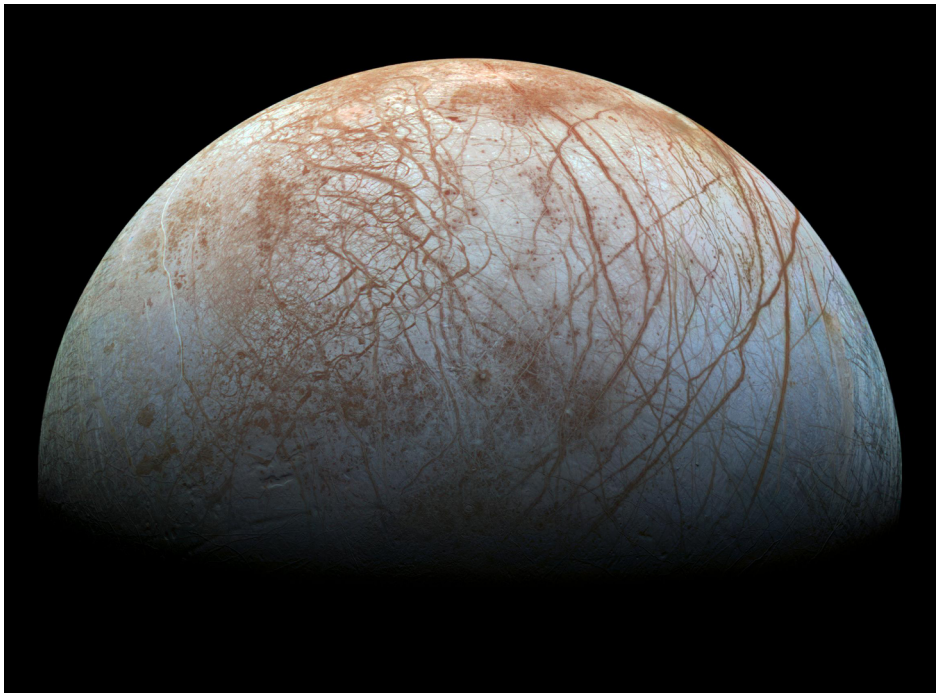
Whether you are a true science nerd, or just science curious, you will find something to enjoy and laugh about in We Have No Idea: A Guide To The Unknown Universe. I highly recommend it.

References:

We Have No Idea: A Guide To The Unknown Universe by Jorge Cham and Daniel Whiteson; Riverhead Books, 2017.

From Galileo to Clipper, Exploring Jupiter's Moons
By Vivian White

"We, too, are made of wonders, of great
and ordinary loves, of small invisible worlds,
of a need to call out through the dark."
From In Praise of Mystery: A Poem for Europa by Ada Limon

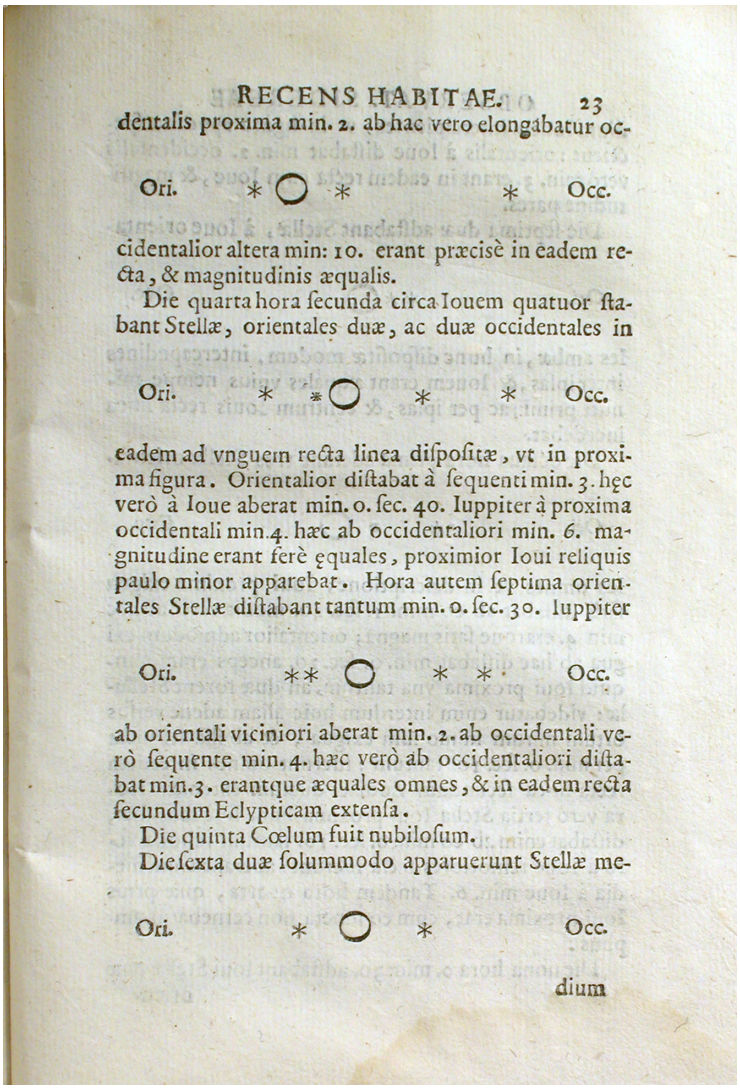


As autumn begins, if you're up late, you may notice a bright point of light rising in the east. Look a bit closer, with a pair of binoculars, and you'll notice it's not a star at all. While stars look point-like no matter how big your backyard telescope, this light appears as a circle under closer examination. Even more curious, you will likely see a line of smaller dots on one or both sides. Congratulations! You've rediscovered the king of the planets - majestic Jupiter - and its four largest moons.

Galileo famously chronicled the four moving dots near Jupiter and surmised that they were orbiting the distant world. While Jupiter has well over 80 discovered moons as of September 2023, these brightest four are called the "Galilean Moons" - Io, Europa, Ganymede, and Callisto. (Great mnemonics exist to remember these in order of distance from Jupiter, such as "I Eat Green Caterpillars") You can follow these like Galileo did, using stargazing apps or the handy image below. A favorite beginning observing challenge is to track the movement of the Galilean Moons over the course of many nights. Even within a few hours, you will notice them moving in relation to Jupiter, just as Galileo did.

Fast forward 414 years, and NASA will be sending a robotic mission to investigate the surface of one of these distant worlds. The Europa Clipper Mission is launching to the cold, icy moon in 2024, to begin orbiting in 2030. With its salty oceans covered by ice, Europa was chosen as an excellent location to continue the search for life outside of Earth. Clipper will be the largest spacecraft ever sent to another planet, designed to withstand Jupiter's punishing radiation. Once it arrives at Jupiter in 2030, NASA plans to do about 50 flybys of Europa, mapping almost the entire surface of this watery world.

What was once only dreamed of in the small telescope of Galileo, or in great works of fiction, NASA is turning our wildest imagination into reality. One of the celebrated quotes



RECENS HABITAE. 23

dentalis proxima min. 2. ab hac vero elongabatur oc-

Ori. * ○ * * Occ.

cidentalior altera min: 10. erant præcisè in eadem re-
cta, & magnitudinis æqualis.

Die quarta hora secunda circa Iouem quatuor stabant Stellæ, orientales duæ, ac duæ occidentales in

Ori. * * ○ * * Occ.

eadem ad vnguem recta linea dispositæ, vt in proxima figura. Orientalior distabat à sequenti min. 3. hęc verò à Ioue aberat min. 0. sec. 40. Iuppiter à proxima occidentali min. 4. hæc ab occidentaliori min. 6. magnitudine erant ferè equales, proximior Ioui reliquis paulo minor apparebat. Hora autem septima orientales Stellæ distabant tantum min. 0. sec. 30. Iuppiter

Ori. ** ○ * * Occ.

ab orientali viciniori aberat min. 2. ab occidentali verò sequente min. 4. hæc verò ab occidentaliori distabat min. 3. erantque æquales omnes, & in eadem recta secundum Eclypticam extensa.

Die quinta Cœlum fuit nubilosum.

Die sexta duæ solummodo apparuerunt Stellæ me-

Ori. * ○ * Occ.

dium

from the classic 2010: Odyssey Two warns, “All these worlds are yours, except Europa. Attempt no landing there.” Science fiction fans can feel relieved knowing that writer Arthur C. Clarke gave his blessing for the Europa Clipper mission.

Join the Europa Message in a Bottle Campaign to send your name with the spacecraft, hear the rest of the poem by the US Poet Laureate, and learn more about the wonders of space travel with the Clipper Mission: https://europa.nasa.gov/participate

Watch a wonderful Clipper webinar with Dr. Cynthia Phillips, planetary geologist with the mission: https://www.youtube.com/live/RnnLJBLRBCA?feature=shared&t=269

Galileo's drawings of Jupiter and its Medicean Stars from Sidereus Nuncius. Image courtesy of the History of Science Collections, University of Oklahoma Libraries

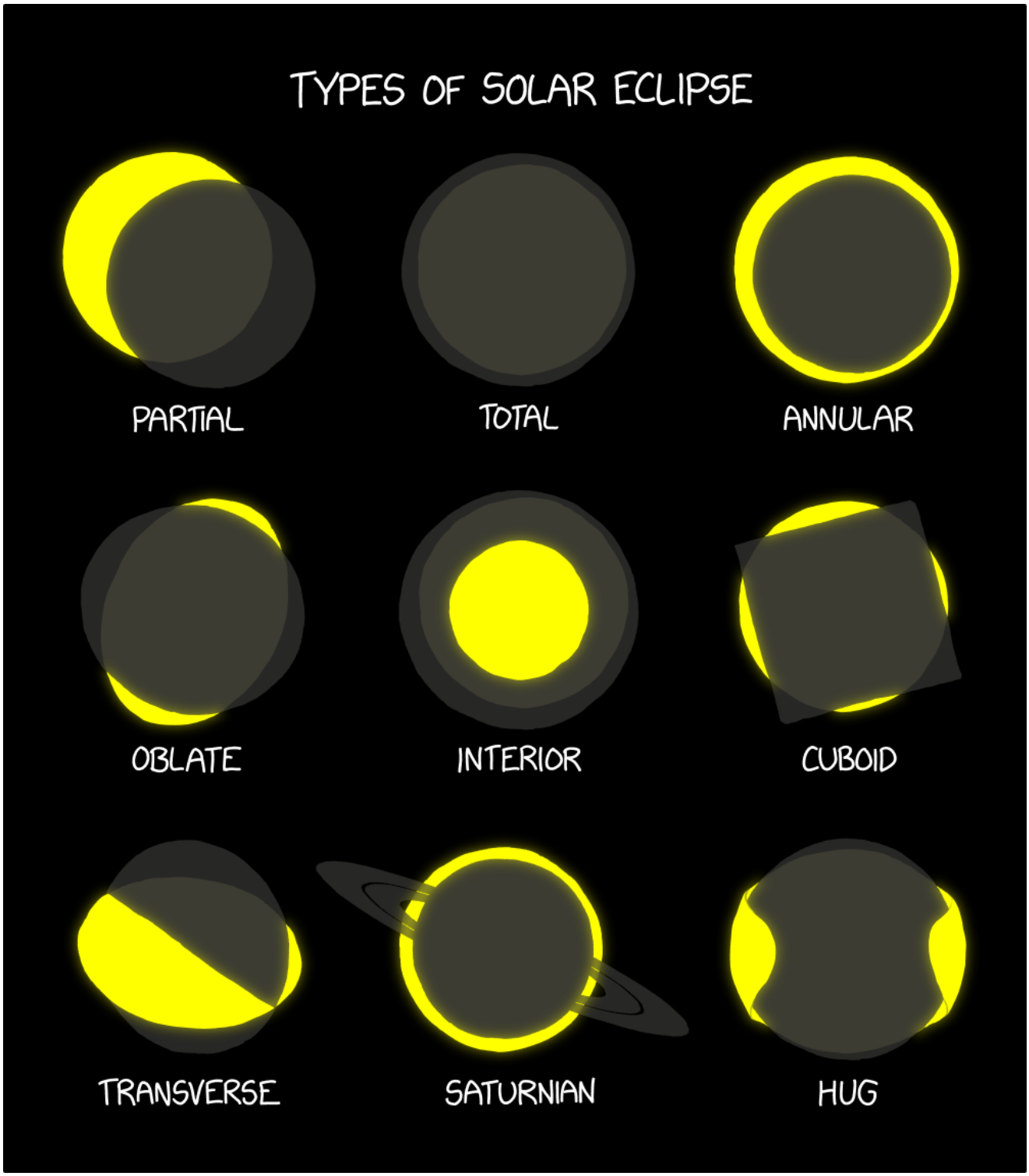
This article is distributed by NASA’s Night Sky Network (NSN). The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Next Membership Meeting:

Wednesday, October 18, 7:30 pm

Cumberland Valley
Girl Scout Council Building
4522 Granny White Pike

xkcd


TYPES OF SOLAR ECLIPSE
PARTIAL
TOTAL
ANNULAR
OBLATE
INTERIOR
CUBOID
TRANSVERSE
SATURNIAN
HUG

Barnard-Seyfert Astronomical Society
Minutes of a Regular Meeting of the Board of Directors
Held on Wednesday, September 6, 2023

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held on September 6, 2023, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Chip Crossman, Tony Drinkwine, Oz Gonzalez, Bud Hamblen, Keith Rainey, Andy Reeves, and Theo Wellington.

Membership report: Keith reported 157 members.

Treasurer's Report: The Truist bank account has $7,696.15. The PayPal account has $487.36.

Social Media: The Facebook page has 2,100 likes and 2,200 followers. "X" has 320 followers.

Meeting programs: There are speakers for the September through December meetings. The January meeting should be the annual telescope workshop.

Posters: Four more posters have been sold.

Solar glasses: Theo ordered 10,000 pairs from Rainbow Symphony at thirty-eight cents per pair, delivery to be before Christmas. We can expect to sell glasses for about $2 per pair.

There being no further business, the meeting was adjourned at 8:30 PM.

Respectfully submitted,

Bud Hamblen
Secretary

Barnard-Seyfert Astronomical Society
Minutes of the Monthly Membership Meeting
Held on Wednesday, September 20, 2023

The Barnard-Seyfert Astronomical Society met at the Girl Scouts Center and on-line via Zoom on Wednesday, September 20, 2023, at 7:30 PM, Tom Beckermann presiding.

Minutes for the August meeting were adopted without discussion.

Membership Report: Tom reported 159 members.

Treasurer's Report: Theo Wellington reported that the Truist bank balance is $7,696.16). The PayPal balance is $544.29. The club ordered 10,000 solar eclipse glasses from Rainbow Symphony for delivery before Christmas. BSAS members will get two pairs. Additional pairs for members will be $1.00 each. Glasses will be available to the public for $2.00 each. Four more posters were sold this month. Posters are $20 each with customer pickup or $25 with shipping.

Social Media: The Facebook page has 2,100 likes and 2,300 followers (https://www.facebook.com/bsasnashville). "X", the service formerly known as Twitter, has 320 followers for @BSASNashville (https://twitter.com/BSASNashville). BSAS is on Instagram (https://www.instagram.com/bsasnashville) with 202 followers (thanks to Steve Hughes for running the Instagram page). The URL for the BSAS Google group is https://groups.google.com/g/bsasnashville. If you need an invitation to the group, please email info@bsasnashville.com.

Loaner Equipment: Tom reported that we do have telescopes available for members to borrow. The URL for the equipment list is https://docs.google.com/spreadsheets/d/1j5OpqArJDeq4AVWfi8HhS7LFoE4R5lWDcLzXZYzDsbE/edit#gid=844728645 If you need help with equipment, the contact email is equipment@bsasnashville.com or you can post a request for help on the BSAS Google group.

Star Parties and Outreach: The public star party at the Edwin Warner Park Special Events Field on August 19 had about 150 guests. A public star party is scheduled at Mill Ridge Park on September 23 from 7:30 to 9:30 PM. The equipment setup time is 6:30 PM. Private star parties are scheduled for September 22 and October 14. The Adventure Science Center will have a solar eclipse day event on October 14.

Bud Hamblen presented "No Solar Retinopathy or How to Look at The Sun Without Burning Out Your Eye."

The URL for the recorded live stream of the meeting is https://www.youtube.com/live/VC2lWTshga0?si=ayUBUkHBkofJ859N

The URLs mentioned in the presentation are:

Story from CNN on eye injury sustained during a partial solar eclipse
https://www.cnn.com/2017/12/07/health/eclipse-eye-damage-case-study/index.html

H-alpha images from ground-based observatories.
https://gong2.nso.edu/products/tableView/table.php?configFile=configs/hAlpha.cfg

Sunspots from the SOHO spacecraft.
https://soho.nascom.nasa.gov/sunspots/

Amazon offers refunds after recalling suspect solar eclipse glasses –
USA Today, 8-14-2017
https://www.usatoday.com/story/money/nation-now/2017/08/14/amazon-offers-refunds-after-recalling-suspect-solar-eclipse-glasses/563940001/

Vanderbilt University Medical Center recalls white eclipse viewing glasses – VUMC Reporter, 8-17-2017
https://news.vumc.org/2017/08/17/vanderbilt-university-medical-center-recalls-white-eclipse-viewing-glasses/

Coronado PST disassembly
https://fullerscopes.blogspot.com/2018/02/pst-dismantling-images-of-parts.html

There being no further business, the meeting was adjourned at 8:40 PM.

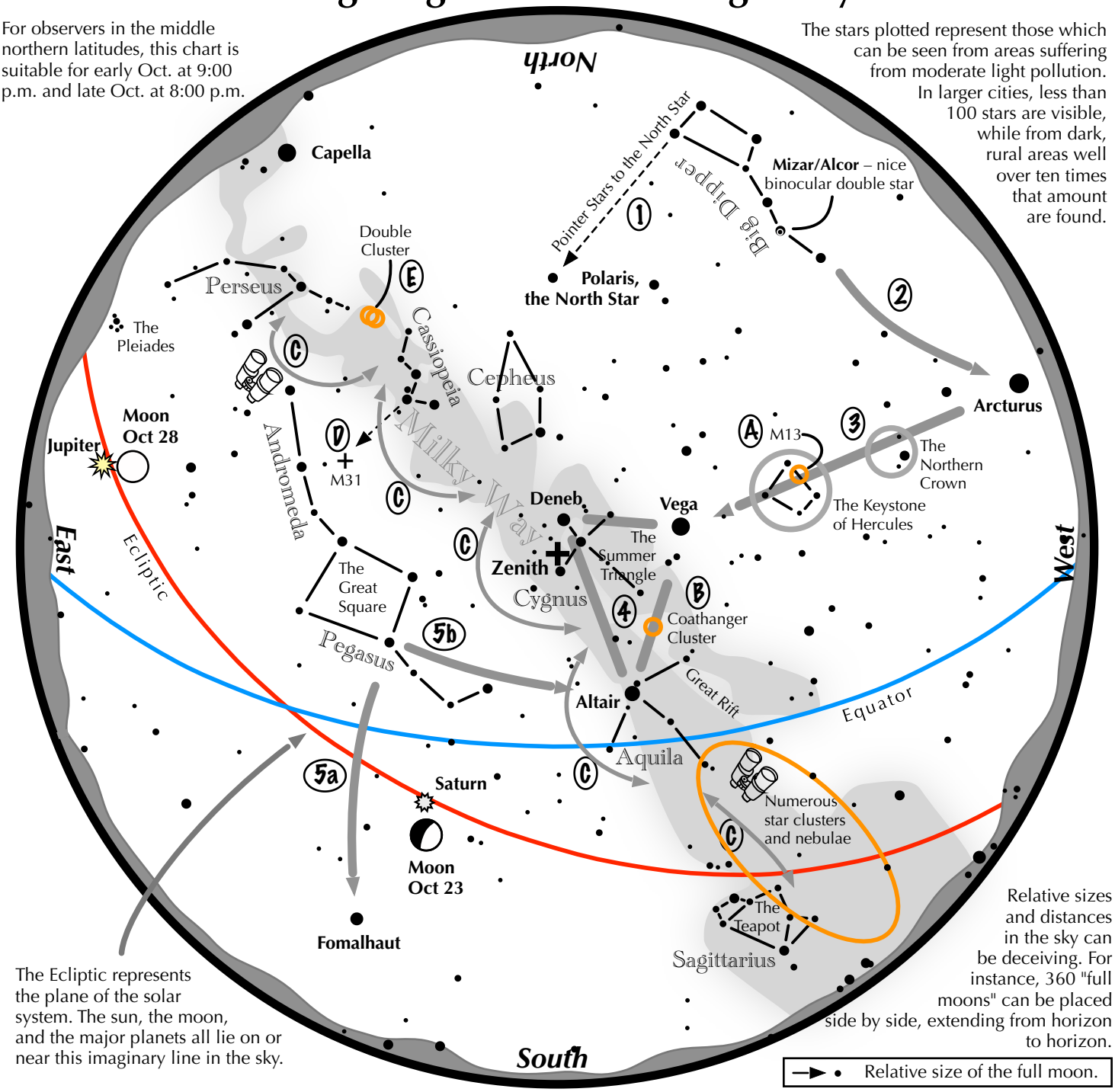
Respectfully submitted,

Bud Hamblen
Secretary

Navigating the October Night Sky

For observers in the middle northern latitudes, this chart is suitable for early Oct. at 9:00 p.m. and late Oct. at 8:00 p.m.

The stars plotted represent those which can be seen from areas suffering from moderate light pollution. In larger cities, less than 100 stars are visible, while from dark, rural areas well over ten times that amount are found.



The Ecliptic represents the plane of the solar system. The sun, the moon, and the major planets all lie on or near this imaginary line in the sky.

Relative sizes and distances in the sky can be deceiving. For instance, 360 "full moons" can be placed side by side, extending from horizon to horizon.

→ • Relative size of the full moon.

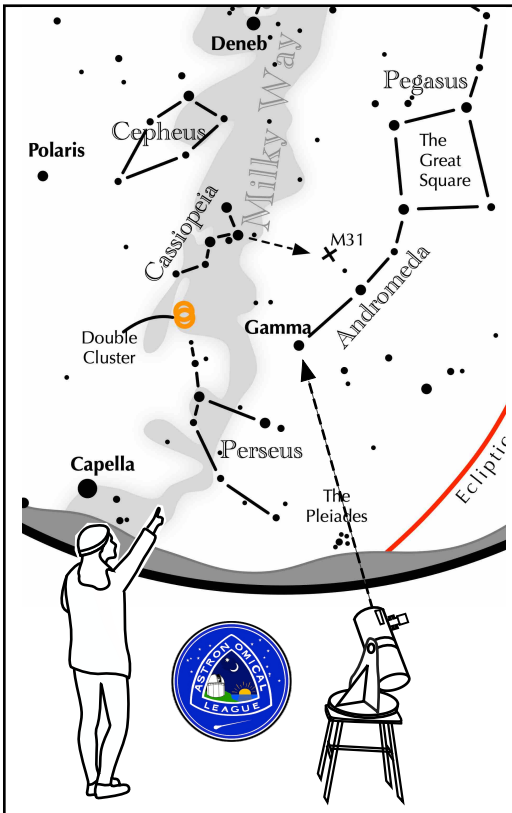
Navigating the October night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the early October evening sky.
3. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
4. Nearly overhead lie the summer triangle stars of Vega, Altair, and Deneb.
5. High in the east are the four moderately bright stars of the Great Square. Its two southern stars point west to Altair. Its two western stars point south to Fomalhaut.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster, a ball of 500,000 stars. **B:** 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger. **C:** Sweep along the Milky Way for an astounding number of fuzzy star clusters and nebulae amid many faint glows and dark bays, including the Great Rift. **D:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **E:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster.

ASTRONOMICAL LEAGUE Double Star Activity



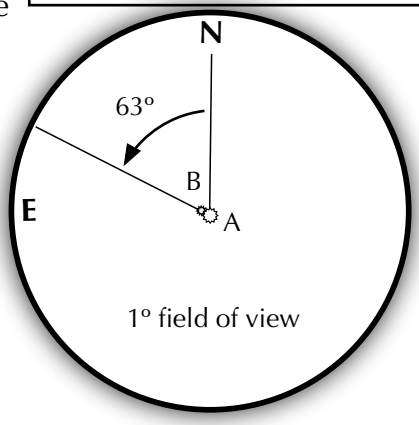
Other Suns: Gamma Andromedae

How to find Gamma Andromedae on an October evening

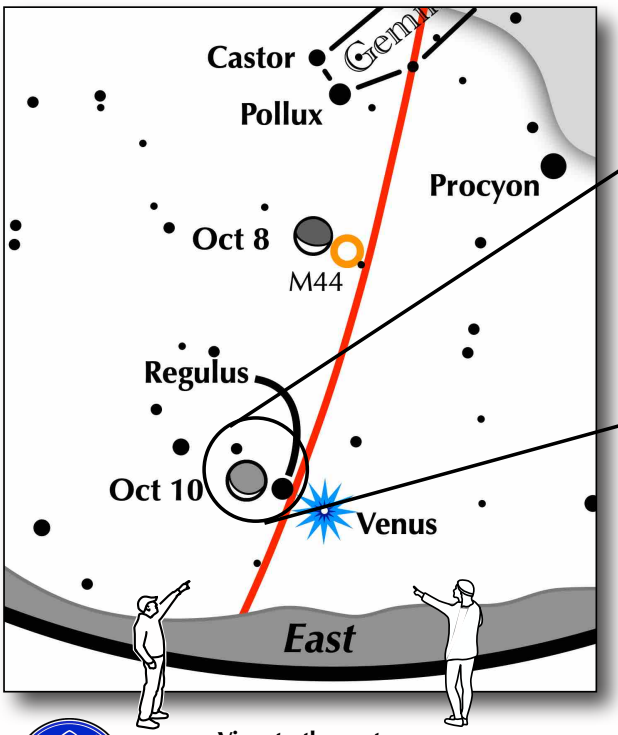
Face northeast. Find the Great Square and the curve of stars extending to the lower left. This is Andromeda. Gamma is the third star on the string and is as bright as the major stars of the Big Dipper. From the "W" of Cassiopeia, Gamma lies to the lower right.

Suggested magnification: 40x
Suggested aperture: >2 inches

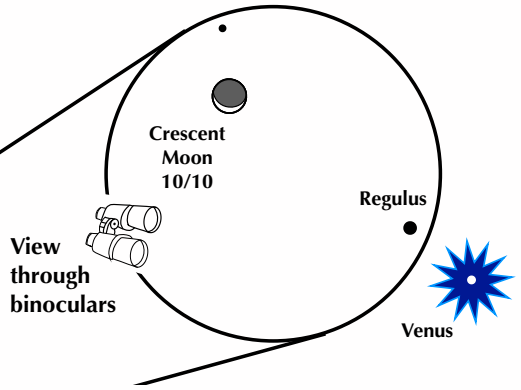
Gamma Andromedae
A-B separation: 9.7 sec
A magnitude: 2.3
B magnitude: 5.0
Position Angle: 63°
A & B colors:
orange, blue



In the early morning on October 10, try this challenge:



View to the east
on October 10
90 minutes before sunrise



Crescent moon meets Venus and Regulus

On the morning of October 10, the crescent moon, glowing full with earthshine, floats left of brilliant Venus. Look 90 minutes before sunrise.

Between them, shines Leo's brightest star, Regulus.

Two mornings earlier a thicker crescent moon was near M44, the Beehive star cluster.

The meeting of the crescent moon and Venus also occurs on the mornings of November 9 when the moon nearly covers Venus, and of December 9.

In honor of the club's 90th anniversary we partnered with Hatch Show Print to create a unique poster that would honor the achievement of the club. For those who don't know Hatch Show has been making posters for a variety of events and concerts for 140 years. In all that time we are their first astronomy club.

On the poster at the center is the moon. This was made from a wood grained stencil that the shop has used for over 50 years. To contrast that the telescope that the people are using is a brand new stencil made for our poster. The poster has three colors. First the pale yellow color of the moon was applied. Next the small stars, circles, and figures at the bottom were colored in metallic gold. The third color is a blue for the night sky. Where it overlaps with the metallic gold it creates a darker blue leaving the figures at the bottom looking like silhouettes. This was a one time printing so the 100 that we have are all that will be printed.

The prints are approximately 13 3/4” x 22 1/4” and are available for $20 at our membership meetings, or $25 with shipping by ordering through bsasnashville.com. Frame not included.

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.