

# The ECLIPSE

*The Newsletter of the Barnard-Seyfert Astronomical Society*



*December 2023*



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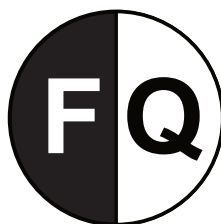
ASA's James Webb Space Telescope has gazed at the Crab Nebula in the search for answers about the supernova remnant's origins. Webb's NIRCам (Near-Infrared Camera) and MIRI (Mid-Infrared Instrument) have revealed new details in infrared light.

Similar to the Hubble optical wavelength image released in 2005, with Webb the remnant appears comprised of a crisp, cage-like structure of fluffy red-orange filaments of gas that trace doubly ionized sulfur (sulfur III). Among the remnant's interior, yellow-white and green fluffy ridges form large-scale loop-like structures, which represent areas where dust particles reside. **Image Credit:** NASA, ESA, CSA, STScI, Tea Temim (Princeton University)

**On the Cover:** Nov. 25, 2023 - Nashville, Tennessee, split by the Cumberland River, is pictured from the International Space Station as it orbited 261 miles above the Volunteer State. At top left, is the Nashville International Airport near the Percy Priest Lake. **Image Credit:** JSC



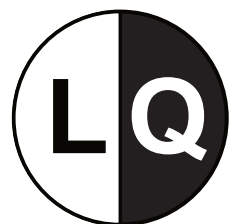
Dec 12  
Jan 11



Dec 19  
Jan 17



Dec 26  
Jan 25



Dec 4  
Jan 3

## Book Review: Feynman reviewed by Robin Byrne

I'm not sure when I actually purchased Feynman by Jim Ottaviani and Leland Myrick, but it sat on my shelf long enough that I was pleasantly surprised to open it and discover that it was a graphic novel. So, instead of a book that could have been a dry telling of Richard Feynman's life, it was a joyous journey through his various escapades. (Though, let's be honest, even a regular biography of Feynman would be hard-pressed to come across as dry.)

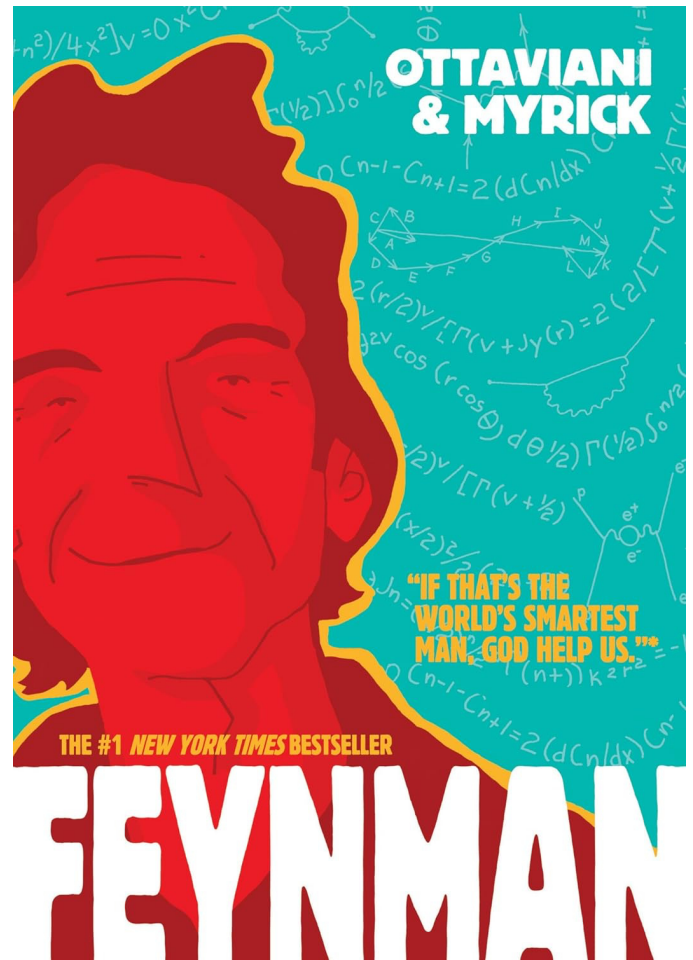
Written by Ottaviani and illustrated by Myrick, Feynman takes us, mostly, chronologically through his life and is written as though Feynman himself is telling the story via various recollections. For lack of a better word, each "chapter" begins with a title and year to set the scene, and then presents a brief story about that moment in Feynman's life.

We see the role Feynman's father played in sparking his interest in science. There are stories of his public school years, college, his first wife, and his role in the Manhattan Project. We also briefly meet his sister, who would later become an astrophysicist. For anyone who has seen the 1996 film *Infinity* with Matthew Broderick, this part of his life will be very familiar. (And if you haven't seen that film, you should.)

The next era in his life takes us through his teaching career, and his contribution to Quantum Electrodynamics (QED). We also see hints of his womanizing, plus some wild detours.

Then the book takes us into Feynman's later, calmer years. We learn about his last marriage, his relationship with his children, and his receiving the Nobel Prize in Physics. This put him on a quest to find a way to explain QED in a manner that could be understood by anyone. Though, I don't think he ever fully achieved that goal. His reluctant role in the investigation of the Challenger explosion is also explored. Of course, scattered throughout are references to his bongo-playing, entertaining lectures, and the various books he wrote throughout his career. The journey ends with Feynman's diagnosis of cancer in both his liver and spleen, and his philosophical approach to this diagnosis and ultimate death.

Ottaviani definitely did his homework. The end of the book includes a long list of references used in the writing of the story. So even though it was written by another, it feels very much as though Richard Feynman truly did narrate this tale. The illustrations by Myrick do a wonderful job of capturing Feynman's look in every era of his life. In fact, all of the people illustrated are done well, and every face is quite expressive.



Feynman is meant to be a fun, quick read, which it most definitely is. If you are looking for an in-depth retrospective of Richard Feynman's life, then this is not the book for you. But if, instead, you are interested in an enjoyable glimpse of who Richard Feynman was and what he did, then Feynman by Ottaviani and Myrick is a book I would highly recommend.

## References:

Feynman by Jim Ottaviani and Leland Myrick, First Second, 2011

# xkcd



SPACE TIP: IF YOU'RE EVER LOST IN THE INNER SOLAR SYSTEM, YOU CAN JUST TYPE OUT THE PHRASE "OPTIMISTIC ALIENS MEASURE SPACE TYPOGRAPHICALLY" IN TIMES NEW ROMAN AND USE THE DOTS AS A MAP.

## Next Membership Meeting:

Wednesday, December 20  
potluck dinner starting at 6:30 pm

Cumberland Valley  
Girl Scout Council Building  
4522 Granny White Pike

## A Flame in the Sky – the Orion Nebula

By Kat Troche

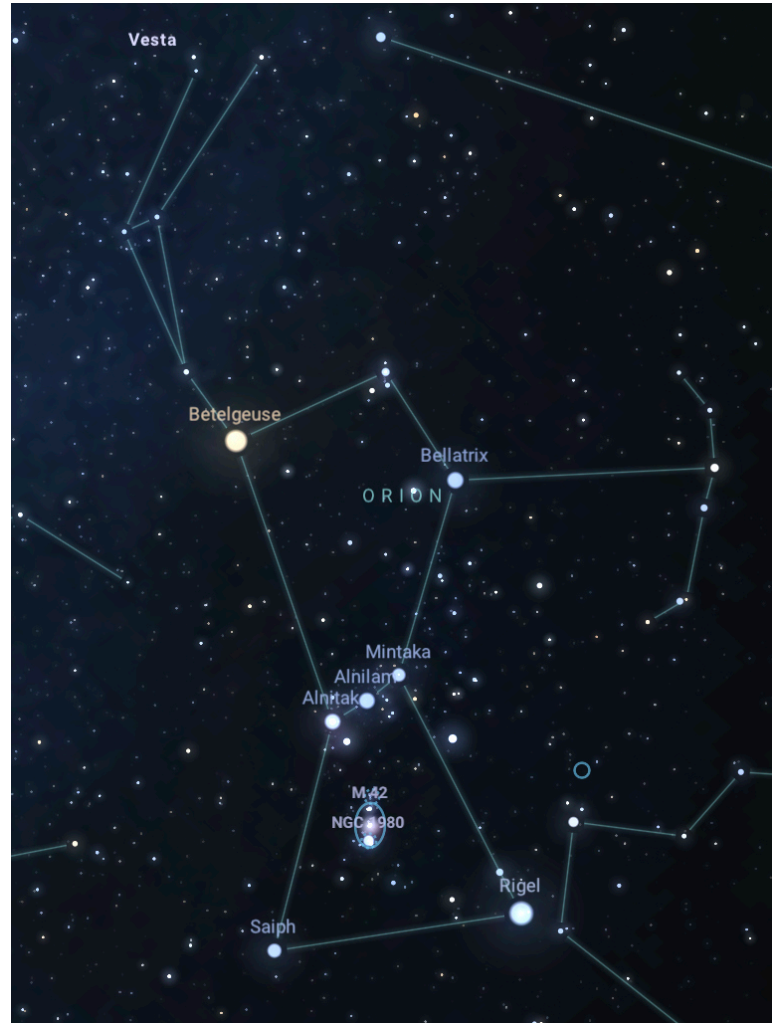
It's that time of year again: winter! Here in the Northern Hemisphere, the cold, crisp sky offers spectacular views of various objects, the most famous of all being [Orion the Hunter](#).

As we've previously mentioned, Orion is a great way to [test your sky darkness](#). With your naked eye, you can easily spot this hourglass-shaped constellation. Known as an epic hunter in Greco-Roman, Orion and all its parts have had many names and meanings across many cultures. In Egyptian mythology, this constellation represented the god Sah. The Babylonians referred to it as The Heavenly Shepard. In most cultures, it is Orion's Belt that has many stories: [Shen](#) in Chinese folklore, or [Tayamnicankhu](#) in Lakota storytelling. But the Maya of Mesoamerica believed that part of Orion contained [The Cosmic Hearth](#) – the fire of creation.

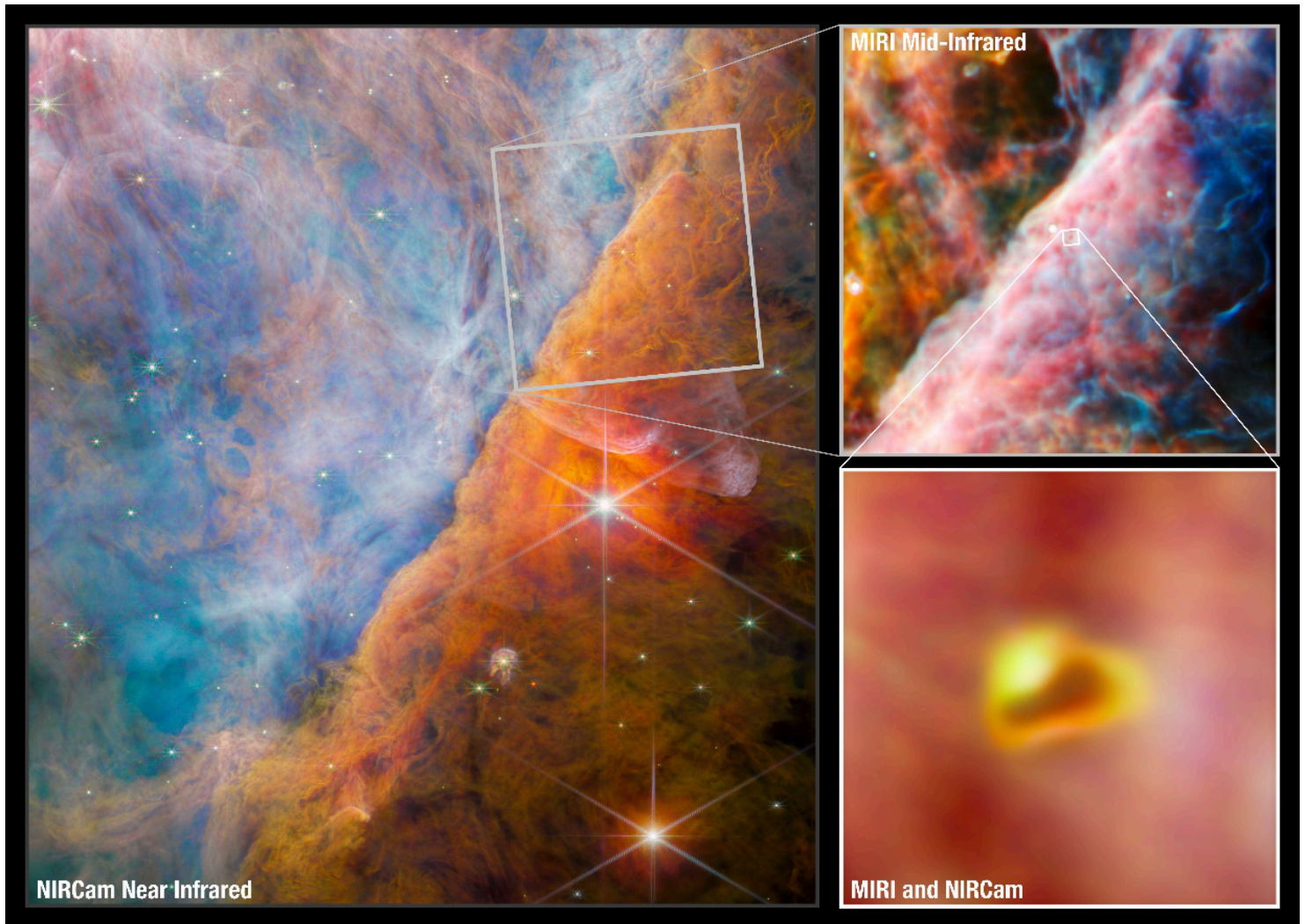
1,500 light years away from Earth sits the star-forming region and crown jewel of Orion – Messier 42 (M42), the Orion Nebula. Part of the “sword” of Orion, this cloud of dust and gas sits below the first star in Orion's Belt, Alnitak, and can easily be spotted with the naked eye under moderate dark skies. You may also use binoculars or a telescope to resolve even more details, like the Trapezium: four stars in the shape of a baseball diamond. These young stars make up the core of this magnificent object.

Of course, it's not just for looking at! M42 is easily one of the most photographed nebulae around, by astrophotographers here on the ground, large ground-based observatories, and space telescopes alike. It has long been a place of interest for the Hubble, Spitzer, and Chandra X-ray Space Telescopes, with James Webb Space Telescope joining the list in February 2023. Earlier this year, NASA and the European Space Agency released [a new photo](#) of the Orion Nebula taken from JWST's NIRCам (Near-Infrared Camera), allowing scientists to image this early star forming region in both short and long wavelengths.

But stars aren't the only items photographed here. In June 2023, JWST's NIRCам and MIRI (mid-infrared instrument) imaged a developing star system with a planetary disk forming around it. That's right – a solar system happening in real time – located within the edges of a section called the [Orion Bar](#). Scientists have named this planet-forming disk d203-506,



Credit: Stellarium Web



SA/Webb, NASA, CSA, M. Zamani (ESA/Webb), PDRs4ALL ERS Team

and you can learn more about the chemistry found [here](#). By capturing these objects in multiple wavelengths of light, we now have even greater insight into what other objects may be hiding within these hazy hydrogen regions of our night sky.

In addition to our Dark Sky Wheel, a fun presentation you can share with your astronomy club would be our [Universe Discovery Guide: Orion Nebula, Nursery of Newborn Stars](#) activity. This will allow you to explain to audiences how infrared astronomy, like JWST, helps to reveal the secrets of nebulae. Or, you can use public projects like the NASA-funded [MicroObservatory](#) to capture M42 and other objects.

Learn more about what to spy in the winter sky with our upcoming mid-month article on the [Night Sky Network](#) page through NASA's website!

*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](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!*

## **Barnard-Seyfert Astronomical Society Minutes of a Regular Meeting of the Board of Directors Held on Wednesday, November 1, 2023**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held on November 1, 2023, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Chip Crossman, Tony Drinkwine, Bud Hamblen, Keith Rainey, and Theo Wellington.

Membership report (Keith Rainey): We have 162 members on the Night Sky Network roster.

Social Media (Theo Wellington): The Facebook activity was steady. "X" activity was declining.

Star parties and outreach: Public nights are scheduled for Warner Park on 11/18/23 and for Shelby Nature Center on 12/16.

Meeting Programs: A "NANOGrav" presentation is scheduled for December, as well as the annual potluck dinner. Meeting sites other than the Girl Scout Center were discussed. The Girl Scouts have increased the building use fee to \$300/meeting or \$3,600 for an entire year.

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, November 15, 2023**

The Barnard-Seyfert Astronomical Society met at the Girl Scouts Center and on-line via Zoom on Wednesday, November 15, 2023, at 7:30 PM, Tom Beckermann presiding.

The minutes for the October meeting were adopted without discussion.

Membership Report: The Night Sky Network membership roster shows 162 members.

Treasurer's Report (Theo Wellington): The Truist bank balance was \$5,978.56. PayPal had \$363.08. There was \$73 in cash from the sale of solar eclipse glasses. The 2024 RASC Handbook will be \$30/copy.

Social Media (Theo): Facebook had about 2000 followers. "X" had about 320.

Star Parties and outreach: 11/11/23 on the Trace was clouded out. Warner Park is scheduled for 11/18/23 (public). Natchez Trace Mile Marker 435.3 is scheduled for 12/9 (members only-bring permit). Shelby Park is scheduled for 12/16 (public).

Keith Rainey presented "All I Want for Christmas Are Astronomy Toys." URLs mentioned:

Orion Telescopes & Binoculars: [telescope.com](https://telescope.com)

Agena Astro: [agenaastro.com](https://agenaastro.com)

Astronomics/Christophers: [astronomics.com](https://astronomics.com)

High Point Scientific: [highpointscientific.com](https://highpointscientific.com)

Astronomical Society of the Pacific: [myasp.astro society.org](https://myasp.astro society.org)

Planetary Society: [planetary.org](https://planetary.org)

The Astronomical League: [store.astroleague.org](https://store.astroleague.org)

There being no further business, the meeting was adjourned at 9 PM.

Respectfully submitted,

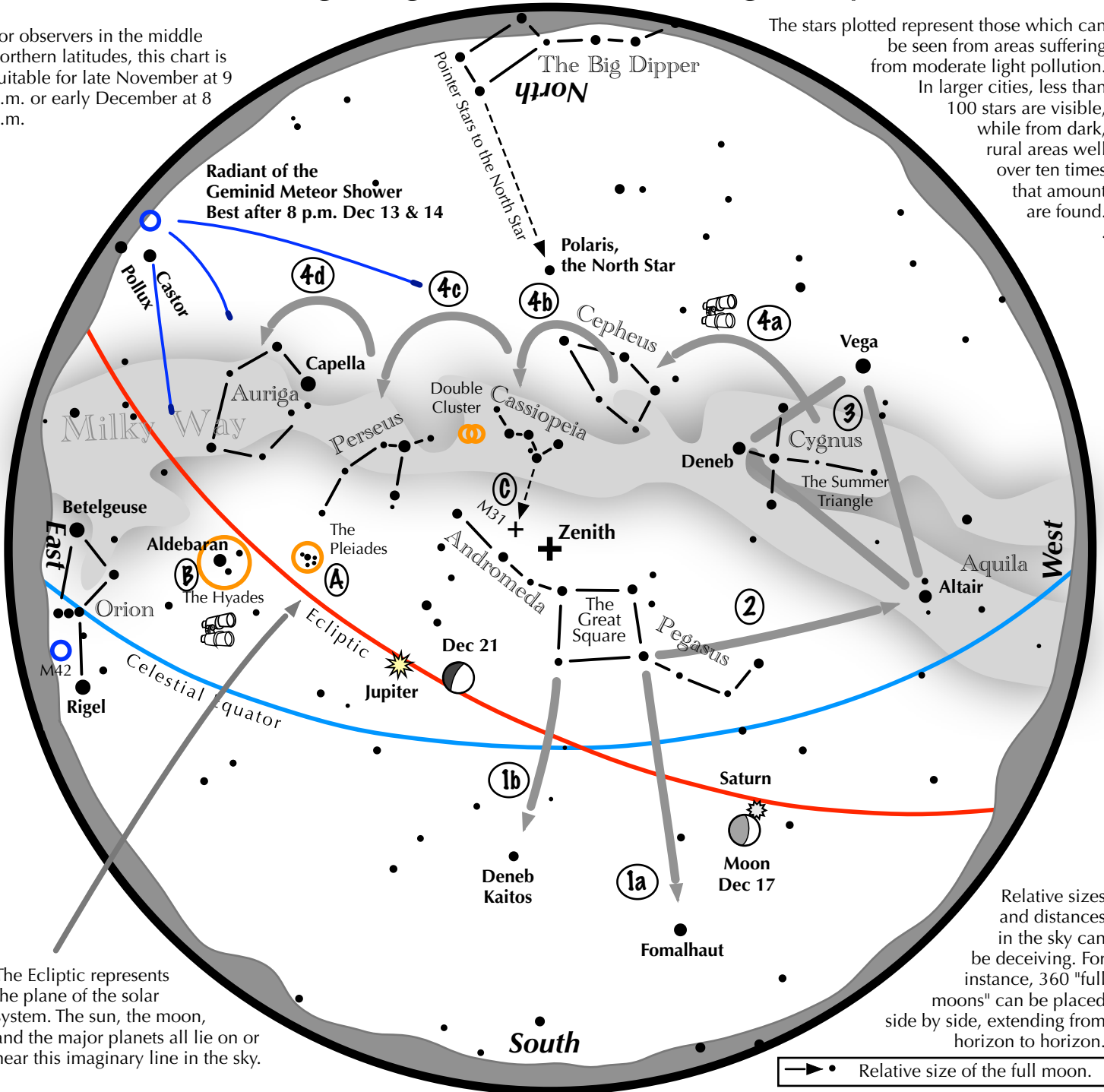
Bud Hamblen  
Secretary



# Navigating the December Night Sky

For observers in the middle northern latitudes, this chart is suitable for late November at 9 p.m. or early December at 8 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.

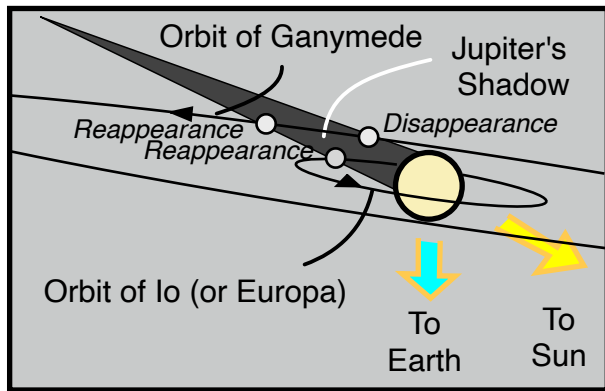
## Navigating the December night sky: Simply start with what you know or with what you can easily find.

- 1 Face south. Almost overhead is the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend an imaginary line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the southwest. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second bright star in the south.
- 2 Draw another line, this time westward following the southern edge of the Square. It strikes Altair, part of the "Summer Triangle."
- 3 Locate Vega and Deneb, the other two stars of the "Summer Triangle." Vega is its brightest member while Deneb sits in the middle of the Milky Way.
- 4 Jump along the Milky Way from Deneb to Cepheus, which resembles the outline of a house. Continue jumping to the "W" of Cassiopeia, to Perseus, and finally to Auriga with its bright star Capella.

### Binocular Highlights

- A and B:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters.
- C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval.
- D:** Sweep along the Milky Way from Altair, past Deneb, through Cepheus, Cassiopeia and Perseus, then to Auriga for many intriguing star clusters and nebulous areas.





### Galilean moon emergence

(Elapsed time varies with moon)

Elapsed time: 30 sec.



Elapsed time: 2 min.



Elapsed time: 4 min.



## An "Oh! Wow!" moment through your telescope

Imagine seeing a world emerge in the darkness, taking several minutes to fully appear. Such a body is Io, Europa, or Ganymede on multiple occasions this December.

Aim a telescope at Jupiter shining in the south a few minutes before the event is predicted to take place. Look away from the planet's bright disk, about one planet diameter from its eastern edge. At the designated time, a faint speck can be discerned. As the seconds pass, that speck grows brighter and brighter.

This is one of the large Galilean moons, slowly leaving Jupiter's shadow while orbiting the giant planet. December is a good month this year to witness an event like this in the evening sky, because Jupiter's shadow angles to the east of the planet, putting the emerging moon relatively far from the planet's glare. Each moon takes a different time to fully emerge, because of its diameter and of its orbital velocity around the planet.

Note: December 12 and 19 have Ganymede disappearing into the shadow and reappearing. December 21 and 28 have Io and Europa both disappearing near the same time.

Make sure that Jupiter is sufficiently above the horizon at your location and that the evening twilight has sufficiently darkened. Begin viewing a few minutes before the listed times.

#### Event commencement: (all times CST)

|          |                                                      |
|----------|------------------------------------------------------|
| Io       | Dec 5, 11:34 pm                                      |
| Io       | Dec 7, 6:04 pm                                       |
| Ganymede | Dec 12, disappearance 5:41 pm, reappearance 7:48 pm  |
| Io       | Dec 13, 1:30 am                                      |
| Europa   | Dec 14, 6:24 pm                                      |
| Io       | Dec 14, 7:58 pm                                      |
| Ganymede | Dec 19, disappearance 9:45 pm, reappearance 11:49 pm |
| { Europa | Dec 21, 9:03 pm                                      |
| { Io     | Dec 21, 9:53 pm                                      |
| { Europa | Dec 28, 11:42 pm                                     |
| { Io     | Dec 28, 11:48 pm                                     |
| Io       | Dec 30, 6:18 pm                                      |

**Use a "high" magnification!**



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](https://bsasnashville.com). Frame not included.



Become a Member of BSAS!  
Visit [bsasnashville.com](http://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](http://bsasnashville.com). If you need more information, write to us at [info@bsasnashville.com](mailto: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](mailto:info@bsasnashville.com).