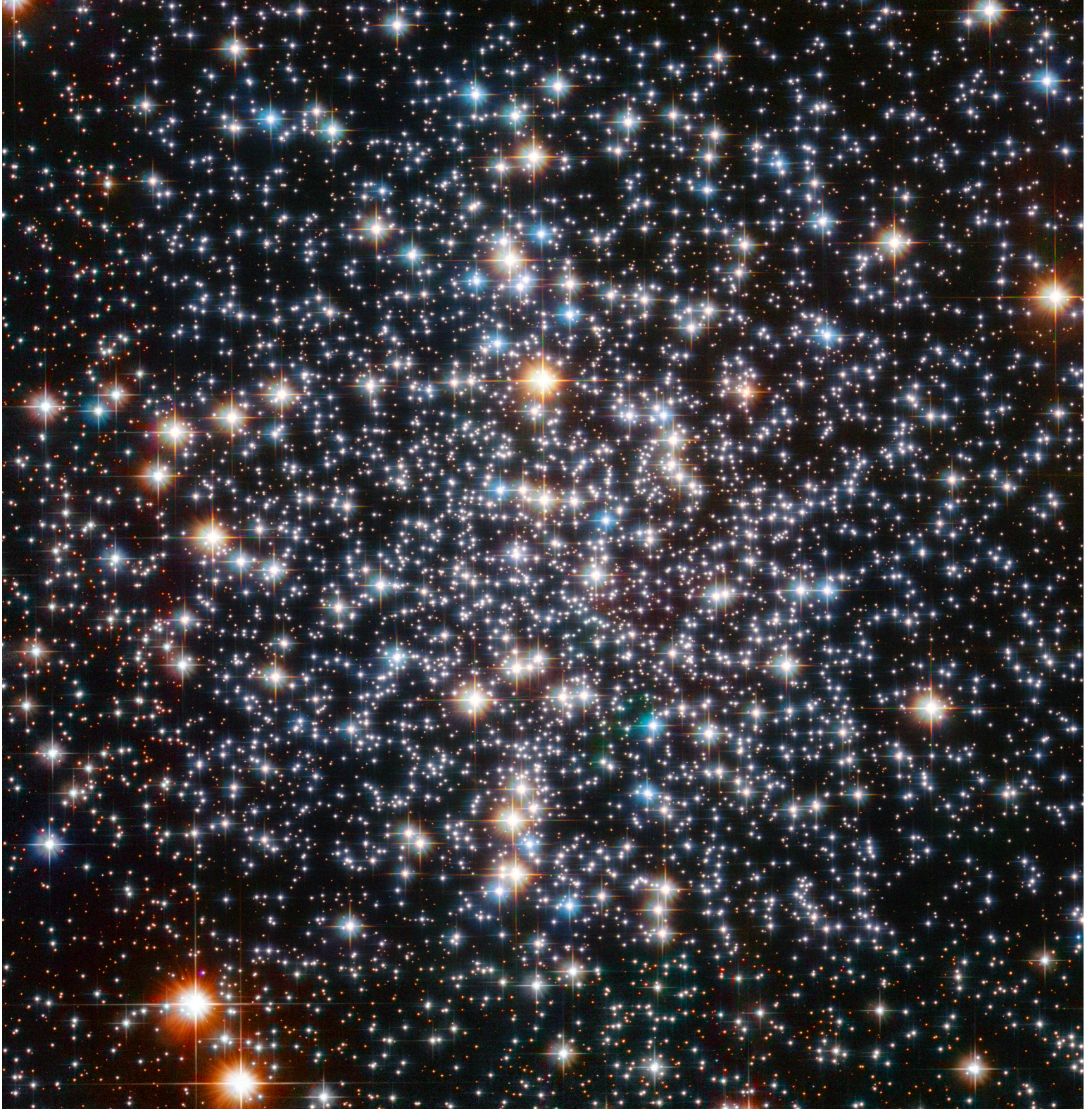


# The ECLIPSE

*The Newsletter of the Barnard-Seyfert Astronomical Society*



*June 2023*



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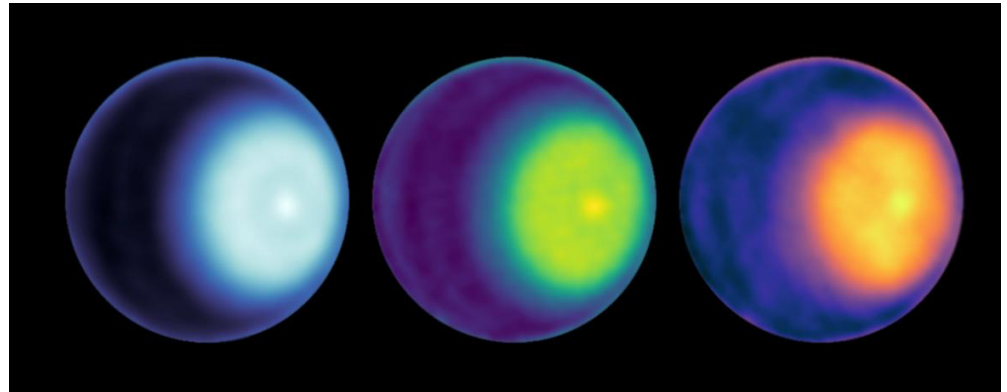
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Contact BSAS officers at  
[bsasnashville.com/contact](https://bsasnashville.com/contact)  
Or email [info@bsasnashville.com](mailto:info@bsasnashville.com)



NASA scientists have made the first observation of a polar cyclone on Uranus. Using radio antenna dishes of the Very Large Array in New Mexico, they were able to peer below the methane clouds and determine there is circulating air at the planet's north pole that is warm and dry.

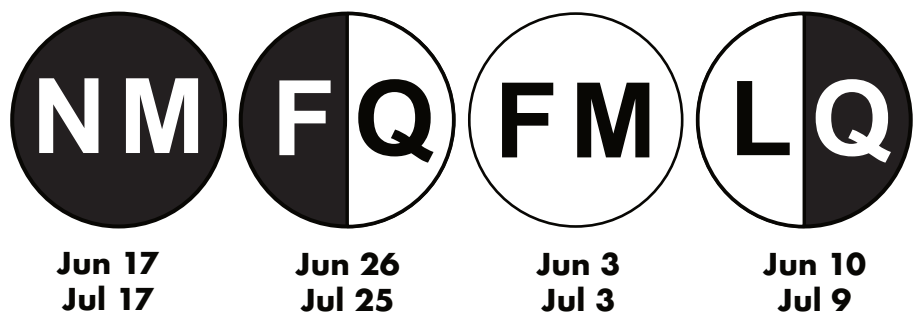
These images were generated using the microwave observations – from left, in wavelength bands K, Ka, and Q. The average brightness was removed to enhance the contrast, and three different color maps were used to highlight various features. The cyclone is visible at the north pole, seen as a light-colored dot right of center in each image of Uranus.

The observations used to generate these images were made in October 2021.

Image Credit: [NASA/JPL-Caltech/VLA](#)

**On the Cover:** A Hubble Space Telescope image of the globular star cluster, Messier 4. The cluster is a dense collection of several hundred thousand stars. Astronomers suspect that an intermediate-mass black hole, weighing as much as 800 times the mass of our Sun, is lurking, unseen, at its core.

Image credits: [ESA/Hubble](#), [NASA](#)



## Book Review: The Day The World Discovered the Sun reviewed by Robin Byrne

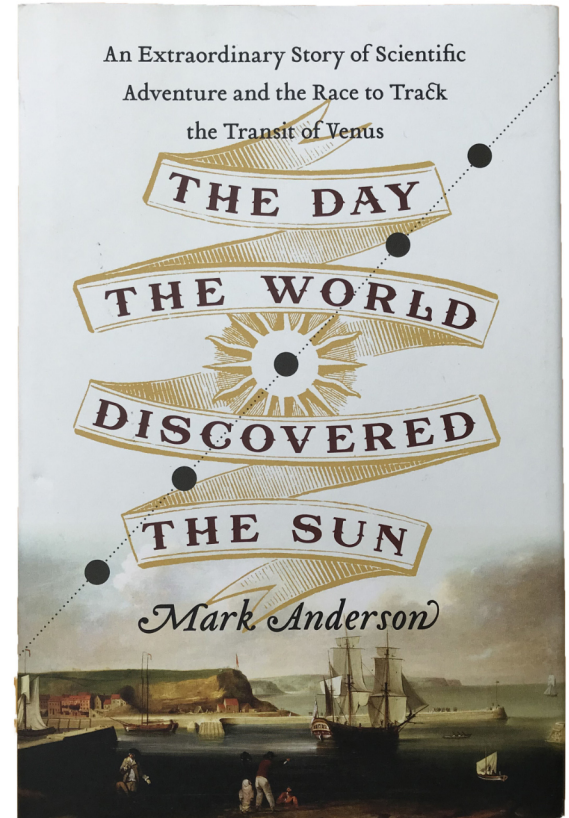
Given the vast number of books about the history of science and exploration that I have ordered over the years, it's no wonder that Amazon recommended I should get "The Day The World Discovered The Sun: An Extraordinary Story Of Scientific Adventure And The Race to Track The Transit Of Venus" by Mark Anderson. While the title may go overboard on its word count, the book itself is a fun and interesting read.

The author chronicles multiple expeditions for observing both the 1761 and the 1769 Venus transit events. We meet several people who will make the observations, including such notable names as Captain James Cook, Maximilian Hell, as well as the team of Charles Mason and Jeremiah Dixon, who are better known for their surveying endeavors. Other, lesser known though equally skilled, astronomers we meet were: Jean-Baptiste Chappe, Nevil Maskelyne, and Charles Green.

The ultimate goal of the observations were to determine the distance to the Sun. This required observing the transits from widely separated points on Earth in order to measure the Sun's parallax. Key moments during the transit, when each edge of Venus touches an edge of the Sun (the points of contact), must be precisely timed. By comparing these measurements taken at various locations, the different angles of observation will lead to the Sun's distance. This, in turn, will then give actual distances within the solar system. Prior to this point in history, all we knew were the relative sizes of the planets' orbits compared to Earth's, such as Mars being roughly 1.5 times farther from the Sun than Earth. What we didn't know was how many miles that corresponded to. It was Edmund Halley who had predicted, prior to his death in 1742, that the Venus transits of 1761 and 1769 would be the ideal opportunity to take the measure of our solar system. And so it was that teams from all over the world cooperated to observe these events to the best of their abilities.

In addition to the observations of the transits, the book covers so much more. For each expedition, we travel along with the teams to their far-flung destinations. And the destinations, by necessity, were widely located in places where the transits would be at their most extreme of either shortest or longest in duration. So we find ourselves in places as far north as Siberia to as far south as Tahiti. But we also experience the trials and tribulations of getting to these places and all the adventures along the way. And boy were there adventures!

Mark Anderson also does a good job of placing these quests in context of both political and scientific events of the time. The politics placed limitations on where people could travel. If your nation was in conflict with another, you were not welcome in their country or any of their colonies. If you were in the good graces of a sovereign, they would likely help smooth your travels to your destination. Scientifically, all of these observations required not just observing the transit, but also precisely determining the local time and the geographical coordinates of your observing post. These various



voyages were all occurring at the same time that there was a competition, of sorts, for finding the best method of determining your longitude while at sea. Each of the voyages tested various proposed techniques, to varying degrees of success. And so we see how the astronomers made multiple observations each day of the Sun's, Moon's, and various stars' positions in the sky, as well as watching the moons of Jupiter as they pass in front of or behind the planet. Each observation was then followed by a series of calculations. All to better determine local time and longitude. A ponderous endeavor!

Ultimately, the 1761 observations were not very useful (other than as a learning experience), but the 1769 efforts were very beneficial. They provided measurements precise enough to be within 96-98% of the actual value of the Sun's distance. Pretty impressive. Beyond measuring our solar system, these expeditions led to other benefits, such as: better techniques for measuring longitude (which meant fewer ships lost at sea), discovery of new places on the globe (such as New Zealand), and finding a way to avoid scurvy on long voyages.

All in all, I thoroughly enjoyed reading "The Day The World Discovered the Sun" by Mark Anderson and highly recommend it. Lots of interesting people and events, woven together nicely for a complete picture of the Venus transits, along with all that went into actually observing them. Like so many things in life, it's not so much the destination as the journey.

#### Reference:

The Day The World Discovered The Sun: An Extraordinary Story Of Scientific Adventure And The Race to Track The Transit Of Venus by Mark Anderson, Da Capo Press, 2012.

## BIENVENUE EN LOUISIANE! (WELCOME TO LOUISIANA!)

Join us for this unique and exciting amateur astronomy gathering!



**July 26–29, 2023**

Hilton Baton Rouge  
Capitol Center Hotel  
201 Lafayette Street  
Baton Rouge, LA 70801

# ALCON 2023



### KEYNOTE SPEAKERS

- ★ David Eicher—writer, editor-in-chief of *Astronomy Magazine*
- ★ Fred Espenak—co-author of *Totality: The Great American Eclipses of 2017 and 2024*
- ★ David Levy—author, comet hunter

### FIELD TRIPS

- ★ Irene Pennington Planetarium
  - ★ LIGO (Laser Interferometer Gravitational-Wave Observatory) Livingston\*
  - ★ Louisiana State University Physics & Astronomy
  - ★ Highland Road Park Observatory
- \*Spaces are limited for this trip!

**SPEAKERS** ★ Pranvera Hyseni ★ Guy Consolmagno ★ Dan Davis ★ And many more!

Brought to Baton Rouge by the **Baton Rouge Astronomical Society**

★★ Registration is now open! Check [alcon2023.org](http://alcon2023.org) ★★



# xkcd

YOUR FUTURE IS HARD TO SEE.  
I CAN MAKE OUT SOME HAZY  
DETAILS IN THE CENTER, BUT  
THE OFF-AXIS COMPONENTS  
ARE PARTICULARLY UNCLEAR.



WIZARDS NEVER DID FIGURE OUT  
HOW TO FIX SPHERICAL ABERRATION.

## **Next Membership Meeting:**

Wednesday, June 21, 7:30 pm

Cumberland Valley  
Girl Scout Council Building  
4522 Granny White Pike

## Look Up in the Sky - It's a Bird

### By Theresa Summer

Bird constellations abound in the night sky, including Cygnus, the majestic swan. Easy to find with its dazzling stars, it is one of the few constellations that look like its namesake and it is full of treasures. Visible in the Northern Hemisphere all summer long, there's so much to see and even some things that can't be seen. To locate Cygnus, start with the brightest star, Deneb, also the northeastern most and dimmest star of the Summer Triangle. The Summer Triangle is made up of three bright stars from three different constellations – read more about it in the September 2022 issue of Night Sky Notes. “Deneb” is an Arabic word meaning the tail. Then travel into the triangle until you see the star Albireo, sometimes called the “beak star” in the center of the summer triangle. Stretching out perpendicular from this line are two stars that mark the crossbar, or the wings, and there are also faint stars that extend the swan's wings.

From light-polluted skies, you may only see the brightest stars, sometimes called the Northern Cross. In a darker sky, the line of stars marking the neck of the swan travels along the band of the Milky Way. A pair of binoculars will resolve many stars along that path, including a sparkling open cluster of stars designated Messier 29, found just south of the swan's torso star. This grouping of young stars may appear to have a reddish hue due to nearby excited gas.

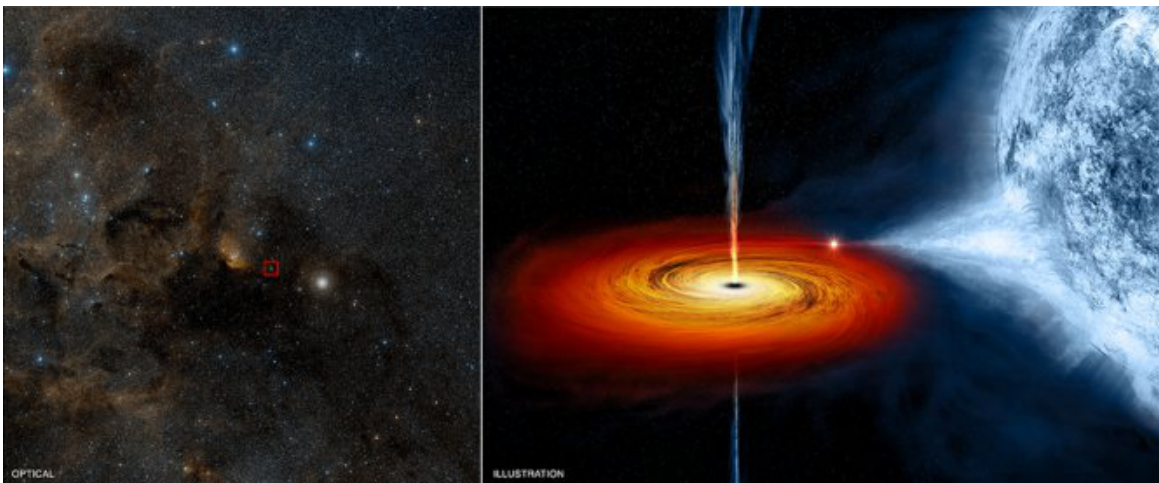


Look up after sunset during summer months to find Cygnus! Along the swan's neck find the band of our Milky Way Galaxy. Use a telescope to resolve the colorful stars of Albireo or search out the open cluster of stars in Messier 29. Image created with assistance from Stellarium: [stellarium.org](http://stellarium.org)

Let's go deeper. While the bright beak star Albireo is easy to pick out, a telescope will let its true beauty shine! Like a jewel box in the sky, magnification shows a beautiful visual double star, with a vivid gold star and a brilliant blue star in the same field of view. There's another marvel to be seen with a telescope or strong binoculars – the Cygnus Loop. Sometimes known as the Veil Nebula, you can find this supernova remnant (the gassy leftovers blown off of a large dying star) directly above the final two stars of the swan's eastern wing. It will

look like a faint ring of illuminated gas about three degrees across (six times the diameter of the Moon).

Speaking of long-dead stars, astronomers have detected a high-energy X-ray source in Cygnus that we can't see with our eyes or backyard telescopes, but that is detectable by NASA's Chandra X-ray Observatory. Discovered in 1971 during a rocket flight, Cygnus x-1 is the first X-ray source to be widely accepted as a black hole. This black hole is the final stage of a giant star's life, with a mass of about 20 Suns. Cygnus x-1 is spinning at a phenomenal rate – more than 800 times a second – while devouring a nearby star. Astronomically speaking, this black hole is in our neighborhood, 6,070 light years away. But it poses no threat to us, just offers a new way to study the universe.



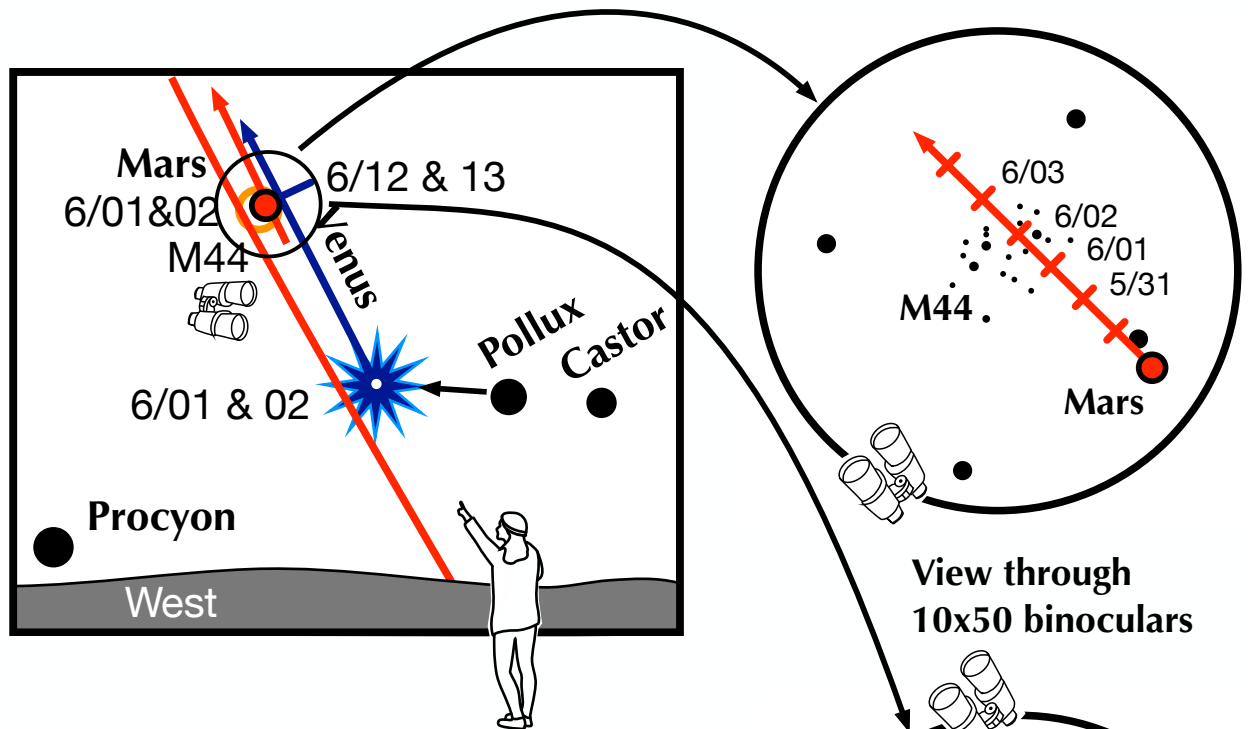
While the black hole Cygnus x-1 is invisible with even the most powerful Optical telescope, in X-ray, it shines brightly. On the left is the optical view of that region with the location of Cygnus x-1 shown in the red box as taken by the Digitized Sky Survey. On the right is an artist's conception of the black hole pulling material from its massive blue companion star. (Credit: NASA/CXC)

Check out the beautiful bird in your sky this evening, and you will be delighted to add Cygnus to your go-to summer viewing list. Find out NASA's latest methods for studying black holes at [www.nasa.gov/black-holes](http://www.nasa.gov/black-holes).

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



## A must see celestial planetary play: Two planets visit the Beehive

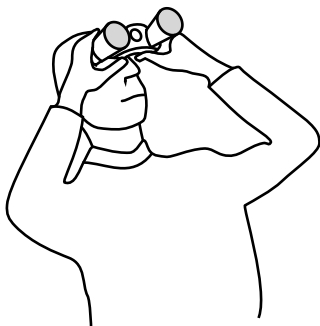


Beginning on June 1, look to the west-northwest 90 minutes after sunset.

- The twin stars of Gemini, Castor and Pollux, will be found forming a horizontal bar low above the horizon.
- Brilliant Venus shines to their left effectively forming the very bright third member of a set of triplets!
- On the same evening and the next, red Mars slides in front of M44, aka the Beehive Star cluster, positioned above Venus. Use

binoculars to find Mars sitting amid the many stellar bees.

- Ten nights later, it is Venus' turn to stay at the Beehive for two consecutive nights. The planet travels along the outskirts, farther from Beehive central than Mars moved. Again, bring out the binoculars. How does the glare of brilliant Venus affect the scene?

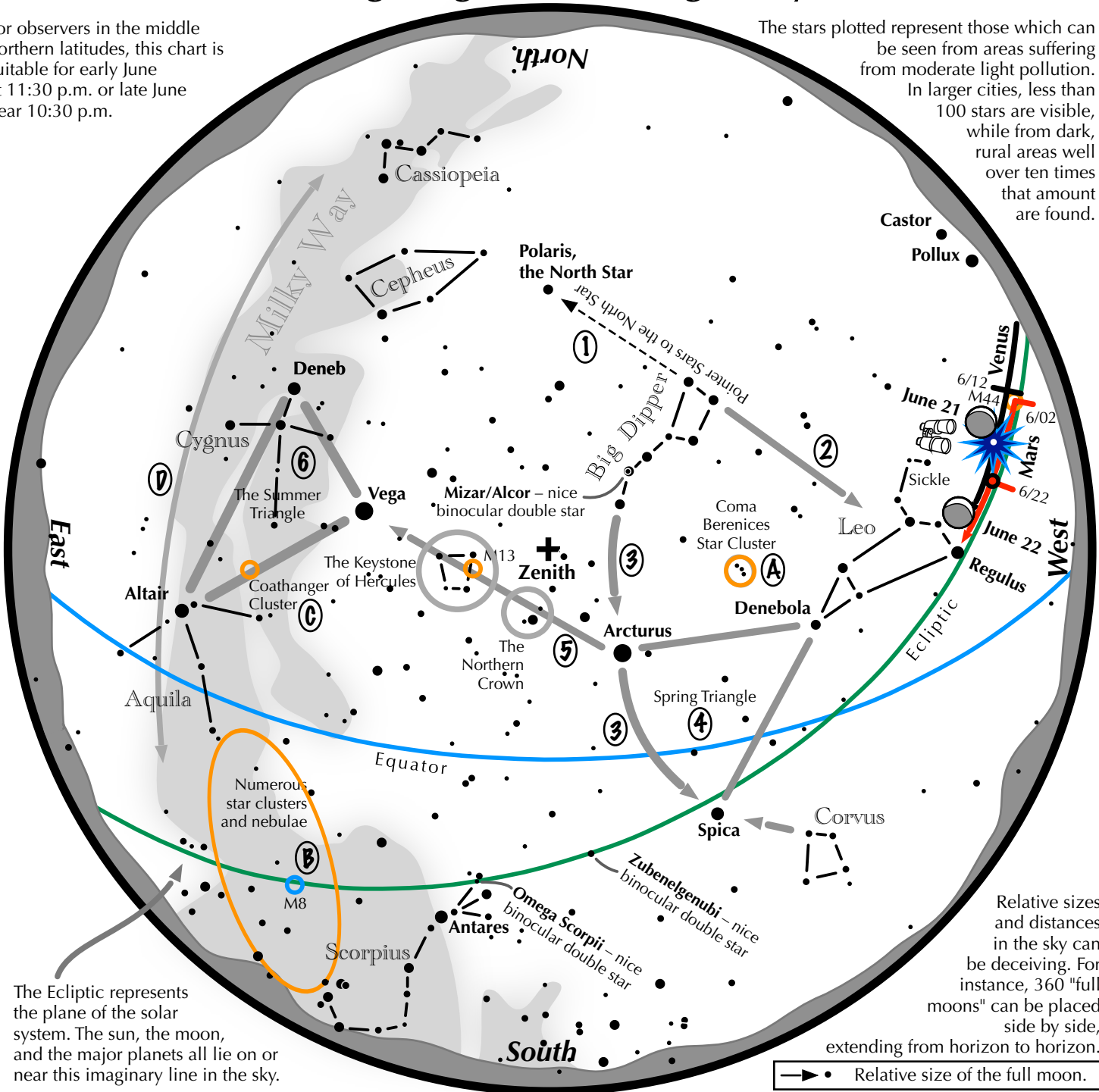




# Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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.

## Navigating the June 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 Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
- 3 Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
- 4 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
- 5 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.
- 6 High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

### Binocular Highlights

- A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
- B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
- C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
- D: Sweep along the Milky Way for an astounding number of faint glows and dark bays.



**Barnard-Seyfert Astronomical Society**  
**Minutes of a Regular Meeting of the Board of Directors**  
**Held On Wednesday, May 3, 2023**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held on May 3, 2023, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Chip Crossman, Tony Drinkwine, Bud Hamblen, Keith Rainey and Theo Wellington. The minutes of the April 5, 2023, board meeting were adopted without discussion.

Treasurer's Report: The Truist bank balance was \$9,650.06 and and PayPal account balance was \$946.05. Theo said that the PayPal balance will be transferred to the bank shortly. The club received a payment via PayPal for a mail order Hatch Show Print poster, but the purchaser hasn't provided a mailing address. We need to update the BSAS web site to ask for a shipping address when the purchaser isn't going to pick up the poster in person. The post office box is up for renewal soon and the Astronomical League dues are up for renewal in June.

Membership report: Keith said we have 237 members on the roster, and that the 2nd quarter dues reminders are about to go out.

Social Media: Theo said the Facebook page (<https://www.facebook.com/bsasnashville/>) is liked by about 2,000 and the twitter feed (@BSASNashville) is followed by 325.

Outreach: The star party scheduled for April 29 at Bowie Nature Park, Fairview, had to be canceled because of the weather. Facilities for a cloudy night program were not available. Theo and Chuck Schlemm were at the Bells Bend Outdoor Center on April 15 for the 11th Annual Nashville Outdoor Recreation Festival and Expo. Chuck was at the Adventure Science Center during Astronomy Day (April 29) with a spaceflight display. A public star party is scheduled for May 27 (Memorial Day weekend) at Cornelia Fort Airpark on May 27. Another star party at Bowie is scheduled for June 24.

Messier Marathon and private star parties: Six observers were at Ron Ladd's property near the Natchez Trace Water Valley Overlook.

Equipment loans: We are trying to hunt down the Coronado H-Alpha solar telescope.

Solar eclipse glasses: Theo has one quote for solar eclipse glasses. The cost should be in the range of 50 to 60 cents each. ASC and Dyer have been asked whether they want to combine their orders with ours to get a better price. How many should we order? The annular eclipse of October 14, 2023, and the total eclipse of April 8, 2024, will both be partial in Nashville.

There being no further business, the meeting was adjourned at 8:00 PM.

Respectfully submitted,

Bud Hamblen  
Secretary



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).