

# The ECLIPSE

*The Newsletter of the Barnard-Seyfert Astronomical Society*



*April 2024*



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**ARTEMIS II CREW MEETS THEIR RIDE** Walking toward their Orion crew module are, from left, astronauts Victor Glover, Reid Wiseman, Christina Koch, and Jeremy Hansen.

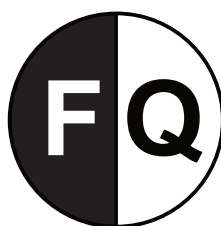
[NASA/Kim Shiflett](#)

**On the cover:** This image from Webb's NIRC*am* (Near-Infrared Camera) instrument shows M82's center in an unprecedented level of detail. With Webb's resolution, astronomers can distinguish small, bright compact sources that are either individual stars or star clusters. Obtaining an accurate count of the stars and clusters that compose M82's center can help astronomers understand the different phases of star formation and the timelines for each stage.

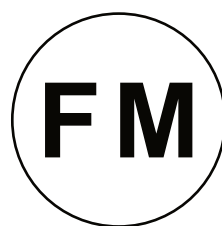
In this image, light at 2.12 microns is colored red, 1.64 microns is green, and 1.40 microns is blue (filters F212N, 164N, and F140M, respectively). [NASA](#), [ESA](#), [CSA](#), [STScI](#), [Alberto Bolatto \(UMD\)](#)



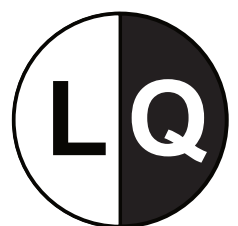
Apr 8  
May 7



Apr 15  
May 15



Apr 23  
May 23



Apr 1  
May 1

## Book Review - Vera Rubin: A Life reviewed by Robin Byrne

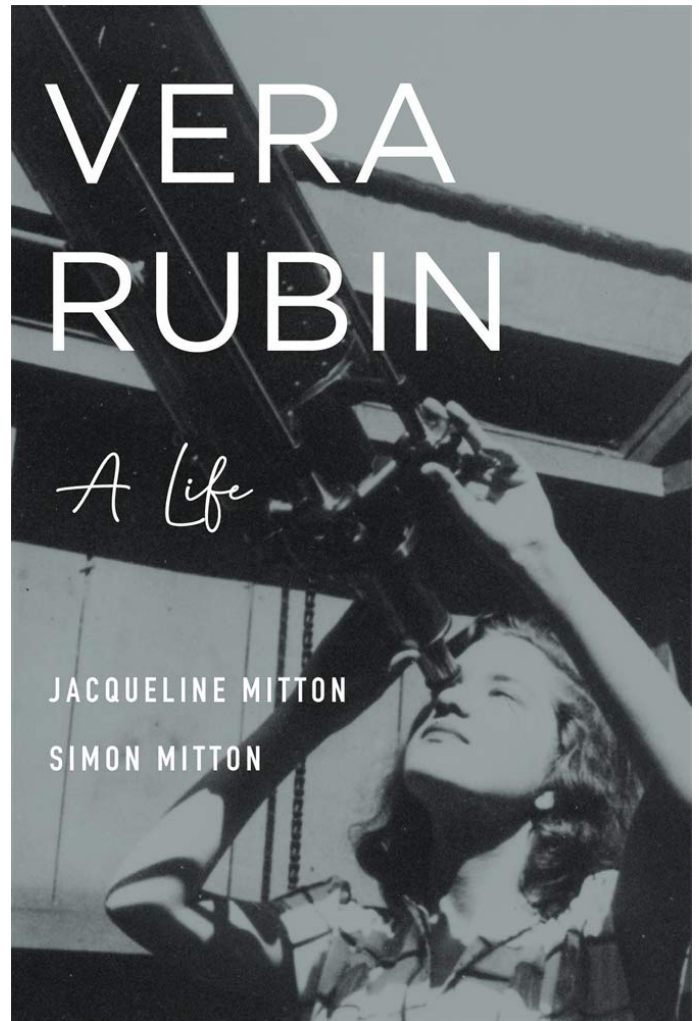
Vera Rubin is one of my astronomy heroes, so finding a book about her work and life made me happy. Reading it made me even happier. *Vera Rubin: A Life* by Jacqueline Mitton and Simon Mitton was both an enjoyable read, as well as a wonderful exploration of Rubin's life and work.

Written in a mostly chronological order, we follow Vera Rubin from childhood to the end of her life. Along the way, we see her passion for astronomy grow and flourish. In an era when very few women pursued a career in the sciences, Vera followed her own path, despite the obstacles of sexism she met along the way. What we also see are all the people who would serve as mentors, helping her to become the successful astronomer we all know.

One of the outstanding characteristics of Vera Rubin that we encounter is her innate drive to work. During times that she was between jobs or at home caring for her newborn children, Rubin was least satisfied. Thanks to the tremendous support of her husband and parents, Rubin was able to raise a family while, mostly, working full-time. Employers that let her work at home, were also a benefit. A common theme was her dining room table covered with research projects she was working on while at home.

Rubin was first and foremost, an observational astronomer. She was happiest when at an observatory, even those that had never before had a woman use their facility and lacked a women's restroom. Using the spectrometer developed by Kent Ford, Rubin meticulously measured the motions of stars in spiral galaxies at varying distances from the centers of the galaxies. Using the star motions, she was able to calculate the mass distribution in the galaxies. It was this project that led to the best evidence yet for the existence of dark matter, due to the calculated mass distributions showing much more mass in the outer portions of the galaxies than the distribution of stars would imply. There was a lot of mass present that just couldn't be seen!

While the story of her research and discoveries is fascinating, more illuminating were the stories of her staunch views concerning the role of women in the astronomical community. Beyond being a trailblazer, Rubin was very vocal about the recognition and respect women in the field deserved. When awarded a prize from an organization that held their meetings at a men's-only club, Rubin declined, stating that she would only accept the award if they discontinued supporting a discriminatory venue. As she became more respected in the field, she used her status to push for more representation of women at professional conferences, pointing out the need for more women to be invited speakers. Many quotes are sprinkled throughout the book, but my favorite is a note she wrote to the National Academy of Sciences (NAS) president, Bruce Albert, after the NAS meeting in



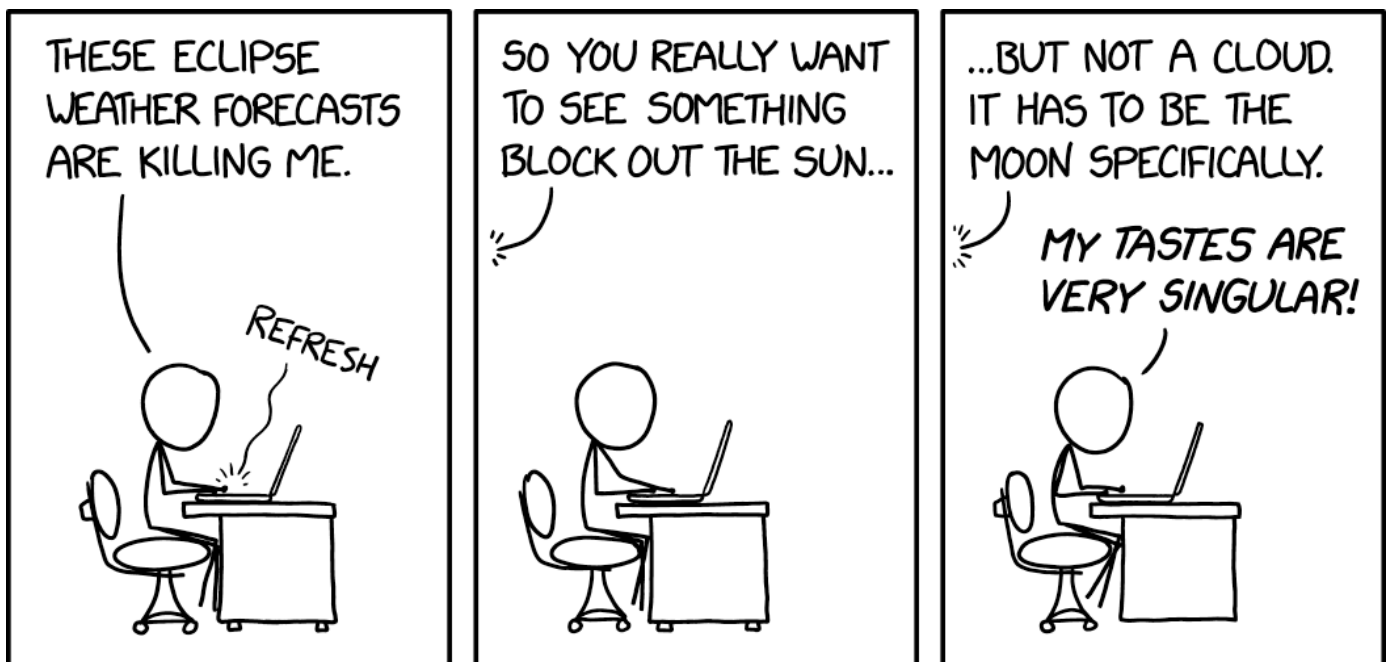
1999: “ WOW!!! What a record to carry into the year 2000!!! You’ve outdone yourselves. Last year I complained about one meeting that had only one woman speaker. This year you’ve proved that you can do worse. At least next year it should be hard to do worse than this. 21 speakers - all male.” This passionate advocacy was also found in Rubin’s mentoring of young women in astronomy, including her own daughter. Many female astronomers owe their success, both personally and professionally, to the support they received from Rubin.

While reading about the declining years of anyone is sad and disheartening, the life of Vera Rubin was so full of light and joy, that the inevitable sad ending is softened by all that came before it. Vera Rubin lived life to the fullest, and her story is an inspiration, not just in terms of her astronomical work, but also as a lesson for how to make the most of your life, regardless of what your career may be. If you want to learn about an amazing woman, and be inspired along the way, I highly recommend Vera Rubin: A Life.

### References:

Vera Rubin: A Life by Jacqueline Mitton and Simon Mitton; Belknap Press of Harvard University Press, 2021

## xkcd



## Participate in Eclipse Science By Kat Troche

April is NASA's Citizen Science Month, and there is no shortage of projects available. Here are some [citizen science projects](#) that you can participate in on April 8th, on and off the path of totality right from your smartphone!

### Eclipse Soundscapes

Eclipse Soundscapes will compare data from a 1932 study on how eclipses affect wildlife – in this case, crickets. There are a number of ways you can participate, both on and off the path. NOTE: you must be 13 and older to submit data. Participants 18+ can apply to receive the free Data Collector kit. Learn more at: [eclipsesoundscapes.org](http://eclipsesoundscapes.org).

### GLOBE Eclipse

Folks that participated in the GLOBE Eclipse 2017 will be glad to see that their eclipse data portal is now open! With the GLOBE Observer smartphone app, you can measure air temperature and clouds during the eclipse, contributing data to the GLOBE program from anywhere you are. Learn more at: [observer.globe.gov/do-globe-observer/eclipse](http://observer.globe.gov/do-globe-observer/eclipse)

### HamSCI

HamSCI stands for Ham Radio Science Citizen Investigation. HamSCI has been actively engaged in scientific data collection for both the October 14, 2023, annular solar eclipse and the upcoming April 8, 2024, total eclipse. Two major activities that HamSCI will be involved in around the solar events will be the Solar Eclipse QSO Party (SEQP) and the Gladstone Signal Spotting Challenge (GSSC) which are part of the HamSCI Festivals of Eclipse Ionospheric Science. Learn more about these experiments and others at: [www.hamsci.org/eclipse](http://www.hamsci.org/eclipse)

### SunSketcher

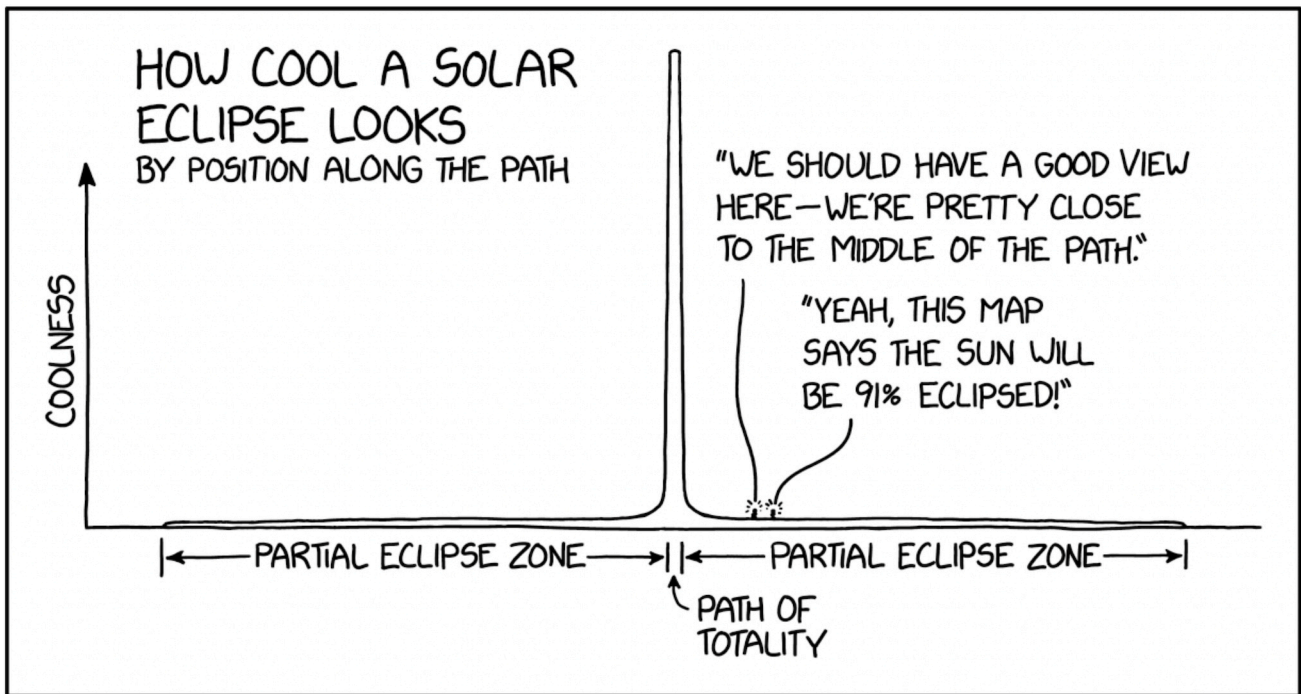
If you're traveling to totality, help the SunSketcher team measure the oblateness, or shape, of the Sun during the eclipse by timing the flashes of Baily's Beads. You will need a smartphone with a working camera for this, along with something to hold the phone in place - don't forget a spare battery! NOTE: The app will need to run from five minutes before the eclipse starts until the end of the eclipse. Any additional phone use will result in Sun Sketcher data loss. Learn more at: [sunskecher.org](http://sunskecher.org).

Don't stop at the eclipse - NASA has citizen science projects you can do all year long – from [cloud spotting on Mars](#) to [hunting for distant planets](#)! By contributing to these research efforts, you can help NASA make new discoveries and scientific breakthroughs, resulting in a better understanding of the world around us, from the critters on the ground, to the stars in our sky.

We'll be highlighting other citizen science projects with our mid-month article on the [Night Sky Network](#) page, but we want to wish all you eclipse chasers out there a very happy, and safe solar eclipse! For last minute activities, check out Night Sky Network's [Solar Eclipse Resources section](#)!

*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!*

xkcd



## **Barnard-Seyfert Astronomical Society Minutes of a Regular Meeting of the Board of Directors Held on Wednesday, March 6, 2024**

The regular meeting of the Board of Directors of the Barnard-Seyfert Astronomical Society was held March 6, 2024, online, Dr. Tom Beckermann presiding. Logged in were Tom Beckermann, Stef Brake, Tony Drinkwine, Bud Hamblen, Keith Rainey, and Theo Wellington.

The minutes of the board meeting on February 7, 2024, as printed in the March 2024, edition of the Eclipse, were adopted without discussion.

Membership report: Kieth reported that there were 178 members. Theo reported 4 new members since the last general meeting.

Treasurer's report: Theo reported the Truist bank balance: \$6,932.79 (\$4,574.87 in the general fund and \$2,357.92 in the equipment fund). The equipment fund is supported by proceeds from the December silent auction. PayPal balance: \$56.43. Expenses: \$17.47 for Zoom. Receipts: 24 internet orders for solar glasses, \$480, plus additional orders for groups of \$100. Theo is working with a school in Robertson County that may buy 600+ pairs of glasses. If anyone wants some for their office, let Theo know!

Social media report: Facebook is liked by 2.2K and followed by 2.4K. "X" (formerly Twitter) has 330 followers. Facebook had 23 new followers this week. Much thanks to the members who are tending to social media accounts.

Star parties and outreach: "Astronomy in Pajamas" is scheduled by the Friends of Warner Parks at the Warner Park Nature Center from 7 to 8 PM on March 8. The Middle Tennessee Science and Engineering Fair is scheduled for March 22, 2024, from 6:30 to 8 PM for the main fair and 8:30 to 9:30 for the Grand Prize (High School) at Belmont University, Ayers Academic Center, 4th Floor. The award ceremony is scheduled for April 9, 2024, from 6:30 to 8 PM at Belmont University, Ayers Academic Center, 4th Floor. The BSAS will offer 1st, 2nd and 3rd place awards for the best astronomy related projects. International Dark Sky Week is April 2 – 8, 2024. Promote starry skies. The Messier Marathon is scheduled for April 5/6 because it appears March 7/8 will be clouded out. A solar eclipse (total a short drive away, but only partial in Nashville) will occur on April 8. The Nashville Outdoor Recreation Festival and Expo is scheduled for April 9, 2024, from 9 AM to 3:30 PM at the Bells Bend Outdoor Center. A public star party is scheduled for April 13, 2024, from 8:30 to 10:30 PM at the Edwin Warner Park Special Events Field. Arrive at least an hour early if you are bringing a telescope.

Upcoming meetings: Dr Billy Teets will present a program on the famous astronomer and Nashville native, E. E. Barnard, at the March 20, 2024, general meeting of the BSAS. The general meeting on April 17, 2024, will be an "open source" follow up to the solar eclipse where members and guests can talk about their eclipse experiences. Hopefully there will be more to say than "we saw clouds". The June and July meetings will be a week later than normal. A presentation on star quakes is upcoming.

The board thanks Ron Ladd for his hospitality.

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

Respectfully submitted,

Bud Hamblen  
Secretary

## **Barnard-Seyfert Astronomical Society Minutes of the Monthly Membership Meeting Held on Wednesday, March 21, 2024**

The Barnard-Seyfert Astronomical Society met at Vanderbilt's Dyer Observatory and on-line via Zoom on Wednesday, March 21, 2023, Theo Wellington presiding. 26 persons signed-in at Dyer.

Treasurer's report: The Truist bank balance is \$7,954.01 (\$3,379.14 in the general fund and \$4,574.87 in the equipment fund). The PayPal balance is \$38.11. The monthly Zoom fee is \$17.47. BSAS is providing eclipse glasses to educational institutions.

Membership report: There are 181 members.

Social media report: Thanks to Donna for taking care of Facebook. Facebook is liked by 2.2K and followed by 2.4K. "X" has 331 followers. Thanks to Steve for taking care of Instagram.

Upcoming meetings: The April meeting is scheduled for April 17, 2024, from 7:30 PM at Vanderbilt's Dyer Observatory. The topic will be members' reports on the solar eclipse. The June meeting will be on June 26, 2024, and the July meeting will be on 24, 2024.

Upcoming star parties: A public star party is scheduled for Saturday, April 13, 2024, at Warner Park Special Events Field.

Upcoming events: The Middle Tennessee Science and Engineering Fair is scheduled for March 22. BSAS is offering awards for outstanding astronomy related projects. A solar eclipse (partial in the Nashville area and total some hours drive away) will occur on April 8, 2024. The Bells Bend Outdoor Festival (daytime) is scheduled for Saturday, April 13, 2024, at Bells Bend Outdoor Center.

Dr Billy Teets presented the life of E. E. Barnard, Nashville native and well-known American astronomer. Billy mentioned that a full length biography of Barnard by William Sheehan, "The Immortal Fire Within", is in print.

Respectfully submitted,

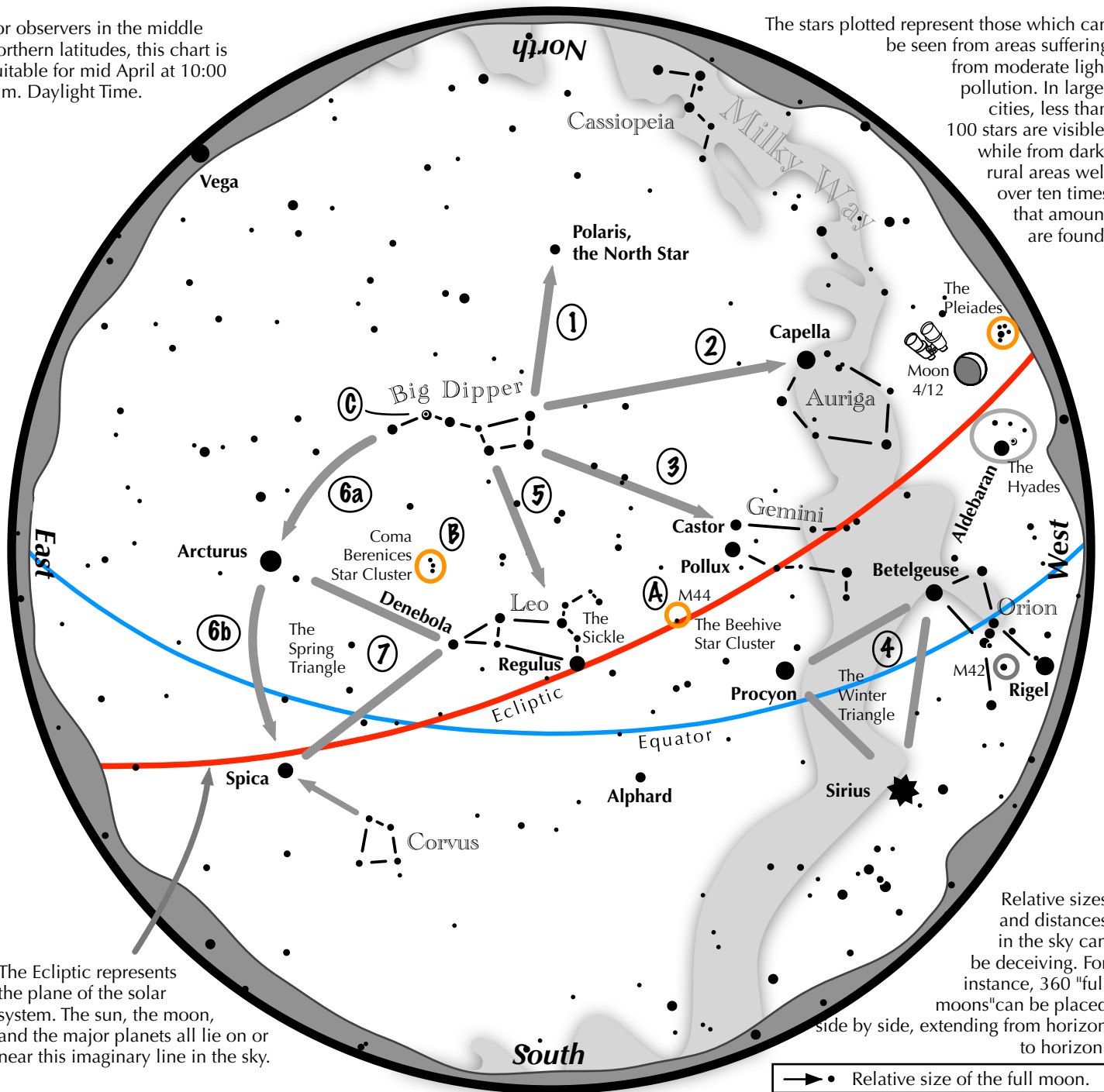
Bud Hamblen  
Secretary



# Navigating the April Night Sky, Northern Hemisphere

For observers in the middle northern latitudes, this chart is suitable for mid April at 10:00 p.m. Daylight Time.

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 April night sky: Simply start with what you know or with what you can easily find.

- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's bowl, draw a line pointing to the twin stars of Castor and Pollux in Gemini.
- 4 Look in the west-southwest for the bright Winter Triangle stars of Sirius, Procyon, and Betelgeuse.
- 5 Directly below the Dipper's bowl reclines the constellation Leo with its primary star, Regulus.
- 6 Follow the arc of the Dipper's handle. It first intersects Arcturus, then continues to Spica.
- 7 Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.

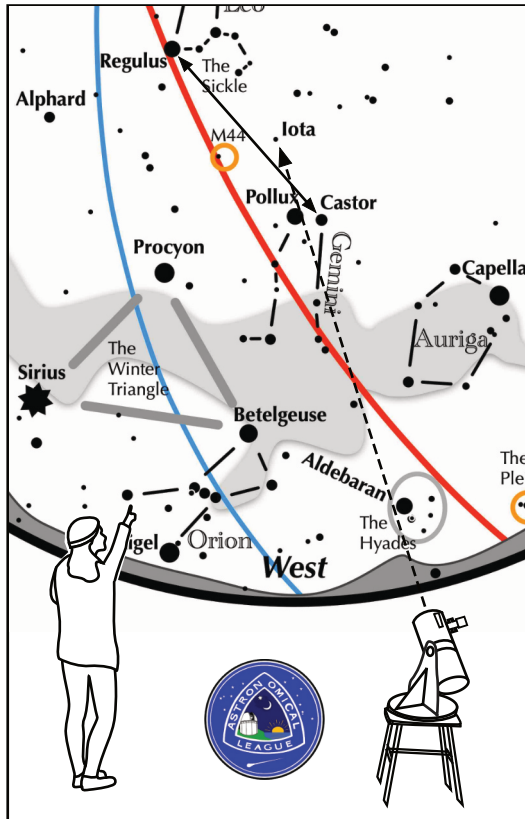
### Binocular Highlights

- A: M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.
- B: Look nearly overhead for the loose star cluster of Coma Berenices.
- C: In the Big Dipper's handle shines Mizar next to a dimmer star, Alcor.



Astronomical League  
www.astroleague.org

## ASTRONOMICAL LEAGUE Double Star Activity



### Other Suns: Iota Cancri

#### How to find Iota Cancri on an April evening

Face west. Look for the twin stars of Gemini, Castor and Pollux. Find Regulus. Iota lies about mid way between Castor and Regulus. It will be a moderately dim star.

Suggested magnification: >20x  
Suggested aperture: >3 inches

#### Iota Cnc

A-B separation: 31 sec

A magnitude: 4.1

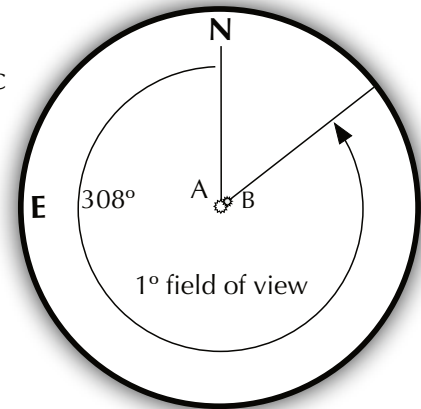
B magnitude: 6.0

Position Angle: 308°

Colors:

yellow

blue



### Next Membership Meeting:

Wednesday, April 17 at 7:30 pm

Dyer Observatory  
1000 Oman Drive  
Brentwood TN 37027



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 Dyer Observatory 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).