



# ASTROFILES

## Auburn Astronomical Society Newsletter

**December 2023** Newsletter Editor — John Wingard — [jwin1048@gmail.com](mailto:jwin1048@gmail.com)

### Moon Phases

- January 3 — Last Quarter
- January 11 — New Moon
- January 17 — First Quarter
- January 25 — Full Moon
- February 2 — Last Quarter
- February 9 — New Moon
- February 16 — First Quarter
- February 24 — Full Moon

### News and upcoming activities

We hope that everyone had a great holiday season this year and it's now time to look ahead to 2024. The big astronomical event for the coming year will be the total solar eclipse on April 8, 2024. It's not too early to make your plans! AAS member Mike Lewis has provided a great article with tips on getting prepared. His article is on the next page. Below is a map of the path of totality across the U.S. with nearest locations for us being in Texas and Arkansas. Mike also provided the two photos below that he took at the previous total solar eclipse in August, 2017 in Athens, TN. The right photo is the spectacular "diamond ring" event that occurs just after totality ends. So don't wait, make your plans for the eclipse now!



### Stay in touch with us



<http://www.auburnastro.org>



<https://www.facebook.com/groups/79864233515/>



Map provided courtesy of Travel & Leisure Magazine

## Planning for North America's Second Total Solar Eclipse!

by AAS member Mike Lewis

According to Space.com, total solar eclipses are not rare occurrences. One is visible somewhere on earth every 18 months. Despite that rate of frequency, a full eclipse of the Sun in the same spot can be very rare, or not. Alabama has only seen one total blackout of the Sun in the last 105 years (June 8, 1918). The next such full eclipse to darken the Yellowhammer State isn't until August 12, 2045: 22 years from now. On that fateful day, a diagonal line of totality will stretch from Tuscaloosa to Montgomery and down through Dothan. Those cities will witness full eclipse ranging from 2 minutes and 56 seconds to 5 minutes and 41 seconds. I'll be a ripe age of 82. I hope I live to see it!

For those who don't want to wait more than two decades to see the awesome spectacle of the Moon's shadow racing across the Sun at a speed of over a thousand miles per hour and darkness enveloping the land for up to 4 minutes, you are in luck. The next total solar eclipse is on April 8, 2024. What's more, you don't have to travel to Greenland, Iceland or Spain. You can drive about 10 hours due west to eastern Texas and western Arkansas.

Not only are these areas of totality closest to us, but they are likely to have better probability of at least partly cloudy skies than areas farther towards the center of the country and the northeast. April, as you know, can be stormy. A number of web sites offer detailed maps covering the zone of totality where the eclipse is 100%. They are included at the end of this article.

Logistics play a huge role in the success of your solar eclipse viewing expedition. Don't think just because the big solar eclipse is only a couple states over that getting there on time and finding a place to set up camp is a cinch. For those of you who ventured out in August of 2017 to view and photograph the last total solar eclipse in our region, you know that planning ahead is essential. I reserved a hotel room within the zone of totality in Athens, TN a full year ahead of the eclipse date. I also chose Athens because of the close proximity of a very large public park where my family and I could set up our gear hours ahead of time without trespassing on anyone's property.

I also surmised correctly that my one-night reservation at a local hotel near I-75 would not also buy me the right to linger past my 11am check out time on hotel grounds to watch the eclipse at 2PM. The hotel practically ran off any guests who hadn't reserved two night's stay. And by the time the eclipse rolled around, the hotel had upped their nightly rated by 100%! Another hard learned lesson was the need for a good size tent to sit under in the direct sunlight for approximately six to eight hours before the eclipse. It's best to plan similarly to what you would need for a long day at the beach: Tent, folding chairs, coolers, suntan lotion, fans, etc. Speaking of the beach, that was exactly what the park resembled at full eclipse – thousands of fellow Sun gazers with tents and cameras.

Last of all, of course, you will need enough safe solar glasses and properly fitting camera/scope solar filters to watch and photograph the partial phases of the eclipse. Totality (full eclipse) is a heavenly but brief experience, so you need to be ready for it. I downloaded "Solar Eclipse Timer" app (\$1.99) onto my cell phone weeks in advance to practice with and it worked like a charm on the day of the eclipse, informing us in a loud "countdown" voice exactly when we needed to take off our eclipse glasses and solar filters on our cameras and scopes in order to see the full eclipse in all its glory. Equally important, the app warned us again when full eclipse was nearing its end so we could be instantly ready to redon our solar glasses and solar filters.

As I write this article, we are approaching January 1, 2024. With just over 3 months lead time for the next big North American solar eclipse on April 8, hotels and RV parks within the zone of totality are filling up fast. What lodging space is still available is going at 3 to 5 times the normal cost. There is still time to plot and plan your eclipse viewing expedition. But I would not delay much longer. Below are some handy links for solar eclipse maps and weather to assist in your plans. Good luck and clear skies!

**[BEST] Interactive National Eclipse Map:** [https://eclipse2024.org/eclipse\\_cities/statemap.html](https://eclipse2024.org/eclipse_cities/statemap.html)

**Great American Solar Eclipse National Map:** <https://www.greatamericaneclipse.com/april-8-2024>

**State Eclipse Maps in Zone of Totality:** <https://nationaleclipse.com/maps.html>

**Alabama Partial Solar Eclipse:** <https://www.timeanddate.com/eclipse/in/usa/alabama?iso=20240408>

**Solar Eclipse Day Weather Predictions:** <https://eclipsophile.com/>

**How to Photograph an Eclipse:** <https://mreclipse.com/>

## Attention all AAS members...

We are always looking for interesting and informative content for the newsletter, especially from our members. We know that we have members that have a lot of nice astronomy gear and do a lot of amazing things with their equipment. Please consider submitting any astronomy-related photos that you have taken that we can share with other readers. Also, have you received a new telescope or other astronomy-related item recently? If so, consider writing up a brief review of that item, including both pros and cons. This might help someone else that could be considering the purchase of that same item. Of course, any related photos are always helpful with the reviews. We can always make room for any photos that you may have. The goal is to make the newsletter more relatable to the members in our coverage area.

In addition, if you have any astronomy-related items that you wish to sell, you can always submit a description of the items, related photos, asking price, and contact information for potential buyers. Any photos, reviews or other items can be sent to me at [jwin1048@gmail.com](mailto:jwin1048@gmail.com). Thank you!

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### For Sale: Sky Watcher 10" Dobsonian reflector

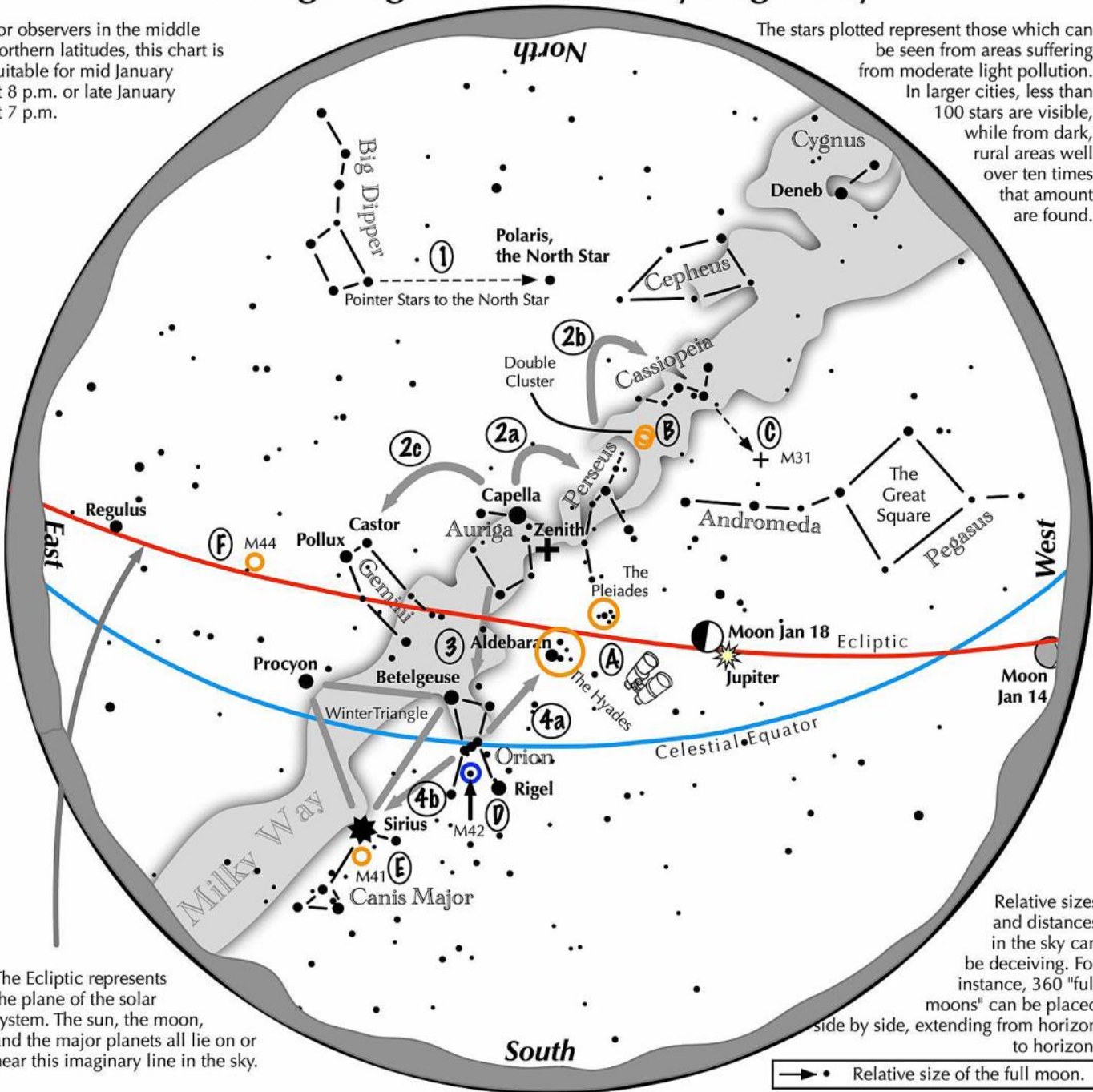
I previously advertised this scope for sale in an earlier newsletter. It is still available. This is a Sky Watcher 10" collapsible Dobsonian reflector in excellent condition. It comes with two Plossl eyepieces (10mm and 25mm), finder scope and user manual. Price is \$500 firm. A new one similar to this is almost twice as much today. Due to the size and weight, I won't ship but would be willing to travel a short distance to meet a buyer. Due to its light-gathering power, this would make a great scope for someone in a fairly dark sky location. If interested, you can contact me at [jwin1048@gmail.com](mailto:jwin1048@gmail.com). Thanks! John Wingard



# Navigating the mid January Night Sky

For observers in the middle northern latitudes, this chart is suitable for mid January at 8 p.m. or late January at 7 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 winter night sky: Simply start with what you know or with what you can easily find.

- 1 Above the northeast horizon rises the Big Dipper. Draw a line from its two end bowl stars upwards to the North Star.
- 2 Face south. Overhead twinkles the bright star Capella in Auriga. Jump northwestward along the Milky Way first to Perseus, then to the "W" of Cassiopeia. Next Jump southeastward from Capella to the twin stars Castor and Pollux of Gemini.
- 3 Directly south of Capella stands the constellation of Orion with its three Belt Stars, its bright red star Betelgeuse, and its bright blue-white star, Rigel.
- 4 Use Orion's three Belt stars to point to the red star Aldebaran, then to the Hyades, and the Pleiades star clusters. Travel southeast from the Belt stars to the brightest star in the night sky, Sirius.

### Binocular Highlights

**A:** Examine the stars of the Pleiades and Hyades, two naked eye star clusters. **B:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster. **C:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **D:** M42 in Orion is a star forming nebula. **E:** Look south of Sirius for the star cluster M41. **F:** M44, a star cluster barely visible to the naked eye, lies to the southeast of Pollux.

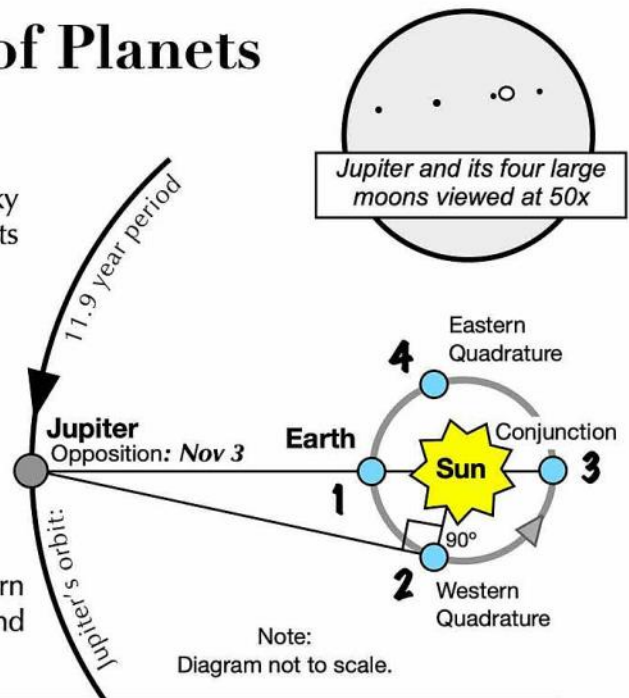




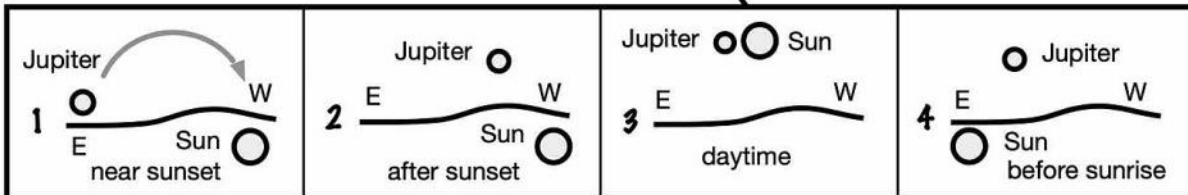
# Jupiter, King of Planets

## Orbital Aspects

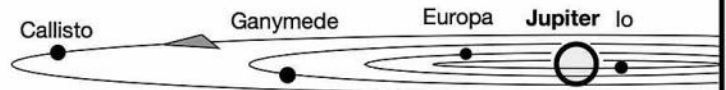
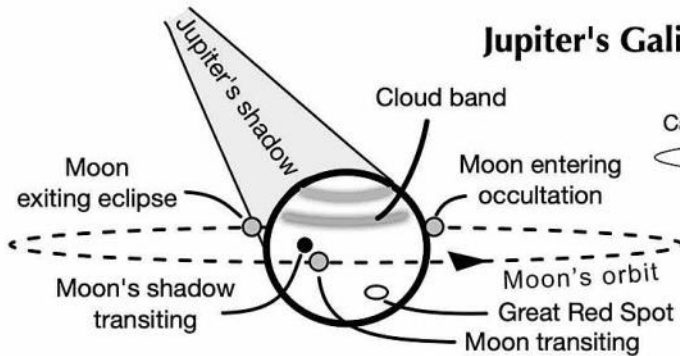
- 1 At opposition – when it is opposite the sun in the sky – Jupiter is at its closest to Earth and, hence, at its brightest. It rises near sunset and is visible all night.
- 2 As Earth moves ahead of Jupiter, it is seen moving nightly towards the west after sunset. Eventually, it will set just after sunset.
- 3 At solar conjunction – when Jupiter lives on the far side of the Sun – it appears in the daytime sky near the Sun, and can't be seen.
- 4 As Earth catches up to Jupiter, it is found in the eastern morning sky moving westward away from the Sun, and rising earlier. Eventually, it rises shortly after sunset.



Note:  
Diagram not to scale.



## Jupiter's Galilean moons



### Relative orbital distances of the Galilean moons

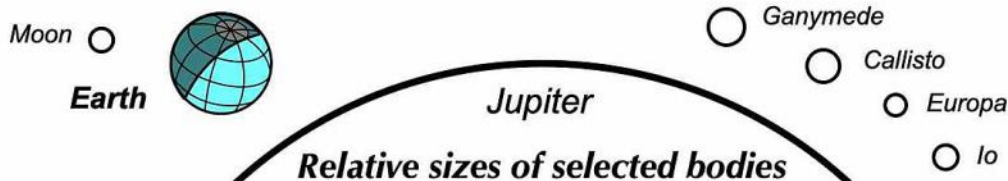
- As the four moons orbit Jupiter, they change their relative positions with each other.
- They are seen as up to four pinpoints on either side of the planet, all in a line.

### A small telescope can show:

- The planet's slight oval shape
- Cloud bands on Jupiter
- Moon entering/exiting occultation
- Moon entering/exiting eclipse
- Moon transiting the planet
- Moon's shadow transiting the planet
- The Great Red Spot rotates into view every 10 hours.



Galilean Moon	Diameter (miles)	Distance (miles)	Period (days)	Opposition Magnitude
Io	2260	262,000	1.8	5.0
Europa	1940	416,000	3.6	5.3
Ganymede	3270	665,000	7.2	4.6
Callisto	2990	1,170,000	16.7	5.7





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!

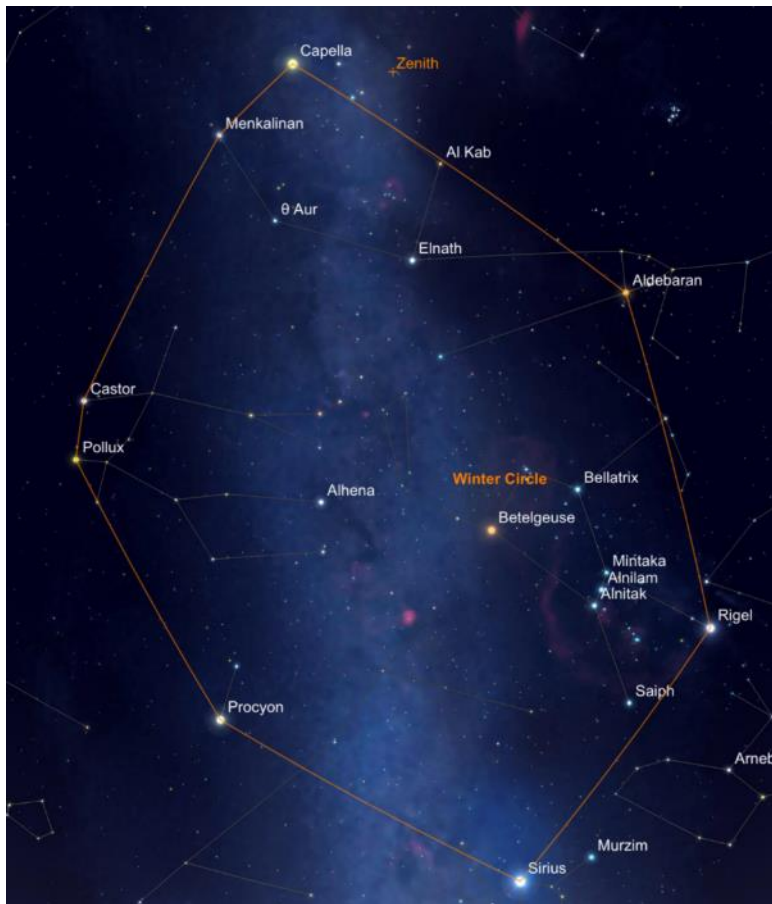
## Connecting the 'Dots' with Asterisms

By Kat Troche

In our December Night Sky Notes, we mentioned that the Orion constellation has a distinct hourglass shape that makes it easy to spot in the night sky. But what if we told you that this is not the complete constellation, but rather, an *asterism*?

An asterism is a pattern of stars in the night sky, forming shapes that make picking out constellations easy. Cultures throughout history have created these patterns as part of storytelling, honoring ancestors, and timekeeping. Orion's hourglass is just one of many examples of this, but did you know Orion's brightest knee is part of another asterism that spans six constellations, weaving together the Winter night sky? Many asterisms feature bright stars that are easily visible to the naked eye. Identify these key stars, and then connect the dots to reveal the shape.

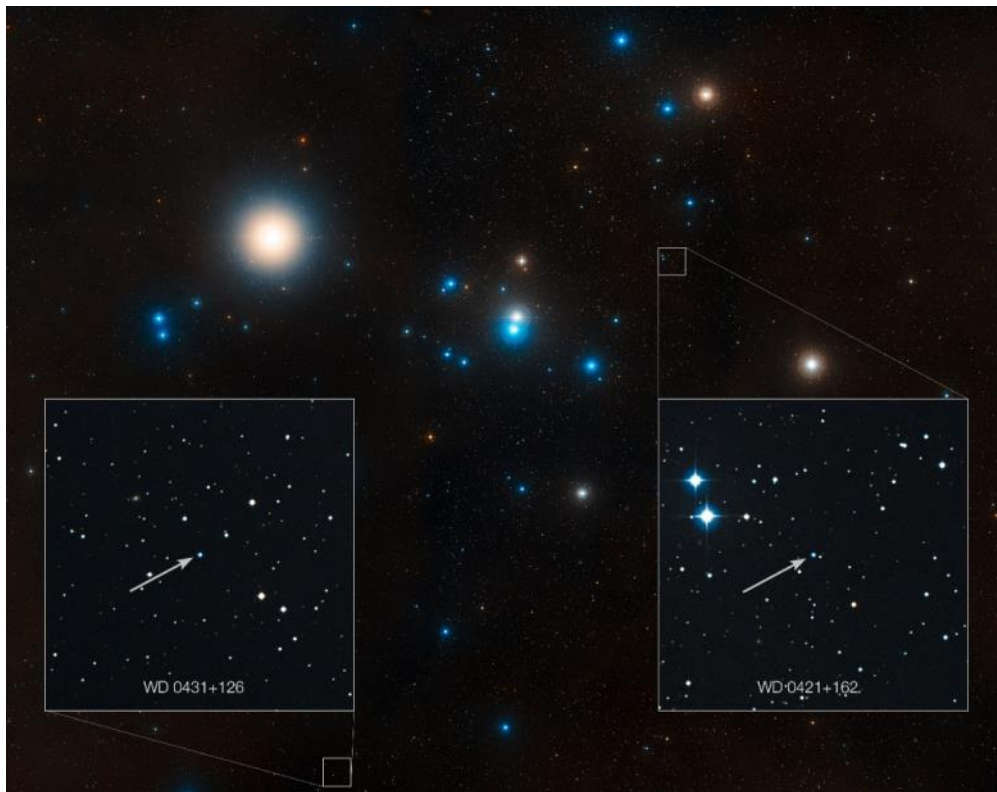
## Asterisms Through the Seasons



Stars that make up the Winter Circle, as seen on January 1, 2024

Try looking for these asterisms this season and beyond:

- **Winter Circle** – this asterism, also known as the Winter Hexagon, makes up a large portion of the Winter sky using stars Rigel, Aldebaran, Capella, Pollux, Procyon, and Sirius as its points. Similarly, the **Winter Triangle** can be found using Procyon, Sirius, and Betelgeuse as points. **Orion's Belt** is also considered an asterism.
- **Diamond of Virgo** – this springtime asterism consists of the following stars: Arcturus, in the constellation Boötes; Cor Caroli, in Canes Venatici; Denebola in Leo, and Spica in Virgo. Sparkling at the center of this diamond is the bright cluster **Coma Berenices**, or Bernice's Hair – an ancient asterism turned constellation!
- **Summer Triangle** – as the nights warm up, the Summer Triangle dominates the heavens. Comprising the bright stars Vega in Lyra, Deneb in Cygnus, and Altair in Aquila, this prominent asterism is the inspiration behind the cultural festival Tanabata. Also found is Cygnus the Swan, which makes up the **Northern Cross** asterism.
- **Great Square of Pegasus** – by Autumn, the Great Square of Pegasus can be seen. This square-shaped asterism takes up a large portion of the sky, and consists of the stars: Scheat, Alpheratz, Markab and Algenib.



This image shows the region around the Hyades star cluster, the nearest open cluster to us. The Hyades cluster is very well-studied due to its location, but previous searches for planets have produced only one. A new study led by Jay Farihi of the University of Cambridge, UK, has now found the atmospheres of two burnt-out stars in this cluster — known as white dwarfs — to be “polluted” by rocky debris circling the star. Inset, the locations of these white dwarf stars are indicated — stars known as WD 0421+162, and WD 0431+126.

NASA, ESA, STScI, and Z. Levay (STScI)

Tracing these outlines can guide you to objects like galaxies and star clusters. The Hyades, for example, is an open star cluster in the Taurus constellation with evidence of rocky planetary [debris](#). In 2013, Hubble Space Telescope’s Cosmic Origins Spectrograph was responsible for breaking down light into individual components. This observation detected low levels of carbon and silicon – a

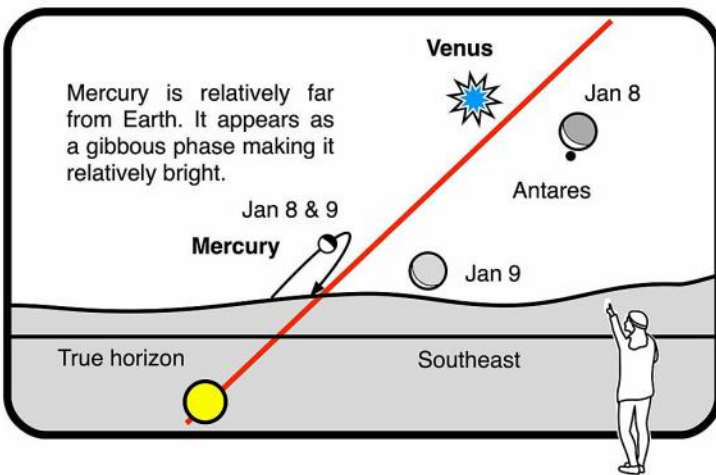
major chemical for planetary bodies. The Hyades can be found just outside the Winter Circle and is a favorite of both amateur and professional astronomers alike.

## How to Spot Asterisms

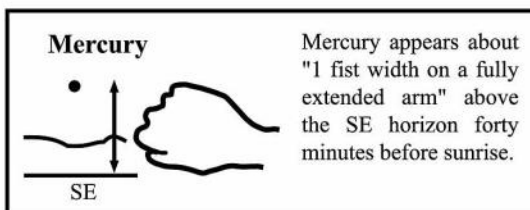
- **Use Star Maps and Star Apps** – Using star maps or stargazing apps can help familiarize yourself with the constellations and asterisms of the night sky.
- **Get Familiar with Constellations** – Learning the major constellations and their broader shapes visible each season will make spotting asterisms easier.
- **Use Celestial Landmarks** – Orient yourself by using bright stars, or recognizable constellations. This will help you navigate the night sky and pinpoint specific asterisms. Vega in the Lyra constellation is a great example of this.

Learn more about how to stay warm while observing this Winter with our upcoming mid-month article on the Night Sky Network page through NASA's website!

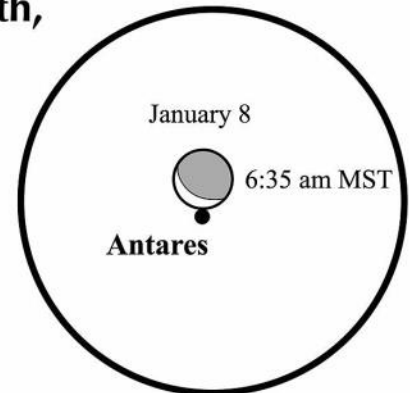
### If you can observe only one celestial event this month, see this one:



### January 8 and 9, 2024: Mercury, Venus, and the moon forty minutes before sunrise in the southeast



View through  
10x50 binoculars  
on January 8



**The Scene:**

### The crescent moon, Antares, Venus, and Mercury in the morning twilight

On January 8, the crescent moon approaches Antares low in the southeast 90 minutes before sunrise.

- The moon occults Antares for viewers living in the southwestern portion of the US. (NM, UT, AZ, and So CA.)

- The event begins at 6:39AM MST, location dependent.

- Use common household binoculars to watch the occultation and begin viewing at 6:35 MST.

- \* The very bright object to the moon's left is Venus.

- 40 minutes before sunrise, look for Mercury low in the southeast to the far lower left of Venus.

On January 9, an even thinner crescent moon lies right of Mercury and below brilliant Venus.





# Auburn Astronomical Society

## Application for Membership

To insure that our records are accurate, please print information clearly

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_

Phone: \_\_\_\_\_ Date of Application: \_\_\_\_/\_\_\_\_/\_\_\_\_

E-Mail: \_\_\_\_\_

Telescopes owned (if any): \_\_\_\_\_

Area(s) of special interest: \_\_\_\_\_

Enclose \$20.00 for regular annual membership, payable in January. *Full-time* student membership is \$10.00.

For NEW members joining after January, refer to the prorated dues table below for the month you are joining:

Jan \$20.00	Feb \$18.33	Mar \$16.66	Apr \$14.99	May \$13.33	Jun \$11.66
Jul \$10.00	Aug \$8.33	Sep \$6.66	Oct \$4.99	Nov \$2.33	Dec \$1.66

New—Just Joining

Renewal

Please make checks payable to: Auburn Astronomical Society and return this application with your payment to:

Auburn Astronomical Society  
c/o John Wingard, Sec/Treasurer  
5 Wexton Ct.  
Columbus, GA 31907

*Note: At this time we do not have an  
option for online payment of dues.*

The Auburn Astronomical Society is a member of the Astronomical League, the national organization representing astronomy clubs throughout the United States. As a club benefit, paid members of the Auburn Astronomical Society are eligible to received quarterly issues of *The Reflector*, the official publication of the Astronomical League. It will be mailed to the address that you provided above but could be delayed somewhat until their mailing lists are updated.

For additional information about our club, please go to our website [www.auburnastro.org](http://www.auburnastro.org) . You can also follow us on our Facebook page. Just search for "Auburn Astronomical Society."