ASTROFILES

Auburn Astronomical Society Newsletter

October 2021 *Newsletter Editor — John Wingard — jwin1048@gmail.com*

Moon Phases

October 12 — First Quarter

October 20 — Full Moon

October 28 — Last Quarter

November 4 — New Moon

November 11 — First Quarter

November 19 — Full Moon

November 27 — Last Quarter

December 4 — New Moon

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http://www.auburnastro.org

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

News and events

As the first hints of fall finally come to our area we are encouraged by the hopeful demise of the dreaded Covid pandemic that has affected us for almost two years now. The AAS was happy to mark this occasion recently with a stargaze hosted by the Central Alabama Community College in Alexander City, AL. The evening of Saturday, October 16th turned out to be a cool and clear night and offered nice views of not only the Moon, but Venus, Jupiter and Saturn as well. Approximately 50-60 people gathered on the interior of the school's track as we participated in the International Observe the Moon Night. Many thanks to the AAS members that came and brought scopes (we counted 13) for the public to use. The photos on the following page show a few of the different types of scopes that were present that night, a fun and enjoyable evening.

The AAS is pleased to welcome this new member to our club:

Alex Kuznetsov — Auburn, AL


CENTRAL ALABAMA
WELCOME TO THE
CACC

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit night-sky.jpl.nasa.gov to find local clubs, events, and more!

Measure the Night Sky

David Prosper

Fall and winter months bring longer nights, and with these earlier evenings, even the youngest astronomers can get stargazing. One of the handiest things you can teach a new astronomer is how to measure the sky – and if you haven't yet learned yourself, it's easier than you think!

Astronomers measure the sky using degrees, minutes, and seconds as units. These may sound more like terms for measuring time - and that's a good catch! – but today we are focused on measuring ***angular distance***. **Degrees** are largest, and are each made up of 60 **minutes**, and each minute is made up of 60 **seconds**. To start, go outside and imagine yourself in the center of a massive sphere, with yourself at the center, extending out to the stars: appropriately enough, this is called the **celestial sphere**. A circle contains 360 degrees, so if you have a good view of the horizon all around you, you can slowly spin around exactly once to see what 360 degrees looks like, since you are in effect drawing a circle from inside out, with yourself at the center! Now break up that circle into quarters, starting from due North; each quarter measures 90 degrees, equal to the distance between each cardinal direction! It measures 90 degrees between due North and due East, and a full 180 degrees along the horizon between due North and due South. Now, switch from a horizontal circle to a vertical one, extending above and below your head. Look straight above your head: this point is called the *zenith*, the highest point in the sky. Now look down toward the horizon; it measures 90 degrees from the zenith to the horizon. You now have some basic measurements for your sky.

Use a combination of your fingers held at arm's length, along with notable objects in the night sky, to make smaller measurements. A full Moon measures about half a degree in width - or 1/2 of your pinky finger, since each pinky measures 1 degree. The three stars of Orion's Belt create a line about 3 degrees long. The famed "Dig Dipper" asterism is a great reference for Northern Hemisphere observers, since it's circumpolar and visible all night for many. The Dipper's "Pointer Stars," Dubhe and Merak, have 5.5 degrees between them - roughly three middle fingers wide. The entire asterism stretches 25 degrees from Dubhe to Alkaid - roughly the space between your outstretched thumb and pinky. On the other end of the scale, can you split Mizar and Alcor? They are separated by 12 *arc minutes* - about 1/5 the width of your pinky.

Keep practicing to build advanced star-hopping skills. How far away is Polaris from the pointer stars of the Big Dipper? Between Spica and Arcturus? Missions like Gaia and Hipparcos measure tiny differences in the angular distance between stars, at an extremely fine level. Precise measurement of the heavens is known as ***astrometry***. Discover more about how we measure the universe, and the missions that do so, at nasa.gov.

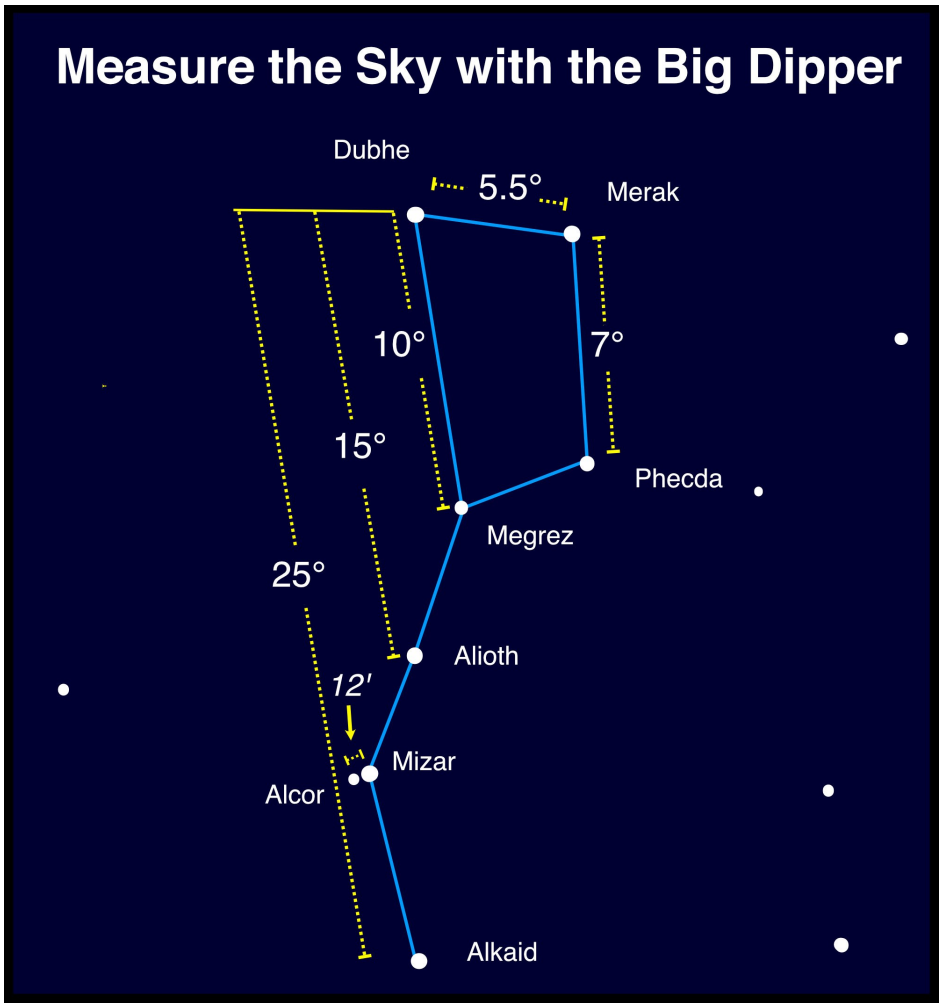
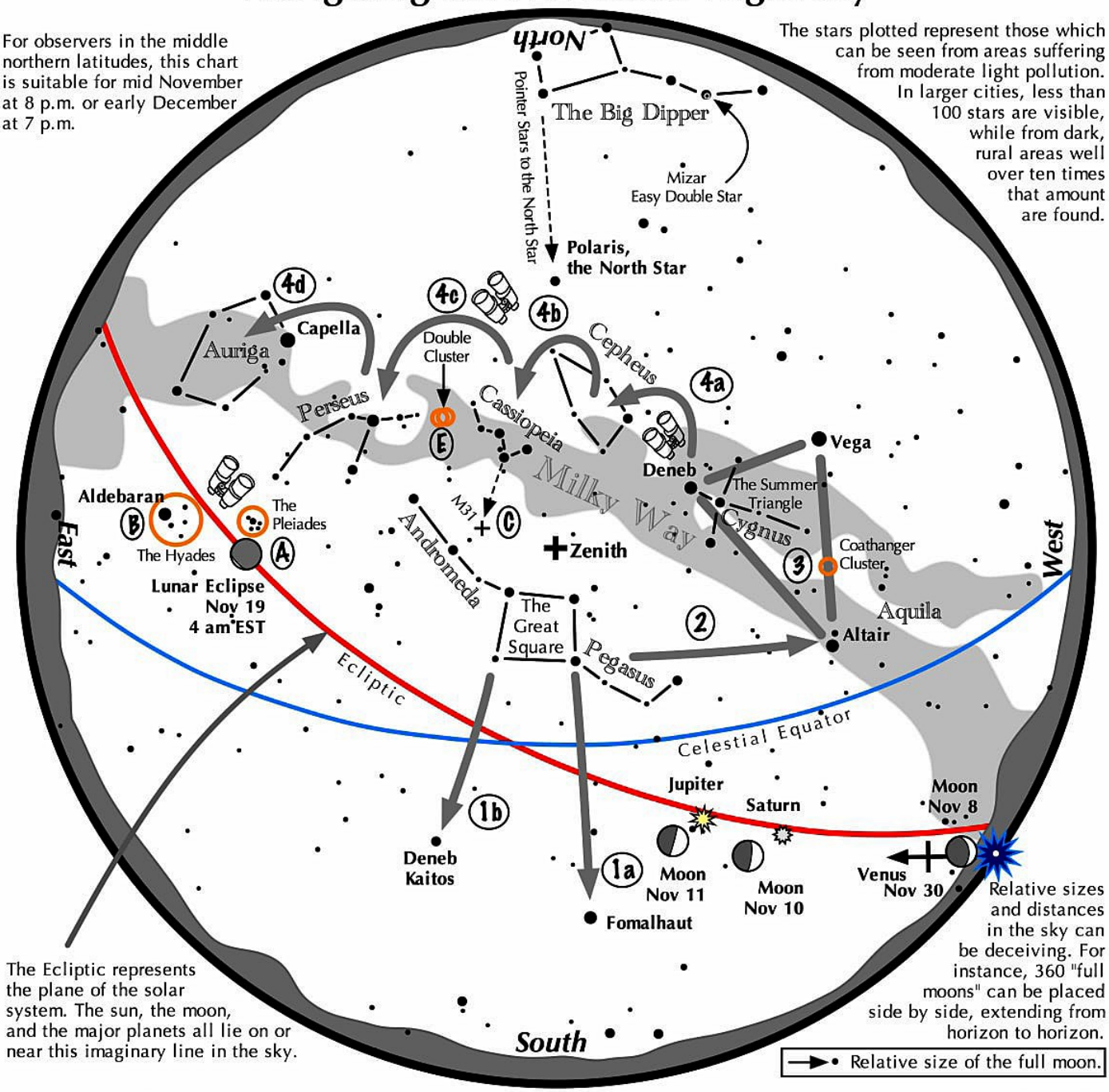


Image created with assistance from Stellarium

Navigating the November Night Sky



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

1. Face south. Almost overhead lies the "Great Square" with four stars about the same brightness as those of the Big Dipper. Extend a line southward following the Square's two westernmost stars. The line strikes Fomalhaut, the brightest star in the south. A line extending southward from the two easternmost stars, passes Deneb Kaitos, the second brighest star in the south.
2. Draw a line westward following the southern edge of the Square until 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, then 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. **E.** The Double Cluster.

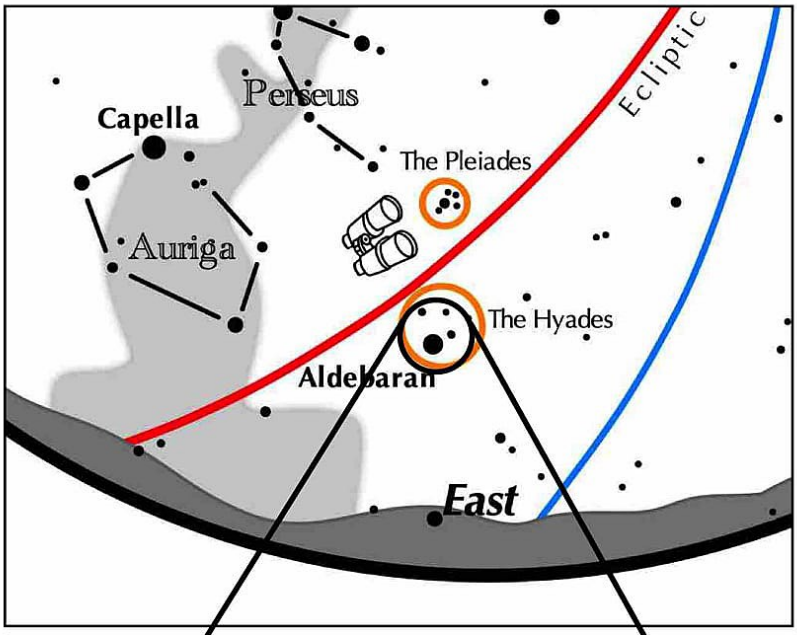
Have you ever seen the dwarf planet Ceres?

end of October brings a good opportunity …

If you observe in a dark suburban (or darker) area, use binoculars to spot the tiny, rocky world.

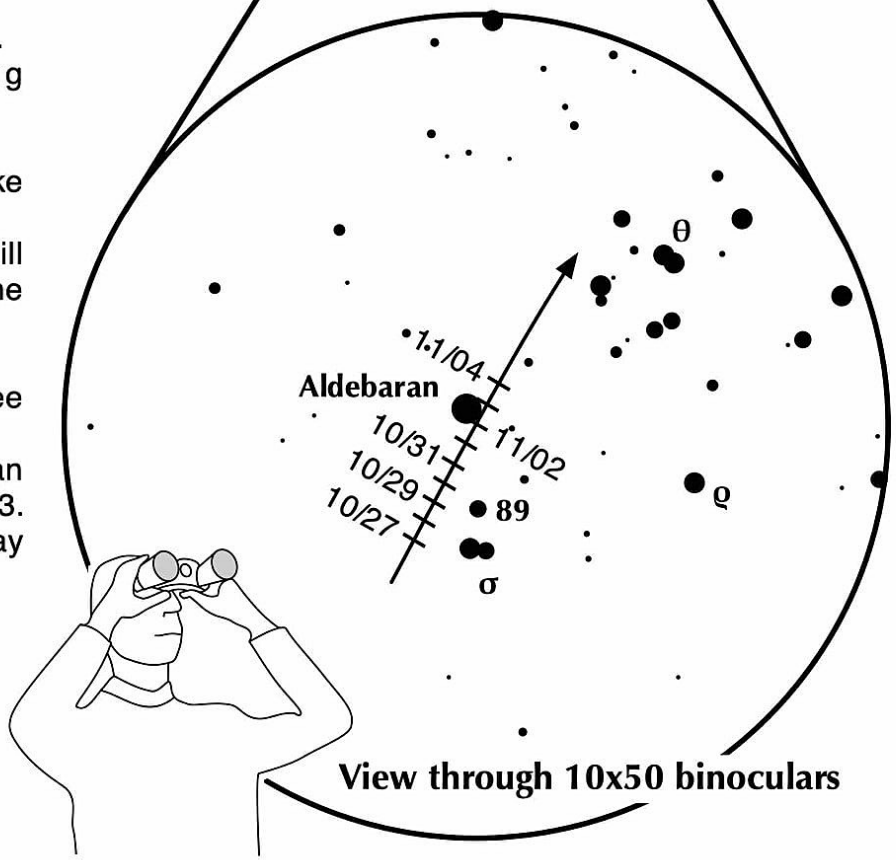
First, find Aldebaran:

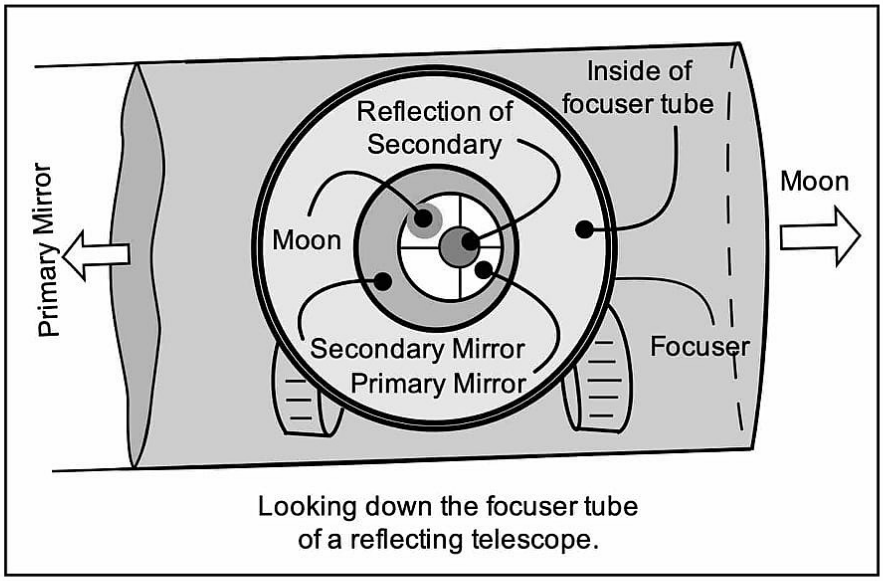
- at 10 p.m. EDT after October 27, face east.
- Look for the distinctive star cluster the Pleiades.
- Just below it is the bright, red star Aldebaran.
- Aldebaran is surrounded by the the loose star cluster, the Hyades.



Next, find Ceres:

- Aim binoculars at Aldebaran.
- Use the accompanying binocular chart.
- Identify Sigma and 89 Tauri.
- Ceres will be the dim starlike object in the plotted location.
- At a magnitude of 6.9, it will not be bright, but one of the dimmer points.
- Plot its location.
- Look the next evening to see how much it has moved.
- Ceres is closest to Aldebaran on the evenings of Nov. 2 & 3. However, the star's glare may obscure the dim dwarf planet.





Looking down the focuser tube
of a reflecting telescope.

Technique for quickly finding the Moon with a small telescope

Has this happened to you? You are visiting a friend who has a small telescope which has not been used in years. He and his friends would like to take a quick look at the Moon. Since you are the astronomer, you are elected to find the silvery orb in the unused scope, which either doesn't have a finder scope or the finder scope is way out of alignment. Can you, the accomplished astronomer, easily put the Moon in the eyepiece's field – especially with everyone watching?

The Moon, being so big and bright, is considered by many people who are not acquainted with telescope operations as surely being easy to find. It is almost embarrassing that that is not necessarily so. Consider that the Moon covers only 1/2 º in the sky and that just roughly pointing the scope in its general direction will not likely place it in the eyepiece. Here is a quick and easy method:

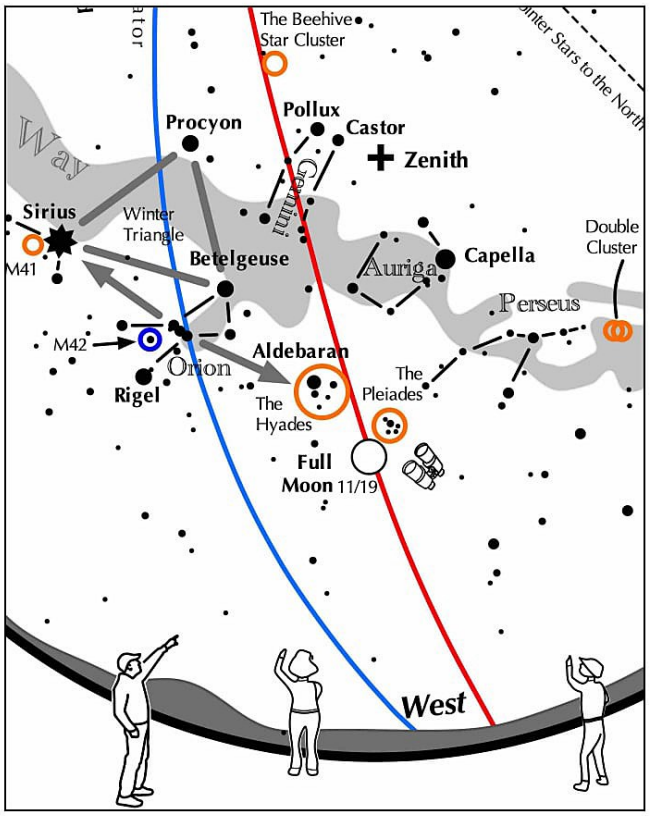
Everyone is looking at you, and your reputation as an astronomer is on the line!

1. Stand behind the telescope, and, while looking along the telescope tube, point it towards the Moon. In fact, it might be pointed directly at it, but in all likelihood, it won't be.
2. Confidently remove the eyepiece and look directly into the focuser tube.
3. If it is a reflector, the glaring glow of the unfocused Moon will be seen off–center in the primary mirror reflecting off the secondary. (If it is a refractor, the Moon will be a blur at the end of the main tube.)
4. While looking down the focuser, position your head so that the secondary mirror will be nearly in the center of the focuser.
5. Nudge the scope so that the Moon's bright glow will be placed, or almost so, behind the secondary mirror's reflection on the primary. (For your own amusement and unrelated to this operation, move your eye away from the focuser along the optical path until it reaches the prime focus. Always an interesting visual effect!)
6. Replace the eyepiece and the Moon should now lie in the field.

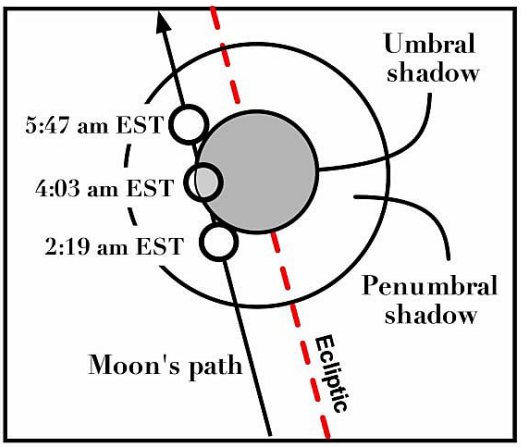
Elapsed time: 19 seconds. Your reputation is maintained!

Take a good look at the photo to the left. This is your last chance to see NASA's James Webb telescope before it is loaded aboard the rocket that will propel it into space in December. The giant instrument has been folded up into a compact package for loading aboard an European Space Agency (ESA) Ariane 5 rocket at ESA's launch site in French Guiana. The launch is ESA's contribution to this historic project that has been in the works for many years. The project has endured many technical setbacks and cost overruns throughout its history, but hopefully on or about December 18, 2021, it will finally get into space. After about a month's journey, the telescope will arrive at the second Lagrange point (L2) some 1.5 million miles from earth where it will set up operation to observe the universe in the infrared portion of the spectrum. It should revolutionize our views and knowledge of the early history of the universe.

In the early morning of November 19, try this challenge:



View to the west on November 19 at 4 am EST, 1 am PST



The Moon slides through an almost total eclipse

In the early morning hours of Nov. 19 for east coasters, and after 11 p.m. on the 18th for west coasters, the brilliant full moon slides into Earth's shadow. But the moon's surface isn't completely covered, just 97% of it at maximum eclipse.

- Even though the partial umbral eclipse begins at 2:19 EST, darkening may not be noticed for another 5 minutes.
- At mid eclipse, can you see that the southern limb of the moon is not in full darkness?
- At mid eclipse, what color is the moon? How red is it?
- Before the eclipse begins, the moon's sky glow blocks viewing the Pleaides star cluster. How close to mid eclipse are the Pleiades still visible?

Auburn Astronomical Society

Membership Application Form

Name:
_____

Address:
_____

City: _____ **State:** _____ **Zip:** _____

Phone: _____ **Date of Application*** _____/_____/_____

E-mail:
_____

Telescope(s):
_____

_____

Area(s) of special interest:
_____

_____

Enclose: $20.00 for regular membership, payable in January. *Full-Time* student membership is half the Regular rate.

*** For *NEW* members joining after January, refer to the prorated Dues Table below:**

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

Make checks payable to: Auburn Astronomical Society and return this application to:

Auburn Astronomical Society
c/o John Wingard, Secretary/Treasurer
#5 Wexton Court
Columbus, GA 31907

For questions about your dues or membership status, contact: jwin1048@gmail.com

Thank you for supporting the Auburn Astronomical Society