ASTROFILES

Auburn Astronomical Society Newsletter

December 2020 *Newsletter Editor — John Wingard — jwin1048@gmail.com*

Moon Phases

December 21 — First Quarter

December 29 — Full Moon

January 6 — Last Quarter

January 13 — New Moon

January 20 — First Quarter

January 28 — Full Moon

February 4 — Last Quarter

February 11 — New Moon

Stay in touch with us

http://www.auburnastro.org

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

Latest News and Events

Well, 2020 is just about over and we hope that everyone is still safe and has had a good holiday. Hopefully 2021 will be a better year and we can begin meeting once again, both at club meetings and star gazes. We will just have to see what the new year brings us.

It's time to renew your dues to the AAS for 2021

It's that time once again...time to renew your annual dues to the Auburn Astronomical Society. I've already received a couple of renewals for 2021, so this is just a friendly reminder for everyone else. Our dues cycle runs from January 1 to December 31 and dues are only $20.00 for the year ($10.00 for full-time students). If you have never been a member of the AAS and would like to join, your dues can be prorated based on the month in which you join. Please refer to the membership application at the end of this newsletter to see the monthly prorated rates. Since we are currently not meeting in person, the best way is to fill out the membership application along with your payment to Auburn Astronomical Society and mail it to me at the address listed on the application. We thank everyone for their continued support of the club!

The AAS would like to welcome as a new member Les Hopson from Dadeville, AL. Les reports that he has a nice scope and is looking forward to meeting up with us soon.

The Great Conjunction

One of the most exciting things that happened, astronomically speaking, in 2020 was the so-called great conjunction of the planets Jupiter and Saturn. The two giant planets moved closer and closer to each other in the sky and on the evening of December 21st, they were just a few arc minutes apart from our vantage point here on Earth. There's no doubt that countless thousands of amateur astronomers were out that night viewing and imaging this somewhat rare phenomenon. AAS member Mike Lewis conducted a small star gaze for relatives and a few neighbors where they not only viewed the conjunction, but the Moon and Mars as well. Here is a shot of his group and one of his shots of the conjunction.

One of the problems experienced by nearly everyone that attempted to photograph the conjunction was the significant difference in the brightness of Jupiter and Saturn. If the exposure was adjusted for a good capture of much the brighter Jupiter, then the dimmer Saturn was underexposed. Then there was the challenge of capturing the four major moons of Jupiter which required yet another different exposure. Some amateurs actually made different exposures for each object and combined them together in post-processing.

Here's a conjunction photo unlike any other you may have seen

The conjunction photo at the left wasn't taken by any amateur, or professional for that matter. It wasn't even taken by anyone on Earth but by NASA's Lunar Reconnaissance Orbiter (LRO) currently orbiting the moon. It was taken on December 21st after ground controllers commanded the spacecraft to look away from the moon's surface long enough to snap this shot of the conjunction. The LRO has been in lunar orbit since 2009 and controllers say that it has enough attitude control reserves to last another 6 years as long as it remains healthy.

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 nightsky.jpl.nasa.gov to find local clubs, events, and more!

Check Your Sky's Quality with Orion!

David Prosper

Have you ever wondered how many stars you can see at night? From a perfect dark sky location, free from any light pollution, a person with excellent vision may observe a few thousand stars in the sky at one time! Sadly, most people don't enjoy pristine dark skies – and knowing your sky's brightness will help you navigate the night sky.

The brightness of planets and stars is measured in terms of **apparent magnitude**, or how bright they appear from Earth. Most visible stars range in brightness from 1st to 6th magnitude, with the lower number being brighter. A star at magnitude 1 appears 100 times brighter than a star at magnitude 6. A few stars and planets shine even brighter than first magnitude, like brilliant Sirius at -1.46 magnitude, or Venus, which can shine brighter than -4 magnitude! Very bright planets and stars can still be seen from bright cities with lots of light pollution**.** Given perfect skies, an observer may be able to see stars as dim as 6.5 magnitude, but such fantastic conditions are very rare; in much of the world, human-made light pollution drastically limits what people can see at night.

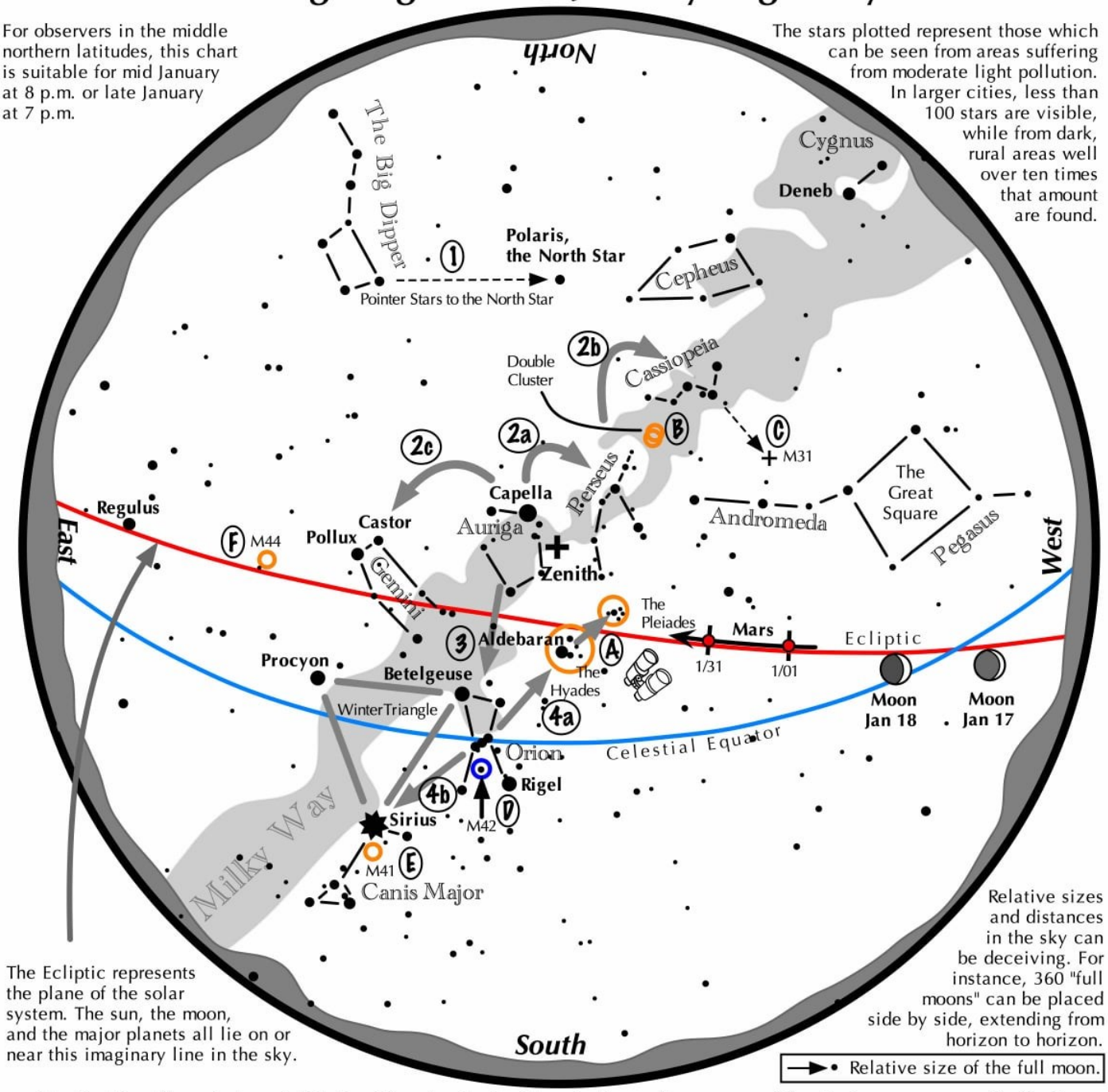
Your sky's **limiting magnitude** is, simply enough, the measure of the dimmest stars you can see when looking straight up. So, if the dimmest star you can see from your backyard is magnitude 5, then your limiting magnitude is 5. Easy, right? But why would you want to know your limiting magnitude? It can help you plan your observing! For example, if you have a bright sky and your limiting magnitude is at 3, watching a meteor shower or looking for dimmer stars and objects may be a wasted effort. But if your sky is dark and the limit is 5, you should be able to see meteors and the Milky Way. Knowing this figure can help you measure light pollution in your area and determine if it's getting better or worse over time. And regardless of location, be it backyard, balcony, or dark sky park, light pollution is a concern to all stargazers!

How do you figure out the limiting magnitude in your area? While you can use smartphone apps or dedicated devices like a Sky Quality Meter, you can also use your own eyes and charts of bright constellations! The Night Sky Network offers a free printable Dark Sky Wheel, featuring the stars of Orion on one side and Scorpius on the other, here: bit.ly/darkskywheel. Each wheel contains six "wedges" showing the stars of the constellation, limited from 1-6 magnitude. Find the wedge containing the faintest stars you can see from your area; you now know your limiting magnitude! For maximum accuracy, use the wheel when the constellation is high in the sky well after sunset. Compare the difference when the Moon is at full phase, versus new. Before you start, let your eyes adjust for twenty minutes to ensure your night vision is at its best. A red light can help preserve your night vision while comparing stars in the printout.

Did you have fun? Contribute to science with monthly observing programs from Globe at Night's website (globeatnight.org), and check out the latest NASA's science on the stars you can - and can't - see, at nasa.gov.

The Dark Sky Wheel, showing the constellation Orion at six different limiting magnitudes (right), and a photo of Orion (left). What is the limiting magnitude of the photo? For most observing locations, the Orion side works best on evenings from January-March, and the Scorpius side from June-August.

Navigating the mid January Night Sky



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 Persues, 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 to the 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.

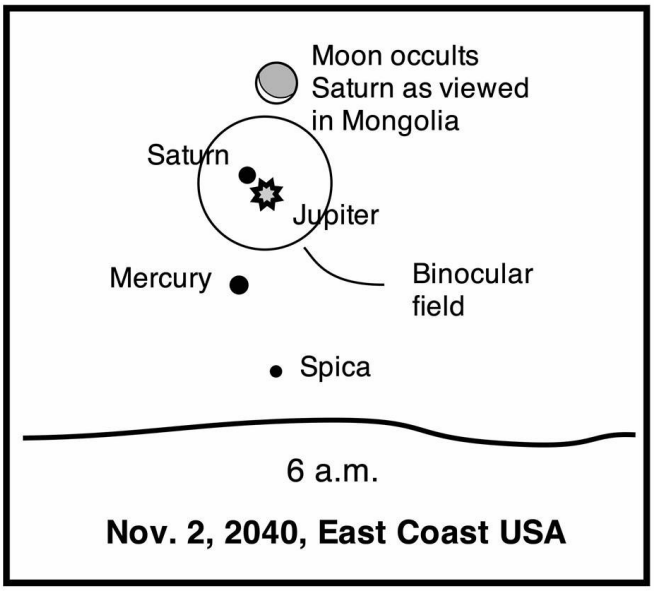
The next Great Conjunction

The Great Conjunction is over. Jupiter now pulls away from Saturn, as they both sink in the western twilight and begin to round the back side of the sun. Conjunctions between these two planets occur about every 19 years 10 1/2 months. On the morning of November 2, 2040, they will be near each other again, but not as close as this event. But for some people, it may be even more of spectacular sight...

The two giant planets lie low in the southeast about 1 hour before sunrise, separated by 1°.

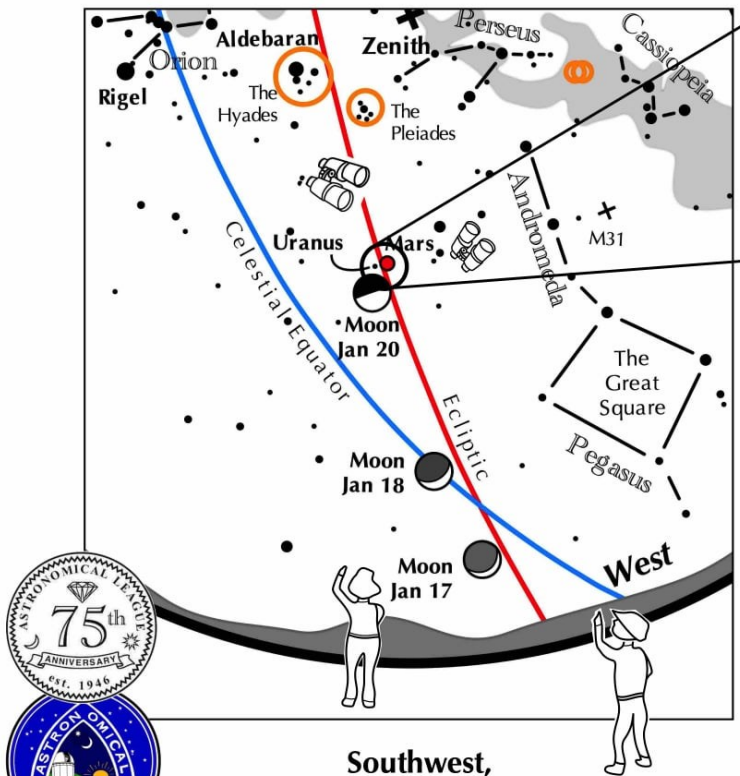
The thin crescent moon glows just above Saturn. From areas in northeast Asia (Mongolia, Russian Far East) the moon occults Saturn! And to gild the lily, Mercury appears at its brightest, just below the celestial trio.

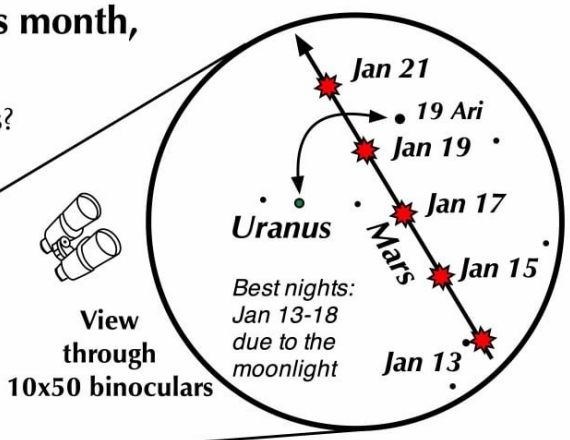
Please note this on your calendars!



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

Have you ever seen the dimmest of the six visible planets? Here is your chance to spot Uranus in binoculars.





Mars meets Uranus

Look to the west 2 hours after sunset in mid January.

- In the west, shines Mars sporting an orange red tint.
- On the nights of January 13 through January 21, easy-to-spot Mars will move past faint Uranus.
- Use binoculars and the map to spot the planetary pair. The 5.7 magnitude star 19 Arietis is the same brightness as Uranus.
- On January 17, Uranus lies 1.8 billion miles from viewers on Earth, while Mars is only 99 million miles away.
- The passing and brightening moon makes viewing more difficult on the nights after January 18. The planets will be slightly more than 1 binocular field to the upper right of the first quarter moon on Jan. 20.

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.

If you are a NEW member joining after the first of the year, refer to the prorated 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!