



ASTROFILES

Auburn Astronomical Society Newsletter

March 2023

Newsletter Editor — John Wingard — jwin1048@gmail.com

Moon Phases

March 14 — Last Quarter

March 21 — New Moon

March 28 — First Quarter

April 6 — Full Moon

April 13 — Last Quarter

April 20 — New Moon

April 27 — First Quarter

May 5 — Full Moon

News and events

With Spring now upon us, we can look forward to more comfortable temperatures in the evenings although it gets darker later now due to Daylight Savings Time. For all of us interested in astronomy, springtime also kicks off what we call “galaxy season,” where a lot of these objects come into favorable viewing positions. There are many, many galaxies to view but a few are annual favorites that never disappoint. Below is a short list of a few of the more popular ones. For those with computerized scopes, it should be easy to select them from the list in the controller and let the scope slew to them. You can also consult numerous sky charts to find the location coordinates of these objects.

- **The Leo Triplet (M65, M66, NGC3628) in the constellation of Leo**
- **Bode’s Galaxy (M81) & Cigar Galaxy (M82) in the constellation of Ursa Major**
- **The Pinwheel Galaxy (M101) in the constellation of Ursa Major**
- **The Whirlpool Galaxy (M51) in the constellation of Canes Venatici**
- **The Needle Galaxy (NGC 4565) in the constellation of Coma Berenices**
- **M106 in the constellation of Canes Venatici**
- **Markarian’s Chain of Galaxies in the constellation of Virgo**

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<http://www.auburnastro.org>



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



AAS members Chris Young and Jay Hall collaborated on this nice shot of the Bode's and Cigar galaxies processed in HaLRGB format.



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 to find local clubs, events, and more!

Solar Eclipses Are Coming!

David Prosper

Have you ever witnessed a total solar eclipse? What about an annular solar eclipse? If not, then you are in luck if you live in North America: the next twelve months will see two solar eclipses darken the skies for observers in the continental United States, Mexico, and Canada!

Solar eclipse fans get a chance to witness an **annular eclipse** this fall. On **Saturday, October 14, 2023**, the Moon will move exactly in front of the Sun from the point of view of observers along a narrow strip of land stretching across the United States from Oregon to Texas and continuing on to Central and South America. Since the Moon will be at its furthest point in its orbit from Earth at that time (known as *apogee*), it won't completely block the Sun; instead, a dramatic "ring" effect will be seen as the bright edge of the Sun will be visible around the black silhouette of the Moon. The distinct appearance of this style of eclipse is why it's called an annular eclipse, as *annular* means *ring-like*. If you are standing under a tree or behind a screen you will see thousands of ring-like shadows projected everywhere during maximum eclipse, and the light may take on a wan note, but it won't actually get dark outside; it will be similar to the brightness of a cloudy day. This eclipse must only be observed with properly certified eclipse glasses, or other safe observation methods like pinhole projection or shielded solar telescopes. Even during the peak of the eclipse, the tiny bit of the Sun seen via the "ring" can damage your retinas and even blind you.

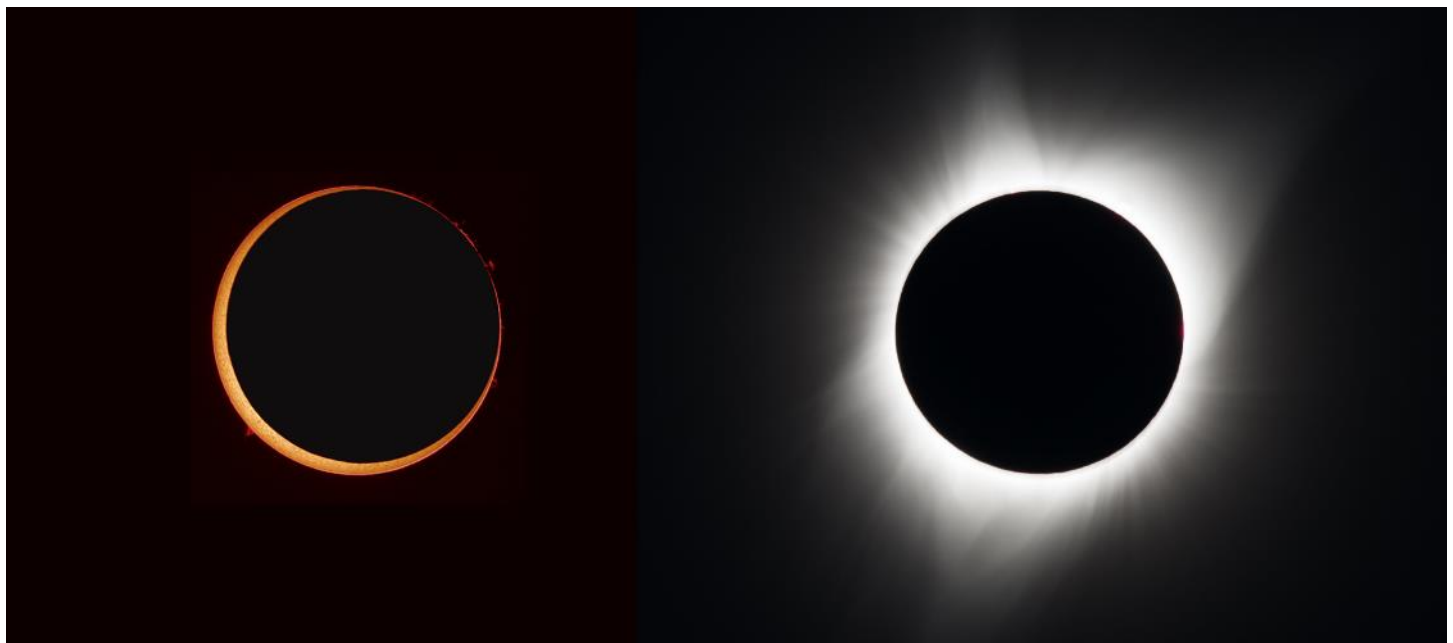
Just six months later, a dramatic **total solar eclipse** will darken the skies from Mexico to northeast Canada, casting its shadow across the USA in a strip approximately 124 miles (200 km) wide, on **Monday, April 8, 2024**. While protection must be worn to safely observe most of this eclipse, it's not needed to witness totality itself, the brief amount of time when the Moon blocks the entire surface of the Sun from view. And if you try to view totality through your eclipse viewer, you won't actually be able to see anything! The Moon's shadow will dramatically darken the skies into something resembling early evening, confusing animals and delighting human observers. You will even be able to see bright stars and planets - provided you are able to take your eyes off the majesty of the total eclipse! While the darkness and accompanying chilly breeze will be a thrill, the most spectacular observation of all will be the Sun's magnificent *corona*! Totality is the only time you can observe the corona, which is actually the beautiful outer fringes of the Sun's atmosphere. For observers in the middle of the path, they will get to experience the deepest portion of the eclipse, which will last over four minutes - twice as long as 2017's total solar eclipse over North America.

While some folks may be lucky enough to witness both eclipses in full – especially the residents of San Antonio, Texas, whose city lies at the crossroads of both paths – everyone off the paths of maximum eclipse can still catch sight of beautiful partial eclipses if the skies are clear. The Eclipse Ambassadors program is recruiting volunteers across the USA to prepare communities off the central paths in advance of this amazing cosmic ballet. Find more information and apply to

share the excitement at eclipseambassadors.org. NASA has published a fantastic Solar Eclipse Safety Guide which can help you plan your viewing at bit.ly/nasaclipsesafety. And you can find a large collection of solar eclipse resources, activities, visualizations, photos, and more from NASA at solarsystem.nasa.gov/eclipses



This detailed solar eclipse map shows the paths of where and when the Moon's shadow will cross the USA for the upcoming 2023 annular solar eclipse and 2024 total solar eclipse, made using data compiled from multiple NASA missions. Where will you be? This map is very detailed, so if you would like to download a larger copy of the image, you can do so and find out more about its features at: <https://svs.gsfc.nasa.gov/5073> Credits: NASA/Scientific Visualization Studio/ Michala Garrison; eclipse calculations by Ernie Wright, NASA Goddard Space Flight Center.

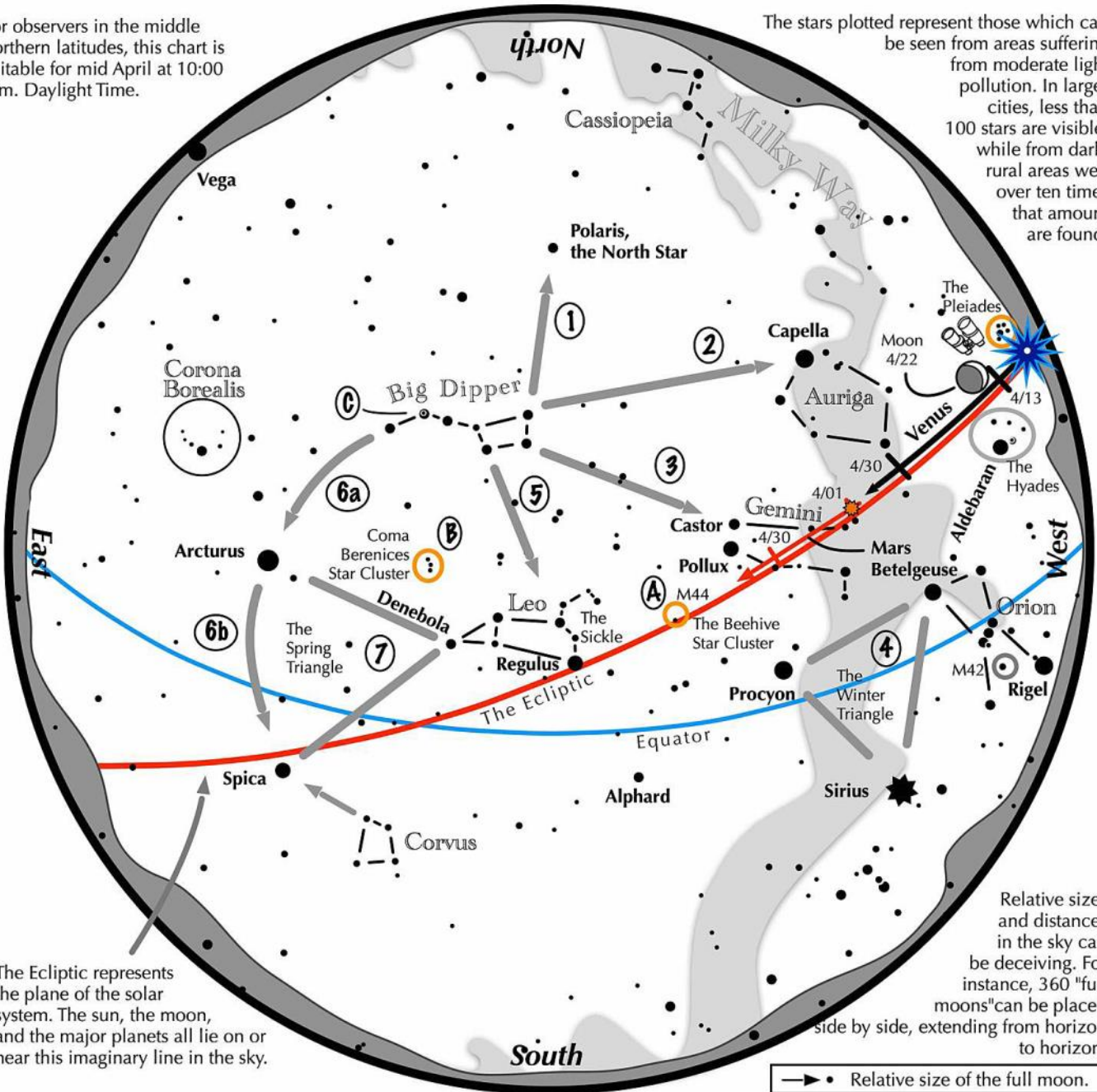


Photos of an annular total solar eclipse (left) and a total solar eclipse (right). Note that the annular eclipse is shown with a dark background, as it is only safe to view with protection – you can see how a small portion of the Sun is still visible as the ring around the Moon. On the right, you can see the Sun's wispy corona, visible only during totality itself, when the

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.

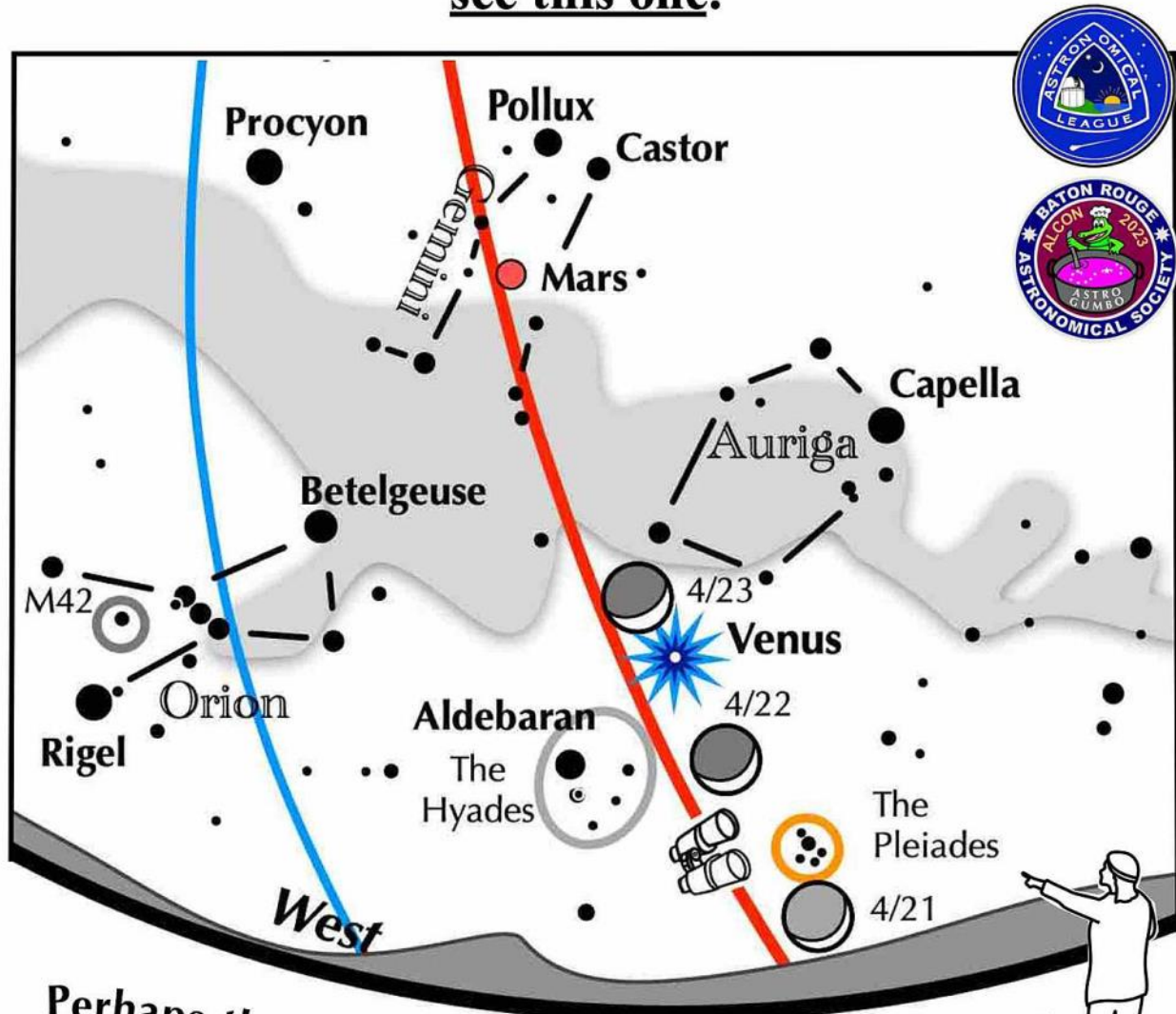
- 1 Extend an imaginary line north from the two stars at the tip of the Big Dipper's bowl. It passes Polaris, the North Star.
- 2 Draw another imaginary line west across the top two stars of the Dipper's bowl. It strikes Capella low in the northwest.
- 3 Through the two diagonal stars of the Dipper's 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.

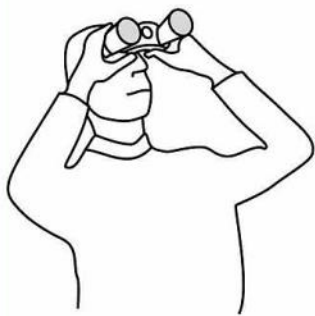


Duplication allowed and encouraged for all free distribution.

If you can see only one celestial event this April,
see this one.



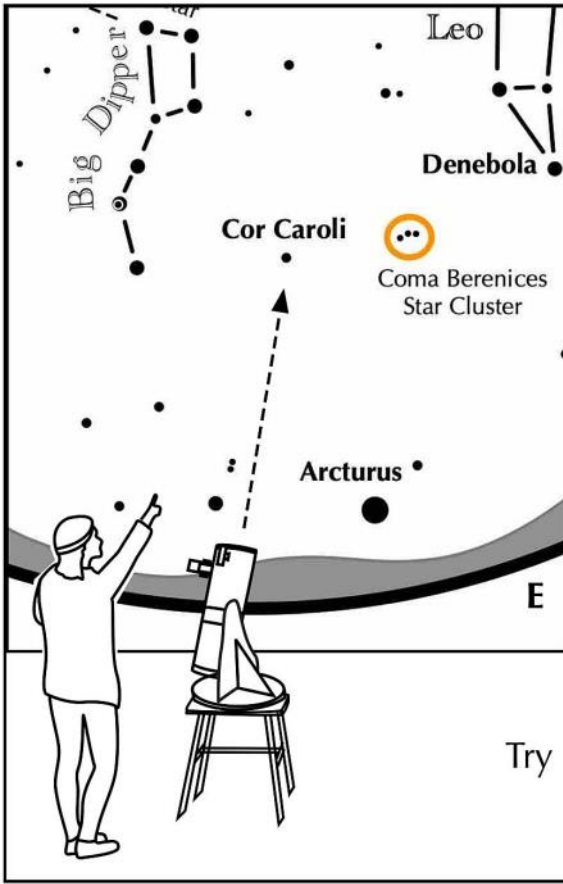
Perhaps the most enchanting evenings of 2023!



Enhance the scene –
use binoculars!

On April 21, 22, and 23, look low in the west-northwest 60 minutes after sunset.

- The crescent moon, glowing full with earthshine, floats just above the horizon in the bright twilight on April 21. Above it, lies the pretty Pleiades star cluster.
- On April 22, the slightly thicker, but more pronounced crescent moon moves between brilliant Venus and the Pleiades, and right of the Hyades star cluster.
- On the third night, the crescent moon stands commandingly above the scene.



Other Suns: Cor Caroli



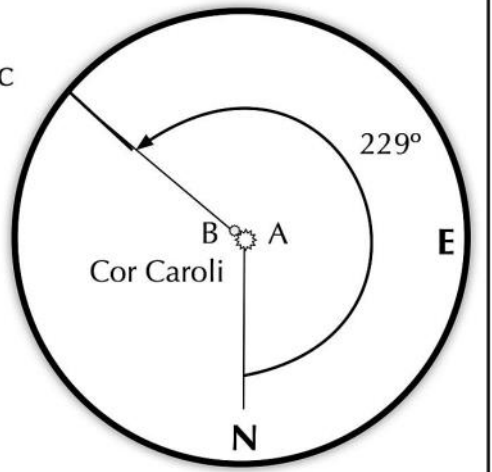
How to find Cor Caroli on an April evening

Look northeast toward the Big Dipper. A star, slightly dimmer than the handle stars, is placed near the center of the handle's curvature. That is Cor Caroli.

Suggested magnification: >20x
Suggested aperture: >2 inches

Cor Caroli

- A-B separation: 19 sec
- A magnitude: 2.9
- B magnitude: 5.5
- Position Angle: 229°
- A color: white
- B color: pale blue



Try using steadily held and sharply focused 10x50 binoculars.

In addition to the monthly star chart from the Astronomical League in each issue of "Astrofiles," there is another handy chart available as a free PDF download from <https://www.skymaps.com/downloads.html>. It contains a star chart for the particular month along with many observing tips and specific events for that month. I typically print it out on card stock as a double-sided single sheet but two separate sheets will also work. Before you click the download button make sure that you have the correct month and the version for the northern hemisphere selected.

The Evening Sky Map

FREE! EACH MONTH FOR YOU TO EXPLORE, LEARN & ENJOY THE NIGHT SKY

Get Sky Calendar on Twitter: <http://twitter.com/skymaps>

Sky Calendar - March 2023

- Venus 0.5° NW of Jupiter at 6h UT (31° from Sun, evening sky). Mag. -4.0 and -2.1.
- Moon at apogee (farthest from Earth) at 18h UT (distance 405,880km; angular size 29.4').
- Moon near Beehive cluster M44 at 8h UT (evening sky).
- Moon near Regulus at 5h UT (evening sky).
- Full Moon at 12:42 UT.
- Moon near Spica at 14h UT (morning sky).
- Moon near Antares at 2h UT (morning sky).
- Last Quarter Moon at 2:09 UT.
- Mercury at superior conjunction with the Sun at 13h UT. The inner planet passes into the evening sky.
- Moon at perigee (closest to Earth) at 16:30 UT (distance 362,696km; angular size 32.8').
- Moon near Saturn at 18h UT (morning sky). Mag. 0.9.
- Dwarf planet 1 Ceres at opposition at 23h UT. Mag. 0.5.
- Vernal equinox at 21:23 UT. The time when the Sun reaches the point along the ecliptic where it crosses into the northern celestial hemisphere marking the start of spring in the Northern Hemisphere and autumn in the Southern Hemisphere.
- New Moon at 17:26 UT. Start of lunation 1240.
- Moon near Jupiter at 23h UT (evening sky). Mag. -2.1. Occultation visible from northern South America.
- Moon near Venus at 11h UT (34° from Sun, evening sky). Mag. -4.0. Look out for this spectacular sight! Occultation visible from parts of Asia and Africa.
- Moon near the Pleiades at 2h UT (evening sky).
- Moon near Mars at 14h UT (evening sky). Mag. 0.8.
- First Quarter Moon at 2:32 UT.
- Moon at apogee (farthest from Earth) at 11h UT (distance 405,215km; angular size 29.2').
- Moon near Beehive cluster M44 at 15h UT (evening sky).

More sky events and links at <http://skymaps.com/skycalendar/>
All times in Universal Time (UT). (USA Eastern Summer Time = UT - 4 hours.)

SKYMAPS ON RECOMMENDED PRODUCTS • <http://skymaps.com/store>

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Help support the production and free distribution of the Evening Sky Map

NORTHERN HEMISPHERE MARCH 2023

SKY MAP SHOWS HOW THE NIGHT SKY LOOKS

DAWKINS 9 PM
LEWIS 8 PM

SYMBOLS
 Galaxy of Double Star Variable Star Diffuse Nebula Planetary Nebula Open Star Cluster Globular Star Cluster

Star Magnitudes ●●●●●
 ● 1st mag. ●● 2nd mag. ●●● 3rd mag. ●●●● 4th mag. ●●●●● 5th mag. ●●●●●● 6th mag. ●●●●●●● 7th mag. ●●●●●●●● 8th mag. ●●●●●●●●● 9th mag. ●●●●●●●●●● 10th mag.

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Procyon binary, Dist=42 ly, 1st, Dist=4.4 ly, 2nd (Southern Hemisphere), Dist=11.4 ly, 1.36 days, Mag 8 companion, In telescope, Dist=52 ly, 10, Dist=44 ly, Companion, Dist=27 ly, 8.7 companions, Dist=700 ly, ~300 times that of Sun, Dist=432 ly, 1.1 & 3.4 over 2.867 days, Visible in binoculars, Dist=399 ly, 10 stars, Dist=152 ly, 1000 star cluster, Dist=46.7 ly, Mag 8 companion star, Dist=432 ly.

Mid eye, Dist=2.5 million ly, 1st, Dist=100 ly, Dist=400 ly, Dist=5000 ly.

Mid eye, 1st mag, Dist=3,300 ly, Age=400 million years, Dist=800 ly, Dist=1,590 ly, 0.2, Dist=30 ly, Sep=68.3', 40 ly, Dist=1,000 ly, In telescope, Dist=1,300 light years, Proxima, Dist=7,300 ly, 40 ly, 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th.

Magnitude - The brightness of a celestial object as it appears in the sky.
Open Star Cluster - A group of tens or hundreds of relatively young stars.
Opposition - When a celestial body is opposite the Sun in the sky.
Planetary Nebula - The remnants of a shell of gas blown off by a star.
Universal Time (UT) - A time system used by astronomers. Also known as Greenwich Mean Time. USA Eastern Standard Time (for example, New York) is 5 hours behind UT.



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 . You can also follow us on our Facebook page. Just search for "Auburn Astronomical Society."