ASTROFILES

Auburn Astronomical Society Newsletter

May 2022 *Newsletter Editor — John Wingard — jwin1048@gmail.com*

Moon Phases

May 22 — Last Quarter

May 30 — New Moon

June 7 — First Quarter

June 14 — Full Moon

June 20 — Last Quarter

June 28 — New Moon

July 6 — First Quarter

July 13 — Full Moon

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

News and events

All of us in the Auburn Astronomical Society are saddened to hear the news that the W. A. Gayle Planetarium in Montgomery is closing, at least for the immediate future. Previously operated by Troy University, it's operation and management will now be the responsibility of the City of Montgomery. Current director Rick Evans posted the following message on the organization's Facebook page this week:

The Planetarium will CLOSE EFFECTIVE JUNE 1ST 2022 until further notice!

Troy University has operated this Planetarium for the City of Montgomery for the past 50 years. In August of last year, Troy and City leadership met to discuss Troy's future involvement. It was jointly decided at that meeting, the University will return the operation and management of the Planetarium back to the City of Montgomery effective May 31st 2022.

The Planetarium will CLOSE EFFECTIVE JUNE 1ST 2022 until further notice to facilitate resolving staffing and operational procedures to comply with City policies,

For further information regarding the future of the Planetarium, please contact the Mayor's office at 334-625-2002.

Trish will be starting in her new role on the Troy University Montgomery campus on June 1st.

I will post updates to this page as they are forthcoming.

Rick Evans,

Director

The AAS has participated in the annual International Astronomy Day event at the planetarium for many years and has thoroughly enjoyed sharing the wonders of the night sky with the children and adults that attended these events. Rick and the planetarium staff have always been very professional and accommodating to our club. It is our hope that the closure is only temporary and that some arrangement can be reached to keep this wonderful facility open to the public.

Heads up! Potential Meteor Shower on May 31, 2022!

We could possibly be treated to a good, relatively new meteor shower in the early morning hours of Tuesday, May 31, 2022. This is due to the fact that the short-period comet *73P/Schwassman-Wachmann* with a period of 5.4 years has shown signs in recent passes to be slowly breaking up, thus possibly releasing many small fragments that could become meteors as the Earth passes through the comet's debris stream. That is scheduled to happen on May 31st. If it does happen, it will be called the Tau Herculids shower because they will appear to radiate from the constellation of Hercules near the globular cluster M3. This will be about a third of the way between the bright star Arcturus and the very end of the handle of the Big Dipper asterism. The best time to view the event will be approximately 1:00 AM EDT and should be well-placed for viewing for most observers in the northern hemisphere. Of course, as we all know, comets and meteor showers are fickle. Sometimes they are great and other times they are disappointing flops. We will just have to wait and see how this one turns out!

Total Lunar Eclipse of May 15-16, 2022

Observers in the Eastern half of the U.S. as well as all of South America were treated to a total lunar eclipse of the moon that began late in the evening of May 15th and carried over into the early morning hours of May 16th. Although the weather conditions in our local region were not great, a couple of AAS members did manage to get a couple of photos of the event. Unlike a solar eclipse that lasts only minutes, this particular lunar eclipse lasted almost 4.5 hours from start to finish, giving viewers plenty of time to catch the event.

At left— The eclipse captured by AAS member Mike Lewis from Alexander City, AL.

At left—The eclipse captured by AAS member Chris Young from his location in Fredinia, AL.

While we don't normally look at bright stars through a telescope, here is an occasion when you should ...

A Springtime Observing Challenge

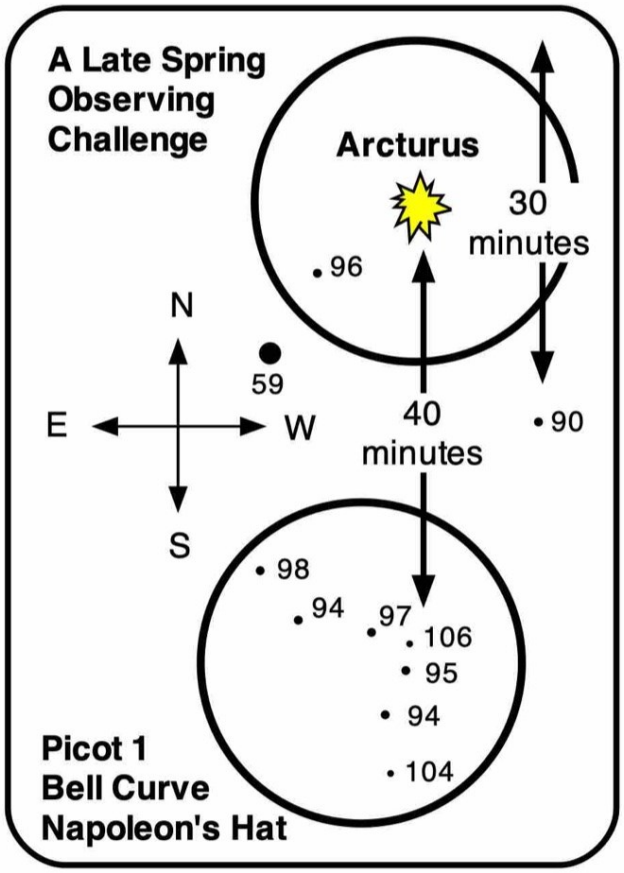
Hats off to Picot 1!

About 40 minutes south of the dazzling Arcturus lies a little known asterism, first recognized by the French astronomer Fulbert Picot. Its seven 9th and 10th magnitude stars resemble a French Field Marshall's hat, "Napoleon's Hat," to some observers, while a familiar "bell curve" to others.

To find Picot 1, zero in on Arcturus with a low power eyepiece, one that gives a large field of view. Then, scan south less than two fields of view. Bingo, you have it! The unmistakable bell curve should fit nicely in the field.

This asterism is best seen through a telescope. Binocular observers may have difficulty since the stars hover around 10th magnitude, the upper range of 10 x 50 glasses. The glare from Arcturus doesn't help, either.

In the accompanying diagram, a low power eyepiece—perhaps one of 25 mm focal length—gives a conservative field of view of 30 arc minutes. The number next to each star designates its magnitude with the decimal point omitted.



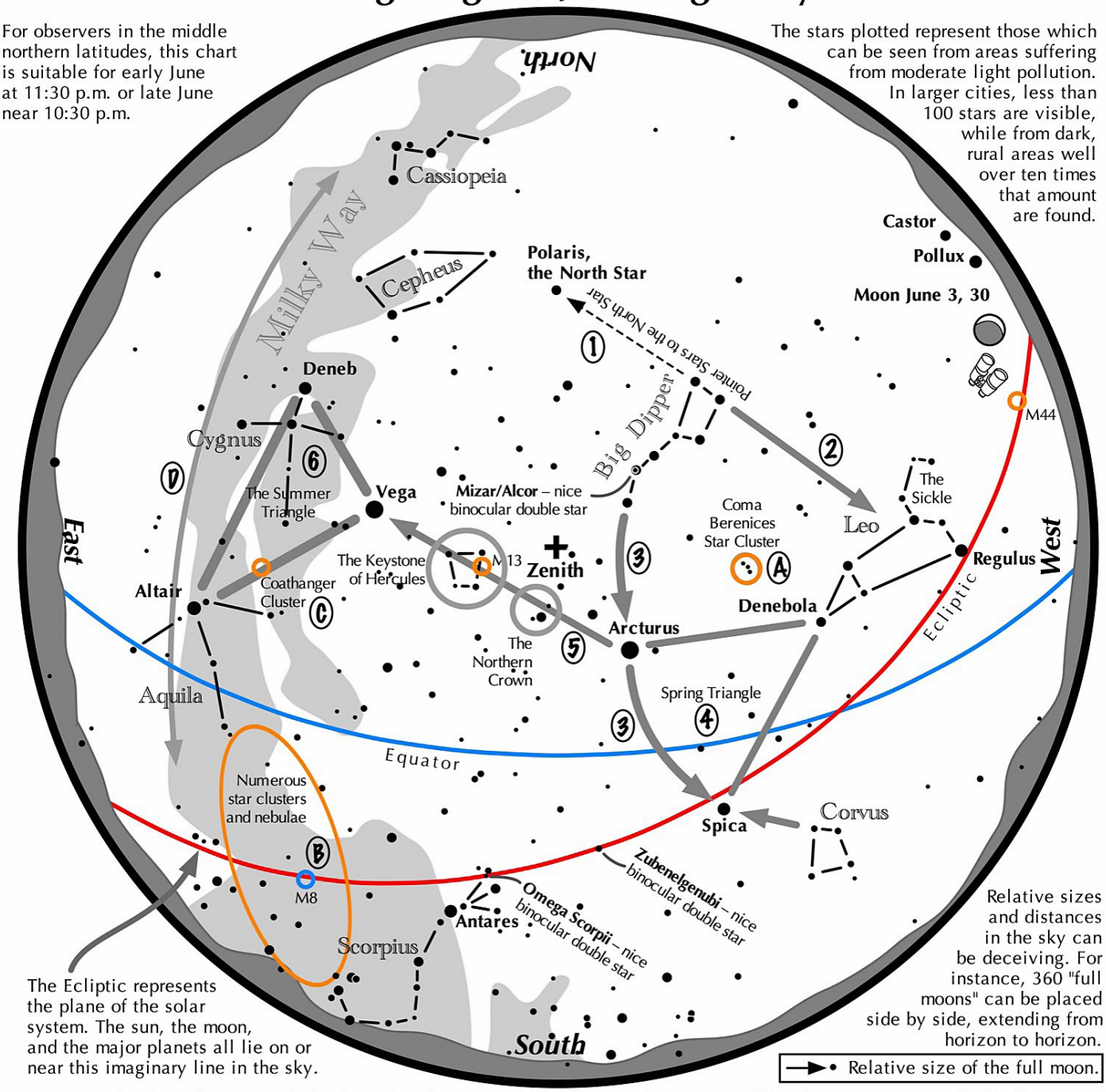
This is not a true cluster of gravitationally related stars, just an interesting line-of-sight grouping. In reality, they are separated by many hundreds of light-years. The nearest lies 48 light-years away, slightly farther than Arcturus' relatively close 37 light-year distance, and the farthest is thought to be nearly 1000 light-years from our little blue world.

If you enjoy this observing challenge, look for more in the Astronomical League's Asterism Observing Program!
https://www.astroleague.org/content/asterism-observing-program

Navigating the June Night Sky

For observers in the middle northern latitudes, this chart is suitable for early June at 11:30 p.m. or late June near 10:30 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 June night sky: Simply start with what you know or with what you can easily find.

1. Extend a line north from the two stars at the tip of the Big Dipper's bowl. It passes by Polaris, the North Star.
2. Draw another line in the opposite direction. It strikes the constellation Leo high in the west.
3. Follow the arc of the Dipper's handle. It first intersects Arcturus, the brightest star in the June evening sky, then Spica.
4. Arcturus, Spica, and Denebola form the Spring Triangle, a large equilateral triangle.
5. To the northeast of Arcturus shines another star of the same brightness, Vega. Draw a line from Arcturus to Vega. It first meets "The Northern Crown," then the "Keystone of Hercules." A dark sky is needed to see these two dim stellar configurations.
6. High in the east are the three bright stars of the Summer Triangle: Vega, Altair, and Deneb.

Binocular Highlights

A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger.
D. Sweep along the Milky Way for an astounding number of faint glows and dark bays.


This article is distributed by NASA's Night Sky Network (NSN). The NSN supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Solstice Shadows

David Prosper

Solstices mark the changing of seasons, occur twice a year, and feature the year's shortest and longest daylight hours - depending on your hemisphere. These extremes in the length of day and night make solstice days more noticeable to many observers than the subtle equality of day and night experienced during equinoxes. Solstices were some of our earliest astronomical observations, celebrated throughout history via many summer and winter celebrations.

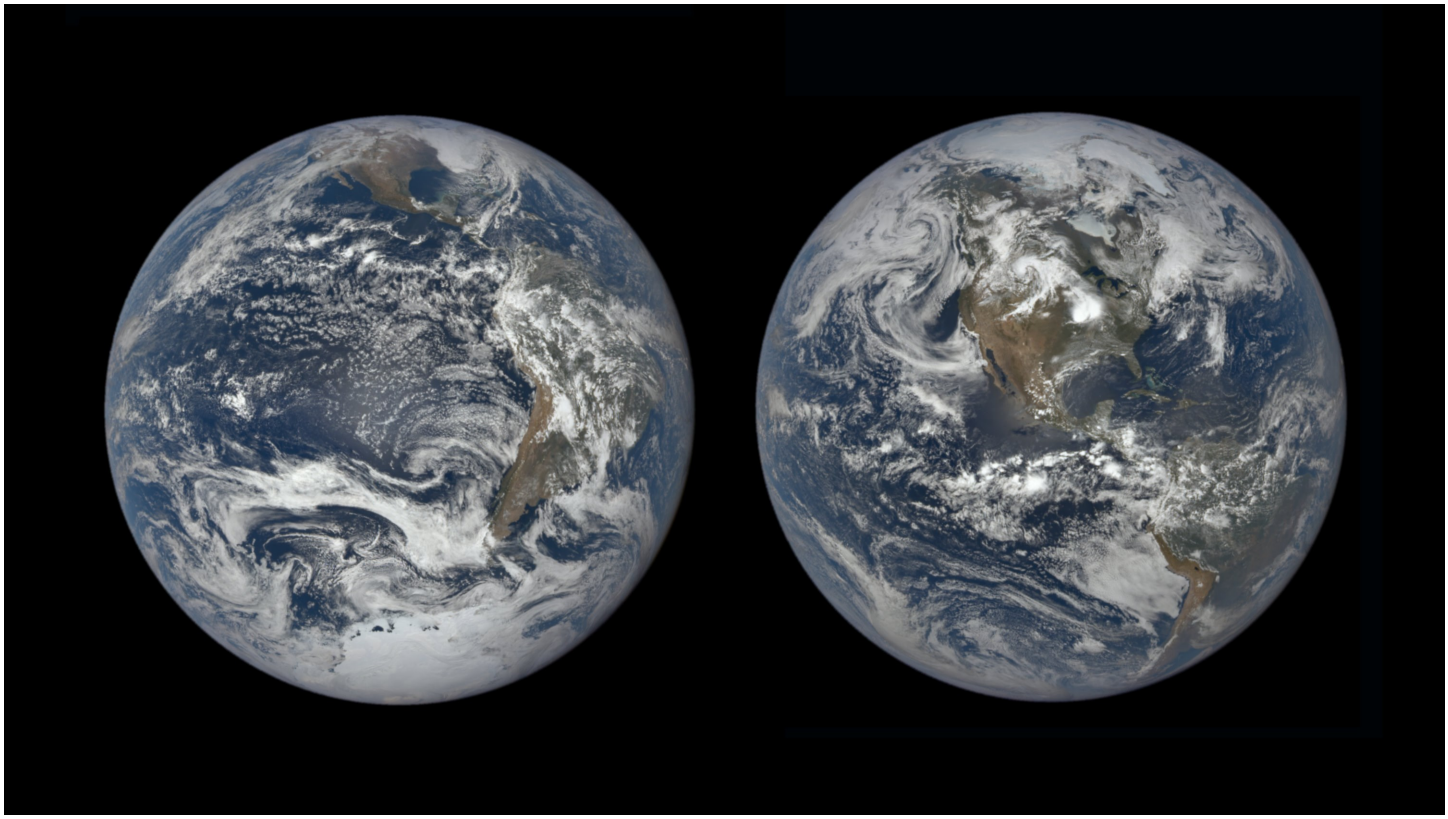
Solstices occur twice yearly, and in 2022 they arrive on June 21 at 5:13 am EDT (9:13 UTC), and December 21 at 4:48pm EST (21:48 UTC). The June solstice marks the moment when the Sun is at its northernmost position in relation to Earth's equator, and the December solstice marks its southernmost position. The summer solstice occurs on the day when the Sun reaches its highest point at solar noon for regions outside of the tropics, and those observers experience the longest amount of daylight for the year. Conversely, during the winter solstice, the Sun is at its lowest point at solar noon for the year and observers outside of the tropics experience the least amount of daylight- and the longest night – of the year. The June solstice marks the beginning of summer for folks in the Northern Hemisphere and winter for Southern Hemisphere folks, and in December the opposite is true, as a result of the tilt of Earth's axis of rotation. For example, this means that the Northern Hemisphere receives more direct light from the Sun than the Southern Hemisphere during the June solstice. Earth's tilt is enough that northern polar regions experience 24-hour sunlight during the June solstice, while southern polar regions experience 24-hour night, deep in Earth's shadow. That same tilt means that the Earth's polar regions also experience a reversal of light and shadow half a year later in December, with 24 hours of night in the north and 24 hours of daylight in the south. Depending on how close you are to the poles, these extreme lighting conditions can last for many months, their duration deepening the closer you are to the poles.

While solstice days are very noticeable to observers in mid to high latitudes, that's not the case for observers in the tropics - areas of Earth found between the Tropic of Cancer and the Tropic of Capricorn. Instead, individuals experience two "zero shadow" days per year. On these days, with the sun directly overhead at solar noon, objects cast a minimal shadow compared to the rest of the year. If you want to see your own shadow at that moment, you have to jump! The exact date for zero shadow days depends on latitude; observers on the Tropic of Cancer (23.5° north of the equator) experience a zero shadow day on the June solstice, and observers on the Tropic of Capricorn (23.5° south of the equator) get their zero shadow day on December's solstice. Observers on the equator experience two zero shadow days, being exactly in between these two lines of latitude; equatorial zero shadow days fall on the March and September equinoxes.

There is some serious science that can be done by carefully observing solstice shadows. In approximately 200 BC, Eratosthenes is said to have observed sunlight shining straight down the shaft of a well during high noon on the solstice, near the modern-day Egyptian city of Aswan. Inspired, he compared measurements of solstice shadows between that location and measurements taken north, in the city of Alexandria. By calculating the difference in the lengths of these shadows, along with the distance between the two cities, Eratosthenes calculated a rough early estimate for the circumference of Earth – and also provided further evidence that the Earth is a sphere!

Are you having difficulty visualizing solstice lighting and geometry? You can build a "Suntrack" model that helps demonstrate the path the Sun takes through the sky during the seasons; find instructions at stanford.io/3FY4mBm. You

can find more fun activities and resources like this model on NASA Wavelength: science.nasa.gov/learners/wavelength. And of course, discover the latest NASA science at nasa.gov.



These images from NASA's DSCOVR mission shows the Sun-facing side of Earth during the December 2018 solstice (left) and June 2019 solstice (right). Notice how much of each hemisphere is visible in each photo; December's solstice heavily favors the Southern Hemisphere and shows all of South America and much of Antarctica and the South Pole, but only some of North America. June's solstice, in contrast, heavily favors the Northern Hemisphere and shows the North Pole and the entirety of North America, but only some of South America.

Credit: NASA/DSCOVR EPIC Source: https://www.nasa.gov/image-feature/goddard/2021/summer-solstice-in-the-northern-hemisphere

A presenter from the San Antonio Astronomy Club in Puerto Rico demonstrating some Earth-Sun geometry to a group during a "Zero Shadow Day" event. As Puerto Rico lies a few degrees south of the Tropic of Cancer, their two zero shadow days arrive just a few weeks before and after the June solstice. Globes are a handy and practical way to help visualize solstices and equinoxes for large outdoor groups, especially outdoors during sunny days!

Credit & Source: Juan Velázquez / San Antonio Astronomy Club

Note to Editors: The images attached to March's "Embracing the Equinox" article can also be used with this article if desired, though slight updates to the captions might be desired to change to focus from equinox to solstice. You can find the archive at: https://nightsky.jpl.nasa.gov/docs/PartnerArticleMarch2022.zip

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
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