Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

June 2022

Membership Meeting
Saturday May 11th 2022 at 7:00p at the Herrett Center - CSI Campus

Centennial Observatory
See Inside for Details

Faulkner Planetarium
See Inside for Details

www.mvastro.org

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Magic Valley Astronomical Society is a member of the Astronomical League

M-51 imaged by
Rick Widmer &
Ken Thomason
Herrett Telescope - Shotwell Camera

June's President's Message

Greetings: Friends and Members

First and foremost, a reminder of our upcoming MVAS meeting on Saturday, June 11th, our former president, Rob Mayer, will address us. Rob has become our resident expert on the Moon and has prepared what should be an excellent presentation. It's entitled: "More than just black and white, the Science of the Colors of the Moon."

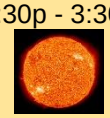
As the month of June is upon us, it signals a time when we can get out to observe and promote our great hobby. Warmer weather and hopefully clearer skies will make that possible. In the years I have been associated with MVAS, one of my favorite summertime activities has been to meet with friends and other good people at many of our public outreach events such as Castle Rocks, Pomerelle, Hagerman Fossil Beds, Craters of the Moon and Three Creek. Unfortunately, some of these places are no longer available for us to use. This brings me to this question. Should we explore other locations or opportunities? Here in Magic Valley? North in the newly designated Dark Sky Reserve? I'd like to open his matter up for a discussion. Please submit any of your thoughts, ideas or suggestions to me or any member of the board.

On some other matters, the James Webb Telescope team has announced it will reveal the next set of images on July 12th. That should be an exciting event. And, there are two potentially exciting observational events happening this month. First, according to S&T Magazine, Comet PanStarrs C-2017 K2 will reappear this month as it moves through Ophiuchus. It's predicted to reach magnitude 8, and it should be visible with binoculars and/or a small telescope during the nighttime hours.

And from approximately June 16th thru the 27th, a rare naked eye planet alignment will be available to observe about 45 minutes before sunrise. It will involve all eight plants along with the moon and the asteroid Vesta. You'll need to start low in the SE and move somewhat higher in the South. Any of you who want to attempt to image this will need to have an ultra-wide-angle lens to cover 107° field of view. Good luck. Best to all of you as you enjoy the nighttime skies,

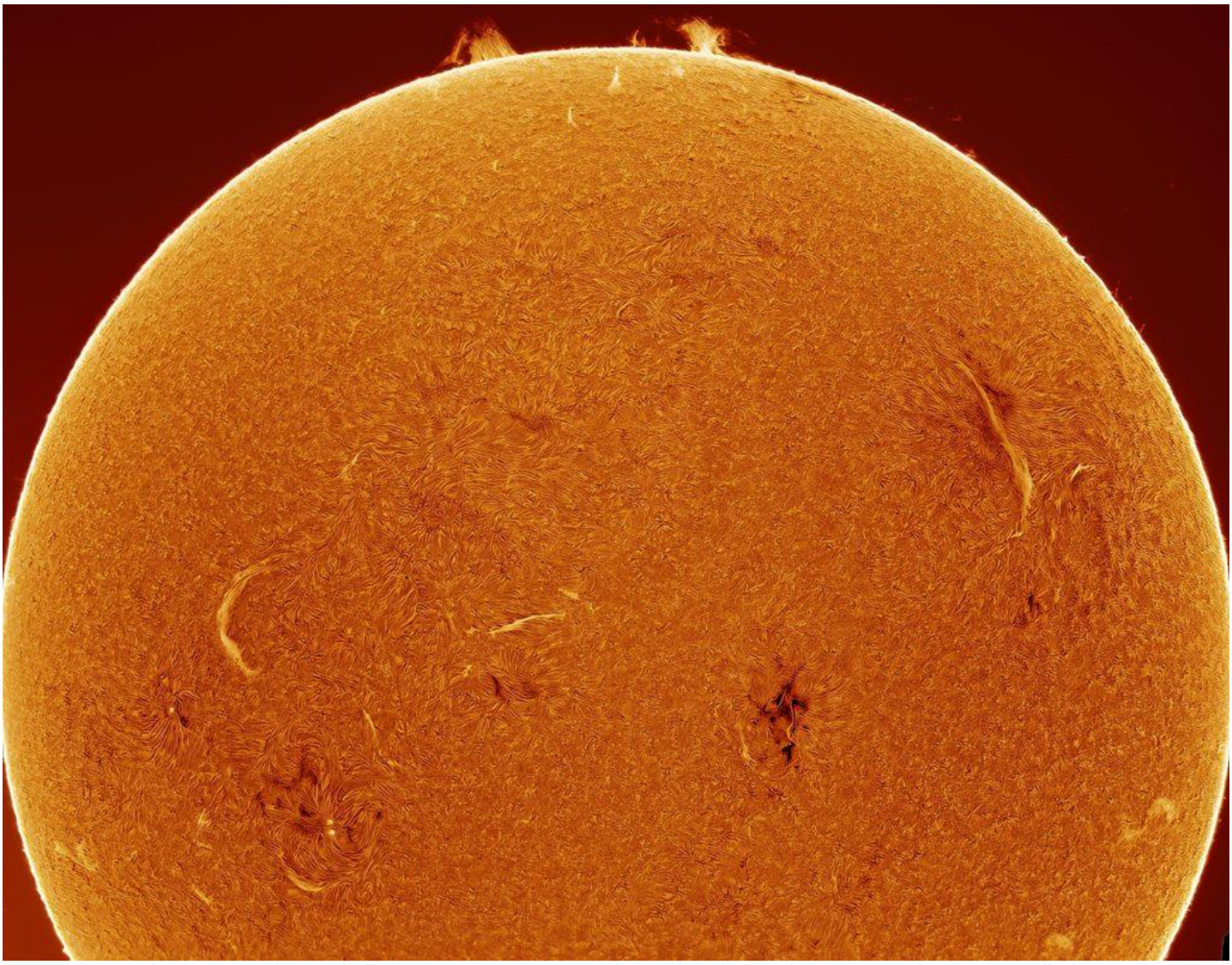
Gary Leavitt, MVAS President

June 2022 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
5	6	7 **First Quarter Moon**  Visible 49% ↑	8 Centennial Observatory Summer Solar Session 1:30p - 3:30p 	9	10	11 MVAS General Meeting 7:00p Herrett Center Centennial Observatory Public Star Party 9:45p - 11:45p
12	13	14 **Full Strawberry Moon**  Visible 100%	15 Centennial Observatory Summer Solar Session 1:30p - 3:30p 	16	17	18
19 **Father's Day** 	20	21 **Last Quarter Moon**  Visible: 50% ↓ **Summer Solstice**	22 Centennial Observatory Summer Solar Session 1:30p - 3:30p 	23	24	25
26	27 **New Moon**  Visible 1% ↑	28	29 Centennial Observatory Summer Solar Session 1:30p - 3:30p 	30		

Be Careful – Be Safe – Get Out There – Explore Your Universe

Night Sky – June 2022

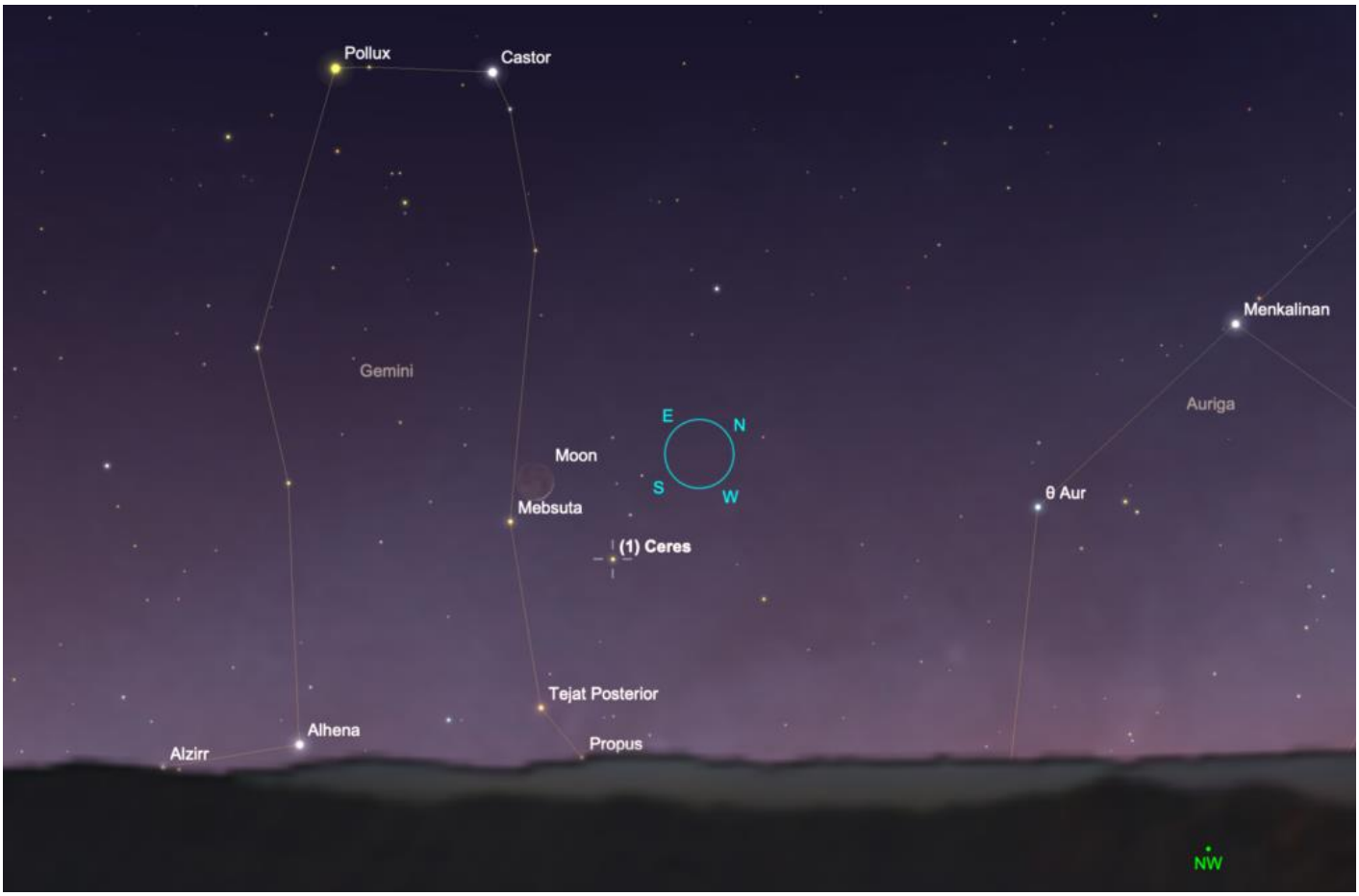


The Sun reaches solstice on June 21, 2022 as it reaches its northernmost point on the ecliptic.

(Looking for last month's night sky guide? You can find it at this link.)

June 2022 brings a procession of planets in the early morning sky. For much of the month, all five bright planets are visible in a long arc before the sun rises, and they're visible from east to west in order of their distance to the Sun – a rare alignment indeed. Jupiter and Saturn grow in size and brightness and reveal plenty of fascinating detail in a small telescope, while Mars also slowly brightens and grows larger. And of course, the best part of the Milky Way returns with its rich collection of hundreds of star clusters, star-forming regions, dark nebulae, and star clouds. Here's what to see in the night sky this month…

1 June 2022. Look for Mars and Jupiter rising together in the southwestern early-morning sky. The pair lies about 10° southeast of the 'Circlet of Pisces' and almost exactly between Venus to the east and Saturn to the west. Jupiter shines at magnitude -2.3, brighter than any star, while dimmer Mars shines at a respectable magnitude +0.7.



A slender crescent Moon in the northwestern sky after sunset along in the stars of Gemini. The dwarf planet Ceres lies to the west of the Moon. The cyan circle spans 2 degrees.

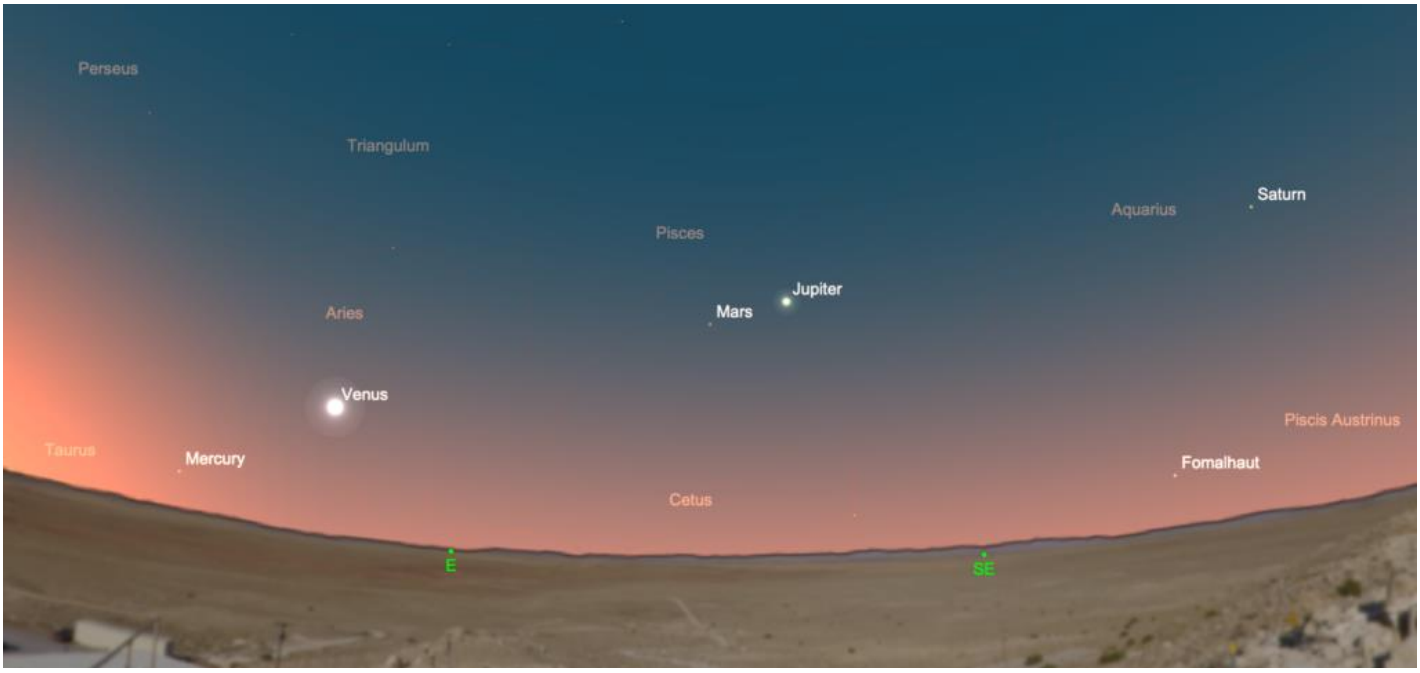
1 June. As darkness falls, look to the northwestern horizon to see the twins of Gemini standing upright as they sink towards the horizon. Also look for a very slender crescent Moon tangled in the legs of the twins. With the help of binoculars or a telescope, look for the dwarf planet Ceres (magnitude 8.7) about 3 degrees west of the Moon.

2 June. In the northwestern sky after sunset lie the two bright stars of Gemini, Castor and Pollux, and a slender crescent Moon.

5 June. Saturn reaches its stationary point and begins retrograde motion, moving westward against the background stars on its way to opposition in August. The planet lies in eastern Capricornus and shines at magnitude +0.7. Its disk spans about 17" and its rings are tilted about 13^{o} to our line of sight.

5-6 June. The crescent Moon passes close to the star Eta Leonis this evening. From the southwestern U.S., Mexico, and Central America, the Moon occults this 4th-magnitude star. Precise timing details at this link.

7 June. First Quarter Moon, 14:48 UT



From about June 10-30, all five bright planets – Mercury, Venus, Mars, Jupiter, and Saturn – lie in a long arc in the sky before sunrise.

10 June. Mercury moves into the morning sky and completes an astonishing arrangement of planets in the early-morning sky. All five bright planets – Mercury, Venus, Mars, Jupiter, and Saturn are now aligned from east to west across more than 90 degrees of sky in order of their distance from the Sun. They remain so for the rest of the month. While they're not visible without optics, Uranus and Neptune also lie within this line of bright planets, but they do not participate in this rare orderly alignment – Uranus lies between Venus and Mars, while Neptune finds itself in the space between Jupiter and Saturn.

14 June. Full Moon ("Strawberry Moon"), 11:52 UT

16 June. Mercury reaches greatest western elongation about 23° west of the Moon in the early morning sky.

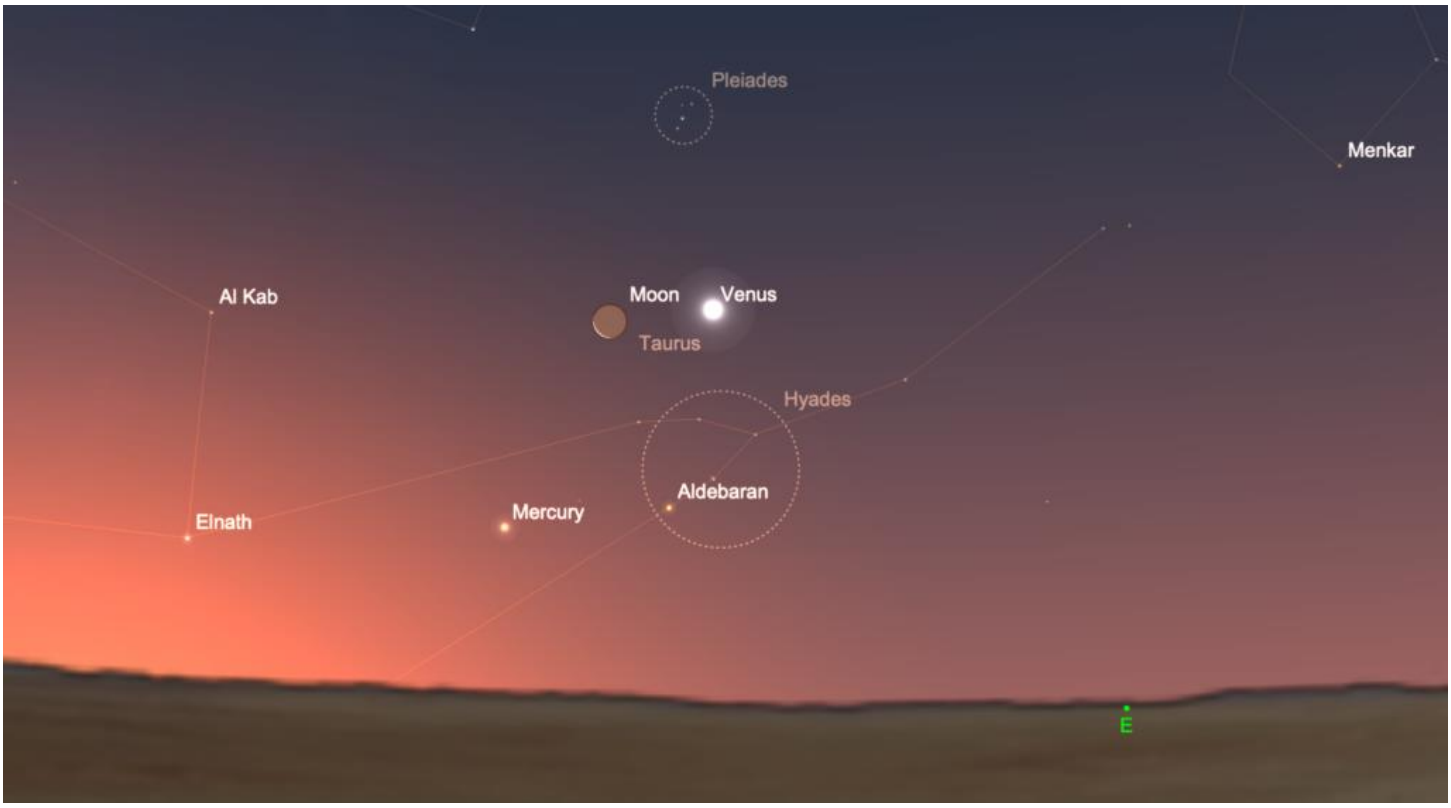
18 June. As morning twilight arrives, find a clear view of the eastern horizon to find brilliant Venus and dimmer Mercury rising with the Pleiades and Hyades star clusters.

21 June. Last Quarter Moon, 03:11 UT

21 June. A quarter Moon lies about 4° from Jupiter in the southeastern morning sky.

21 June. The June solstice arrives at 09:14 UT marking the beginning of summer in the northern hemisphere and winter in the southern hemisphere, and the longest and shortest days of the year.

22 June. Mars lies about a degree north of the waning crescent Moon in the early-morning sky



Mercury and Venus lie near the Pleiades and Hyades star clusters from June 25-27 in the eastern sky before sunrise.

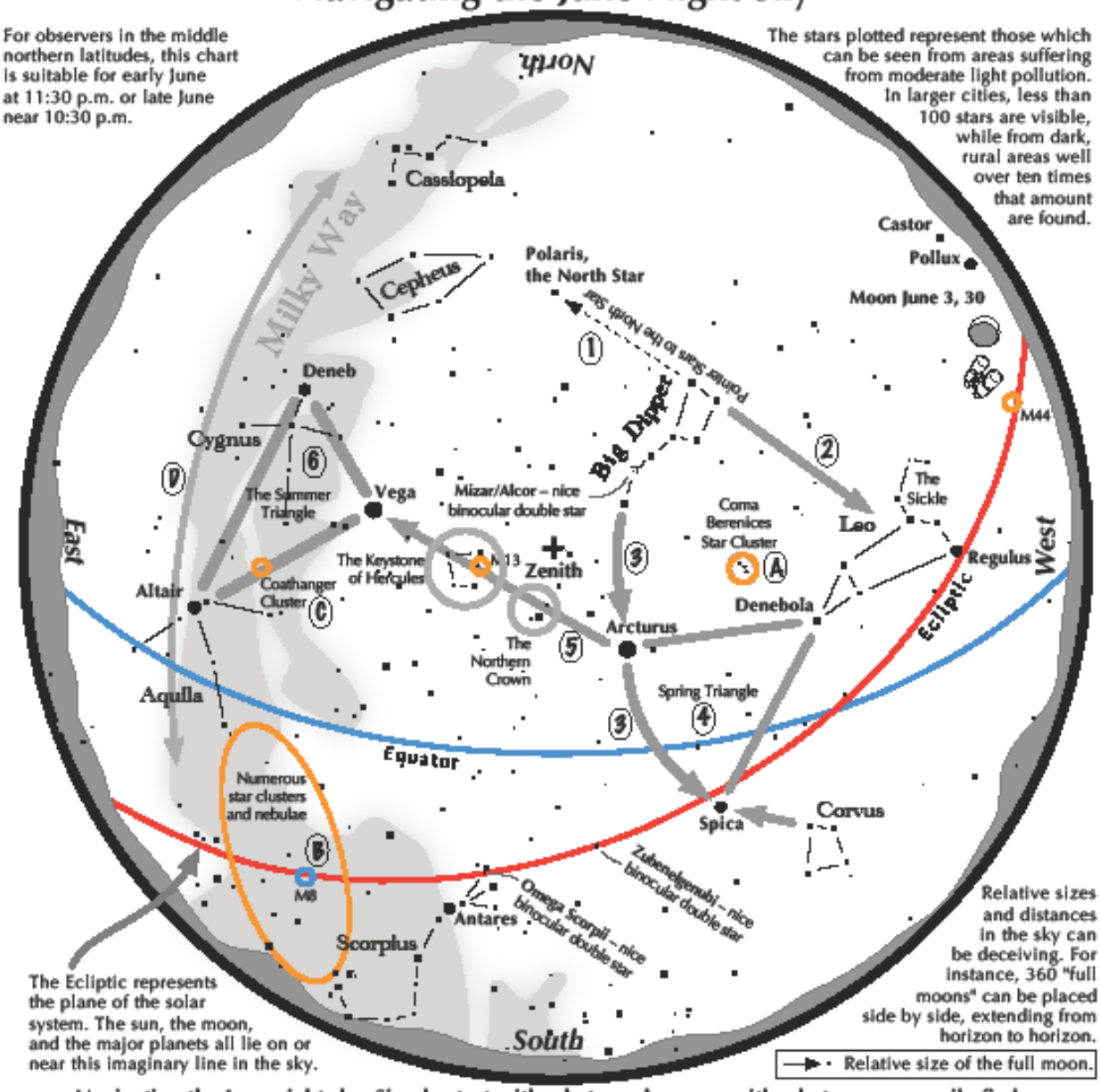
25-27 June. The slender crescent Moon joins Mercury, Venus, and the Pleiades and Hyades star clusters in the eastern sky before sunrise.

29 June. New Moon, 02:52 UT

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

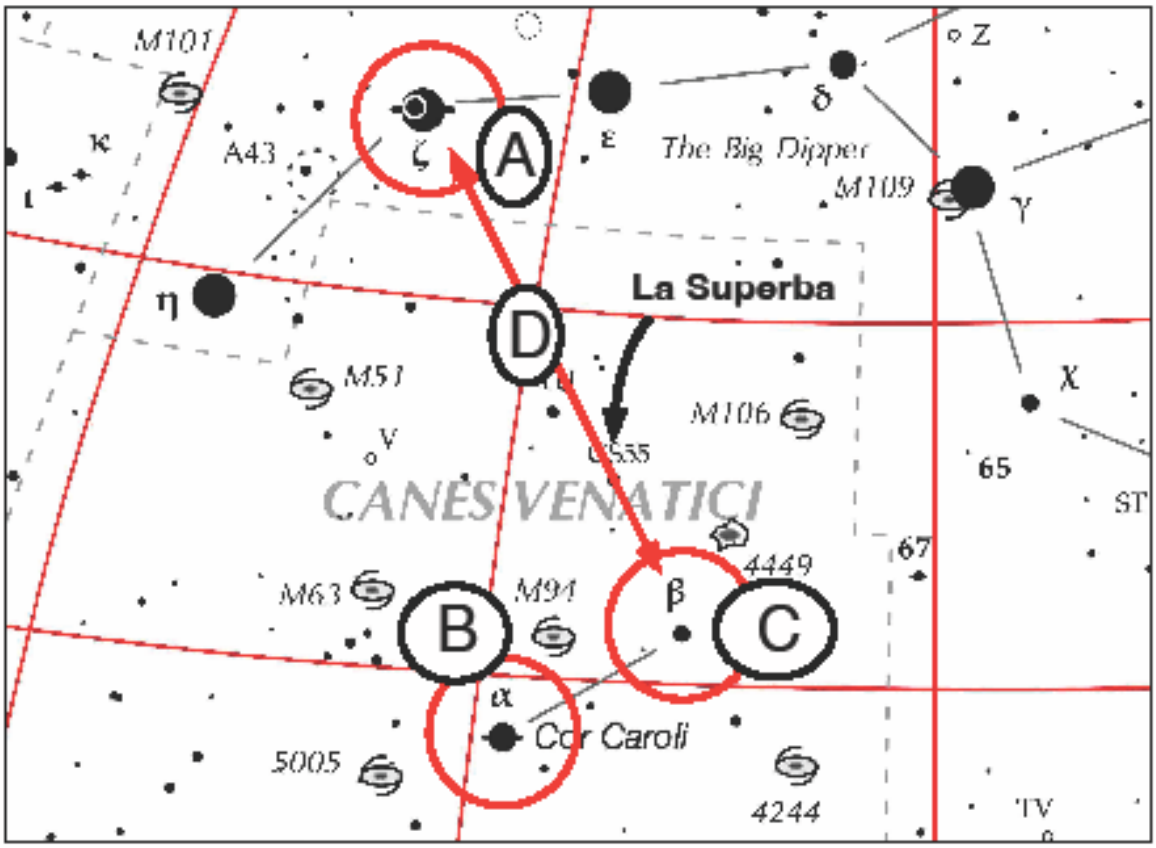
A: Between Denebola and the tip of the Big Dipper's handle, lie the stars of the Coma Berenices Star Cluster.
B: Between the bright stars of Antares and Altair, hides an area containing many star clusters and nebulae.
C: 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars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

A Springtime Attraction:

La Superba!

A beautiful, very red star

also known as Y Canum Venaticorum, AL Carbon Star 55



Practice star hopping and triangulation ...

How to find "La Superba"

A. Find Zeta Ursae Majoris – also called Mizar – the next star to the end of the Big Dipper's handle.
B. Locate Cor Caroli, Alpha Canum Venaticorum, near the center of the handle's curvature.
C. Find 4.2 magnitude Beta to Alpha's northwest.
D. Draw a line between Zeta and Beta.
E. About 3/4 along this line shines La Superba.

Appearance in binoculars or a telescope:
1. betweeen 4.8 and 6.3 magnitude
2. Redder than Betelgeuse.

Physical Characteristics:
Distance: 760 light-years
Radius: 350 suns; 3.3 AU (past the orbit of Mars)
Temperature: 5000 F (sun = 10,000 F
Luminosity: 6200 suns

How bright and how red is La Superba to you?

You can enlarge the previous 2 files by double clicking them.

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!

Solstice Shadows

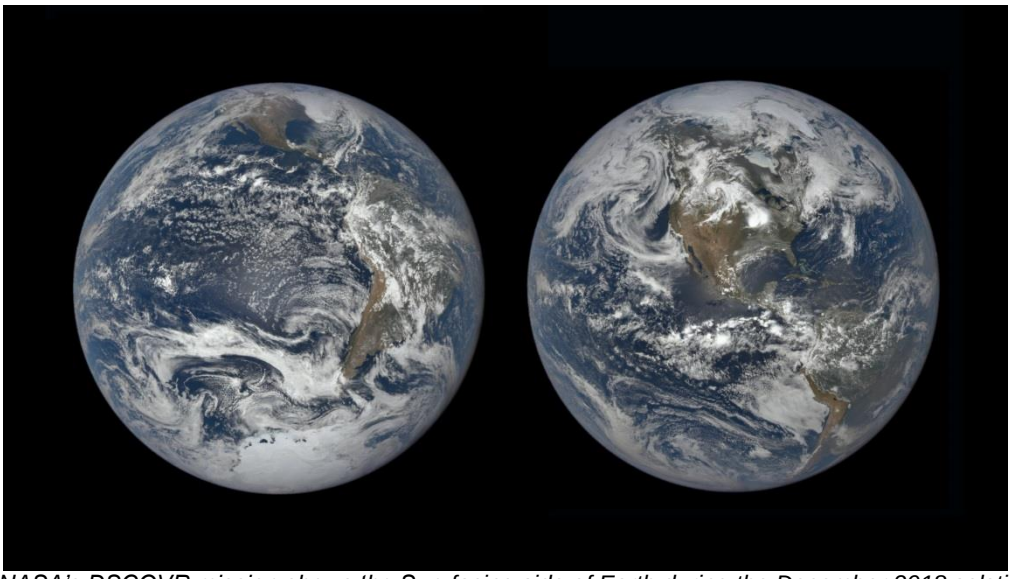
David Prosper

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

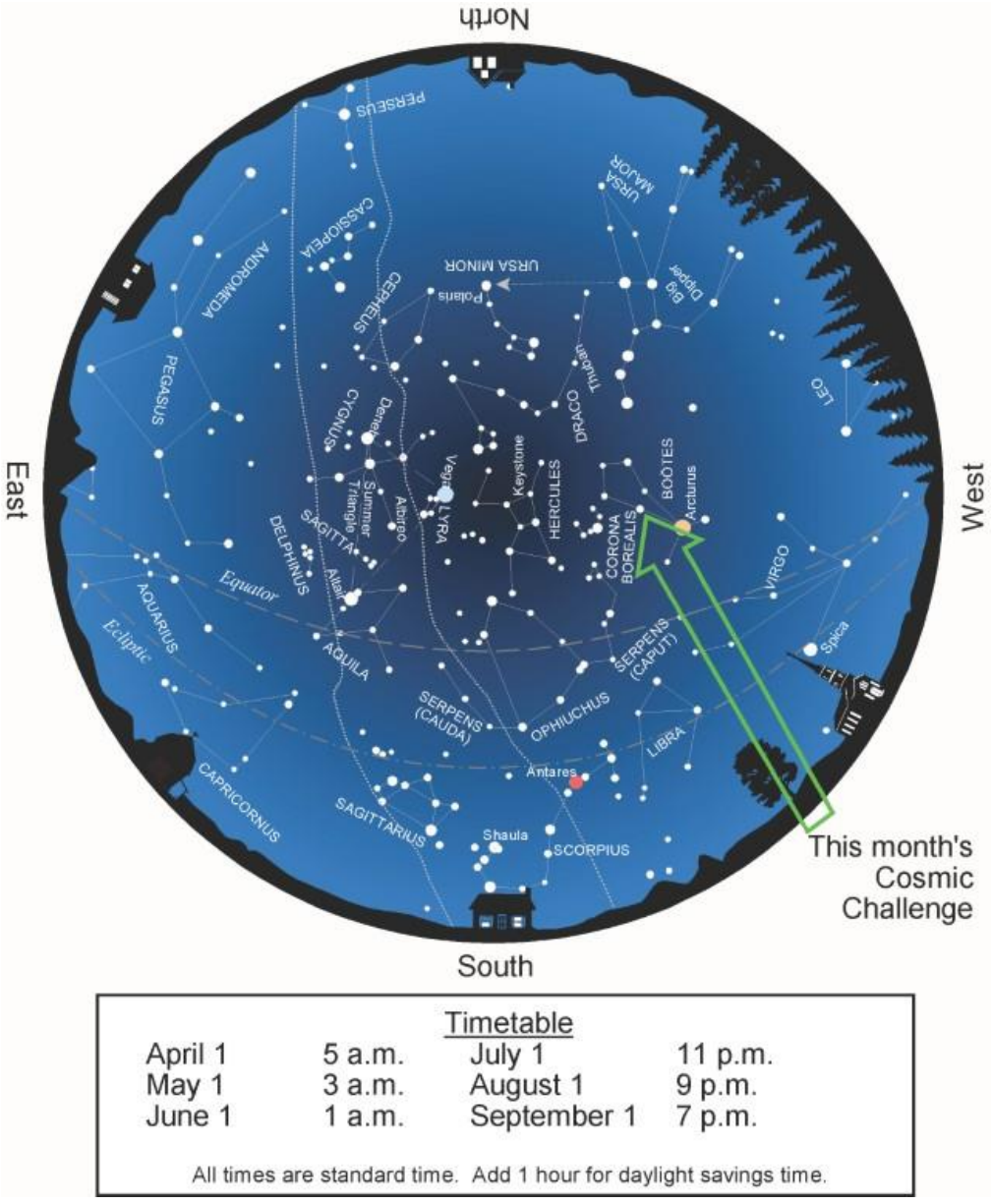
Note to Editors: The images attached to March's "Embracing the Equinox" article can also be used with this article if desired, though slight updates to the captions might be desired to change to focus from equinox to solstice. You can find the archive at: https://nightsky.jpl.nasa.gov/docs/PartnerArticleMarch2022.zip

Izar [Epsilon (ε) Boötis]

	3- to 5-inch (76-127mm) telescopes

Target	Type	RA	DEC	Constellation	Magnitude	Sep.
Izar [Epsilon (ε) Boötis]	Binary star	14h 45.0m	+27° 04.5'	Boötes	2.5, 5.0	2.9"

Finding this month's challenge object is no challenge at all unless you are trying to starhop to it from the inner city. That can be tough, but for everyone else, Izar (Epsilon [ε] Boötis) is visible easily by eye to the northeast of brilliant Arcturus (Alpha [α] Boötis) as one of six stars that make up the constellation's distinctive kite shape. Swing your telescope its way and it still looks like a single star, as it does to the naked eye. So, what's the attraction?



Timetable

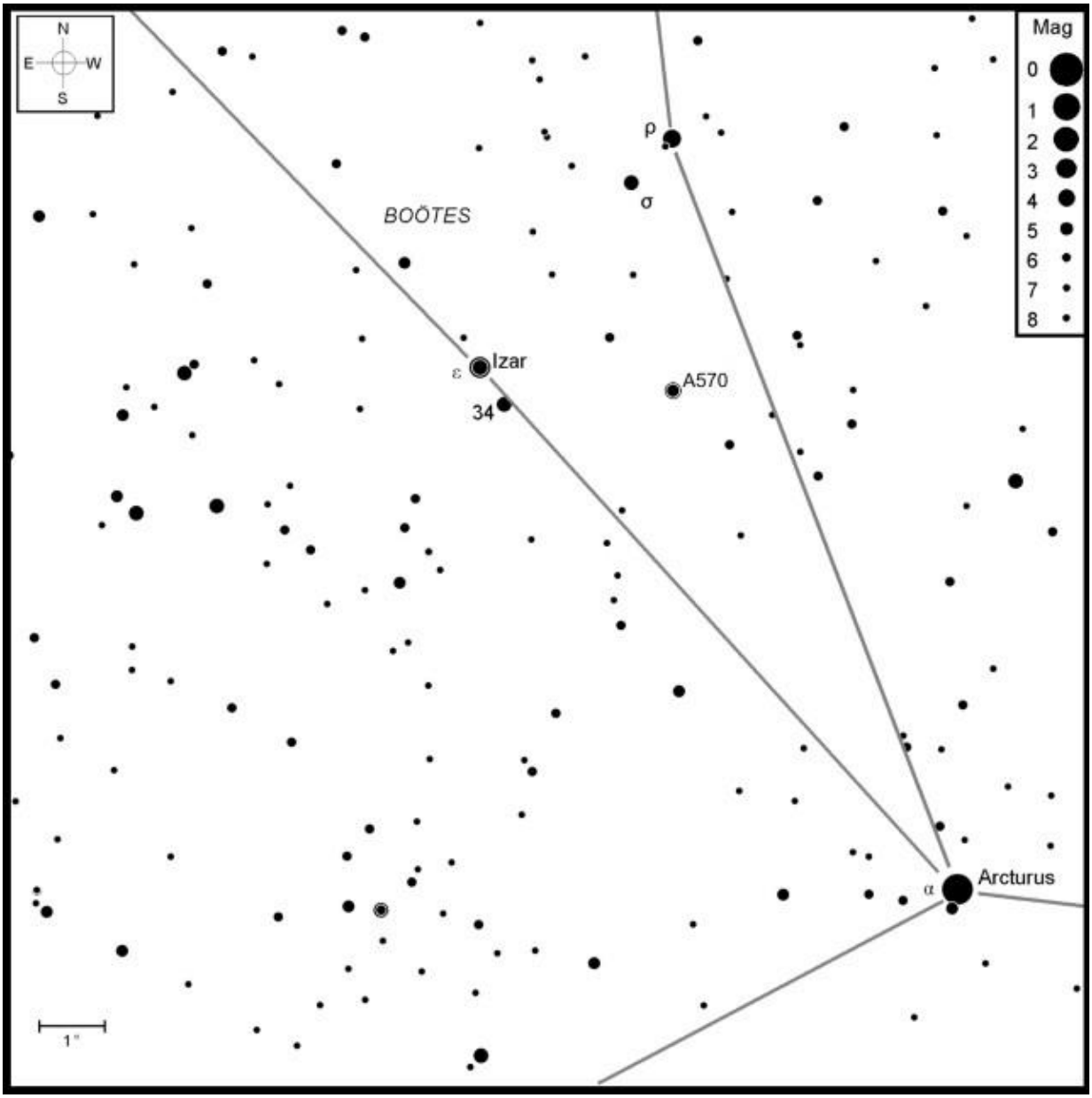
April 1	5 a.m.	July 1	11 p.m.
May 1	3 a.m.	August 1	9 p.m.
June 1	1 a.m.	September 1	7 p.m.

All times are standard time. Add 1 hour for daylight savings time.

June evening star map, adapted from Star Watch by Phil Harrington

Izar is one of the more challenging binary stars in the northern spring sky for small telescopes. Low-power binoculars readily show it to be accompanied by 34 Boötis, a red 5th-magnitude sun 39' to its southwest. They form an attractive pairing, even though they have no relation to each other.

The challenge presented here is to see Izar's actual companion, 5th-magnitude Izar B. Izar B is 2.9" away from the system's primary star, 3rd-magnitude Izar A. Observers usually describe Izar A as looking either yellowish or pale orange, while Izar B ranges from bluish to sea green or emerald.



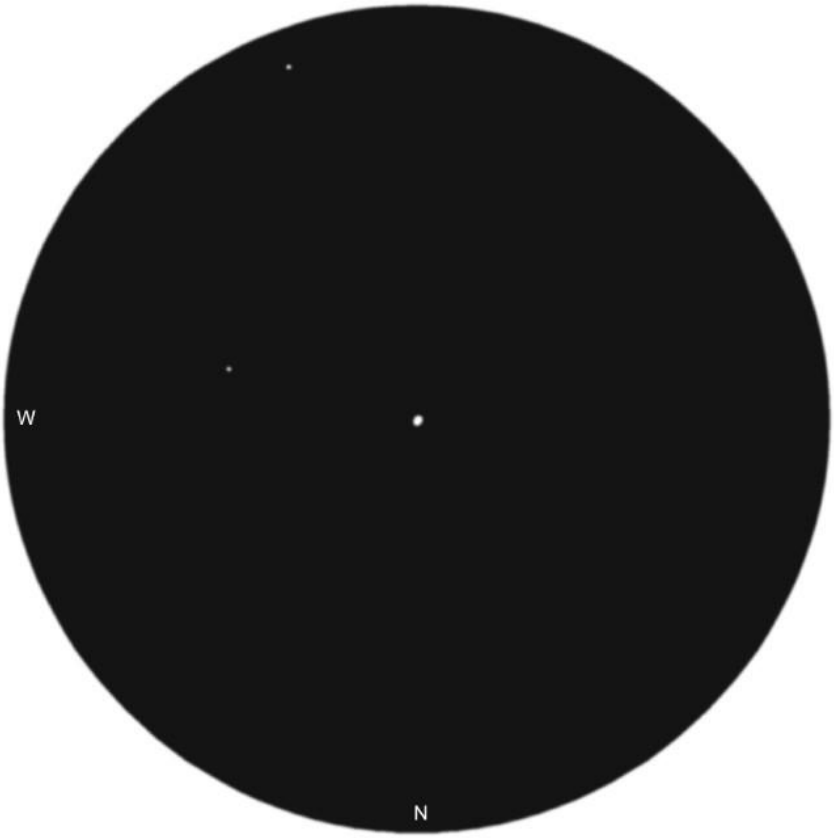
Finder chart for this month's Cosmic Challenge. adapted from Cosmic Challenge by Phil Harrington
Click on the chart to open a printable PDF version in a new window

Two stars separated by 2.9" sounds as though they are wide enough to drive a truck through until you consider the circumstances. The problem is due to the optical properties of light. Because light travels in waves, stars never appear as perfect points through telescopes. Instead, a star will focus to a small central disk -- the Airy disk -- encircled by one or more dim rings called diffraction rings. The distance to the first, most prominent diffraction ring is about six times the area of the Airy disk itself. In the aperture range set for this month's challenge, Izar A's first diffraction ring is approximately 3 arc-seconds away from its Airy disk. As a result, the companion lies nearly superimposed on the primary star's first diffraction ring, lowering image contrast and creating the challenge.

With this in mind, I headed out with my 4-inch (102-mm) f/10 refractor to my suburban backyard a few years ago to see what I could see. Popping in a 7-mm eyepiece (143x), I could readily split the pair, with Izar B appearing as a bright spot on A's diffraction ring. It helped that this particular instrument has very good image contrast and that the seeing was

steady. Had I been viewing through a similar size telescope with an obstructed optical design (that is, a reflector or a Catadioptric), the resulting lower contrast could have prevented me from seeing the companion.

Like many refractors, mine came with an objective lens cap that has a smaller central opening. In this case, the smaller opening, which is normally covered by a plastic dust cap, measures 1.75 inches (45 mm) across. Could I still see Izar B if I effectively stopped down my refractor to a create 45-mm f/22 instrument? Not expecting much in the way of success, I removed the dust cap, placed the lens cover over the objective, and aimed again at the star. To my surprise, I could see both suns fairly easily, the companion now just inside the first diffraction ring. Incidentally, to make this as "blind" a test as possible, I purposely conducted these observations before looking up the companion's position angle. Sometimes, knowing where something is will cause you to see it even if it is not visible -- witness the plethora of Martian canal observations at the end of the 19th century! Afterward, when I went back inside to check, sure enough it was right where I saw the companion, northwest of Izar A.



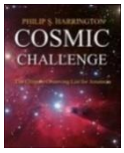
Izar as portrayed through the author's 4-inch (10.2 cm) telescope.

To be successful at spotting Izar B, you'll need high quality optics, both in your telescope and in the eyepiece, and steady seeing. Light pollution is of little or no concern once Izar is in view since both stars are so bright.

Now, I know there are going to be readers out there who say that splitting Izar is easy. Sure, if you are viewing it with a telescope larger than the specified aperture range, Izar poses little challenge. So, for those readers, I am offering a bonus challenge, the binary star A570 (ADS 9301). You will see that it is also plotted on the chart above, not quite 3° west of Izar. Here, we find two stars, magnitudes 6.0 and 6.5, separated by only 0.2". That's a challenge for any scope!

Good luck with this month's challenge! And be sure to post your results in this column's discussion forum.

Remember that half of the fun is the thrill of the chase. Game on!



About the Author: Phil Harrington writes the monthly *Binocular Universe* column in Astronomy magazine and is the author of 9 books on astronomy. Visit his website at www.philharrington.net to learn more.

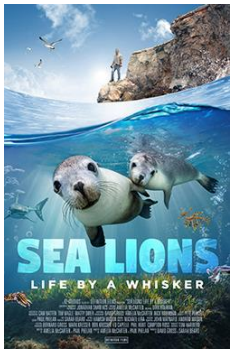
Observatory and Planetarium Events

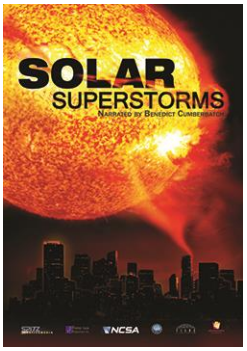
Centennial Observatory Upcoming Events

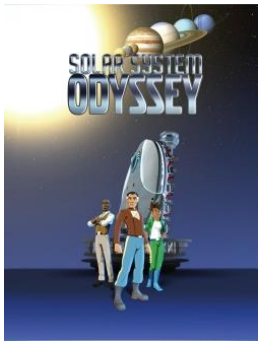
Event	Place	Date	Time	Admission
Summer Solar Session #2	Centennial Observatory	Wednesday, June 8th, 2022	1:30 to 3:30 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, June 11th, 2022	9:45 to 11:45 PM	FREE
Summer Solar Session #3	Centennial Observatory	Wednesday, June 15th, 2022	1:30 to 3:30 PM	FREE
Summer Solar Session #4	Centennial Observatory	Wednesday, June 22nd, 2022	1:30 to 3:30 PM	FREE
Summer Solar Session #5	Centennial Observatory	Wednesday, June 29th, 2022	1:30 to 3:30 PM	FREE

Faulkner Planetarium

Now Showing!







Note: There are more shows for the Planetarium. To learn more and find show times visit the Now Showing link above.

Visit the Herrett Center Video Vault

About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
550 Sparks St.
Twin Falls, ID

The Magic Valley Astronomical Society (MVAS) was founded in 1976. The Society is a non-profit [501(c) 3] educational and scientific organization dedicated to bringing together people with an interest in astronomy.

In partnership with the Centennial Observatory, Herrett Center, College of Southern Idaho - Twin Falls; we hold regularly scheduled monthly meetings and observation sessions, at which we share information on current astronomical events, tools and techniques for observation, astrophotography, astronomical computer software, and other topics concerning general astronomy. Members enthusiastically share their telescopes and knowledge of the night sky with all who are interested. In addition to our monthly public star parties we hold members only star parties at various locations throughout the Magic Valley.

MVAS promotes the education of astronomy and the exploration of the night sky along with safe solar observing through our public outreach programs. We provide two types of outreach; public star parties and events open to anyone interested in astronomy, and outreach programs for individual groups and organizations (e.g. schools, churches, scout troops, company events, etc.), setting up at your location. All of our outreach programs are provided by MVAS volunteers at no cost. However, MVAS will gladly accept donations. Donations enable us to continue and improve our public outreach programs.

Membership is not just about personal benefits. Your membership dues support the work that the Magic Valley Astronomical Society does in the community to promote the enjoyment and science of astronomy.
Speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs just to name a few of the programs that your membership dues support.

Annual Membership dues will be:
$20.00 for individuals, families, and $10.00 for students.
Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com

Donations to our club are always welcome and are even tax deductible. Please contact a board member for details.

Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others please contact President Gary Leavitt, for more information on these and other benefits.

Telescopes are an individual thing and not practical for public use. However, everyone should have the experience of a good look at the moon for at least 5 minutes in their life time. It is a dimension and feeling that is unexplainable. Pictures or TV can't give this feeling, awareness, or experience of true dimension. A person will not forget seeing our closest neighbor, the moon.

Norman Herrett in a letter to Dr. J. L. Taylor, president of the College of Southern Idaho, Twin Falls, ID, USA.