Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

April 2023

Membership Meeting
Saturday, April 8th, at 7:00 pm at the Herrett Center for Arts and Science
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

April President's Message

Hi Friends and Family: It's good for Spring to finally be here, but it's definitely taking its sweet time coming. While visiting grandchildren In N. Utah the past several weeks, I don't ever remember being around so much snow. Here at my daughter's home in N. Ogden, they've had two (2) feet plus the past 6 days.

Back to my favorite topic, Astronomy. Lots of fun and exciting things happening this month. First, our Saturday April 8th meeting program has Jay Hartwell talking about Jupiter. Still looking at 7pm at the Herrett Center library. Jupiter and three of its icy moons (Europa, Ganymede and Callisto) are the target of a ESA space probe scheduled to launch this month from their spaceport in French Guiana. Even since Galileo found the four moons in the winter of 1609-1610 through his tiny spyglass, the world has wondered what these objects were made of. "JUICE" Jupiter Icy moons Explorer will be launch to find out. The journey will take over seven (7) years. The probe will then spend time researching Jupiter and the three icy moons. Io, due to its volcanic nature, will not be on the list this time. Let me refer you to an excellent article on the subject In Astronomy Magazine's April issue.

Observers this month can find the planet Venus in the area of Taurus and M45 (the Pleiades) this month and the Lyrid Meteor Shower which peaks April 22, should offer some excellent viewing opportunities.

Hopefully Mother Nature will allow more clear skies than in past months. Everyone, have a great month. Sorry about having to cancel our Messier Marathon night on 25th of March, but we will have better skies.

Gary Leavitt, President
MVAS

MVAS Meeting Notes

Summary Minutes of MVAS General Meetings – Q1 of 2023 by Rick Hull – MVAS Secy.

Jan 2023: 10 people were in attendance, including new member James Hoadley and guest, welcome!

The speaker was our very own Tim Frazier. First he started off with a recent event; a picture of the Mars Occultation by the Moon this past Dec 7th. Then he got into his talk; "Restoration of a classic Cave Newtonian". By way of introduction, ATM (amateur telescope making) really took off post WWII, due in large part to surplus materials, and then the space race.

About a decade later commercial manufacturers of telescopes entered the consumer market for complete scopes and/or parts. Unitron, Edmund, Starliner, and Cave are some of those early names. (Raise your hand, if you remember ordering these suppliers catalogs, and wishing you could afford one of these products.) One that Tim always wanted; a Cave 8" Deluxe Model B. (Me too!) It so happened that in spring 2022, MVAS Newsletter Editor and former Boise Astronomical Society President, David Olsen, asked Tim if he would restore this very model. Tim showed us many pictures of the challenging condition of most of the parts, and then the "after" view once Tim worked his magic! I must say he did a very nice job! See picture. As the project progressed, it became suspected that this may have been the model prototype; base on some differences with production units, and upon the 1952 inscribed date on the primary mirror.

Feb 2023: 15 attendees, including another new (or perhaps, returning?) member, Ken Thomason, welcome!
The speaker was none other than our President, Gary Leavitt. His talk was on "Comets & Good Guys who chased them". First off, he showed us an illustration from the year 1007, indicating man's fascination with comets. Then there was this tapestry from 1077, 230 feet long, which included a comet, which some think may be Halley's Comet. Gary then proceeded to highlight past comets and comet observers. There was the Great Comet of 1811 which reached an estimated magnitude 0 and was visible to the naked eye for 260 days! Halley, the 2nd Astronomer Royal, was not famous for the discovery of his namesake comet, but for predicting its orbit and past/future apparitions. Donati's Comet of 1858 was the subject in first photographic attempt of a comet. E.E. Bernard photographed over 20 comets. In more recent history, we have David Levy and Terry Lovejoy, among others, who are amateur astronomers focused on visual discovery of comets. Now, most comet discoveries are by dedicated survey telescopes, such as the Pan-Starrs NEO survey scope on Maui. Gary closed with his 1st comet photo, of a Pan-Starrs comet near M31.

Mar 2023: 12 attendees
The speaker was Dr. Candace Wright on "Science Update for James Webb Space Telescope". First she played a promotional 1 year video retrospective. Then she would address updates in 4 research categories. First category was others worlds. One example was an Exo-Planet found via transit discovery; it is big, hot, with a very short year. But an atmosphere including clouds has been inferred! Another other world, is Chariklo, a Centaur object which now orbits amongst the Solar System's gas giants. Once thought to be a Kuiper Belt Object, Centaurs are asteroid sized, but contain both dust and gas similar to comets. JWST has found Chariklo has rings, and has detected crystal water ice. Category 2 is Stellar life cycles. At present this is in the early stages of science, with lots of comparisons between JWST images and Hubble images. Also there is significant activity in calibration of the 4 IR filter pass-bands. Using an object like M92 Globular Cluster with an estimated age of 12 -13 million years provides the necessary info. In the Eagle Nebula's Pillars of Life, the JWST has been able to observe very distant galaxies, which were obscured to Hubble by the Hydrogen clouds; and it has observed gas jets from very young stars within the cloud. In the Southern Ring Planetary Nebula, the JWST has observed the white dwarf center star, and found it has a Carbon core, rare indeed. Category 3 is Galaxies through time. Comparing Hubble to JWST images of Stephen's Quintet has changed how we perceive these galaxies. Then, there are the Green Pea Galaxies. Discovered previously in 2009, they are very hard to observe and analyze, being very small, round, and indeed green; they are high in UV emissions and have high rate of star formation. However, using the improved resolution and spectral analysis of JWST, it observed GPG's through gravitational lensing of a galaxy cluster 4.6 BLY away, and determined the GPG's are greater than 13B years old. Last category discussed; understanding the Early Universe. Still early, but the example of the GPG's demonstrates JWST ability to analyze spectra in far distant reaches of the known universe. It has observed a very, very old galaxy, yet has found 6 massive B stars, 10 – 100 times the norm, which puts into question some of our theories of galaxy formation after the Big Bang. Lastly, JWST has observed a Supernova in a distant galaxy via gravitational lensing by a cluster a mere 3.6 BLY away! So, more to come, exciting times!

The Night Sky This Month – April 2023

The southern Milky Way from Crux through Carina and Vela. Image credit: Brian Ventrudo.

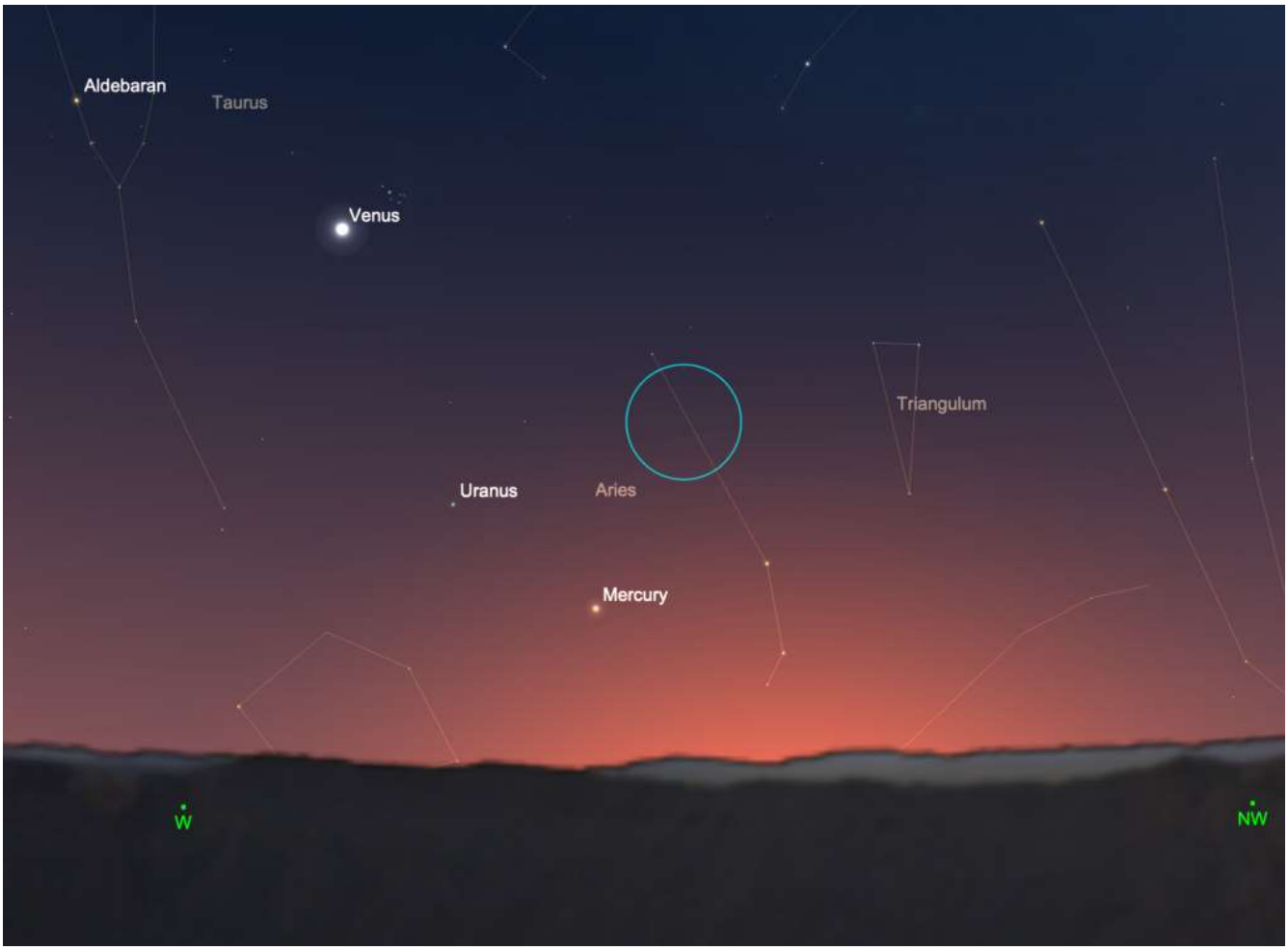
(Looking for last month's 'Night Sky'? Find it at this link…)

Venus and Mercury put on a fine show in the western sky after dawn this month, while Mars lingers in Gemini as it slowly dims and shrinks. Jupiter reaches conjunction with the Sun on April 11 and will reappear in the eastern morning sky in the coming weeks. Saturn's already made it into the dawn sky, and both gas giants will continue to brighten and extend their angular distance from the Sun in the next many months. And a meteor shower – the Lyrids – makes its annual appear with the Moon mostly out of the way. Here's what to see in the night sky this month.

6 April. Full Moon, 04:35 UT (the 'Pink Moon')

6 April. As April arrives, Mercury begins its best evening apparition of the year for northern observers. The little planet begins the month at an impressive magnitude -1.0 very low over the west-northwestern horizon. Then it dims but rises higher each day on the way to greatest eastern elongation about 19^{o} degrees from the Sun on April 11 when it shines at magnitude 0 with its disk about 39% illuminated. Then it plunges back towards the horizon, passing the waxing crescent Moon on the 21st.

9 April. Look low in the southeast and south in the late evening through dawn to see the waning gibbous Moon less than a degree from the bright star Antares in Scorpius.



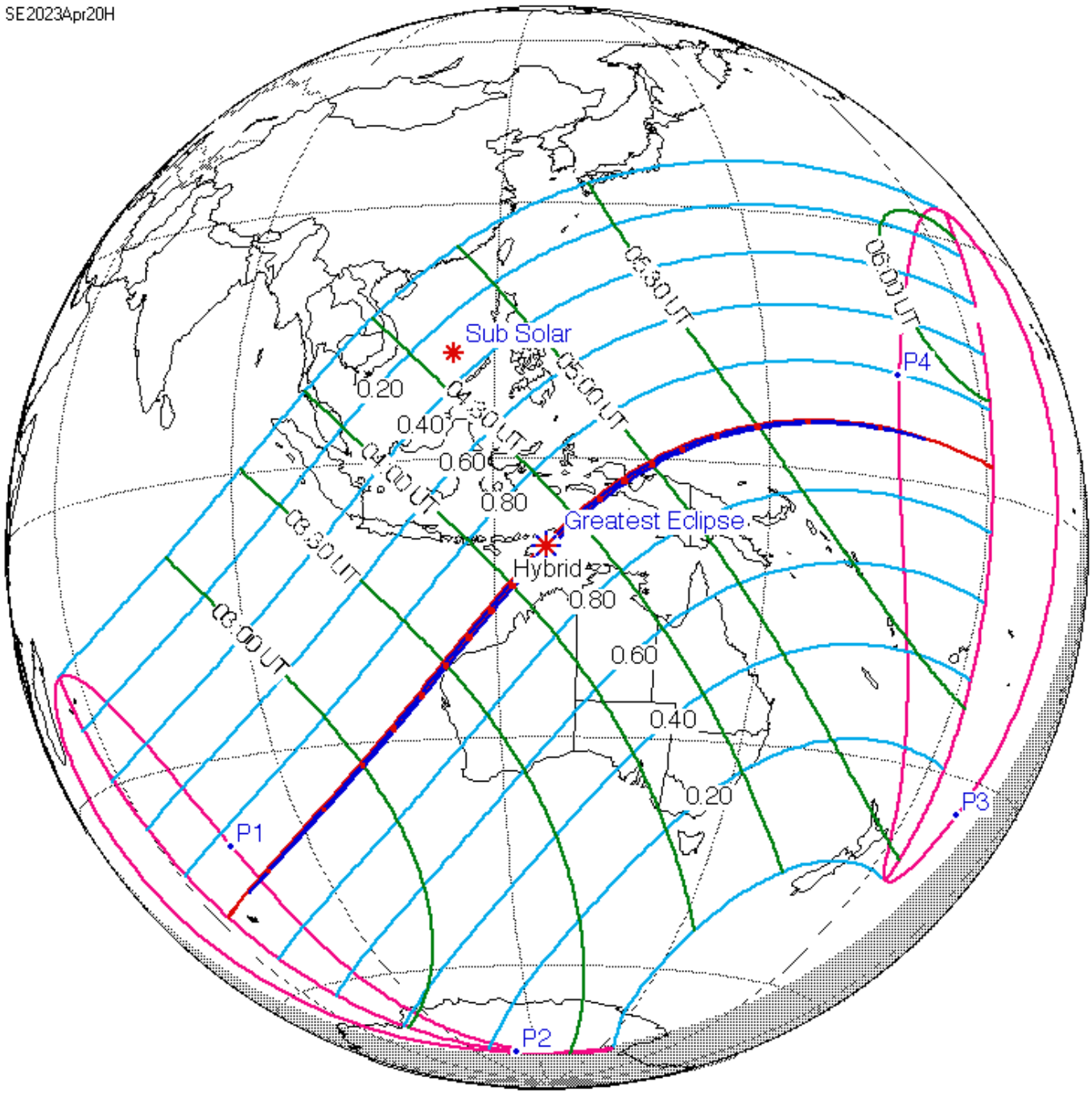
Mercury, Venus, and the Pleiades on April 10, 2023 in the western sky after sunset. Cyan circle shows a 5 degree field of view.

10-11 April. Brilliant Venus lies less than 3^{o} from the Pleiades above the north-northwestern horizon after sunset. Venus continues to move higher and get bright in April. Through a telescope, the planet's disk appears to get a little thinner (though still gibbous) but it also grows larger as the planet and Earth get closer. The planet shines at magnitude -4.1 for much of the month.

13 April. Last Quarter Moon, 09:11 UT

14 April. Look for Mars, dimming but still respectably bright at about magnitude +1.3, tangled in the stars of Gemini in the western sky after sunset.

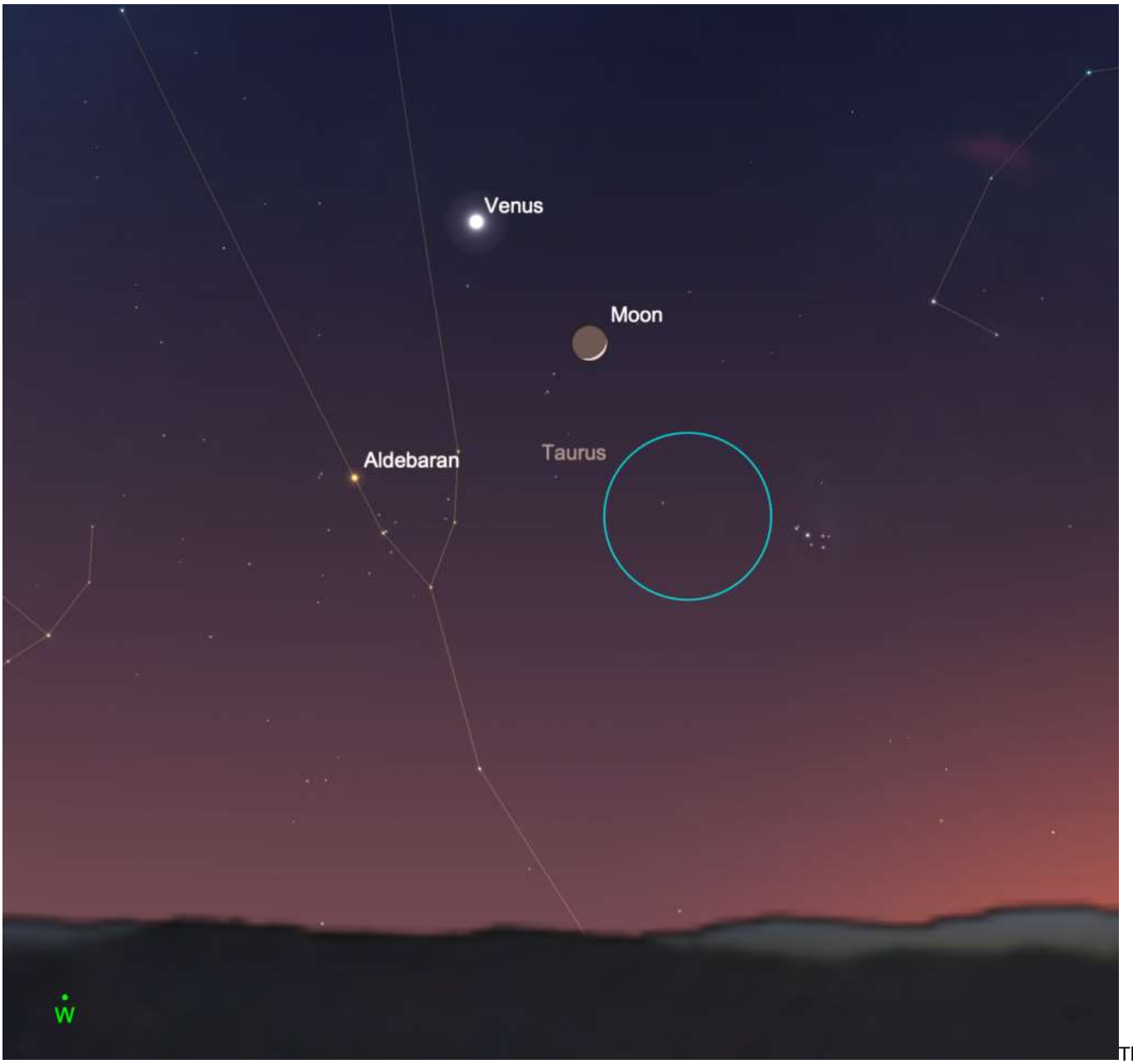
17 April. Neptune, now emerged in the morning sky, lies about 5^{o} northeast of the waning crescent Moon in the eastern pre-dawn sky.



The path of the hybrid eclipse of April 20, 2023 across Australia and Indonesia. Image credit: Fred Espenak/NASA.

20 April. New Moon, 04:13 UT

20 April. The new Moon brings a solar eclipse to a slender band in Western Australia and Indonesia. This is a hybrid eclipse, total and annular depending on location and timing. While seeing the maximum eclipse presents logistical challenges, observers over a wide range in this part of the world can see a partial solar eclipse today with proper eye protection. See more details of eclipse coverage at this link.



The Moon, Venus, and the Pleiades on April 22, 2023 in the western sky after sunset. Cyan circle shows a 5 degree field of view.

22 April. Look for the waxing crescent Moon near the Pleiades in Taurus in the west northwest after sunset.

22 April. The Lyrid meteor shower peaks in the early-morning hours. This is the first significant meteor shower since the Quadrantids in early January. The Lyrids display some 15-20 meteors per hour in good conditions. The slender crescent Moon stays out of the way this year. The Lyrids trace their apparent paths back to a point between the constellations Hercules and Lyra, both of which rise in the east around midnight.

23 April. As evening arrives, look to the west for Venus about 2 ^{o} to 3^{o} south of the waxing crescent Moon.

27 April. First Quarter Moon, 21:20 UT

April Skies by Dick Cookman

Highlights: Comet Journal, Martian Landers, Meteor Showers, Planet Plotting, April Moon
Focus Constellations: Ursa Major, Ursa Minor, Draco, Cepheus, Cassiopeia, Camelopardalis, Perseus, Auriga, Taurus, Gemini, Cancer, Leo, Virgo, Coma Berenices, Bootes, Hercules

• Comet Journals

Comets C/2022 E3 (ZTF) and C/2020 V2 (ZTF) have faded to 10th magnitude. The former is south of Orion and moving into southern hemisphere skies as it leaves the inner solar system. The latter moves from Triangulum to Aries in April. Perihelion occurs in May, 2023 and it is closest to Earth in September.
C/2022 A2 (PanSTARRS) is also at 10th magnitude in Andromeda. It was closest to Earth on January 17 and was at perihelion on Feb. 18.

• Mars Landers

NASA's Perseverance rover is now on top of the river delta on the edge of Jezero Crater. After coring a rock designated as Berea, it stored the first sample of the mission's newest science campaign on Thursday, March 30. "The Berea core highlights the beauty of rover missions," said Perseverance's project scientist, Ken Farley of Caltech in Pasadena. "Perseverance's mobility has allowed us to collect igneous samples from the relatively flat crater floor during the first campaign, and then travel to the base of the crater's delta, where we found fine-grained sedimentary rocks deposited in a dried lakebed. Now we are sampling from a geologic location where we find coarse-grained sedimentary rocks deposited in a river. With this diversity of environments to observe and collect from, we are confident that these samples will allow us to better understand what occurred here at Jezero Crater billions of years ago."

• Meteor Showers

The Lyrid meteor shower, in the predawn dark skies after New Moon in April, can approach 90 meteors per hour, but 15 to 20 is more likely. Watch for them emanating out of northwestern skies in the hours before dawn. Pi Puppid meteors peaking on the 24th may appear rising above the eastern horizon.
Apr. 22: Lyrids. Active Apr 16-25. Radiant 18h04m -34°. ZHR ~var<90. 49 km/sec. 2 days after New Moon. Progenitor: Comet C/1861 G1 (Thatcher).

• Planet Plottings

"Dē revolutionibus orbium coelestium" (On the Revolutions of the Heavenly Spheres) by the Polish cleric Copernicus was published when he was on his deathbed in 1543. It offered a Sun centered model of the universe which contrasted with the accepted Earth centered Ptolemaic model. Predictions of planetary positions from his model fared no better than the Ptolemaic model although they were somewhat simpler to calculate. Correct predictions awaited Keplers' "Epitome astronomical Copernicanae, 1-3, De doctrina sphaerica" which was published in 1618. He derived the 3 laws of planetary motion and determined that planetary orbits are not perfect circles, they are ellipses!

Saturn (1.0) in Aquarius and Neptune (8.0 to 7.9) in Pisces are morning planets in April. The waning crescent Moon passes Saturn on the 15th and Neptune on the 17th. Jupiter will not be visible in April because it is on the other side of the Sun in Pisces and reaches solar conjunction on April 11. The waning crescent Moon passes Jupiter on the 19th, just before New Moon on the 20th.

On the 1st, Mercury (-1.0) is just above the western horizon in Pisces after sunset. Each succeeding night it will be higher until the 11th when it reaches greatest eastern elongation of 19° in Aries and drops to a magnitude of -0.1. The waxing crescent Moon passes less than 2° from dimming Mercury and even dimmer Uranus (5.8) in Aries on the 21st when all three are below brilliant Venus (-4.0) in Taurus. The waxing crescent Moon passes within 2° of Venus on the 23rd and 3° of Mars (1.0) in Gemini on the 25th.

Planet	Constellation(s)	Magnitude	Planet Passages	Time	Date
Sun	Aries	-26.5	New Moon	12:13AM EDT	4/20
Mercury	Pisces, Aries	-1.0 to 5.8	Max East Elongation	6:00PM EDT	4/11
Venus	Aries, Taurus	-3.9 to -4.0			
Mars	Gemini	1.0 to 1.3			
Jupiter	Pisces	-1.9	Solar Conjunction	6:00PM EDT	4/11
Saturn	Aquarius	1.0			
Uranus	Aries	5.8 to 5.9			
Neptune	Pisces	8.0 to 7.9			

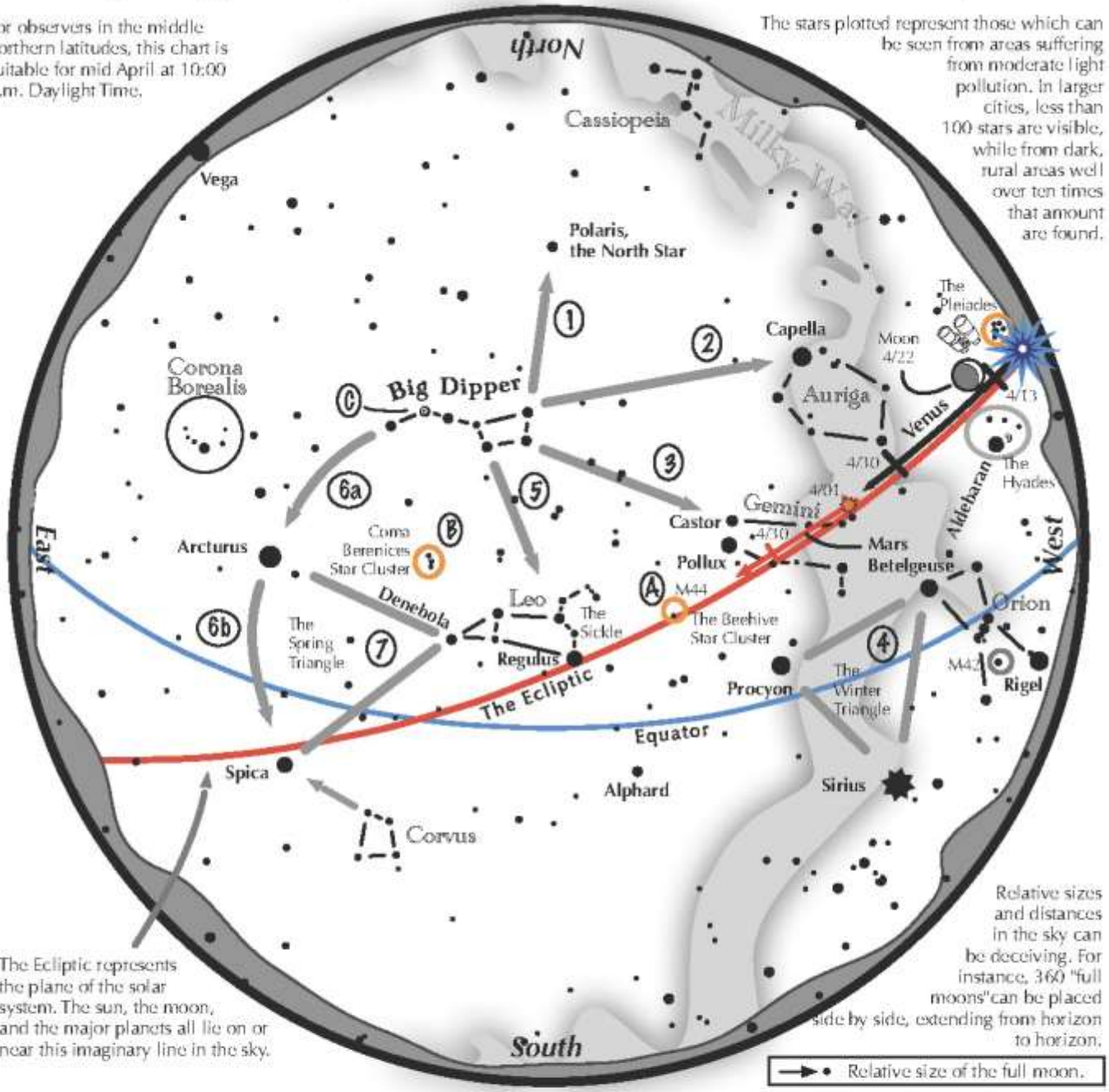
• April Moon

April's New Moon is in Aries on the 20th at 12:13AM EDT. It marks the start of Lunation 1241 which ends 29.49 days later with the New Moon of May in Taurus on the 19th at 11:55AM EDT. The New Moon will eclipse the Sun over the Pacific and Indian oceans. The Full Moon is in Leo on the 6th at 12:35AM EST. The April Moon is called the "Grass Moon" and "Egg Moon", celebrating grass sprouting and the end of the hen's molting season when egg production returns. It was called the "Seed Moon" in Medieval England and for Celts it was the "Growing Moon". In China, it is the "Peony Moon" and Colonial Americans called it "Planter's Moon". Anishnaabe (Odawa and Ojibwe) first people recognize the April Moon as the "Boiling Sap Moon" ("Iskigamizige-giizis" in the western dialect and Skigamizige-giizis" in the eastern dialect). The cultural teaching of the cycle of life and nature during the 4th Grandmother Moon of Creation is explained by Earth Haven Farm in Ontario as follows: "The fourth moon of Creation is Sucker Moon, when sucker goes to the Spirit World in order to receive cleansing techniques for this world. When it returns to this realm, it purifies a path for the Spirits and cleanses all our water beings. During this time we can learn to become healed healers.

Lunar Perigee distance (minimum lunar distance) is 228,645 mi. (57.69 Earth radiil) on the 15th at 10:24PM EDT. Lunar Apogee (maximum lunar distance) is on April 28 at 2:43AM EST when the Moon's distance is 251,220 mi. (63.39 Earth radii). A The waning crescent Moon appears to pass Saturn on the 15th, Neptune on the 17th, and Jupiter on the 19th. A waxing crescent passes Mercury and Uranus on the 21st, Venus on the 23rd, and Mars on the 25th.

Planet	Constellation	Magnitude	Moon Passages	Moon Phase	Moon Age
Sun	Aries	-26.8	12:13AM EDT, 4/20	New	0 Days
Mercury	Aries	2.3	1.78°SE, 5:00AM EDT, 4/21	Waxing Crescent	1.20 Days
Venus	Taurus	-4.0	1.3°N, 9:00AM EDT, 4/23	Waxing Crescent	3.37 Days
Mars	Gemini	1.3	3.0°N, 10:00AM EDT, 4/25	Waxing Crescent	5.91 Days
Jupiter	Pisces	-1.9	0.33°NE, 2:00PM EDT, 4/19	Waning Crescent	28.53 Days
Saturn	Aquarius	1.0	3°S, Midnight EDT, 4/15	Waning Crescent	24.44 Days
Uranus	Aries	5.9	1.7°N, 9:00AM EDT, 4/21	Waxing Crescent	1.37 Days
Neptune	Pisces	7.9	2.0° S, 1:00PM EDT, 4/17	Waning Crescent	27.00 Days

Navigating the April Night Sky, Northern Hemisphere



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.

Astronomical League
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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/nasaeclipsesafety. 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 Moon completely – or totally - hides the Sun from view. A total solar eclipse is only safe to view without protection during totality itself; it is absolutely necessary to protect your eyes throughout the rest of the eclipse! Credits: Left, Annular Eclipse: Stefan Seip (Oct 3, 2005). Right, Total Eclipse, NASA/Aubrey Gemignani (August 21, 2017)

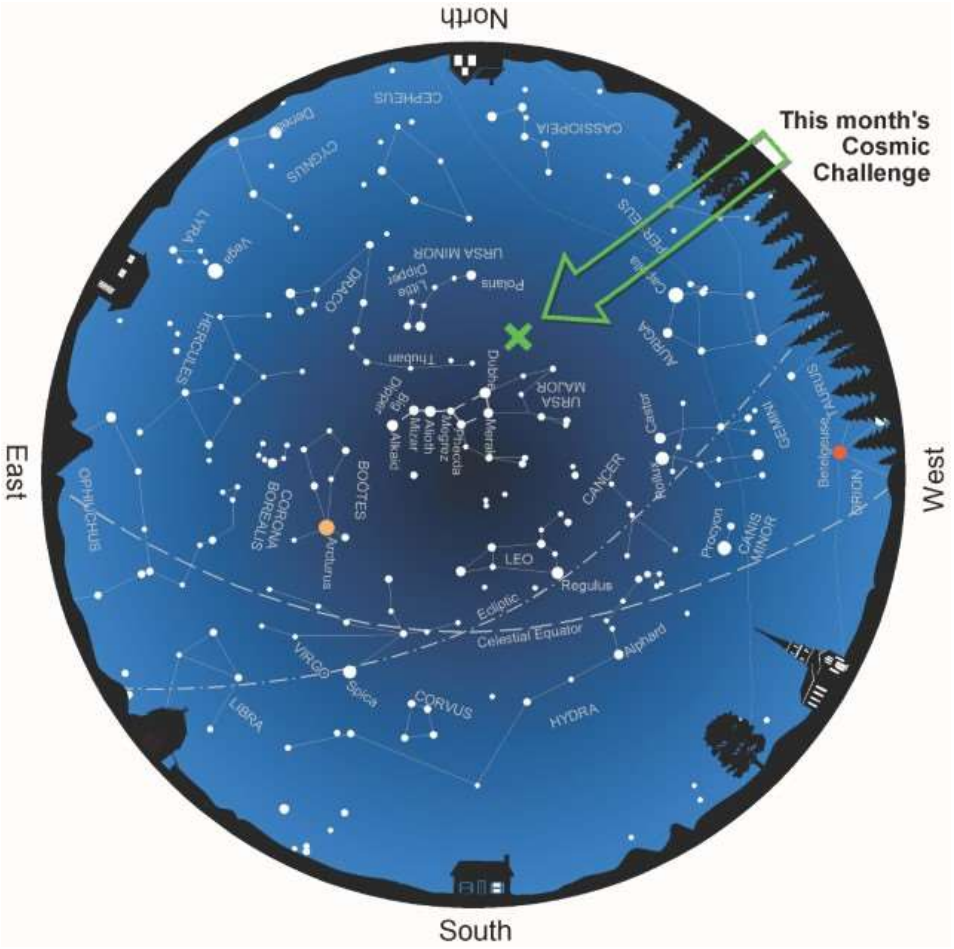
Phil Harrington's Cosmic Challenge

Cosmic Challenge: NGC 2976 and NGC 3077

This month's suggested aperture range:
Giant Binoculars, 3- to 5-inch (7.6-12.7cm) telescopes
This month's featured telescope, the Meade ETX-90EC

Target	Type	RA	DEC	Const.	Mag	Size
NGC 2976	Galaxy	09h 47.3h	+67° 55.1'	Ursa Major	10.2	5.9'x2.6'
NGC 3077	Galaxy	10h 03.4h	+68° 44.0'	Ursa Major	10.6	5.5'x4'

M81 and M82 form perhaps the most famous pair of galaxies north of the celestial equator. Johann Elert Bode bumped into both quite by chance on New Year's Eve 1774. His discovery is commemorated today by M81's nickname, Bode's Galaxy. But his discoveries went unknown by his contemporaries. Both galaxies went unobserved for another 5 years until they were independently rediscovered by Pierre Méchain. Charles Messier incorporated Méchain's find into his burgeoning catalog some 19 months later.



Above: Evening star map showing the location of this month's Cosmic Challenge
Credit: *Map adapted from* ***Star Watch*** *by Phil Harrington*

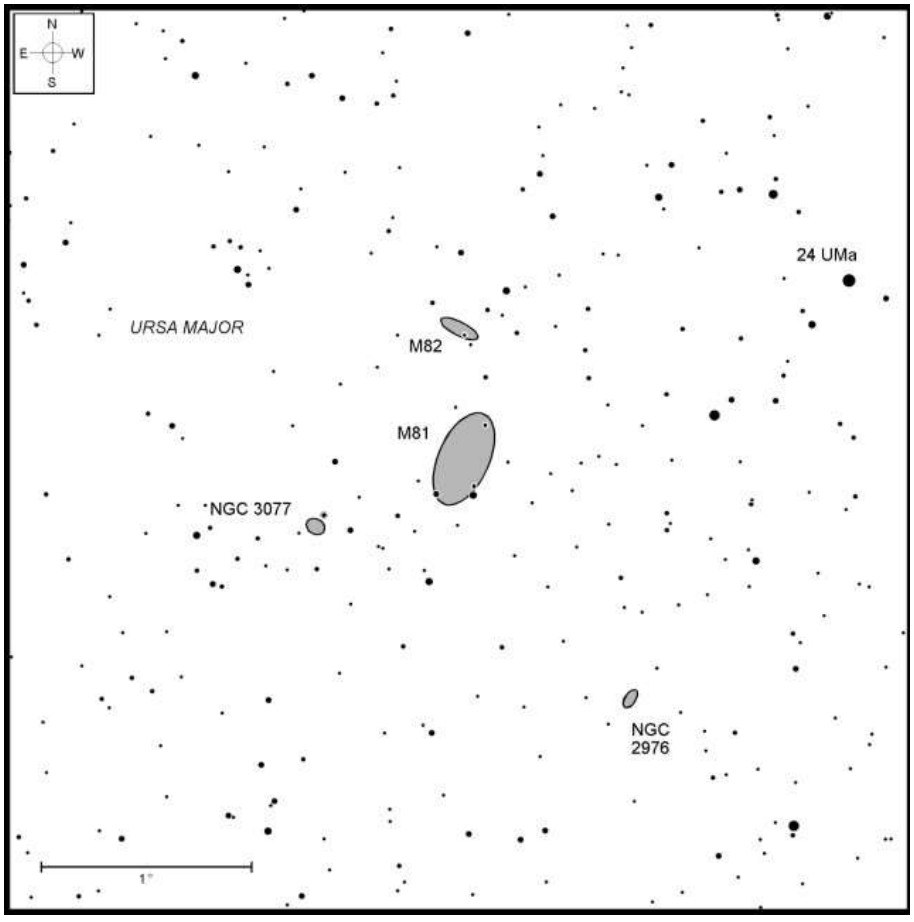
Above: Finder chart for this month's Cosmic Challenge.

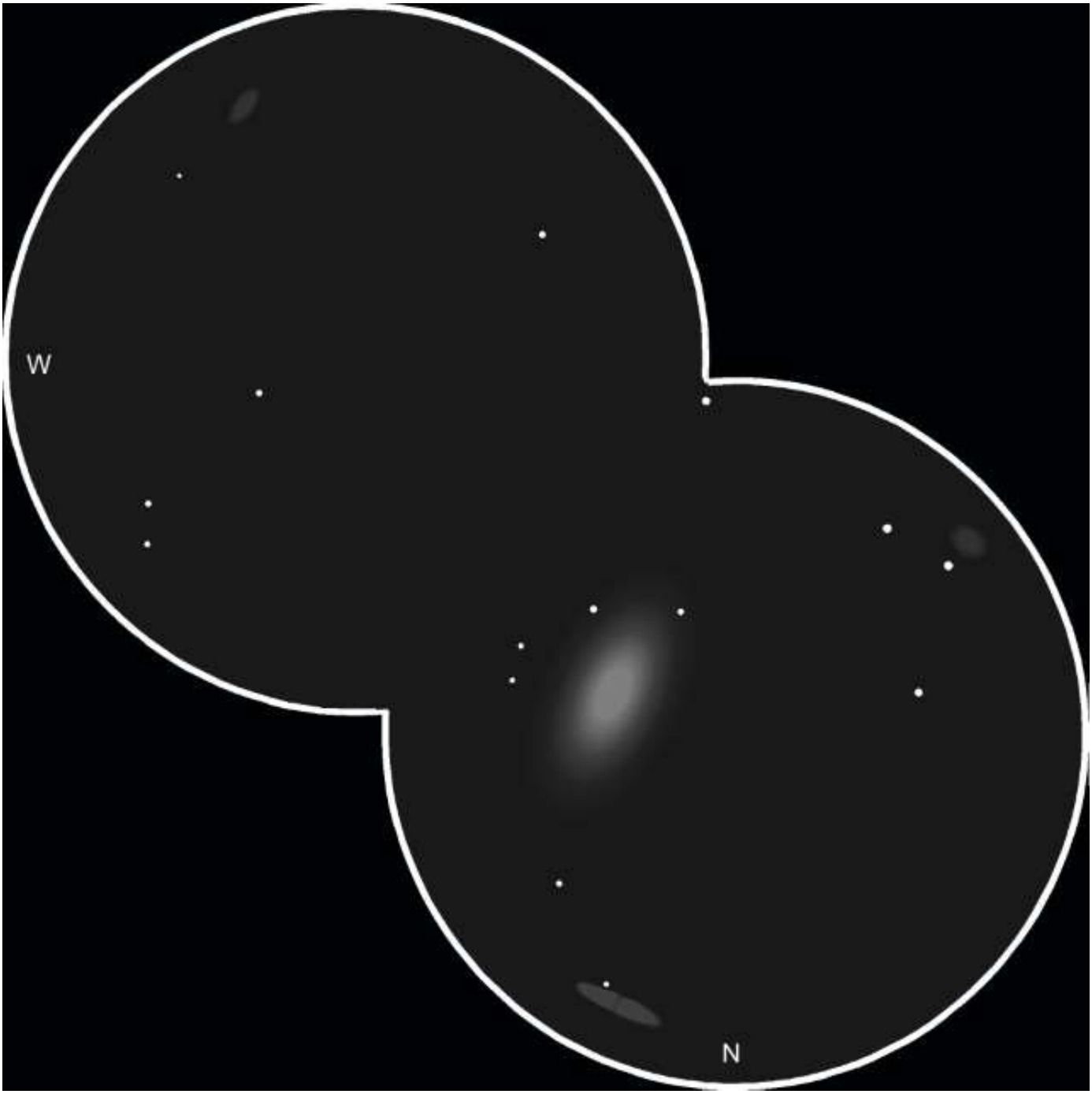
***Credit:** Chart adapted from **Cosmic Challenge** by Phil Harrington*
Click on the chart to open a printable PDF version in a new window

Bode, Méchain, and Messier missed fainter companions that are found nearby. Two more decades would pass before William Herschel discovered their dim glows, yet both of this month's challenges - **NGC 2976** and **NGC 3077** -- can be spotted through small backyard telescopes given good skies.

NGC 3077, an odd-looking 10th-magnitude elliptical galaxy, lies about 45' to the southeast of M81, just beyond a 10th-magnitude field star. As shown in the digitized sketch below, NGC 3077 looks like a slightly oval, fuzzy patch of gray light that is best described as "featureless." Look carefully with averted vision, though and you should spot a faint stellar nucleus just peeking out of the galaxy's center, as I can through my 8-inch (20.3cm) reflector.

Long-exposure close-up images reveal several opaque dust clouds along the edge of the galaxy that radiate away from the galaxy's core like spokes on a bicycle wheel. Elliptical galaxies are typically void of nebulosity, but NGC 3077's unusual appearance is probably due to its gravitational interplay with M81. Evidence of this is clearly visible in radio images, which reveal long filamentary threads of gas swirling between the two.





Above: The M81 Gang, as portrayed in this digitized sketch through the author's 4-inch (10.2cm) refractor. M81 is near the center of this overlapping two-field view, while M82's cigar-shaped disk is at the bottom. NGC 2976 is shown at the upper left, while NGC 3077 is at right.

Below: An amazing image of M81, M82, and NGC 3077 set behind Milky Way dust clouds. This image, taken by CN'er **Rupesh Varghese** (rupeshjoy143), is the result of 43 hours of data gathered through his Explore Scientific FCD100 Series 127mm f/7.5 Apo Refractor. Visit Rupesh's website, **lostphotons.com**, to read more about this great image as well as his many other outstanding results.

NGC 2976 is set about 1½° southwest of M81. Rated not quite half a magnitude fainter than NGC 3077, NGC 2976 appears as little more than a dim, oval glimmer through my 4-inch (10.2cm) refractor. Like NGC 3077, NGC 2976 appears in close-up images to be riddled by gravitational warping caused by its proximity to M81. Although classified as a spiral galaxy, its nearly edge-on tilt to our line of sight coupled with these distortions blur its spiral arms in photographs.

There is still more to the M81 family of galaxies. Indeed, more than 30 individual systems belong to the brood, although many are found far from M81's immediate vicinity. NGC 2403, a bright spiral and second most massive member in the group, lies 14° to the west in Camelopardalis, while NGC 4236, a barred spiral, is in Draco, a distant 21° to the east. Both are visible through 3- to -5-inch telescopes, even under the veil of moderate light pollution. Another groupie, the irregular galaxy NGC 2366, is also bright enough to be seen through your telescope as a small smudge some 4° north-northwest of NGC 2403. But I'll save those for future months.

Have a favorite challenge object of your own? I'd love to hear about it, as well as how you did with this month's challenge. Contact me through my website or post to this month's discussion forum.

Until next month, 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, including Cosmic Challenge: The Ultimate Observing List for Amateurs.

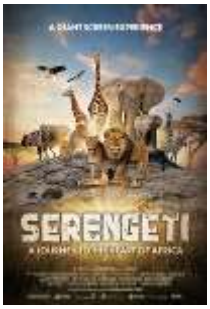
Observatory and Planetarium Events

Centennial Observatory Upcoming Events

All events are weather permitting.

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, April 8th, 2023	9:15 to 11:15 PM	FREE
Mercury at Greatest Eastern Elongation	Centennial Observatory	Tuesday, April 11th, 2023	8:00 to 8:30 PM	FREE
International Astronomy Day Solar Viewing	Centennial Observatory	Saturday, April 29th, 2023	11:00 AM to 4:00 PM	FREE
International Astronomy Day Nighttime Telescope Viewing	Centennial Observatory	Saturday, April 29th, 2023	9:00 to 11:00 PM	FREE

Faulkner Planetarium



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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 both 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: (a) public star parties and events open to anyone interested in astronomy; (b) 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, which enable us to 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. Among the programs that your membership dues support are speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs, just to name a few.

Annual Membership dues are $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 Robert Mayer 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.