Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society

October 2023

Membership Meeting
October 14th at the Herrett Center
CSI main campus at 7:00pm

Centennial Observatory
See Inside for Details

Faulkner Planetarium
See Inside for Details

Club Officers

Gary Leavitt, President
leavittg@cableone.net

Dr. Jay Hartwell, Vice President
drhartwellod8@gmail.com

Rick Hull, Secretary
hull3hull3@yahoo.com

Jim Tubbs, Treasurer / ALCOR
jtubbs015@msn.com
208-404-2999

David Olsen, Newsletter Editor
editor@mvastro.org

Rick Widmer, Webmaster
rick@developersdesk.com

Magic Valley Astronomical Society is a member of the Astronomical League

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

www.mvastro.org

President's Message

Hi everyone:

Several things on my mind this Month.

First. For those of you planning to attend the Annular Eclipse on the 14th, we wish you well. Saturday's, October 14th; meeting on that night will still proceed with Rob Mayer our presenter. He'll do our Year in Pictures. Depending on the time available, I may put together a few extras.

The November meeting will feature our elections for 2024. Please consider the names of Members, who you would like to nominate, and bring them to the meeting on the 11th.

One other thing, I wanted to pass on an announcement from NASA concerning the James Webb Space Telescope (JWST). Apparently the JWT found an exoplanet, K2-18b, that's about 8.6x size of earth with the presence of carbon bearing molecules including methane and carbon-monoxide. Think of the possibilities? Have a great Fall and month.

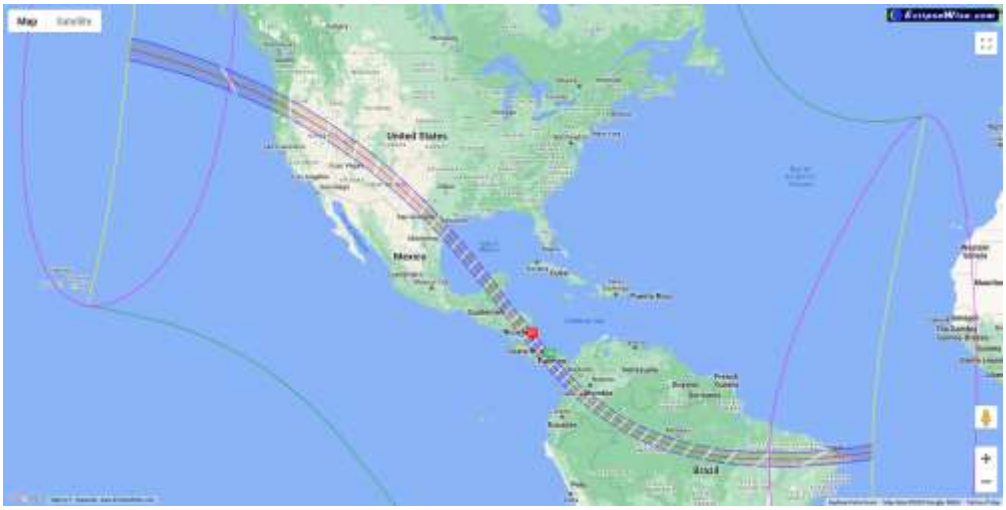
Gary Leavitt, MVAS President

Calendar for October 2023

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6 Last Quarter Moon 7:49am 	7
8	9 	10	11	12	13 New Moon at 11:55am  On the 14th	14  Info next page
15	16	17	18	19	20 First Quarter Moon  On the 21st	21 International Observe the Moon Night 7:30 - 9:30 CSI Centennial OBS
22	23	24	25	26	27	28 Full Moon 2:24pm 
29	30	31 Halloween 				

The Annular Solar Eclipse of Saturday, October 14th, 2023

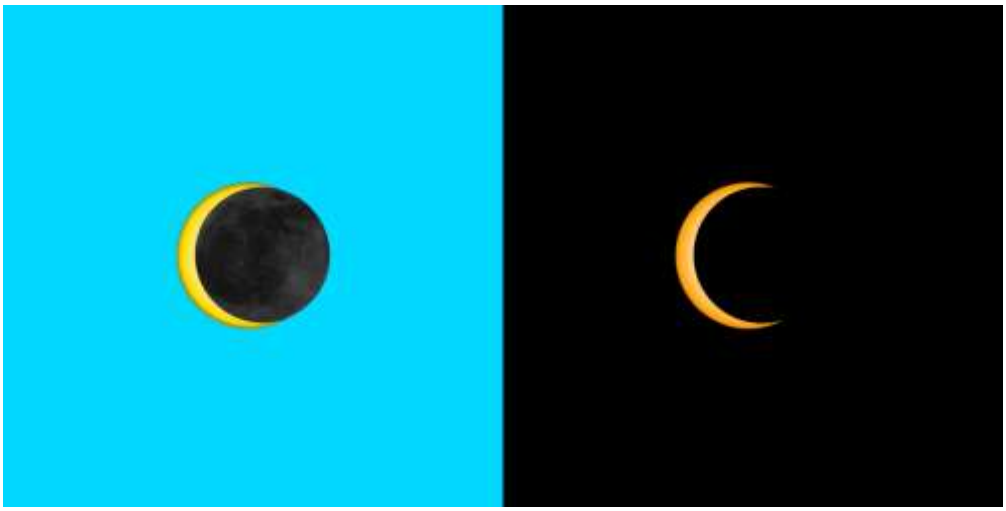
This is the first solar eclipse visible from Idaho since August 21st, 2017. For viewers along a path that runs from the Oregon coast to the easternmost point of Brazil, it will appear as an annular ("ring of fire") eclipse. Except for the extreme southwest corner of Owyhee County, all Idaho locations will see a partial eclipse, with the sun appearing as a crescent at maximum eclipse.



Map courtesy of Fred Espenak, owner of the "Mr. Eclipse" website.

Follow these solar eclipse viewing safety rules to avoid permanent eye damage:

- Proper filters (such as those available very inexpensively from the Herrett Center Store) **MUST** be used to view this eclipse safely! Such filters are designed to go directly over the eyes; **DO NOT** use them between your eye and any form of magnifying optics, like binoculars or a telescope.
- Supervise small children who may be tempted to stare at the sun during the eclipse, since their normal instinct to stop looking due to discomfort will be diminished due to the reduced brightness (although the potential for permanent eye damage is not diminished).
- Welding glass must be rated at #14 or higher to prevent permanent eye damage. Stacking lower-rated welding glass (e.g. a #10 and a #4) does **NOT** provide equivalent protection as a #14! Just because you don't experience pain doesn't mean your eyes are not being damaged!
- If you use an electronically-darkening welding helmet, be sure it is rated to provide #14 or higher equivalent protection.
- Sunglasses are completely inadequate protection, regardless of any lack of perceived discomfort.
- Do not use solar filters which attach to a telescope's eyepiece. (In fact, if you have one of these eyepiece solar filters, throw it away—it's not safe!) The solar heat concentrated on them can cause them to crack suddenly and allow damaging light to reach the eye. The only safe solar filters for telescopes and binoculars filter the sunlight *before* it enters the optics, not after!
- Completely exposed and properly developed black-and-white negative film may be used as a filter (but seriously, who has any of that around anymore?)
- Make a simple pinhole projector by poking a small hole in a piece of cardboard, and casting the eclipsed sun's image onto another piece of cardboard (white works best.) **DO NOT** try to look through the pinhole!
- Instructions for building an optimum pinhole projector can be found here (Microsoft Word document).



Relative positions of the sun and moon at mid-eclipse (l) and actual appearance of the sun through a solar filter at mid-eclipse (r), as seen from Twin Falls, Idaho, USA.

Eclipse timeline (all times listed are in Mountain Daylight Time (UT-6 hrs.) for Twin Falls, Idaho, USA), calculated by the Solar Eclipse Calculator & Diagram by Xavier Jubier:

- 09:00:00 AM — **Centennial Observatory opens** for telescope viewing, weather permitting.
- 09:08:14 AM — **First contact.** A tiny, growing "bite" begins to appear on the upper right quadrant of the sun as the moon begins its excursion across the solar disk.
- 10:25:33 AM — **Mid-eclipse.** The moon reaches its maximum coverage of the solar disk (85%); the sun appears as a thin crescent with "horns" pointing to the right (see diagram, above). See if you can spot Venus with the unaided eye by standing where the sun is hidden by a building but the view to the south is unobstructed. Venus will look like a white dot high in the sky, due south. In a telescope, it will appear as a quarter phase (half illuminated).
- 11:50:38 AM — **Last contact** the last, tiny "bite" of the moon's silhouette disappears from the lower left quadrant of the solar disk, signaling the eclipse's end.
- 12:00:00 PM — **Observatory closes.**

The observatory will re-open for the monthly free star party at 7:45pm to 9:45pm.

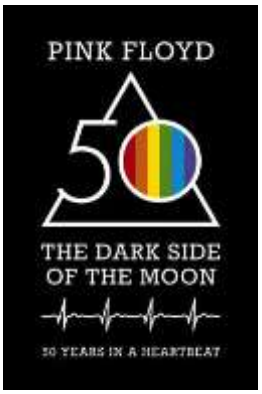
Centennial Observatory and Faulkner Planetarium Events

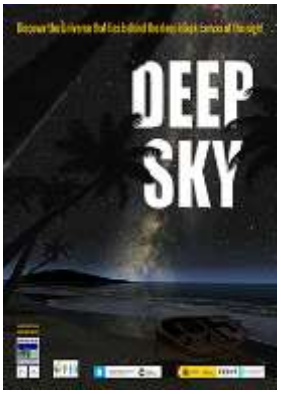
Observatory Upcoming Events
All events are weather permitting.

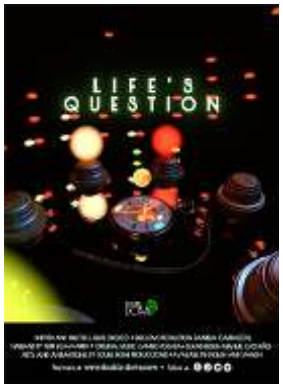
Event	Place	Date	Time	Admission
Partial Solar Eclipse	Centennial Observatory	Saturday, October 14th, 2023	9:00 AM to 12:00 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, October 14th, 2023	7:45 to 9:45 PM	FREE
International Observe the Moon Night	Centennial Observatory	Saturday, October 21st, 2023	7:30 to 9:30 PM	FREE

Faulkner Planetarium Shows
For the full schedule and times visit!

Now Showing!







Visit the Herrett Center Video Vault

The Night Sky This Month – October 2023

Here's your Cosmic Pursuits newsletter Highlight's for October 2023!

1. While deep-sky sights abound in the evening sky, our own solar system offers us the best sights this month. Jupiter and Saturn move into prime viewing territory, two meteor showers arrive, and an annular solar eclipse and a famous comet also grace the October skies. Here's what to see in the Night Sky This Month...

2. Just a month from opposition, brilliant Jupiter is now poised for prime viewing over the next few months. There's always plenty to see on and around the biggest planet. To help you get the best view, here's your guide to observing Jupiter in 2023.

3. The JWST delivers another "OMG" image - a brand-new protostar emerging from the dust and gas of the interstellar medium. Just dazzling.

4. Take an engaging tour of the Holmdel Horn Antenna, the historic radio 'telescope' in New Jersey that discovered the faint signature of the fiery beginning of the entire universe.

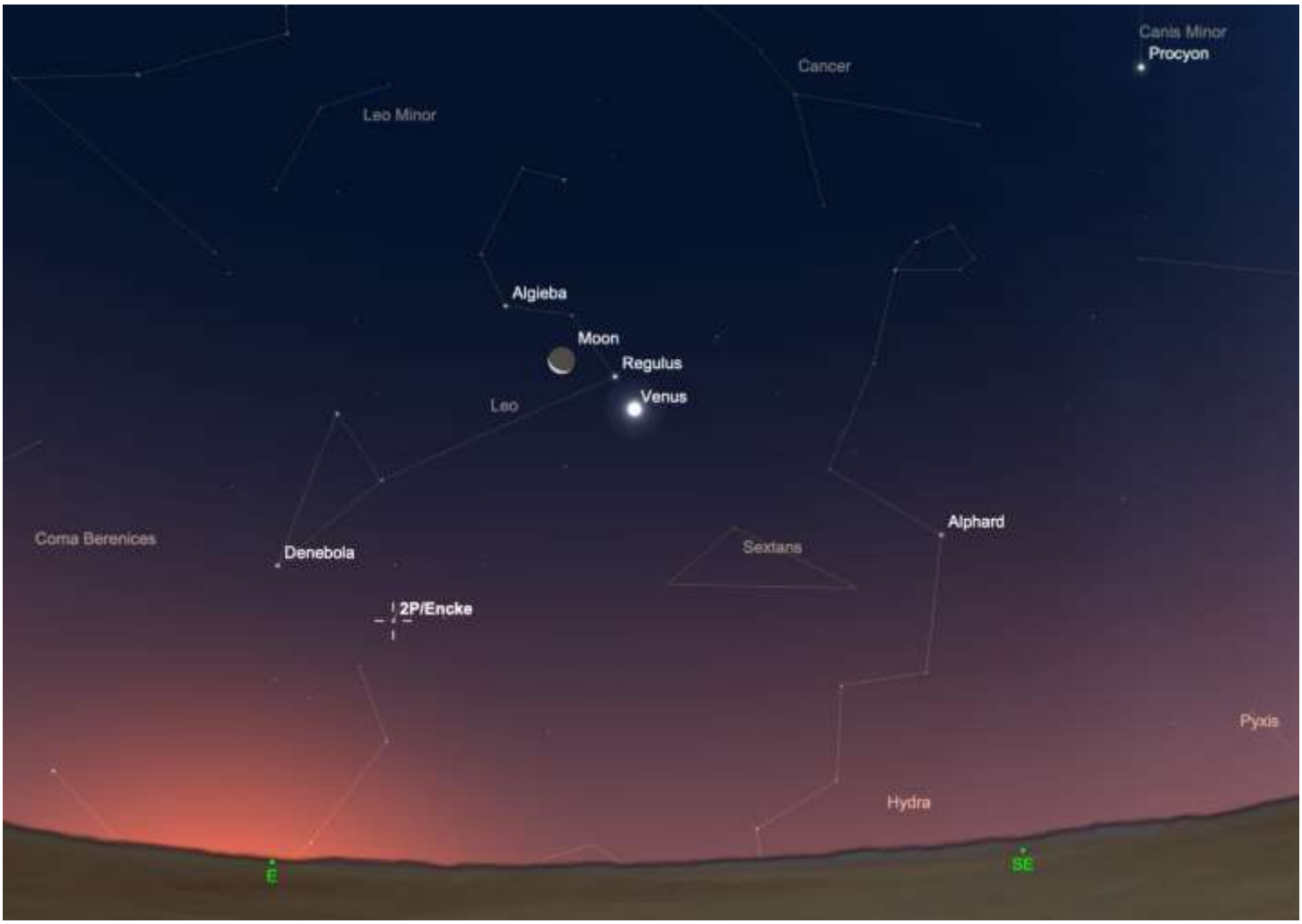
5. Enjoy the best images from the Astronomy Photography of the Year competition for 2023.

And the astronomy quote of the month...*"We are stardust brought to life, then empowered by the universe to figure itself out—and we have only just begun."* Neil deGrasse Tyson

The northern winter constellations Orion, Canis Major, and Taurus. (Looking for last month's 'Night Sky'? Find it at this link…)

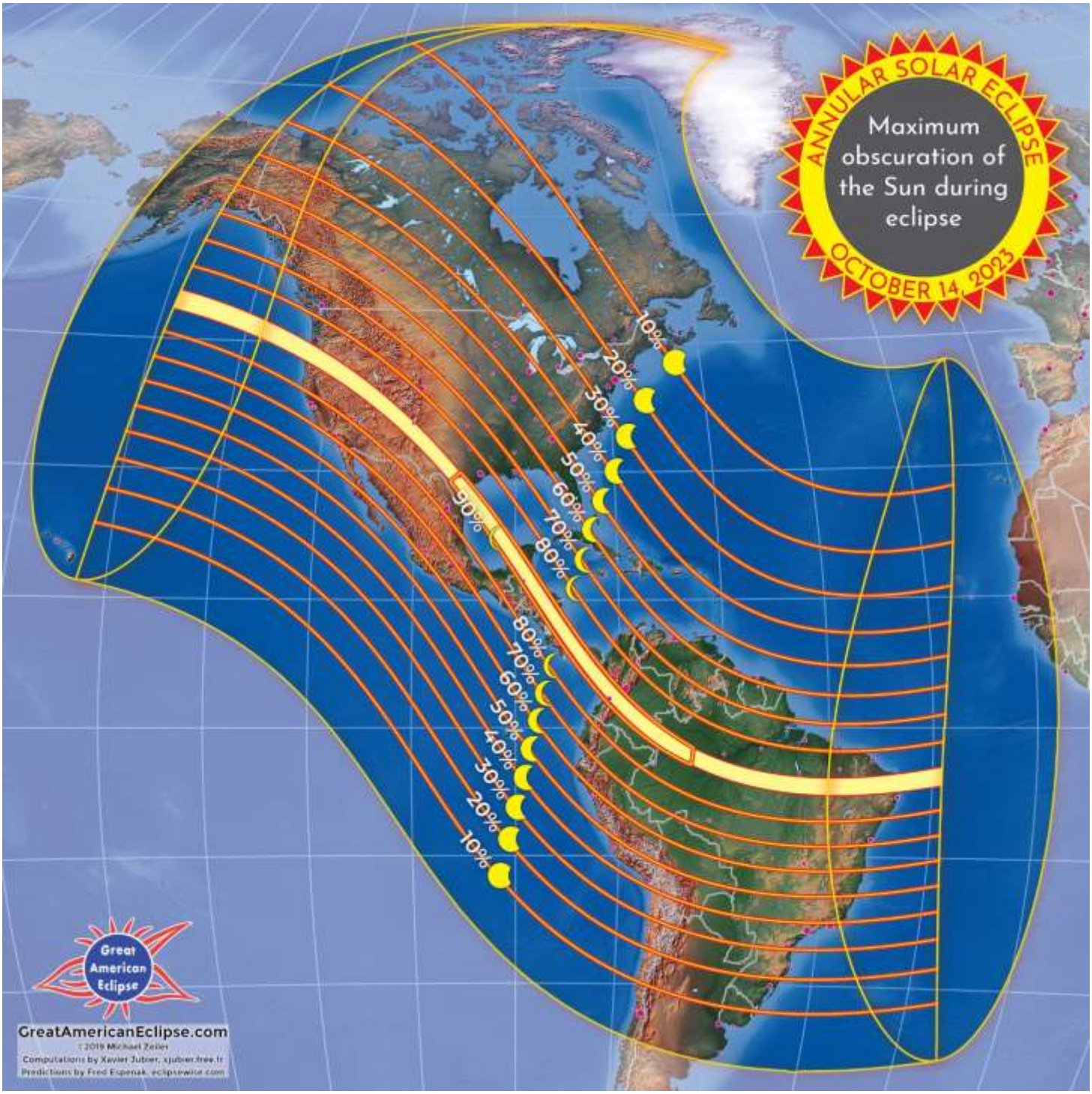
While deep-sky sights abound in the evening sky, our own solar system offers us the best sights this month. Jupiter and Saturn move into prime viewing territory, two meteor showers arrive, and solar and lunar eclipse also fill out the month of October. Here's what to see in the night (and daytime) sky this month.

1-2 October 2023. The fat waning Moon rises with Jupiter in the east in the mid-evening hours. Now just a month from opposition, Jupiter shines brightly at magnitude -2.7 and dominates the eastern sky before midnight and far outshines any star in the sky. The planet, now in southern Aries, is well-positioned for observing through the end of the year and into early 2024.
6 Oct. Last Quarter Moon, 13:48 UT
7 Oct. The waning crescent Moon lies the star Castor and Pollux in Gemini in the pre-dawn sky.



Venus and a waning crescent Moon on either side of Regulus in the eastern sky at morning twilight on Oct. 10, 2023.

10 Oct. Look to the east before dawn to see Venus about 2° south of Regulus, the brightest star in Leo, while the Moon lies about 3° north of the same star. Venus continues its excellent apparition as the 'Morning Star' and shines today at magnitude -4.5. In a telescope, its disk spans about 28" and appears as a thick crescent. As the month progresses, the planet's disk becomes half-lit then moves into a gibbous phase.
12-16 Oct. Over the next two weeks, northern-hemisphere observers with very dark sky can see the zodiacal light in the east about 90-120 minutes before sunrise. This whitish glowing wedge of light appears to thrust upward from the horizon. The zodiacal light is simply sunlight reflected off tiny dust particles in the inner solar system.
14 Oct. New Moon, 17:55UT.
14 Oct. An annular solar eclipse arrives in a narrow band across North America (from Oregon to Texas), Central America, and northern South America. The eclipse occurs from 16:12 UT to 19:46 UT. Outside the band of annularity, many observers in the Americas will see a partial solar eclipse over a wide area. Look for precise timing and visibility at this link.



The path of the annular solar eclipse on Oct. 14, 2023. This map also shows the regions where a partial solar eclipse is visible. Image credit and copyright Michael Zeiler at GreatAmericanEclipse.com

Oct. 15. It's not much to look at, but little Comet 2P/Encke makes a return this month to our part of the solar system. After Comet 1P/Halley, Encke was the second comet for which a periodic orbit was calculated, in this case by its namesake Johann Franz Encke in 1819. The comet was seen by Charles Messier in 1786 and Caroline Herschel in 1795, among other observations. But it was Encke who figured out all these observations were of the same comet. With a 3.3-year orbital period, the comet is a frequent visitor to the inner solar system. But it's not particularly bright. In mid-October this year, the comet may reach a peak brightness of magnitude 7.5 as it travels across Leo and Virgo. Grab a small telescope and have a look – it will have a dense coma and, at best, a small tail that points westward away from the Sun.

The path of Comet 2P/Encke in early October 2023 in the eastern morning sky.

22 Oct. The Orionids, one of the best meteor showers of the year, peak in the early morning hours today. They usually show as many as 20-40 fast-moving meteors per hour in dark sky. These meteors can appear anywhere in the sky and trace their paths back to the radiant near the top of the club of Orion. Maximum activity usually occurs between midnight and dawn. The first quarter Moon gets out of the way by the time of maximum meteor activity this year. Like the Eta Aquariids in May, the Orionids are tiny pieces of Comet 1/P Halley that strike the upper atmosphere as the Earth passes through the famous comet's debris field.
22 Oct. First Quarter Moon, 03:29 UT
23 Oct. Venus lies high and bright in the early morning sky at greatest western elongation some 46^{o} from the Sun.
24 Oct. Saturn lies about 3^{o} north of a growing gibbous Moon today. The planet is past opposition but still in a great position for observing in a telescope. The lengthening shadows that result from the angle between the planet, Earth, and Sun make for a more dramatic appearance of the rings when observed at high magnification in a telescope.
26 Oct. Tiny Neptune lies about 1.5^{o} north of the Moon.
29 Oct. Full Moon, 20:25 UT.
31 Oct. The South Taurid meteor shower peaks on Nov. 6, but the shower is now underway. Look for bright meteors tracing their path back to Taurus which you can see in the eastern sky in the late evening. Because of increasing activity at the end of October, the South Taurids are sometimes called the "Halloween Fireballs".

October Skies

Dick Cookman

Highlights: Comet Journal, Martian Landers, Meteor Showers, Planet Plotting, October Moon

Focus Constellations: Ursa Major, Ursa Minor, Draco, Cepheus, Cassiopeia, Camelopardalis, Auriga, Perseus, Andromeda, Pegasus, Cygnus, Aquila, Lyra, Hercules

Comet Journals

Comets C/2023 P1 (Nishimura) was briefly viewed in the glow of the Sun before dawn in the first week of September between Cancer and Leo then moved into evening skies, staying so close to the Sun and horizon that relatively few observers were able to enjoy its beauty as it moved through Leo in the 2nd week, and Virgo in late September before dropping into southern hemisphere skies. It may be an Oort Belt comet and was closest to Earth on September 12. It passed through perihelion on September 18.

Comet 103P/Hartley is a nice sight at 8th magnitude in larger (50+mm) binoculars, or small (3 to 4in.) diameter telescopes. In early to mid-October it moves from Auriga, through Gemini, into Cancer. It was closest to Earth on September 26 and will reach perihelion on October 12. The green comet has a mile long tail hiding behind it so we see a slightly out of round image with one side showing a tiny bit of the tail.

Mars Landers

The Mars Perseverance rover is exploring Jezero Crater and collecting samples of rocks and soil that may preserve signs of ancient life. Those samples have been stowed for future return to Earth. Experiments with the onboard MOXIE instrument have been completed, proving that it can generate oxygen from the Martian atmosphere. The oxygen can be used to combust rocket fuel for the return trip to Earth for future missions, greatly reducing the need to transport oxygen from Earth for that purpose. Returning samples to Earth, would permit far more extensive testing in order to reveal details about the origin of Mars, its ancient history, and modern day conditions which influence formation and evolution of the samples. Mars has abundant CO2, H2O, an other substances which may be utilized for the production of oxygen and other substances, facilitating life support and enabling logistical advances for the eventual visitation and exploration and of Mars by humans.

Meteor Showers

October provides the moderate Draconid meteor shower and a better Orionid shower which is more favorable because the Moon sets well before best viewing at 4:00AM.

- **October 8-9, 11PM: Draconids.** Active Oct. 6 – 10. Radiant 17h28m +54°. ZHR 0 to storm. 20 km/sec. Unfavorable, Waning Crescent Moon. Progenitor: Comet 21P/Giacobini-Zinner
- **October 21, 4AM: Delta Aquariids.** Active October 2 – November 7. Radiant 06h20m +16°. ZHR 20. 66 km/sec. favorable – Waxing Crescent Moon. Progenitor: Comet 1P/Halley.

Planet Plottings

Mercury (-1.0 to -0.7) in Leo, Virgo, and Libra, Venus (-4.4 to -4.2 in Leo, and Uranus (+5.7 to +5.6) and Jupiter (-2.7 to -2.8) in Aries are morning planets. Before sunrise on the 1st, Mercury is low in the sky. By the 5th, it is lost in the Sun's glare as it approaches superior solar conjunction on the 20th. Venus shines brightly before dawn below Leo throughout the month. It is brightest in early October and highest in the southwestern sky on the 23rd when at greatest western elongation of 46 degrees. Uranus and Jupiter rise in Aries after 8PM EDT and are best viewed when they are high in the southern sky after midnight. As Jupiter approaches solar opposition on November 3, it will get progressively brighter during October.

Neptune and Saturn rise before sunset and are best viewed in the evening. Although Saturn's opposition with the Sun was last month, it is still an impressive sight in southern evening skies. Mars is now on the other side of the Sun and is lost to view as it is buried in its glare and approaching solar conjunction on November 18.

A waning gibbous Moon appears to pass Jupiter on the 1st and Uranus on the 2nd. The waning crescent passes Venus on the 10th and Mercury on the 14th. The waxing Crescent passes Mars on the 15th, then the waxing gibbous Moon passes Saturn on the 24th, Neptune on the 25th, and Jupiter & Uranus on the 29th.

Planet	Constellation(s)	Magnitude	Planet Passages	Time	Date
Sun	Virgo	-26.5	New Moon	1:55PM EDT	10/14
Mercury	Leo, Virgo, Libra	-1.0 to -0.7	Superior Conjunction	2:00AM EDT	10/20
Venus	Leo	-4.4 to -4.2	Max. West Elongation (46 degrees)	7:00PM EDT	10/23
Mars	Virgo, Libra	1.7 to 1.5			
Jupiter	Aries	-2.7 to -2.8			
Saturn	Aquarius	0.6 to 0.7			
Uranus	Aries	5.7 to 5.6			
Neptune	Pisces	7.8			

October Moon

The New Moon of October is in Virgo on the 14th at 1:55PM EDT. There will be an annular lunar eclipse in the western USA on a line from the southwest coast of Oregon to southeast coast of southern Texas. The New Moon marks the start of Lunation 1247 which ends 29.68 days later with the New Moon of November in Aquarius on the 13th at 4:26AM EST.

The Full Moon on the 28th occurs at 4:24PM in Sagittarius. It is called the Hunter's Moon. It was called the Blood Moon in Medieval England. For Celts, it was the Harvest Moon and, in China, it is the Kindly Moon. The Harvest Moon was in September this year and Colonial Americans called the succeeding full moon the Hunter's Moon because hunters can easily see and hunt any animals attracted by the produce left behind in the newly harvested fields.

Anishnaabe (Odawa and Ojibwe) first people recognize the 10th Moon of the year as "Binaakwe-giizis" (Falling Leaves Moon). Ontario's Earth Haven Farm presents cultural teachings explaining the cycle of life and nature of October's Grandmother Moon of Creation: "The tenth moon of Creation is the Falling Leaves Moon, a time when Mother Earth is honored with the grandest of colors. As all of Creation makes their offerings to her, we become aware of all the miracles of Creation before us and our spiritual energies are once again awakened."

Lunar Apogee (maximum lunar distance) is on October 9 at 11:42PM EDT when the Moon's distance is 251,920 mi. (63.57 Earth radii). Lunar perigee is on the 25th when the Moon is at 226,721 mi. (57.21 Earth radii) at 11:02PM EDT.

Planet	Constellation	Magnitude	Moon Passages	Moon Phase	Moon Age
Sun	Virgo	-26.8	1:55PM EDT, 10/14	New	0 Days
Mercury	Virgo	-1.3	0.65°S, 6:00AM EDT, 10/14	Waning Crescent	29.39 Days
Venus	Leo	-4.3	6.0°N, 6:00AM EDT, 10/10	Waning Crescent	25.35 Days
Mars	Virgo	1.7	0.94°S, Noon EDT, 10/15	Waxing Crescent	0.92 Days
Jupiter	Aries	-2.7	3.0°N, 11:00PM EDT, 10/1	Waning Gibbous	17.06 Days
Jupiter	Aries	-2.8	3.0°N, 4:00AM EDT, 10/29	Waning Gibbous	14.59 Days
Saturn	Aquarius	0.7	3.0°S, 4:00AM EDT, 10/24	Waxing Gibbous	9.59 Days
Uranus	Aries	5.7	3.0°N, 1:00PM EDT, 10/2	Waning Gibbous	17.64 Days
Uranus	Aries	5.6	3.0°N, 10:00PM EDT, 10/29	Waning Gibbous	15.34 Days
Neptune	Pisces	7.8	1.5° S, 9:00PM EDT, 10/25	Waxing Gibbous	11.30 Days

NASA Night Sky Notes

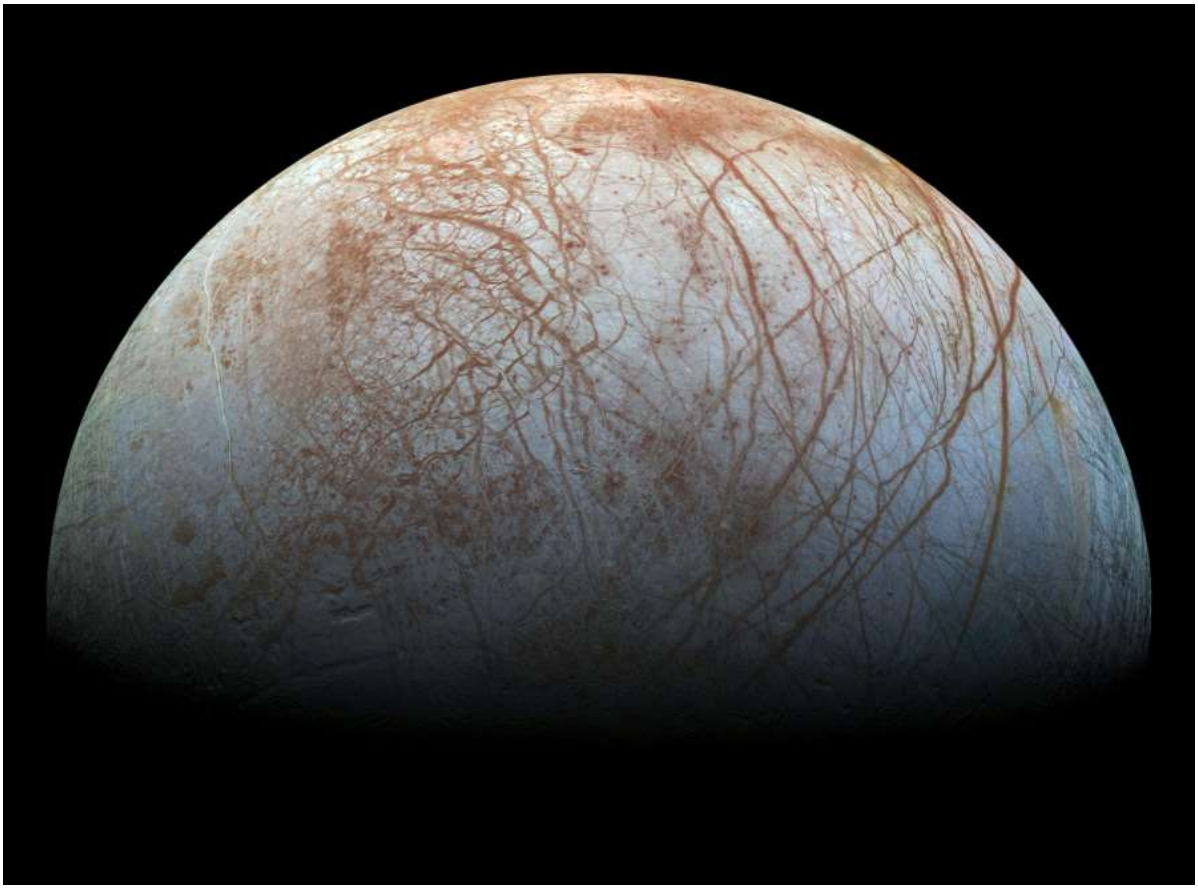
This article is distributed by NASA Night Sky Network

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!

From Galileo to Clipper, Exploring Jupiter's Moons

By Vivian White

"…We, too, are made of wonders, of great and ordinary loves, of small invisible worlds, of a need to call out through the dark." From *In Praise of Mystery: A Poem for Europa* by Ada Limon



As autumn begins, if you're up late, you may notice a bright point of light rising in the east. Look a bit closer, with a pair of binoculars, and you'll notice it's not a star at all. While stars look point-like no matter how big your backyard telescope, this light appears as a circle under closer examination. Even more curious, you will likely see a line of smaller dots on one or both sides. Congratulations! You've rediscovered the king of the planets - majestic Jupiter - and its four largest moons.

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Ori. * ○ * * Occ.

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Ori. * * ○ * * Occ.

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ab orientali viciniori aberat min. 2. ab occidentali verò ſequente min. 4. hæc verò ab occidentaliori diſtabat min. 3. erantque æquales omnes, & in eadem recta ſecundum Eclypticam extenſa.

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Die ſexta duæ ſolummodo apparuerunt Stellæ me-

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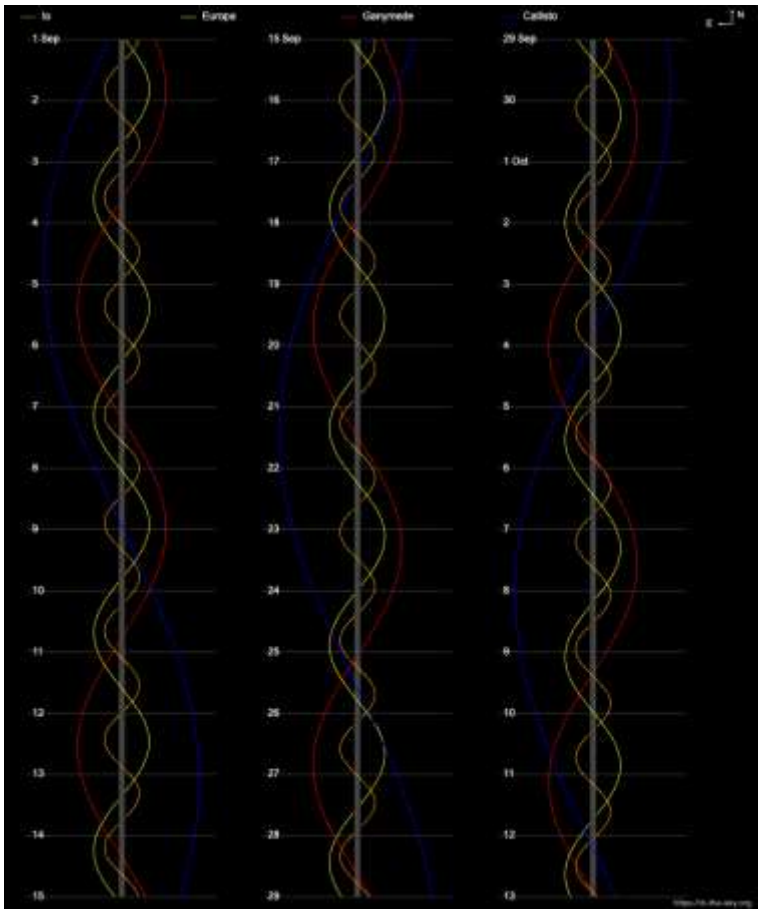
Galileo's drawings of Jupiter and its Medicean Stars from Sidereus Nuncius. Image courtesy of the History of Science Collections, University of Oklahoma Libraries.

Galileo famously chronicled the four moving dots near Jupiter and surmised that they were orbiting the distant world. While Jupiter has well over 80 discovered moons as of September 2023, these brightest four are called the “Galilean Moons” - Io, Europa, Ganymede, and Callisto. (Great mnemonics exist to remember these in order of distance from

Jupiter, such as “I Eat Green Caterpillars”) You can follow these like Galileo did, using stargazing apps or the handy image below. A favorite beginning observing challenge is to track the movement of the Galilean Moons over the course of many nights. Even within a few hours, you will notice them moving in relation to Jupiter, just as Galileo did.

Fast forward 414 years, and NASA will be sending a robotic mission to investigate the surface of one of these distant worlds. The Europa Clipper Mission is launching to the cold, icy moon in 2024, to begin orbiting in 2030. With its salty oceans covered by ice, Europa was chosen as an excellent location to continue the search for life outside of Earth. Clipper will be the largest spacecraft ever sent to another planet, designed to withstand Jupiter’s punishing radiation. Once it arrives at Jupiter in 2030, NASA plans to do about 50 flybys of Europa, mapping almost the entire surface of this watery world.



The position of the Galilean Moons of Jupiter in October 2023: https://in-the-sky.org/jupiter.php

What was once only dreamed of in the small telescope of Galileo, or in great works of fiction, NASA is turning our wildest imagination into reality. One of the celebrated quotes from the classic 2010: Odyssey Two warns, “All these worlds are yours, except Europa. Attempt no landing there.” Science fiction fans can feel relieved knowing that writer Arthur C. Clarke gave his blessing for the Europa Clipper mission.

Join the Europa Message in a Bottle Campaign to send your name with the spacecraft, hear the rest of the poem by the US Poet Laureate, and learn more about the wonders of space travel with the Clipper Mission: https://europa.nasa.gov/participate

Watch a wonderful Clipper webinar with Dr. Cynthia Phillips, planetary geologist with the mission: https://www.youtube.com/live/RnnLJBLRBCA?feature=shared&t=269

Phil Harrington's Cosmic Challenge

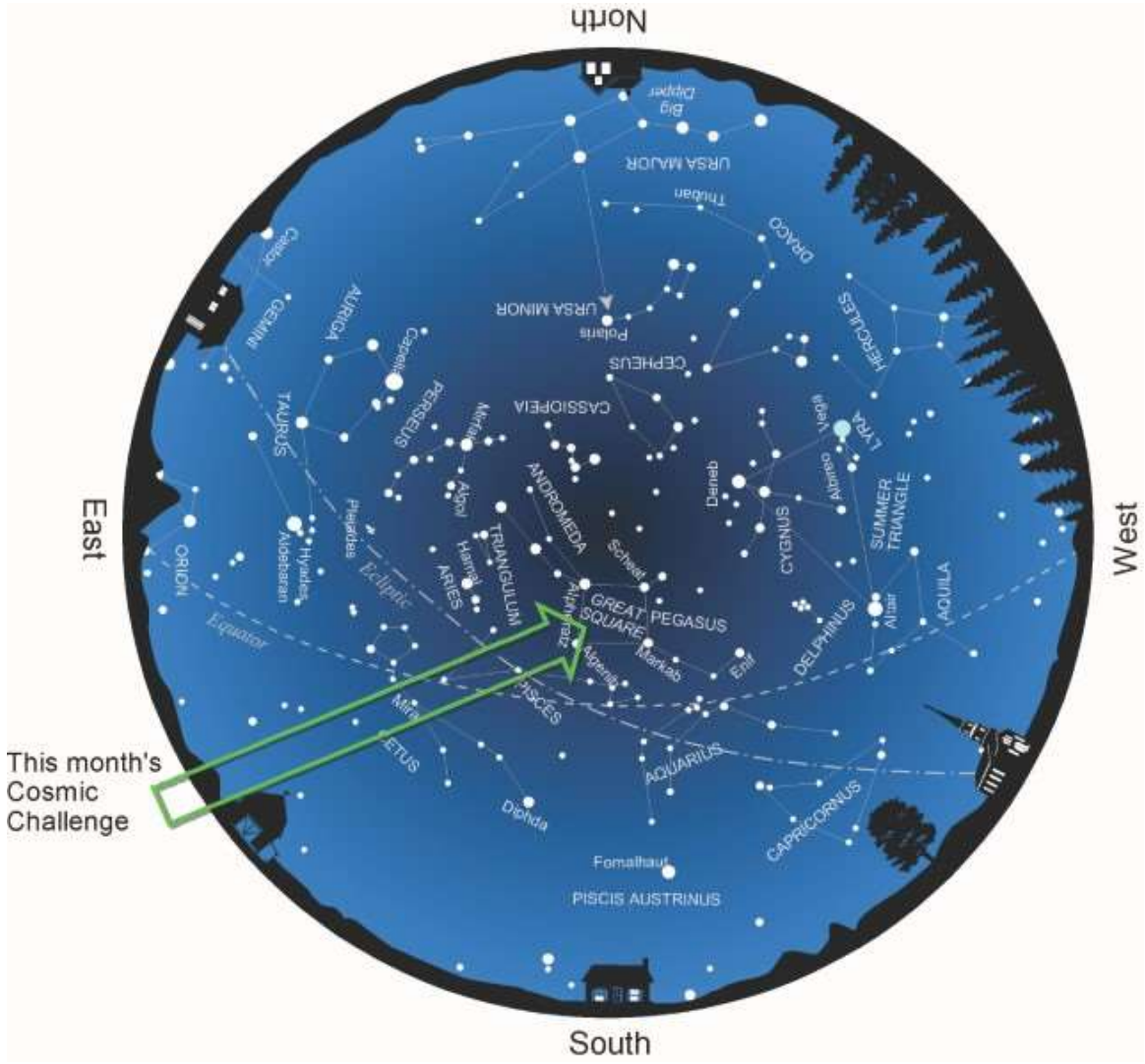
The Great Square

This month's suggested aperture range: The Naked Eye

Target	RA	DEC	Constellation	Magnitude
Stars in the Great Square	23h 38m	+22°	Pegasus	varies

Pegasus is one of the best-known autumn constellations. Depicting the winged horse that Perseus used to rescue Princess Andromeda from the clutches of Cetus the Sea Monster, Pegasus flies high in our southern sky during October and November evenings.

Pegasus is usually drawn upside down in our sky, with four stars – Alpheratz (Alpha [α] Andromedae), Scheat (Beta [β] Pegasi), Markab (Alpha [α] Pegasi), and Algenib (Gamma [γ] Pegasi) -- marking the corners of a great square that frames the horse's torso. (Although always shown as marking the northeast corner of the Great Square of Pegasus, Alpheratz is technically assigned to the neighboring constellation Andromeda. In fact, Alpheratz is Alpha (α) Andromedae.)



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

Above: The Great Square rises over trees from the author's Long Island backyard.

A line of three stars – Homam (Zeta [ζ] Pegasi) Baham (Theta [θ] Pegasi), and Enif (Epsilon [ε] Pegasi) -- hooking to the southwest of Markab is usually shown as the horse's neck and head, with Enif marking its nose.

Unfortunately, this means that poor Pegasus is flying upside down from a Northern Hemisphere perspective. To make matters worse, we only see the front half of the horse; its hindquarters are nowhere to be found (there is a political joke in here somewhere, but I'll leave that to you).

Rather than strain to see a horse flying across the sky, planetarium lecturers often tell their audiences that the Great Square marks a baseball diamond, a perfect allusion for this month's World Series. In our cosmic baseball diamond, Scheat and Alpheratz, both 2nd magnitude, mark home plate and first base, respectively. The remaining two stars, Algenib and Markab, both 3rd-magnitude stars, are second and third base, respectively.

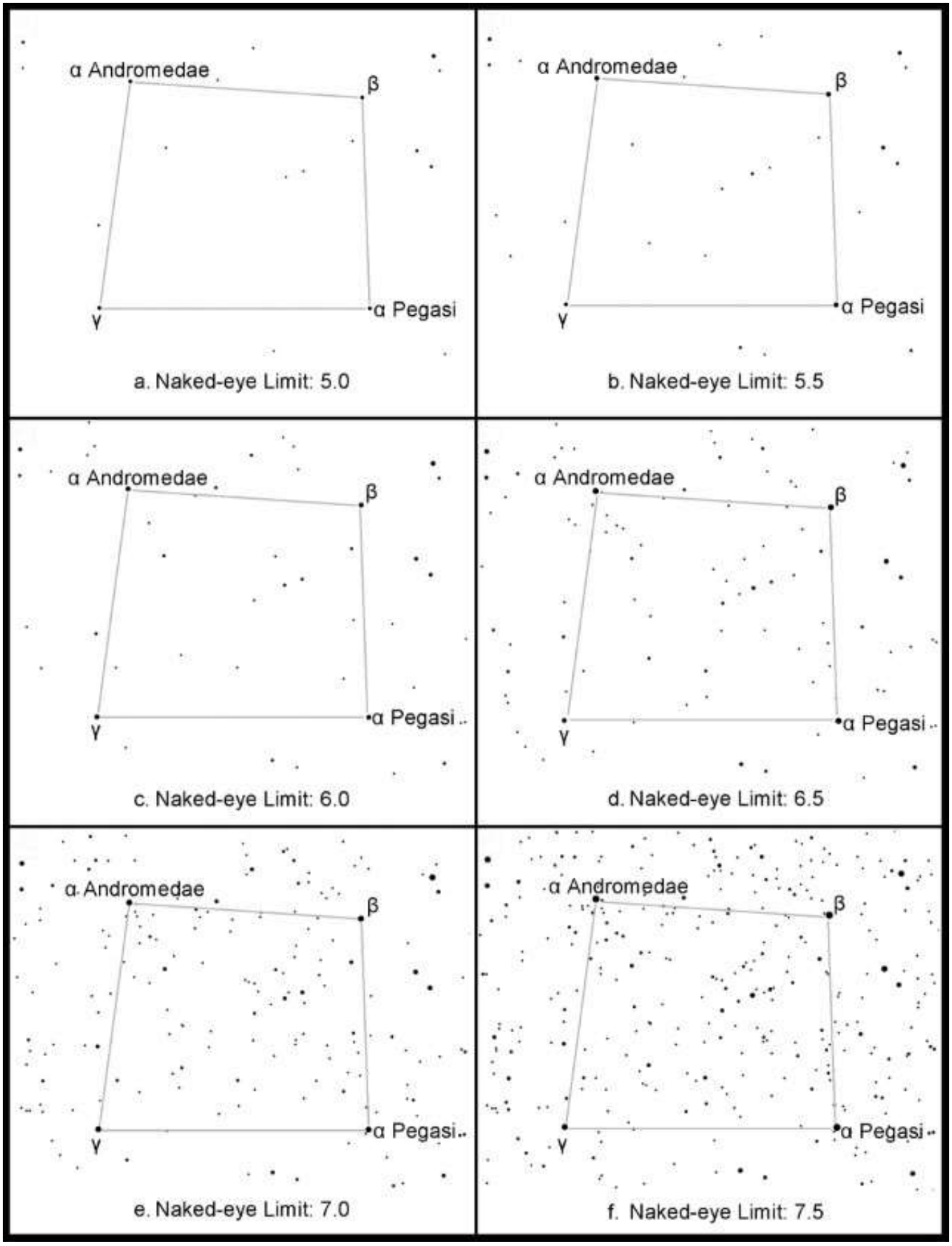


Chart adapted from Cosmic Challenge by Phil Harrington Click on the chart to open a printable PDF version in a new window

Let's fill in the rest of the team players out in the field. Pitching today's game is number 71; 5.3-magnitude 71 Pegasi, that is. It looks like he's about to be joined on the mound by 4.4-magnitude catcher Upsilon (υ) Pegasi and team manager Tau (υ) Pegasi, at magnitude 4.6. It would also appear that the home plate ump, 4.8-magnitude 56 Pegasi, is heading out to see what's going on. With a time-out called, the batter, 3.5-magnitude Mu (μ) Pegasi has headed back to the on-deck circle to talk to Lambda (λ) Pegasi, at magnitude 4.0, who is next at bat.

Meanwhile, at first base, we have Psi (ψ) Pegasi, a 4.7-magnitude sun that appears to be playing in as if looking for the batter to bunt. Second baseman Chi (χ) Pegasi, at magnitude 4.8, is playing in the hole between first and second. Shortstop Phi (φ) Pegasi, at magnitude 5.1, and third baseman 70 Pegasi (magnitude 4.6) round out the infield, while HD 216489 is the 5.6-magnitude third base coach.

Depending on the darkness and transparency of your observing site, you may be able to see the full complement of players on our cosmic ball field, or possibly just the four bases. From dark, rural sites, however, the infield looks to be overrun by fans racing in from the stands, as if this must have been the final game of the World Series and the game has just ended.

Stars within the Great Square of Pegasus

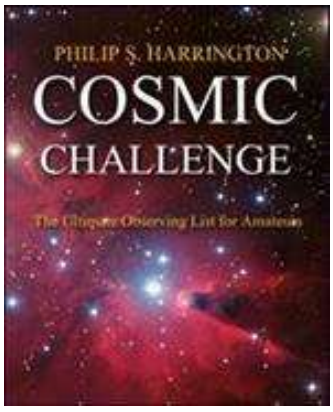
Naked-eye Limiting Magnitude	Number of stars	Chart panel
5.0	4	a.
5.5	7	b.
6.0	9	c.
6.5	24	d.
7.0	37	e.
7.5	76	f.

How many stars can you count inside the Great Square? The table above lists the number of stars visible in half-step increments beginning at magnitude 5.0, while the corresponding panels in the chart above plot the locations of those stars.

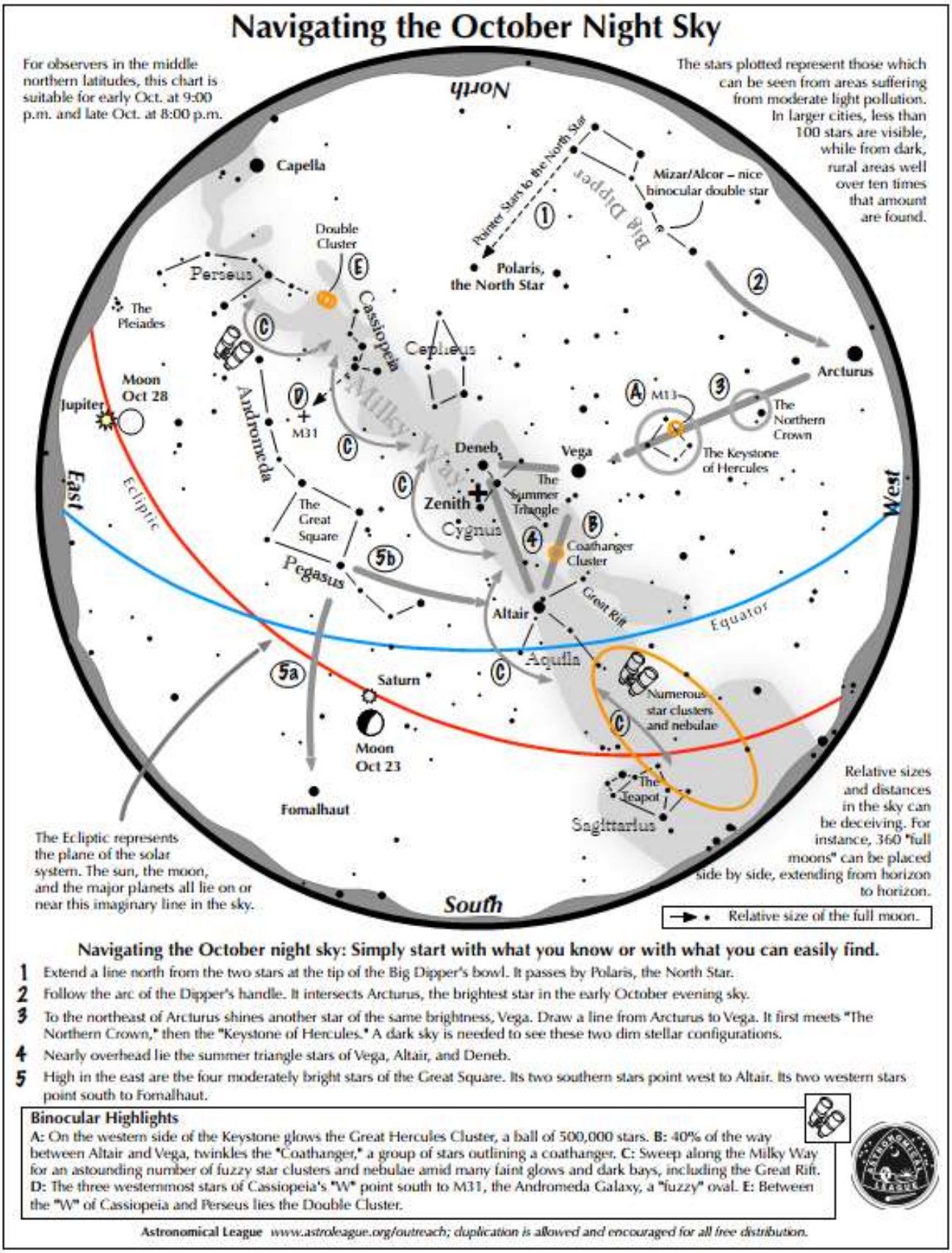
Wait for the Great Square to reach culmination, its greatest altitude above the horizon, before attempting a star count. That occurs at about 10 PM local standard time (11 PM local daylight saving time) on October 1 and 8 PM local standard time (9 PM local daylight saving time) on November 1.

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. Visit his web site at www.philharrington.net to learn more.



Night Sky Map



Navigating the October 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. Follow the arc of the Dipper's handle. It intersects Arcturus, the brightest star in the early October evening sky.
3. 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.
4. Nearly overhead lie the summer triangle stars of Vega, Altair, and Deneb.
5. High in the east are the four moderately bright stars of the Great Square. Its two southern stars point west to Altair. Its two western stars point south to Fomalhaut.

Binocular Highlights

A: On the western side of the Keystone glows the Great Hercules Cluster, a ball of 500,000 stars. **B:** 40% of the way between Altair and Vega, twinkles the "Coathanger," a group of stars outlining a coathanger. **C:** Sweep along the Milky Way for an astounding number of fuzzy star clusters and nebulae amid many faint glows and dark bays, including the Great Rift. **D:** The three westernmost stars of Cassiopeia's "W" point south to M31, the Andromeda Galaxy, a "fuzzy" oval. **E:** Between the "W" of Cassiopeia and Perseus lies the Double Cluster.

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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 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 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