Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

January 2023

Membership Meeting
Saturday, January 14th, 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

Club Officers

Gary Leavitt, President
garysastrolabs@gmail.com

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

Secretary

Jim Tubbs, Treasurer, AL-Cor
jtubbs015@msn.com
208-404-2999

David Olsen, Newsletter Editor

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

President's Message

MVAS Astro members and friends…Hope the Holiday Season was good and safe for all of you.

Don't really have a lot of items to discuss this month. Unfortunately during my recent stay with family members over the break, I caught a good dose of the flu bug. My doc says there's a lot of it going around.

Back to Astro: Our scheduled meeting on the 14th will feature our annual telescope workshop. Tim F will be bringing one of his projects down and I will visit with you on more lighter and mobile setups. Also should mention that January is the time we all need to get caught up on our dues. Jim T. will gladly accept your annual dues, which still is $20 / member. Quite the bargain in this day and age.

Whereas January and create a chilling background to observe and/or image, some of the best skies for Astro can be experienced. Some of my better comet imaging has been during the winter months. Speaking of which, I have been reading several articles about a potentially naked eye comet C/2022 E3 (ZTF) that was discovered last March. Posts say the comet will reach its perihelion Jan 12th and make its closest approach to earth about Feb 1st. You can check cometchasing.skyhound.com for a daily track. "And then there's Orion, standing magnificently in the Southern Sky."

Best to you all;

Gary Leavitt, President
MVAS

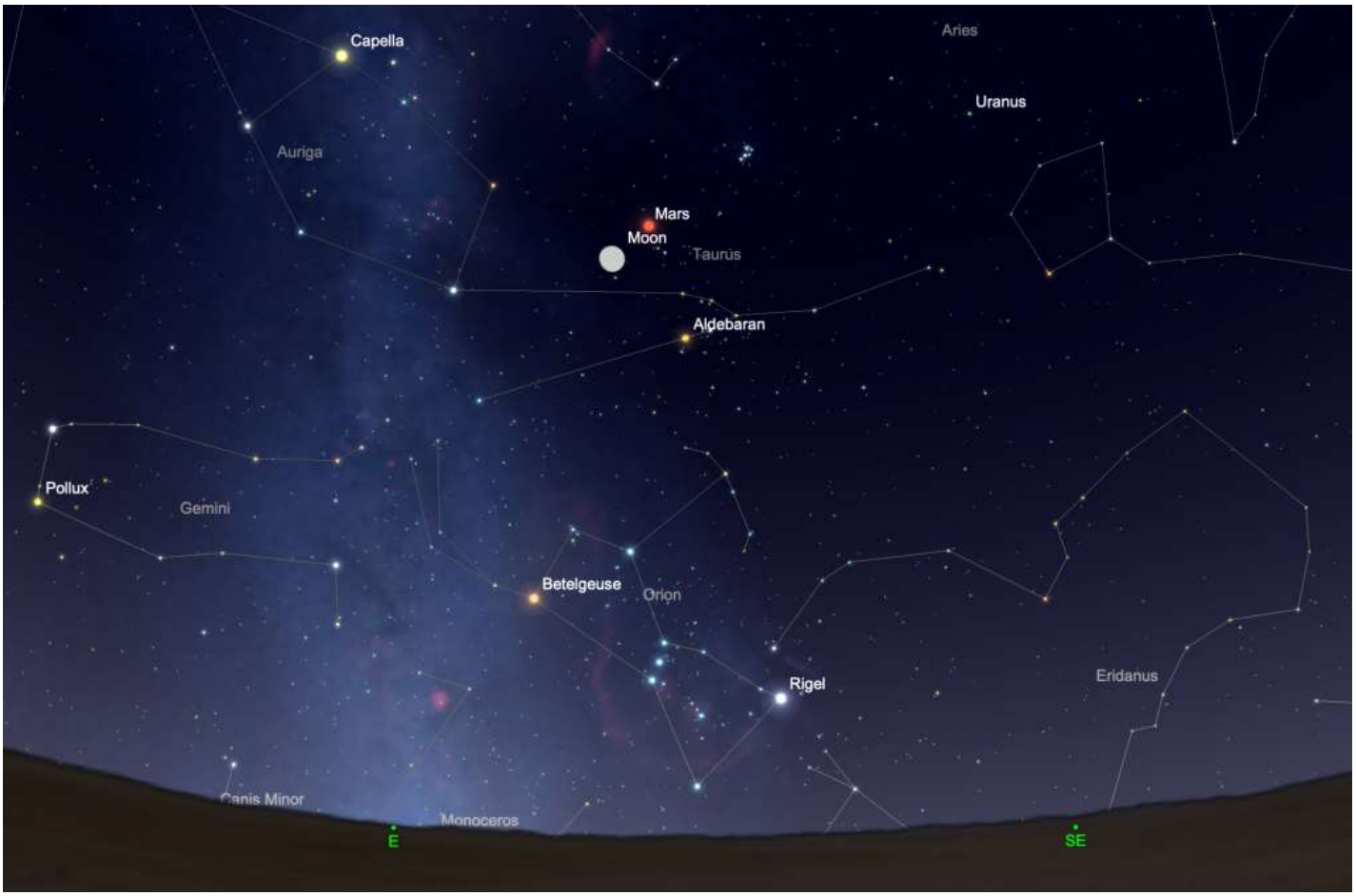
January Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 New Year's Day 	2	3	4	5	6 Full Ice Moon  Visible: 100% Age: 14.36 days	7
8	9	10 Telescope Tuesday 6:30p to 9:00p Details in the Centennial Observatory Section	11	12	13 Twin Falls Parks & Recreation "Cabin Fever Day" Solar Viewing On the 14th	14 **MVAS General Meeting** Herrett Center 7:00 pm Centennial Obs. Monthly Star Party 6:30p – 9:00p
15 Last Quarter Moon  Visible: 46% ↓ Age: 22.55 days	16 Martin Luther King Day 	17	18	19	20	21 New Moon  Visible: 1% ↓ Age: 29.10 days Lunation 1238
22 Conjunction of Venus and Saturn 5:00p - 6:00p	23	24 Telescope Tuesday 6:30p to 9:00p Details in the Centennial Observatory Section	25	26	27	28
29	30 Conjunction of Mars and the Moon 9:45pm - 10:45pm	31				

The Night Sky This Month – January 2023

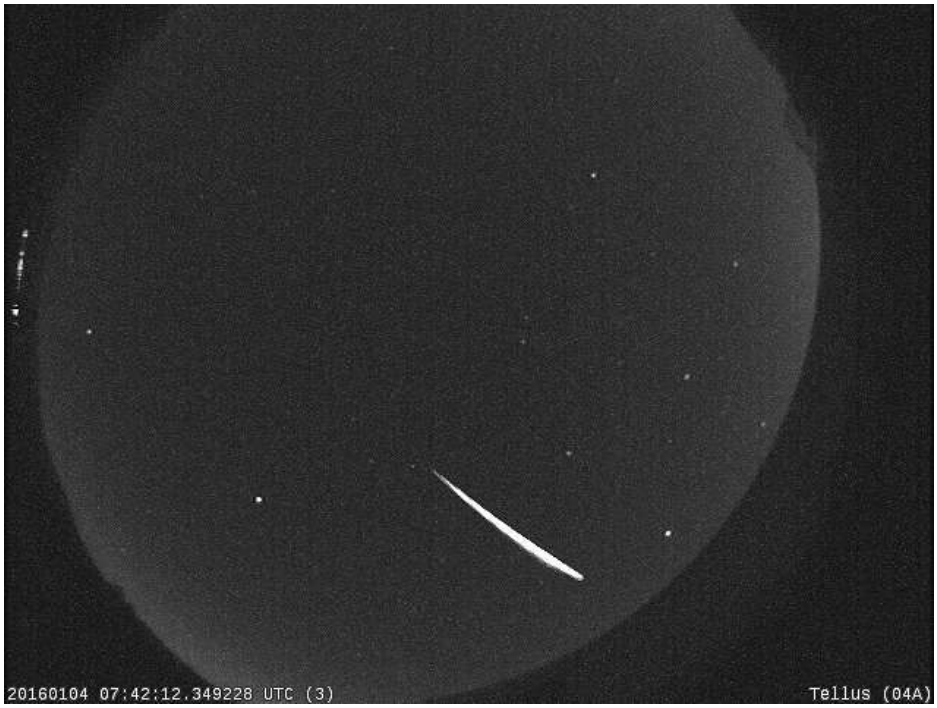
The northern winter constellations over Cathedral Rock near Sedona, Arizona. Image credit: Brian Ventrudo
(Looking for last month's 'Night Sky'? Find it at this link…)

Happy New Year! As 2023 gets underway, four bright planets lie in the evening sky, Mars high up in Taurus with Jupiter, Venus, and Saturn further towards the horizon. Brave the cold on January 4 to spot a few Quadrantid meteors before dawn. Observers in Polynesia, Mexico, and the U.S southwest see the Moon occult Mars on Jan. 30th. And wherever you are, take in the bright and beautiful stars of this season and resolve in this new year to never let a clear sky go to waste. Here's what to see in the night sky this month!



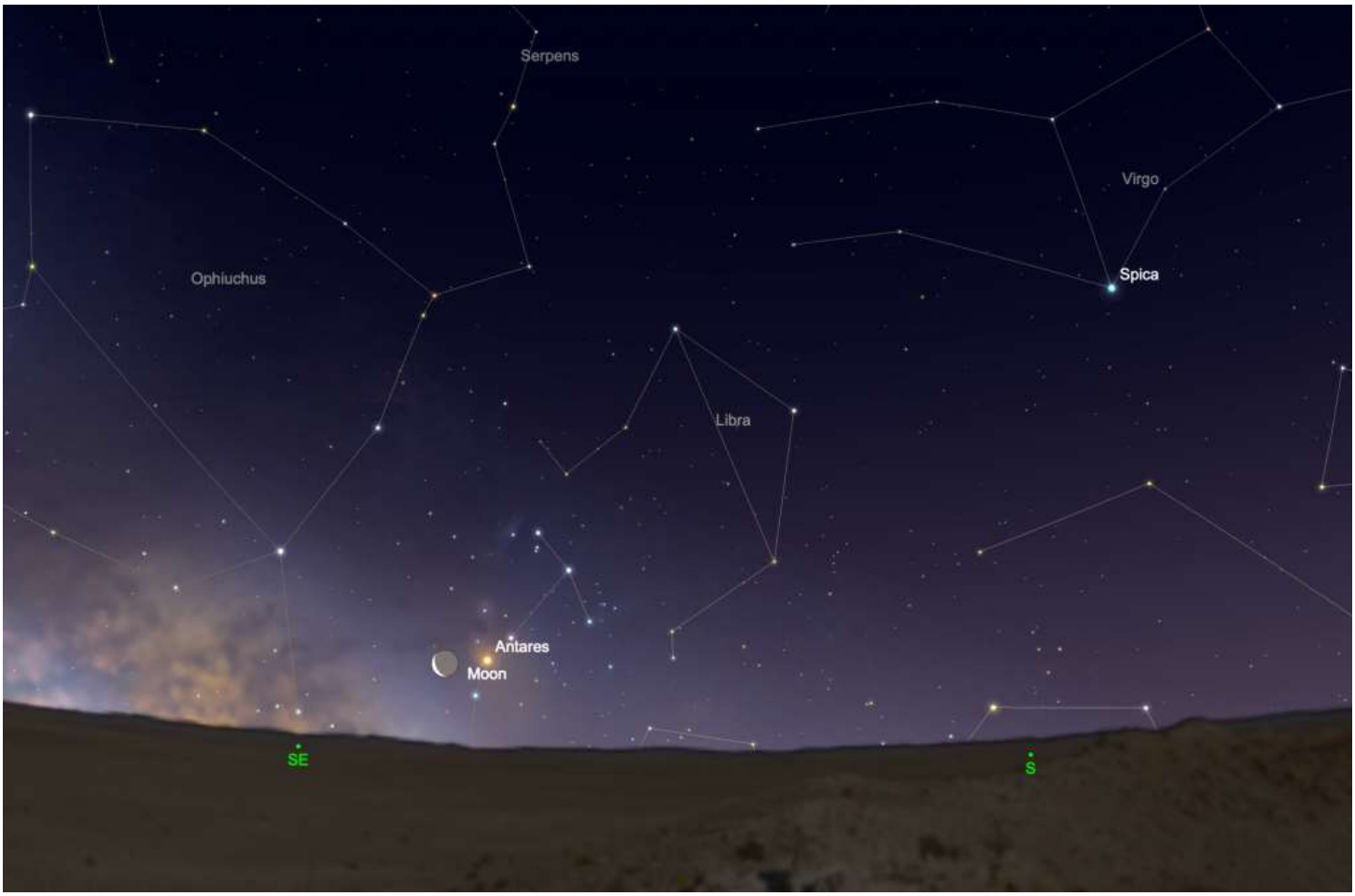
The gibbous Moon and Mars in Taurus on the evening of Jan. 3, 2023.

3 January 2023. A fattening Moon lies near still-bright Mars and the orange star Aldebaran in Taurus. The Red Planet shines at magnitude -1.2 with a disk about 14” across. The planet still lies close enough to reveal detail in a telescope in steady air, but it begins to shrink quickly during January and shines at magnitude -0.3 by the end of the month.



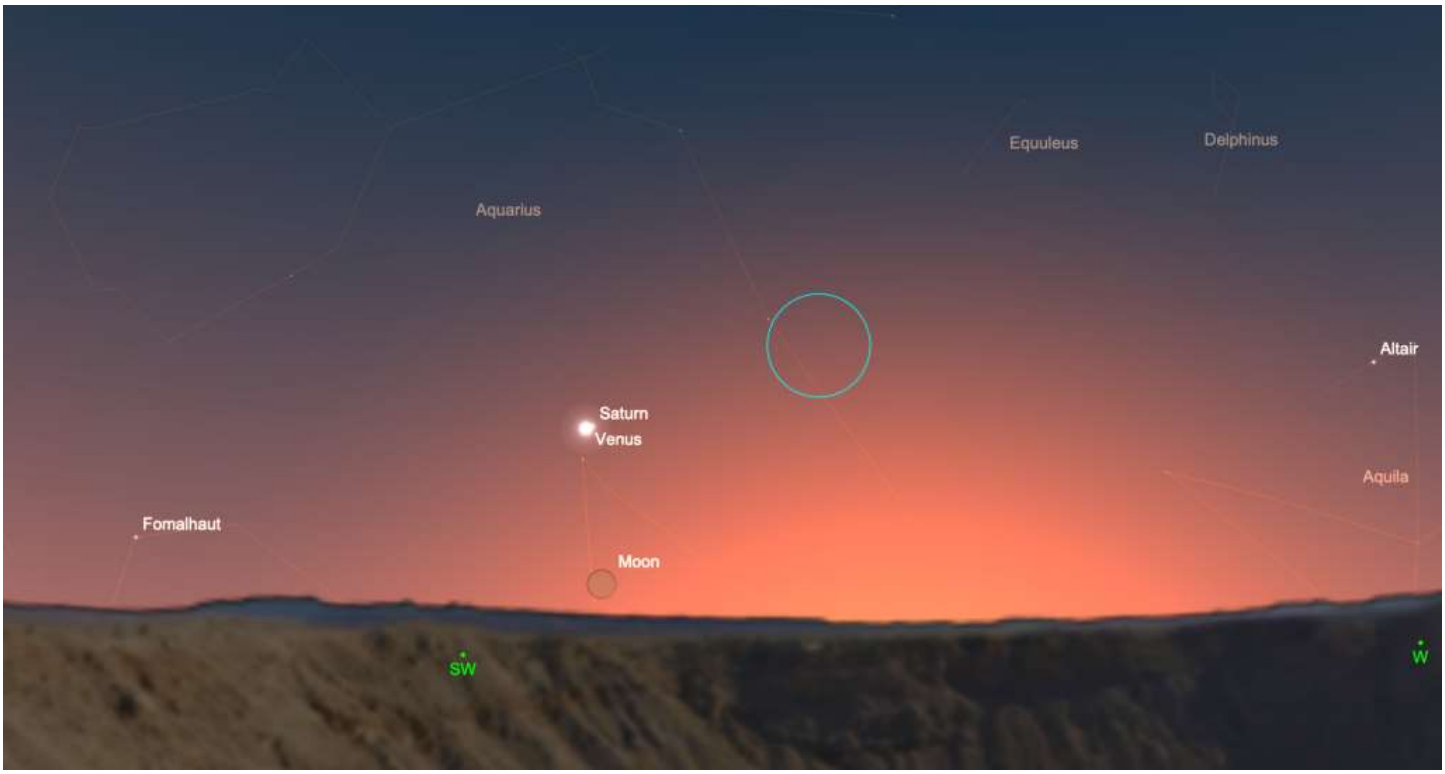
A Quadrantid meteor imaged with a NASA all-sky camera in 2016. Credit: NASA.

3-4 Jan. The brief but sometimes intense Quadrantid meteor shower peaks. The Quadrantids average about 25-40 meteors in dark sky. The predicted time of the peak of the shower is 3h Universal Time on January 4. But look anytime on the night of the 3rd and into the early morning of the 4th, especially in the morning when the radiant is higher in the sky. The Quadrantids take their name from the defunct northern constellation Quadrans Muralis. They can appear anywhere in the sky, but the radiant lies just north of the bright star Arcturus in the northeastern sky in the pre-dawn hours or just over the north-northwestern horizon after evening twilight when the nearly-full Moon gets out of the way. The shower strongly favors northern-hemisphere observers.
4 Jan. Earth lies at perihelion, its closest point to the Sun at a distance of 147,098,925 km.
6 Jan. Full Moon, 23:08 UTC.
6 Jan. The full Moon forms a tidy little triangle with Castor and Pollux, the two bright stars in Gemini.
7 Jan. Mercury reaches inferior conjunction with the Sun.
10 Jan. The waning gibbous Moon sits about 4° from Regulus in Leo in the early-morning hours.
12 Jan. Mars reaches its stationary point and now begins prograde motion eastward from night to night against the background stars. The planet still lies in Taurus near the Pleiades and Hyades star clusters.
15 Jan. Last Quarter Moon, 02:10 UTC
16 Jan. The thinning Moon lies about 6° from Spica in Virgo before dawn.



Antares and the waning crescent Moon in the southeastern sky before dawn on Jan. 18, 2023.

18 Jan. Antares, the bright red-orange supergiant at the heart of Scorpius, reappears low in the southeastern sky before sunrise. Today it's joined by a thin waning crescent Moon.
21 Jan. New Moon, 20:53 UTC



Saturn and Venus lie 0.5 degrees apart in the southwestern sky on the evening of Jan. 22, 2023.

22 Jan. Grab a pair of binoculars to see Venus and Saturn just half a degree apart low in the southwest after sunset. You need a clear view of the horizon to spot the pair as they emerge in the twilight. A small telescope still shows Saturn's rings, if little else with a disk about 15" across, while the 10"-wide disk of far-brighter Venus appears almost fully illuminated

23 Jan. Look for Venus about 3° north of a slender Moon in the southwest.

25 Jan. The waxing crescent Moon lies near Jupiter in the southwest after sunset.

25 Jan. Jupiter lies about 2° north of the thick crescent Moon in the southwest. The planet shines at an impressive magnitude -2.2 and spans about 37". It's always worth a look in a telescope.

28 Jan. First Quarter Moon, 15:19 UTC

28 Jan. The first-quarter Moon lies halfway between Mars and Jupiter.

28-29 Jan. Uranus lies less than a degree north of the Moon.

30 Jan. Mercury reaches greatest western elongation about 25° from the Sun. The planet, now at magnitude 0.0, lies low over the eastern horizon before sunrise for northern observers, but southern-hemisphere observers see the planet at a higher and more accessible altitude over the eastern horizon.

30-31 Jan. Mars lies very close to the gibbous Moon for observers in most of the world. But for observers in New Zealand, Mexico, northern South America, and the southwestern U.S., the planet passes behind the Moon at about 04:00 UTC.

January Celestial Calendar

by Dave Mitsky

All times are UT (subtract seven hours, and one calendar day when appropriate, for MDT)

1/12 Comet C/2022 E3 (ZTF) is at perihelion (166,053,636 kilometers or 103,185,729 miles distant from the Sun) today; Mars is stationary at 21:00
1/15 Last Quarter Moon occurs at 2:10; the Curtiss Cross, an X-shaped clair-obscure illumination effect located between the craters Parry and Gambart, is predicted to be visible at 14:02
1/18 Mercury is stationary at 12:00; the dwarf planet Pluto is in conjunction with the Sun at 15:00
1/20 The Moon is 7 degrees south of Mercury at 8:00; Jupiter is at perihelion at 12:00
1/21 New Moon (lunation 1238) occurs at 20:53; the Moon is at perigee, subtending 33' 31" from a distance of 356,569 kilometers (221,562 miles), at 20:53
1/22 The Moon, Venus, and Saturn within a circle with a diameter of 3.6 degrees at 10:00; Venus is 0.4 degrees south of Saturn at 21:00
1/23 Uranus is stationary at 3:00; the Moon is 4 degrees south of Saturn at 7:00; the Moon is 3 degrees south of Saturn at 8:00
1/25 The Moon is 3 degrees south of Neptune at 6:00
1/26 The Moon is 1.8 degrees south of Jupiter at 2:00; asteroid 6 Hebe (magnitude +8.4) is at opposition at 9:00
1/28 First Quarter Moon occurs at 15:19
1/29 The Lunar X (the Purbach or Werner Cross), an X-shaped clair-obscure illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to be visible at 00:51; the Moon is 0.9 degrees north of Uranus at 4:00
1/30 Mercury is at greatest western elongation (25 degrees) at 6:00; the Hesiodus lunar crater light ray is predicted to be visible at 15:52
1/31 The Moon is 0.1 degrees south of Mars at 4:00

Galileo Galilei discovered Io, Europa, and Callisto on January 7, 1610. Galileo Galilei discovered Ganymede on January 13, 1610. Nicolas-Louis de Lacaille discovered the emission nebula NGC 3372 (the Eta Carinae Nebula) on January 25, 1752. Charles Messier discovered the globular cluster M56 on January 23, 1779. Charles Messier discovered the globular cluster M80 on January 4, 1781. William Herschel discovered the spiral galaxy NGC 1084 on January 10, 1785. Pierre François André Méchain discovered Comet 2P/Encke on January 17, 1786. William Herschel discovered Titania and Oberon, two satellites of Uranus, on January 11, 1787. Giuseppe Piazzi discovered the first asteroid, 1 Ceres, on January 1, 1801. Louis Daguerre took the first photograph of the Moon on January 2, 1839. Alvan Clark discovered the white dwarf star Sirius B (the Pup) on January 31, 1862. The 36-inch Clark refractor at the Lick Observatory saw first light on January 3, 1888. Charles Perrine discovered the Jovian satellite Elara on January 2, 1905. Philibert Jacques Melotte discovered the Jovian satellite Pasiphae on January 27, 1908. Clyde Tombaugh photographed Pluto on January 23, 1930. Mike Brown, Chad Trujillo, and David Rabinowitz discovered Eris on January 5, 2005.

The Quadrantid meteor shower is predicted to peak between 10:40 p.m. to 1:40 a.m. EST January 3rd/4th (3:40 to 6:40 UT on January 4th). The radiant lies at the junction of the constellations of Boötes, Hercules, and Draco, in what was once called Quadrans Muralis, and will be about 40 degrees in altitude at 4:00 a.m. local time. Unfortunately, bright moonlight from a 92%-illuminated gibbous Moon will severely compromise the peak of this year's Quadrantids. The Quadrantid shower can sometimes reach zenithal hourly rates of more than 100 meteors per hour for a relatively short period of time. The near-Earth asteroid 2003 EH1, which may be an extinct comet, is believed to be the source of these meteors. However, it is now thought that a second object, namely Comet 96P/Machholz, may be contributing a less intense and shallower Quadrantid peak. For more on the Quadrantids, consult https://earthsky.org...-meteor-shower/ and https://www.imo.net/...-meteor-shower/

The major meteor showers occurring this year are discussed at https://skyandtelesc...howers-in-2023/ and https://amsmeteors.o...hower-calendar/

Information on Iridium flares and passes of the ISS, the X-37B, the Tiangong, the HST, Starlink, the BlueWalker 3, and other satellites can be found at http://www.heavens-above.com/

The Moon is 9.3 days old, is illuminated 69.9%, subtends 31.1 arc minutes, and is located in Aries on January 1st at 0:00 UT. Favorable librations for the following lunar features occur on the indicated dates: Mare Marginis on January 1st, Crater Bailly on January 10th, Mare Orientale on January 15th, and Crater Vestine on January 25th. The Moon is at apogee on January 8th and at perigee on January 21st. New Moon occurs on January 21st. The Moon passes near the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 5:00 on January 3rd, the first-magnitude star Aldebaran (Alpha Tauri) at 22:00 on January 3rd, the bright open cluster M35 in Gemini at 19:00 on January 5th, the first-magnitude star Castor (Alpha Geminorum) at 9:00 on January 7th, the first-magnitude star Pollux (Beta Geminorum) at 14:00 on January 7th, the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 19:00 on January 8th, the first-magnitude star Regulus (Alpha Leonis) at 17:00 on January 10th, the first-magnitude star Spica (Alpha Virginis) at 3:00 on January 15th, the first-magnitude star Antares (Alpha Scorpii) at 12:00 on January 18th, and M45 once again at 10:00 on January 30th. The Moon occults Uranus from parts of Europe and Canada on January 1st and again on January 29th from Canada and Mars from southern and eastern Africa on January 3rd and again on January 31st from the southern United States, Cuba, Mexico, most of Central America, and northwestern South America. Consult http://www.lunar-occ...ota/iotandx.htm for information on lunar occultation events. Visit https://saberdoesthe...does-the-stars/ for tips on spotting extreme crescent Moons and https://curtrenz.com/moon.html for Full Moon and other lunar data. Browse https://skyandtelesc...ads/MoonMap.pdf and https://celestron-si...RReeves-web.pdf and https://nightsky.jpl...ObserveMoon.pdf for simple lunar maps. Click on http://astrostrona.pl/moon-map for an excellent online lunar map. Visit http://www.ap-i.net/avl/en/start to download the free Virtual Moon Atlas. Consult http://time.unitariu...moon/where.html for current information on the Moon and https://www.fourmila.../lunarform.html for information on various lunar features. See https://svs.gsfc.nasa.gov/4874 for a lunar phase and libration calculator and https://quickmap.lro...2vIBvAXwF1SizSg for the Lunar Reconnaissance Orbiter Camera (LROC) Quickmap. Click on https://www.calendar...ar/2023/january for a lunar phase calendar for this month. Times and dates for the lunar crater light rays predicted to occur this month are available at http://www.lunar-occ...o/rays/rays.htm

The Sun is located in Sagittarius on January 1st. The Earth is at perihelion on January 4th. On that date, it's about 3% (5.0 million kilometers or 3.1 million miles) closer to the Sun than at aphelion on July 4th and about 2.7% closer to the Sun than on average. The Earth receives about 7% more solar energy at perihelion than at aphelion. Since the Earth is moving faster in its elliptical orbit at perihelion, the northern hemisphere winter is four days shorter than its summer. The distance from the Earth to the Sun is 0.983296 astronomical units at perihelion. The Sun enters Capricornus on January 19th.

Data (magnitude, apparent size, illumination, and distance from the Earth in astronomical units) for the planets and Pluto on January 1st: Mercury (+1.3, 9.0", 16%, 0.75 a.u., Sagittarius), Venus (-3.9, 10.4", 96%, 1.61 a.u., Sagittarius), Mars (-1.2, 14.7", 97%, 0.64 a.u., Ophiuchus), Jupiter (-2.4, 39.3", 99%, 5.01 a.u., Aquarius), Saturn (+0.8, 15.8", 100%, 10.54 a.u., Capricornus), Uranus (+5.7, 3.6", 100%, 19.32 a.u. on January 16th, Aries), Neptune (+7.9, 2.2", 100%, 30.43 a.u. on January 16th, Aquarius), Pluto (+14.5, 0.1", 100%, 35.67 a.u. on January 16th, Sagittarius).

During the evening, Mars lies in the east, Uranus in southeast, Mercury, Jupiter, Saturn, and Neptune in the southwest, and Venus in the west. At midnight, Mars and Uranus are in the west. Mercury can be seen in the southeast in the morning.

The bright planets visible in January's sky are discussed at https://earthsky.org...saturn-mercury/

All of the planets are covered in the article at https://skynews.ca/p...e-january-2023/

A guide to planetary observing for the year by the British magazine The Sky at Night is posted at https://www.skyatnig...nets-night-sky/

The apparent and comparative sizes of the planets, along with their magnitudes and distances, can be determined, for a given date and time, at https://www.timeandd...lanets/distance The graphic at https://www.astrolea...copes85x 11.pdf compares the apparent sizes of the bright planets to that of the Moon.
The article at https://britastro.or...-size-of-things discusses the sizes and distances of the planets of the solar system and a number of other celestial bodies in terms of scale models.

Basic astronomical data such as sunrise and sunset times, morning and evening twilight times, moonrise and moonset times, the phase of the Moon, which naked-eye planets are visible in the evening and morning skies, rise and set times for each of them can be found at https://skyandtelesc...-coms-almanac/#

Another online data generator for various astronomical events is available at https://astronomynow.com/almanac/

Asteroid 4 Vesta 4 Vesta and asteroid 3 Juno travel to the south of Neptune this month, with 4 Vesta coming within approximately five degrees of the planet in mid-January. Asteroid 27 Euterpe passes one degree south of Uranus in early January. Asteroid 2 Pallas (magnitude +7.6) is at opposition in Canis Major on January 8th. Asteroid 6 Hebe (magnitude +8.4) is at opposition in Cancer on January 26th. Other asteroids brighter than magnitude +11.0 that reach opposition this month include asteroid 64 Angelina (magnitude +10.4) on January 3rd and asteroid Julia (magnitude +10.9) on January 24th. See http://asteroidoccul.../2023_01_si.htm for information on asteroid occultation events taking place this month.For information on this year's bright asteroids and upcoming asteroid occultation events respectively, consult https://curtrenz.com/asteroids.html and http://asteroidoccultation.com/

During January, Comet C/2022 E3 (ZTF) will grow brighter as it travels rapidly northwestward from Corona Borealis to Camelopardalis. When it reaches perihelion on January 12th, the comet will be 1.11 astronomical units from the Sun. On the morning of January 22nd, C/2022 E3 (ZTF) will pass within three degrees of the lenticular galaxy M102. By the end of the month, it may reach a brightness of fifth magnitude. Click on https://earthsky.org...for-binoculars/ and https://www.skyatnig...-c-2022-e3-ztf/ for online articles on the comet. Finder charts are available on pages 48 and 49 of the January 2023 issue of Sky & Telescope. Visit https://cobs.si/ and http://cometchasing.skyhound.com/ and http://www.aerith.ne...t/future-n.html for information on comets that are visible this month.

A list of the closest approaches of comets to the Earth is posted at http://www.cometogra.../nearcomet.html

A wealth of information on solar system celestial bodies is posted at http://nineplanets.org/ and https://curtrenz.com/astronomy.html

Information on the celestial events transpiring each week can be found at http://astronomy.com/skythisweek and https://skyandtelesc...ky-at-a-glance/

A monthly podcast on various astronomical topics is available at https://skyandtelesc...t-january-2023/ and https://actualastron...n-january-2023/

A short video on January's astronomical events can be seen at https://solarsystem....ching/whats-up/

The constellations of January are discussed at https://hubblesite.o...es/tonights-sky

Free star charts for the month can be downloaded at http://www.skymaps.com/downloads.html and http://whatsouttonight.com/

Omicron2 (40) Eridani is a fourth-magnitude triple star system consisting of three dwarf stars: a type K1V yellow-orange dwarf known as Keid, a type DA4 white dwarf, and a type M4.5e red dwarf. Omicron is located about 16 light years from the Earth at 4h15m16.32s, -7°39′10.34″. Ninth-magnitude Omicron B is the most easily visible white dwarf star and can be seen with an aperture of six inches.

The famous eclipsing variable star Algol (Beta Persei) is at a minimum, decreasing in magnitude from 2.1 to 3.4, on January 2nd, 5th, 7th, 10th, 13th, 16th, 19th, 22nd, 25th, 27th, and 30th. Consult page 50 of the January 2023 issue of Sky & Telescope for the times of the minima. The Demon Star is at minimum brightness for approximately two hours and is well-placed for observers in North America on the night of January 1st, centered at 10:42 p.m. EST (3:42 UT on January 2nd). Minima can also be observed on the night of January 4th, centered at 7:41 p.m. EST (0:41 UT on January 5th), on the night of January 22nd, centered at 12:27 a.m. EST (5:27 UT on January 22nd), and on the night of January 24th, centered at 9:16 p.m. EST (2:16 UT on January 25th). The chance of seeing Algol at least one magnitude fainter than normal on a random night is about 1 in 30. See http://stars.astro.i.../sow/Algol.html and http://www.solstatio...ars2/algol3.htm for more on Algol.

Data on current supernovae can be found at http://www.rochester...y.org/snimages/

Information on observing some of the more prominent Messier galaxies is available at http://www.cloudynig...ur-astronomers/

Finder charts for the Messier objects and other deep-sky objects are posted at https://freestarcharts.com/messier and https://freestarcharts.com/ngc-ic and https://www.cambridg...s_january-march

Telrad finder charts for the Messier Catalog are posted at http://www.custerobs...cs/messier2.pdf and http://www.star-shin...ssierTelrad.htm

Telrad finder charts for the SAC's 110 Best of the NGC are available at https://www.saguaroa...k110BestNGC.pdf

Author Phil Harrington offers an excellent freeware planetarium program for binocular observers known as TUBA (Touring the Universe through Binoculars Atlas) at http://www.philharrington.net/tuba.htm

Some binocular deep-sky object targets for January are shown in the graphic at https://nightsky.jpl...2023January.pdf

Stellarium and Cartes du Ciel are useful freeware planetarium programs that are available at http://stellarium.org/ and https://www.ap-i.net/skychart/en/start

Deep-sky object list generators can be found at http://www.virtualcolony.com/sac/ and https://telescopius.com/ and http://tonightssky.com/MainPage.php

Freeware sky atlases can be downloaded at http://www.deepskywa...-atlas-full.pdf and https://www.cloudyni...ar-charts-r1021 and https://allans-stuff.com/triatlas/

One hundred and five binary and multiple stars for January: Omega Aurigae, 5 Aurigae, Struve 644, 14 Aurigae, Struve 698, Struve 718, 26 Aurigae, Struve 764, Struve 796, Struve 811, Theta Aurigae (Auriga); Struve 485, 1 Camelopardalis, Struve 587, Beta Camelopardalis, 11 & 12 Camelopardalis, Struve 638, Struve 677, 29 Camelopardalis, Struve 780 (Camelopardalis); h3628, Struve 560, Struve 570, Struve 571, Struve 576, 55 Eridani, Struve 596, Struve 631, Struve 636, 66 Eridani, Struve 649 (Eridanus); Kappa Leporis, South 473, South 476, h3750, h3752, h3759, Beta Leporis, Alpha Leporis, h3780, Lallande 1, h3788, Gamma Leporis (Lepus); Struve 627, Struve 630, Struve 652, Phi Orionis, Otto Struve 517, Beta Orionis (Rigel), Struve 664, Tau Orionis, Burnham 189, h697, Struve 701, Eta Orionis, h2268, 31 Orionis, 33 Orionis, Delta Orionis (Mintaka), Struve 734, Struve 747, Lambda Orionis, Theta-1 Orionis (the Trapezium), Theta-2 Orionis, Iota Orionis, Struve 750, Struve 754, Sigma Orionis, Zeta Orionis (Alnitak), Struve 790, 52 Orionis, Struve 816, 59 Orionis, 60 Orionis (Orion); Struve 476, Espin 878, Struve 521, Struve 533, 56 Persei, Struve 552, 57 Persei (Perseus); Struve 479, Otto Struve 70, Struve 495, Otto Struve 72, Struve 510, 47 Tauri, Struve 517, Struve 523, Phi Tauri, Burnham 87, Xi Tauri, 62 Tauri, Kappa & 67 Tauri, Struve 548, Otto Struve 84, Struve 562, 88 Tauri, Struve 572, Tau Tauri, Struve 598, Struve 623, Struve 645, Struve 670, Struve 674, Struve 680, 111 Tauri, 114 Tauri, 118 Tauri, Struve 730, Struve 742, 133 Tauri (Taurus)

Seventy deep-sky objects for January: B26-28, B29, M36, M37, M38, NGC 1664, NGC 1778, NGC 1857, NGC 1893, NGC 1907, NGC 1931 (Auriga); IC 361, Kemble 1 (Kemble's Cascade asterism), NGC 1501, NGC 1502, NGC 1530, NGC 1569 (Camelopardalis); NGC 1507, NGC 1518, NGC 1531, NGC 1532, NGC 1535, NGC 1537, NGC 1600, NGC 1637, NGC 1659, NGC 1700 (Eridanus); IC 418, M79, NGC 1832, NGC 1888, NGC 1964 (Lepus); B33, Cr65, Cr69, Cr70, IC 434, M42, M43, M78, NGC 1662, NGC 1973-75-77, NGC 1981, NGC 1999, NGC 2022, NGC 2023, NGC 2024, NGC 2112 (Orion); Be11, NGC 1491, NGC 1496, NGC 1499, NGC 1513, NGC 1528, NGC 1545, NGC 1548, NGC 1579, NGC 1582, NGC 1605, NGC 1624 (Perseus); DoDz3, DoDz4, M1, Mel 25, NGC 1514, NGC 1587, NGC 1647, NGC 1746, NGC 1807, NGC 1817 (Taurus)

Top ten binocular deep-sky objects for January: Cr65, Kemble 1, M36, M37, M38, M42, NGC 1528, NGC 1647, NGC 1746, NGC 1981

Top ten deep-sky objects for January: M1, M36, M37, M38, M42, M43, M78, M79, NGC 1501, NGC 2024

Challenge deep-sky object for January: IC 2118 (Eridanus)
The objects listed above are located between 4:00 and 6:00 hours of right ascension.

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!

Spot the Messenger: Observe Mercury

David Prosper

Most planets are easy to spot in the night sky, but have you spotted Mercury? Nicknamed *the Messenger* for its speed across the sky, Mercury is also the closest planet to the Sun. Its swift movements close to our Sun accorded it special importance to ancient observers, while also making detailed study difficult. However, recent missions to Mercury have resulted in amazing discoveries, with more to come.

Mercury can be one of the brightest planets in the sky – but also easy to miss! Why is that? Since it orbits so close to the Sun, observing Mercury is trickier than the rest of the "bright planets" in our solar system: Venus, Mars, Jupiter, and Saturn. Mercury always appears near our Sun from our Earth-bound point of view, making it easy to miss in the glare of the Sun or behind small obstructions along the horizon. That's why prime Mercury viewing happens either right before sunrise or right after sunset; when the Sun is blocked by the horizon, Mercury's shine can then briefly pierce the glow of twilight. Mercury often appears similar to a "tiny Moon" in a telescope since, like fellow inner planet Venus, it shows distinct phases when viewed from Earth! Mercury's small size means a telescope is needed to observe its phases since they can't be discerned with your unaided eye. Safety warning: If you want to observe Mercury with your telescope during daytime or before sunrise, **be extremely careful**: you don't want the Sun to accidentally enter your telescope's field of view. As you may already well understand, this is extremely dangerous and can not only destroy your equipment, but permanently blind you as well! That risk is why NASA does not allow space telescopes like Hubble or the JWST to view Mercury or other objects close to the Sun, since even the tiniest error could destroy billions of dollars of irreplaceable equipment.

Despite being a small and seemingly barren world, Mercury is full of interesting features. It's one of the four rocky (or terrestrial) planets in our solar system, along with Earth, Venus, and Mars. Mercury is the smallest planet in our solar system and also possesses the most eccentric, or non-circular, orbit of any planet as well: during a Mercurian year of 88 Earth days, the planet orbits between 29 million and 43 million miles from our Sun – a 14-million-mile difference! Surprisingly, Mercury is **not** the hottest planet in our solar system, despite being closest to the Sun; that honor goes to Venus, courtesy its thick greenhouse shroud of carbon dioxide. Since Mercury lacks a substantial atmosphere and the insulating properties a layer of thick air brings to a planet, its temperature swings wildly between a daytime temperature of 800 degrees Fahrenheit (427 degrees Celsius) and -290 degrees Fahrenheit (-179 degrees Celsius) at night. Similar to our Moon, evidence of water ice is present at Mercury's poles, possibly hiding in the frigid permanent shadows cast inside a few craters. Evidence for ice on Mercury was first detected by radar observations from Earth, and followup observations from NASA's MESSENGER mission added additional strong evidence for its presence. Mercury sports a comet-like tail made primarily of sodium which has been photographed by skilled astrophotographers. The tail results from neutral atoms in its thin atmosphere being pushed away from Mercury by pressure from the nearby Sun's radiation.

NASA's Mariner 10 was Mercury's first robotic explorer, flying by three times between 1974-1975. Decades later, NASA's MESSENGER first visited Mercury in 2008, flying by three times before settling into an orbit in 2011. MESSENGER thoroughly studied and mapped the planet before smashing into Mercury at mission's end in 2015. Since MESSENGER, Mercury was briefly visited by BepiColombo, a joint ESA/JAXA probe, which first flew by in 2021 and is expected to enter orbit in 2025 - after completing six flybys. Need more Mercury in your life? Check out NASA's discoveries and science about Mercury at solarsystem.nasa.gov/mercury/, and visit the rest of the universe at nasa.gov.

Mercury reaches maximum western elongation on the morning of January 30, which means that your best chance to spot it is right before sunrise that day! Look for Mercury towards the southeast and find the clearest horizon you can. Observers located in more southern latitudes of the Northern Hemisphere have an advantage when observing Mercury as it will be a bit higher in the sky from their location, but it's worth a try no matter where you live. Binoculars will help pick out Mercury's elusive light from the pre-dawn glow of the Sun. Image created with assistance from Stellarium

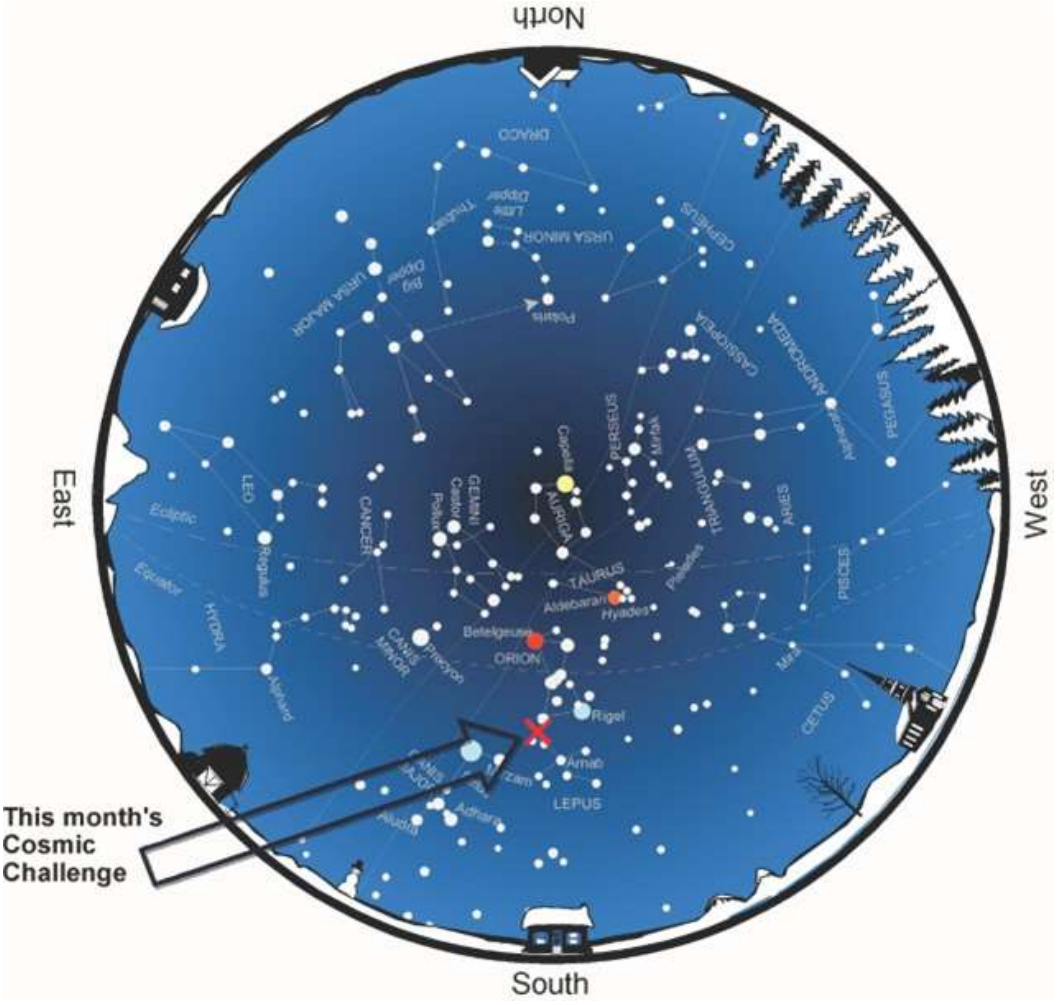
Phil Harrington's Cosmic Challenge

IC 418

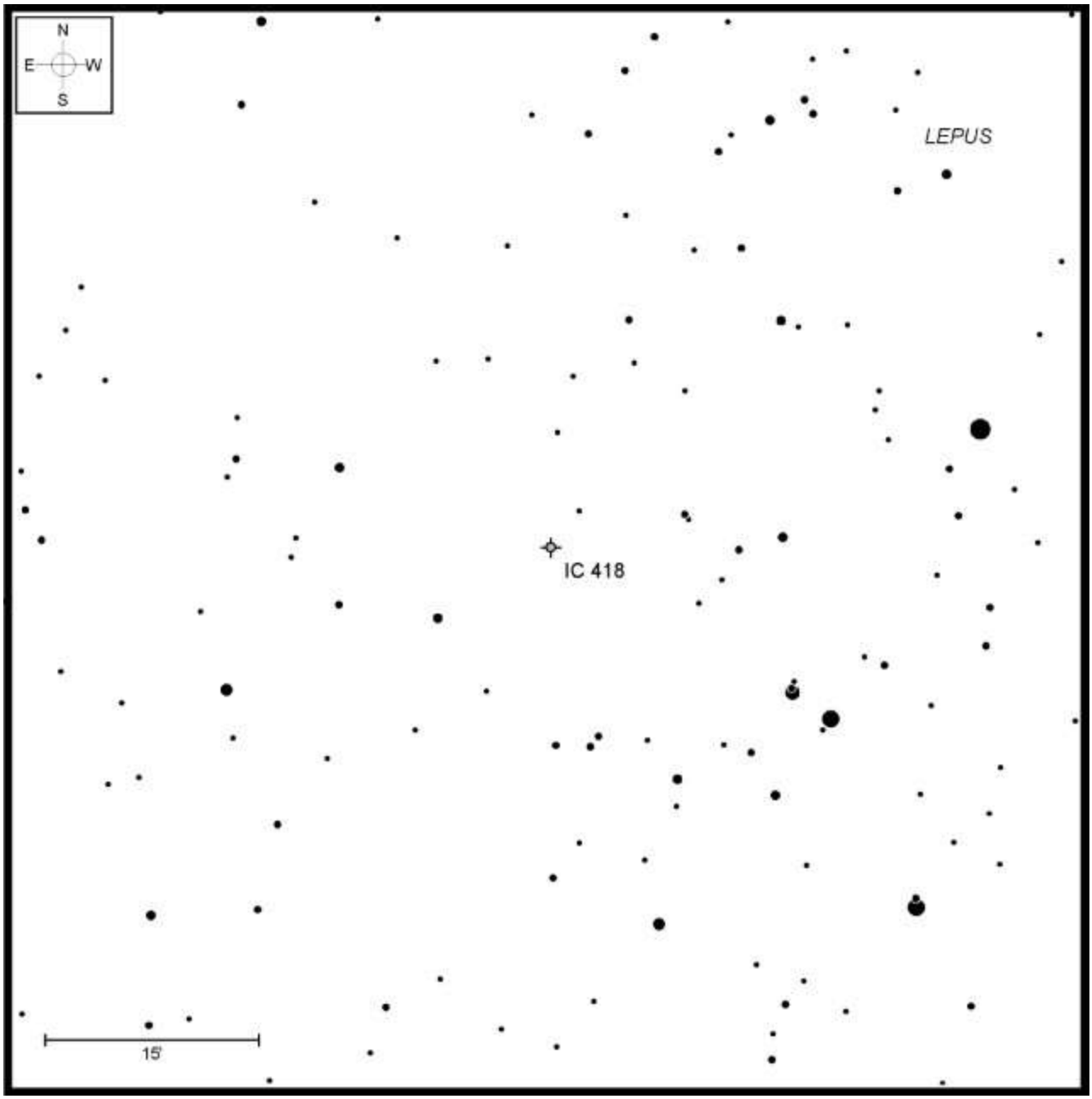
This month's suggested aperture range:
6- to 9.25-inch (15- to 24-cm) Telescopes
Featured Telescope
Meade LS-6

Target	Type	RA	DEC	Constellation	Magnitude	Size
IC 418	Planetary nebula	05h 27.5m	-12° 41.8'	Lepus	9.6	12"

If you have ever glanced at a compendium of images taken with the Hubble Space Telescope, then chances are you have seen this next challenge. You may not know it by its catalog number, IC 418, but instead may recognize it by its nickname, the Spirograph Nebula. That nickname came about because the Hubble images show an amazingly complex cloud of entangled filaments that create a strange, oval cloud that looks like it could have been drawn using a child's Spirograph toy. Remember those? You would trace intertwining arcs by rolling a color pen in a circle along the inside or outside of another circle.



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



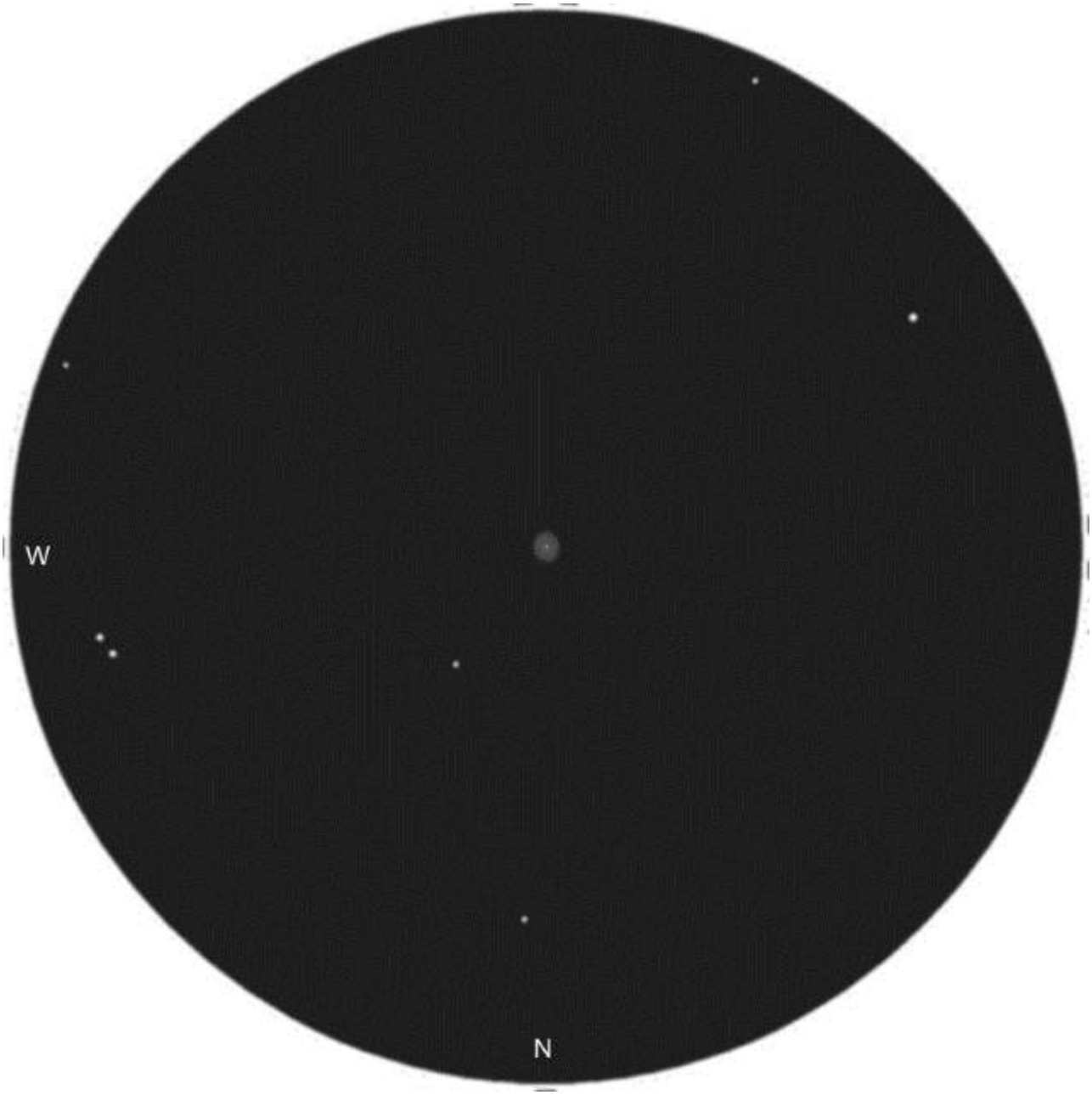
Above: Finder chart for this month's Cosmic Challenge.

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

Despite its disk shining at magnitude 9.6, IC 418 remains an underappreciated target among amateur astronomers. Why, I don't know. It might be that there is just so much to look at in the winter sky that nobody pays much attention to a planetary nebula that even the Herschels missed during their sky surveys. That could lead some to think that any planetary listed in the Index Catalog is probably so difficult to see that they don't even try. Too bad because they are missing a nice catch.

To find IC 418, drop 4° southward from Rigel [Beta (β) Orionis] to a keystone of four 4th- and 5th-magnitude stars -- Iota (ι), Kappa (κ), Lambda (λ), and Nu (ν) Leporis. By tracing a line from Iota southeastward through Nu, and continuing that line an equal distance further beyond, you'll come right to the field of IC 418. Look for a close-set pair of 12th-magnitude stars lies just 10' to its west-northwest.

Once you have the nebula in view, switch to as high a magnification that seeing conditions will allow for the best view. My notes jotted down several years ago at the eyepiece of my 8-inch reflector at 203x evoke memories of a "small, bright disk, perhaps a greenish-gray, surrounding an obvious central star. Although clearly not a ring, averted vision suggests a darker central area adjacent to the central star, just to its north and south." The sketch below was also made at the time.



Above: IC 418 through the author's 8-inch (20.4-cm) f/7 reflector.

Below: Hubble Space Telescope image that led to the "Spirograph Nebula" nickname. Purists still prefer to call it the "Raspberry Nebula."

What color is IC 418? In its most famous Hubble rendition, IC 418 shows off a burnt orange edge fading into a purplish disk. A blue inner disk surrounds the white hot progenitor star buried within. That color, however, is false, induced to accent subtle contrasts in the Spirograph-like structure.

How about you? What color do you see when you look at IC 418? Observers seem to disagree. Some, like me, see a gray disk with just a hint of a greenish tinge. Others recall a pinkish or reddish tint. The issue appears to boil down to aperture. The larger the instrument, the more distinct IC 418's ruddy hue. Magnification also plays a role. While higher magnifications are needed to see the planetary disk, they tend to dilute any coloring. To see the reddish or pinkish effect that has led to IC 418's original nickname, the Raspberry Planetary, stick to magnifications below about 175x.

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.

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

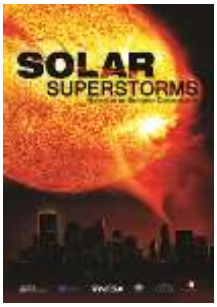
About the Author: Phil Harrington writes the monthly *Binocular Universe* column in Astronomy magazine and is the author of 9 books on astronomy, including Cosmic Challenge: The Ultimate Observing List for Amateurs.

Observatory and Planetarium Events

Centennial Observatory Upcoming Events

Event	Place	Date	Time	Admission
Telescope Tuesday	Centennial Observatory	Tuesday, January 10th, 2023	6:30 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission
Twin Falls Parks & Recreation "Cabin Fever Day" Solar Viewing	Centennial Observatory	Saturday, January 14th, 2023	11:00 AM to 2:00 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, January 14th, 2023	6:30 to 9:00 PM	FREE
Close Conjunction of Venus and Saturn	Centennial Observatory	Sunday, January 22nd, 2023	5:00 to 6:00 PM	FREE
Telescope Tuesday	Centennial Observatory	Tuesday, January 24th, 2023	6:45 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission
Close Conjunction of Mars and the Moon	Centennial Observatory	Monday, January 30th, 2023	9:45 to 10:45 PM	FREE

Faulkner Planetarium



Now Showing!

Visit the Herrett Center Video Vault

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.