Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, February 10th 2018
7:00pm at the
Herrett Center for Arts & Science
College of Southern Idaho.

Public Star Party Follows at the Centennial Observatory

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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

President's Message
Tim Frazier

MVAS president's message, February 2018

Last month's triple-header eclipse of a super, blue, blood moon ushered in February with a bang. However, this is a difficult month for me as it is still definitely winter but spring is coming and the early morning skies are filled with summer constellations. Jupiter, Mars and Saturn are visible in the predawn glow but wearing a parka to view objects in Scorpio and Sagittarius somehow just seems wrong. Those temperatures should be reserved for Orion and Canis Major.

February does contain a number of important dates including the 1995 launch of *Discovery* with Eileen Collins as the pilot, the first woman to do so. Birthdays of note are Galileo's, 1564, and Jules Verne's, 1828. Both of these visionaries had tremendous impact on astronomy, one by his observations and the other by his imaginings of the future. Sadly, it is also the month in 2003 when the shuttle *Columbia* was destroyed during reentry.

For the MVAS, it is a month of outreach and acquisition. On February 8th we will participate in Rupert Elementary School's Science Night by having a star party for the students, their families and guests. Last year there were about 600 attending so this is a great opportunity to meet people interested in science and introduce them to astronomy. Hopefully, we can attract some new members.

As for the acquisition, we now have the First Federal Foundation check in our account so I have placed the order for our new trailer. It could take up to two months for it to be constructed but it will be ready for our late spring and early summer outings. This trailer will make it much easier to transport our equipment to star parties and our telescopes more accessible for any of our gatherings.

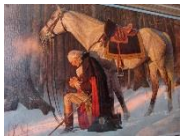
This month's program on the 10th is a show in the Faulkner Planetarium of the Herrett Center. This is a state of the art facility that features amazing visual projections and stunning sound effects. It is a great way to spend a (probably) cloudy evening so bring your friends and family for this bit of sensory overload.

Bundle up, folks, and enjoy the winter sky. Spring is not too far away.

Tim

Calendars

February 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1 Full Moon Snow Moon  99% Visible ↓ Lunar Eclipse	2 Groundhog Day 	3
4	5	6	7 Last Quarter Visible 52% ↓ Astronomy Talk 7:00pm Herrett Center Astronomy Talk Star Party Centennial Obs.	8	9	10 MVAS Meeting at 7:00pm at the Herrett Center Faulkner Planetarium Public Star Party Centennial Obs.
11	12 Lincoln's Birthday 	13 Mardi Gras 	14 Valentine's Day 	15 New Moon Lunation 1177 1% Visible↓ 	16	17
18	19 President's Day 	20	21	22 Washington's Birthday 	23 First Quarter 52% Visible ↑ 	24
25	26	27	28			

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.

Be Safe – Get Out There – Explore Your Universe

Celestial Calendar

All times, unless otherwise noted, are UT (subtract seven hours and, when appropriate, one calendar day for MST)

2/1 Asteroid 19 Fortuna (magnitude +10.1) is at opposition at 1:23; the Moon is 0.92 degree north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 19:00
2/3 The astronomical cross-quarter day (i.e., a day half way between a solstice and an equinox) known as Imbolc, Candlemas, or Groundhog Day occurs today in astronomical terms
2/7 The Moon is 4.3 degrees north of Jupiter at 19:47
2/9 The Curtiss Cross, an X-shaped Clair-Obscure illumination effect located between the craters Parry and Gambart, is predicted to be visible at 7:19; the Moon is 4.4 degrees north of Mars at 5:12; the Moon is 9.4 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 11:00; the Moon is 0.93 degree south of asteroid 4 Vesta at 12:35
2/10 Jupiter is at western quadrature at 23:00
2/11 The equation of time is at a minimum for the year (-14.24 minutes) at 10:00; the Moon is at apogee, subtending 29' 27" from a distance of 405,700 kilometers (252,090 miles), at 14:16; the Moon is 2.5 degrees north of Saturn at 14:46
2/12 Mars is 5.0 degrees north of Antares at 2:00
2/14 Asteroid 3 Juno is in conjunction with the Sun at 11:00; Mercury is at its greatest latitude south of the ecliptic plane (-7.0 degrees) at 18:00; Venus is at its greatest latitude south of the ecliptic plane (- 3.4 degrees) at 20:00; the Moon is at the descending node (longitude 315.0 degrees) at 21:12
2/15 The Moon is 1.1 degrees north-northwest of Mercury at 18:00; a partial solar eclipse is at maximum at 20:51;
2/16 The Sun enters Aquarius (ecliptic longitude 327.88 degrees) at 15:00; the Moon is 0.53 degree south-southeast of Venus at 17:00
2/17 The Moon, Venus, and Neptune lie within a circle with a diameter of 5.65 degrees at 3:00; the Moon is 1.6 degrees south-southeast of Neptune at 4:00; Mercury is in superior conjunction at 12:00
2/20 The Moon is 4.4 degrees south-southeast of Uranus at 11:00
2/21 Venus is 0.54 degree south-southeast of Neptune at 19:00
2/22 The Lunar X (the Purbach or Werner Cross), an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to visible at 18:04
2/23 The Moon is 9.1 degrees south-southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 1:00; sunrise takes place on the isolated lunar mountain Mons Pico at 1:33; The Moon is 0.7 degree north of the first-magnitude star Aldebaran (Alpha Tauri) at 17:07; sunrise takes place on the isolated lunar mountain Mons Piton at 17:08
2/25 The Moon is 4.5 degrees south of the bright open cluster M35 in Gemini at 7:00; Mercury, Venus, and Neptune lie within a circle with a diameter of 4.54 degrees at 12:00; Mercury is 0.43 degree south-southeast of Neptune at 13:00
2/26 The Moon is 8.6 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 19:00
2/27 The Moon is at perigee, subtending 32' 50" from a distance of 363,933 kilometers (226,137 miles), at 14:39; the Moon is 2.3 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 17:28
2/28 The Moon is at the ascending node (longitude 134.9 degrees) at 5:04; asteroid 51 Nemausa (magnitude +9.8) is at opposition at 5:06

Nicolas Copernicus (1473-1543), Galileo Galilei (1564-1642), Jacques Cassini (1677-1756), William Huggins (1824-1910), John Dreyer (1852-1926), Bernard Lyot (1897-1952), and Clyde Tombaugh (1906-1997) were born this month.

Nicolas Louis de Lacaille discovered the open cluster NGC 3228 in Vela on February 11, 1752. Nicolas Louis de Lacaille discovered the face-on barred spiral galaxy M83in Hydra on February 23, 1752. Johann Bode discovered the globular cluster M53 in Coma Berenices on February 3, 1775. The planetary nebula M97 in Ursa Major was discovered by Pierre François André Méchain on February 16, 1781. Caroline Herschel discovered the open cluster NGC 2360 in Canis Major on February 26, 1783. William Herschel discovered the face-on barred spiral galaxy NGC 4027 in Corvus on February 7, 1785. William Herschel's 40-foot-focal-length telescope saw first light on February 19, 1787. Clyde Tombaugh discovered Pluto on February 18, 1930. James Hey detected radio waves emitted by the Sun on February 27, 1942. Gerald Kuiper discovered the Uranian satellite Miranda (magnitude +15.8) on February 16, 1948. The first pulsar, PSR B1919+21, was discovered by Jocelyn Bell Burnell and Antony Hewish on February 24, 1967. Supernova 1987A was discovered by Ian Shelton, Oscar Duhalde, and Albert Jones on February 23, 1987.

The zodiacal light should be visible from a dark location in the west after evening twilight from February 2nd to February 16th. Click on https://www.atoptics.co.uk/highsky/zod1.htm for more on the zodiacal light.

The Sun, the Moon, & the Planets

The Moon is 14.9 days old, is illuminated 99.7%, subtends 33.2', and is located in the constellation of Leo at 0:00 UT on February 1st. The Moon is at apogee on February 11th and at perigee on February 27th. The Curtiss Cross occurs on February 9th and the Lunar X occurs on February 22nd. New Moon occurs on February 15th. There is no Full Moon this month. The Moon occults Regulus on February 1st, an event best seen from northern Asia, Russia, northern Europe, and northwestern Alaska and on the night of February 28th/March 1st, an event visible from northern and western Europe, Greenland, and northern North America. An occultation of Aldebaran on February 23rd favors northern Asia, Russia, and most of Europe. Browse http://www.lunar-occultations.com/iota/ for information on these events and upcoming lunar occultations. Click on http://www.calendar-12.com/moon_calendar/2018/february for a February 2018 lunar calendar. Visit http://saberdoesthestars.wordpress.com/2011/07/05/saber-does-the-stars/ for tips on spotting extreme crescent Moons. Times and dates for the lunar crater light rays predicted to occur this month are available at http://www.lunar-occultations.com/rlo/rays/rays.htm

The Sun is located in the constellation of Capricornus on February 1st. It enters Aquarius on February 16th. A moderate partial solar eclipse, number 17 in Saros 150, is visible from most of Chile, Argentina, Uruguay, the Falkland Islands, and Antarctica on February 15th. The instant of greatest eclipse takes place at 20:52:33 TD (Terrestrial Dynamical) Time (20:51:25 UT). A maximum of 60% coverage will occur in Antarctica. Consult https://www.eclipsewise.com/solar/SEprime/2001-2100/SE2018Feb15Pprime.html for more on the eclipse. The middle of eclipse season (i.e., when the Sun is at same longitude as the Moon's descending node, 315.1 degrees) occurs on February 4th.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto on February 1: Mercury (magnitude -0.6, 4.9", 95% illuminated, 1.38 a.u., Capricornus), Venus (magnitude -3.9, 9.8", 100% illuminated, 1.70 a.u., Capricornus), Mars (magnitude +1.2, 5.6", 91% illuminated, 1.67 a.u., Scorpius), Jupiter (magnitude -2.0, 35.9", 99% illuminated, 5.50 a.u., Libra), Saturn (magnitude +0.6, 15.3", 100% illuminated, 10.83 a.u., Sagittarius), Uranus (magnitude +5.9, 3.5", 100% illuminated, 20.39 a.u. on February 15th, Pisces), Neptune (magnitude +8.0, 2.2", 100% illuminated, 30.89 a.u. on February 15th, Aquarius), and Pluto (magnitude +14.3, 0.1", 100% illuminated, 34.30 a.u. on February 15th, Sagittarius).

Mercury, Venus, and Neptune can be seen in the west and Uranus in the southwest in the evening sky. In the morning sky, Mars and Jupiter lie in the south and Saturn in the southeast.

Mercury is in conjunction with the Sun on February 17th. It then reappears low in the west at dusk and draws closer to Venus but won't be visible, despite being unusually bright, until the very end of the month.

A very slender waxing crescent Moon lies less than three degrees from Venus very low in the west-southwest on the evening of February 16th. On February 28th, Venus is just five degrees above the horizon 30 minutes after the Sun sets. Mercury is positioned 2.3 degrees from Venus on that date.

Mars increases in apparent diameter from 5.6 arc seconds to 6.6 arc seconds and brightens by 0.4 magnitudes during February. It glows at magnitude +1.2 on February 1st, magnitude +1.0 on February 15th, and magnitude +0.8 on February 28th. On February 1st, Mars is less than one degree from the binary star Graffias (Beta Scorpii). Mars departs Scorpius and travels eastward into Ophiuchus on February 8th. It lies five degrees north of Antares on February 11th. On February 24th, the Red Planet passes 14 arc minutes north of the ninth-magnitude globular cluster NGC 6287. Mars rises around 2:00 a.m. local time by the end of February.

As the month begins, **Jupiter** rises before 2:00 a.m. local time. By the end of February, the gas giant planet rises shortly before midnight. It brightens from magnitude -2.0 to magnitude -2.2 and increases in apparent diameter from 35.9 arc seconds to 38.9 arc seconds during February. The Moon passes four degrees north of Jupiter on February 7th. Ganymede disappears into eclipse starting at 2:43 a.m. EST (7:43 UT) and reappears at 4:24 a.m. EST (9:24 UT) on February 6th. Europa enters the shadow of Jupiter at 5:08 a.m. EST (10:08 UT) on February 11th. Io reappears from occultation ten minutes later at 5:18 a.m. EST (10:18 UT). Callisto is due south of Jupiter on that date. Data on Galilean satellite events is available online at http://www.shallowsky.com/jupiter/ and http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ and on page 51 of the February 2018 issue of Sky & Telescope. Click on http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/ or consult page 50 of the February 2018 issue of Sky & Telescope to determine transit times of the central meridian by the Great Red Spot.

At mid-month, **Saturn** shines at magnitude +0.6. Its rings are inclined 26 degrees from edge-on and span 36 arc seconds. Saturn is situated four degrees from the bright globular cluster M22 in Sagittarius on February 1st, three degrees from M22 on February 14th, and two degrees from the globular cluster on the final day of the month. The Moon passes two degrees north of Saturn of February 11th. The Ringed Planet rises shortly after 3:00 a.m. local time by the end of February. For information on the satellites of Saturn, browse http://www.skyandtelescope.com/observing/interactive-sky-watching-tools/

On February 1st, **Uranus** can be found in southeastern Pisces three degrees from the fourth-magnitude star Omicron Piscium and the fifth-magnitude star Mu Piscium. The prograde (eastward) motion of the seventh planet takes it to a location 2.3 degrees west of Omicron Piscium by the end of the month. Uranus is located five degrees south of the waxing Moon on February 20th. Uranus sets shortly after 11:00 p.m. local time as February begins and nearly two hours before that time by the end of the month.

Neptune lies 1.1 degrees southwest of the fourth-magnitude star Lambda Aquarii on February 1st. It disappears from view after the first week of February.

See http://www.curtrenz.com/uranep.html for additional information on the two outer planets.

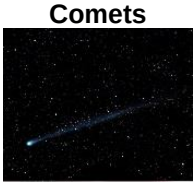
Online finder charts for Uranus and Neptune can be found at http://www.nakedeyeplanets.com/uranus.htm and http://www.nakedeyeplanets.com/neptune.htm and also at http://www.skyandtelescope.com/wp-content/uploads/WEB_Uranus_Neptune17.pdf

The dwarf planet **Pluto** is not visible this month.

Asteroids

Asteroid **1 Ceres** takes a northwestward course through northern Cancer this month. It passes about one degree north of the fourth-magnitude star Iota Cancri on February 3rd and about one half of a degree south of the sixth-magnitude star Sigma1 Cancri on February 21st. Asteroids brighter than magnitude +11.0 coming to opposition this month include asteroid 19 Fortuna on February 1st and asteroid 51 Nemausa on February 28th. From certain parts of southern Canada and the northern United States, asteroid 20 Massalia (magnitude +10.0) occults the 9.2-magnitude star HD 35003 in Taurus for a maximum of 19 seconds on the night of February 16th. For more on this event, see http://asteroidoccultation.com/2018_02/0217_20_54194.htm

Comets



Comet C/2016 R2 (PanSTARRS) travels northeastward through Taurus and Perseus during February. The comet may shine at tenth or eleventh magnitude as it does so. It passes about two degrees to the east of the center of M45 on February 4th. Visit http://cometchasing.skyhound.com/ and http://www.aerith.net/comet/future-n.html for additional information on comets visible this month.

Meteors

Visit https://www.amsmeteors.org/home.html for information on Meteors for March.

Various events taking place within our solar system are discussed at http://www.bluewaterastronomy.info/styled-4/index.html

For more on the planets and how to locate them, browse http://www.nakedeyeplanets.com/ and https://freestarcharts.com/planets-this-month

ISS

Information on Iridium flares and passes of the ISS, Tiangong-1, USAF's X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/

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

The Deep Sky

Fifty deep-sky objects for February: NGC 2146, NGC 2403 (Camelopardalis); M41, NGC 2345, NGC 2359, NGC 2360, NGC 2362, NGC 2367, NGC 2383 (Canis Major); M35, NGC 2129, NGC 2158, NGC 2266, NGC 2355, NGC 2371-72, NGC 2392, NGC 2420 (Gemini); NGC 2419 (Lynx); M50, NGC 2232, NGC 2237, NGC 2238, NGC 2244, NGC 2245, NGC 2251, NGC 2261, NGC 2264, NGC 2286, NGC 2301, NGC 2311, NGC 2324, NGC 2335, NGC 2345, NGC 2346, NGC 2353 (Monoceros); NGC 2169, NGC 2174, NGC 2194 (Orion); M46, M47, M93, Mel 71, NGC 2421, NGC 2423, NGC 2438, NGC 2439, NGC 2440, NGC 2467, NGC 2506, NGC 2509 (Puppis)

Top ten binocular deep-sky objects for February: M35, M41, M46, M47, M50, M93, NGC 2244, NGC 2264, NGC 2301, NGC 2360

Top ten deep-sky objects for February: M35, M41, M46, M47, M50, M93, NGC 2261, NGC 2362, NGC 2392, NGC 2403

Free star maps for February can be downloaded at http://www.skymaps.com/downloads.html and http://www.telescope...thly-Star-Chart

Information on the celestial events transpiring each week can be found at http://astronomy.com/skythisweek and http://www.skyandtelescope.com/observing/sky-at-a-glance/

The famous eclipsing variable star Algol (Beta Persei) is at a minimum, decreasing in magnitude from 2.1 to 3.4, on February 2nd, 5th, 7th, 10th, 13th, 16th, 19th, 22nd, 25th, and 27th. Consult page 50 of the February 2018 issue of Sky & Telescope for the times of the minima. The Demon Star is at minimum brightness for approximately two hours centered at 11:30 p.m. EST on February 1st (4:30 UT on February 2nd) and at 10:05 p.m. EST on February 24th (3:05 UT on February 25th). For more on Algol, see http://stars.astro.illinois.edu/sow/Algol.html and http://www.solstation.com/stars2/algol3.htm

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

Information on observing some of the more prominent Messier galaxies is available at http://www.cloudynights.com/topic/358295-how-to-locate-some-of-the-major-messier-galaxies-and-helpful-advice-for-novice-amateur-astronomers/

Finder charts for the Messier objects and other deep-sky objects are posted at https://freestarcharts.com/messier and https://freestarcharts.com/ngc-7023 and http://www.cambridge.org/features/turnleft/seasonal_skies_october-december.htm

Telrad finder charts for the Messier Catalog and the SAC's 110 Best of the NGC are posted at http://www.astro-tom.com/messier/messier_finder_charts/map1.pdf and http://www.saguaroastro.org/content/db/Book110BestNGC.pdf respectively.

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

Freeware sky atlases can be downloaded at http://www.deepskywatch.com/files/deepsky-atlas/Deep-Sky-Hunter-atlas-full.pdf and https://www.uv.es/jrtorres/triatlas.html

Mars Landers

Opportunity is descending eastward down "Perseverance Valley" which cuts through the western rim and leads to the floor of "Endeavor Crater", the 14 mile wide crater located on "Meridiani Planum". The rover entered the valley on May 15, 2017 (Sol 4720) and is engaged in determining how the boulder lined channel was cut into the side of the crater. Primary candidates so far include water erosion and erosion by mud or debris flows. Although evidence to date does not favor either mechanism, mission scientists hope that deposits at the valley terminus may provide additional clues.

During the November solstice Opportunity survived temperatures below -140°F. It is continuing its program of panoramic imaging of "Perseverance Valley" and arrived at a location upstream of a fork in the channel on Dec. 10th (Sol 4934). Robert Frost provided no usable input about which fork to take as each was less traveled. After 3 weeks of collecting Panoramic Camera (Pancam) color stereo imagery and Alpha Particle X-ray Spectrometer (APXS) data, mission scientists pondered the evidence and decided on the north fork. On Sol 4958 (Jan. 3, 2018), Opportunity drove about 13 feet (4 meters) in that direction. and devoted the next few sols to remote sensing. The Alpha Particle X-ray Spectrometer (APXS) was used on Sol 4961 (Jan. 6, 2018) to keep the rover state as stable as possible. Meanwhile, the batteries were tested with the Zero Degree Heater (ZDH).

Solar array energy production increased from 420 to 624 watt-hours per sol as wind cleaned dust from the solar collectors. As of Sol 4977 (Jan. 23, 2018), Opportunity achieved a total distance traveled on Mars of 28.02 miles (45.09 kilometers).

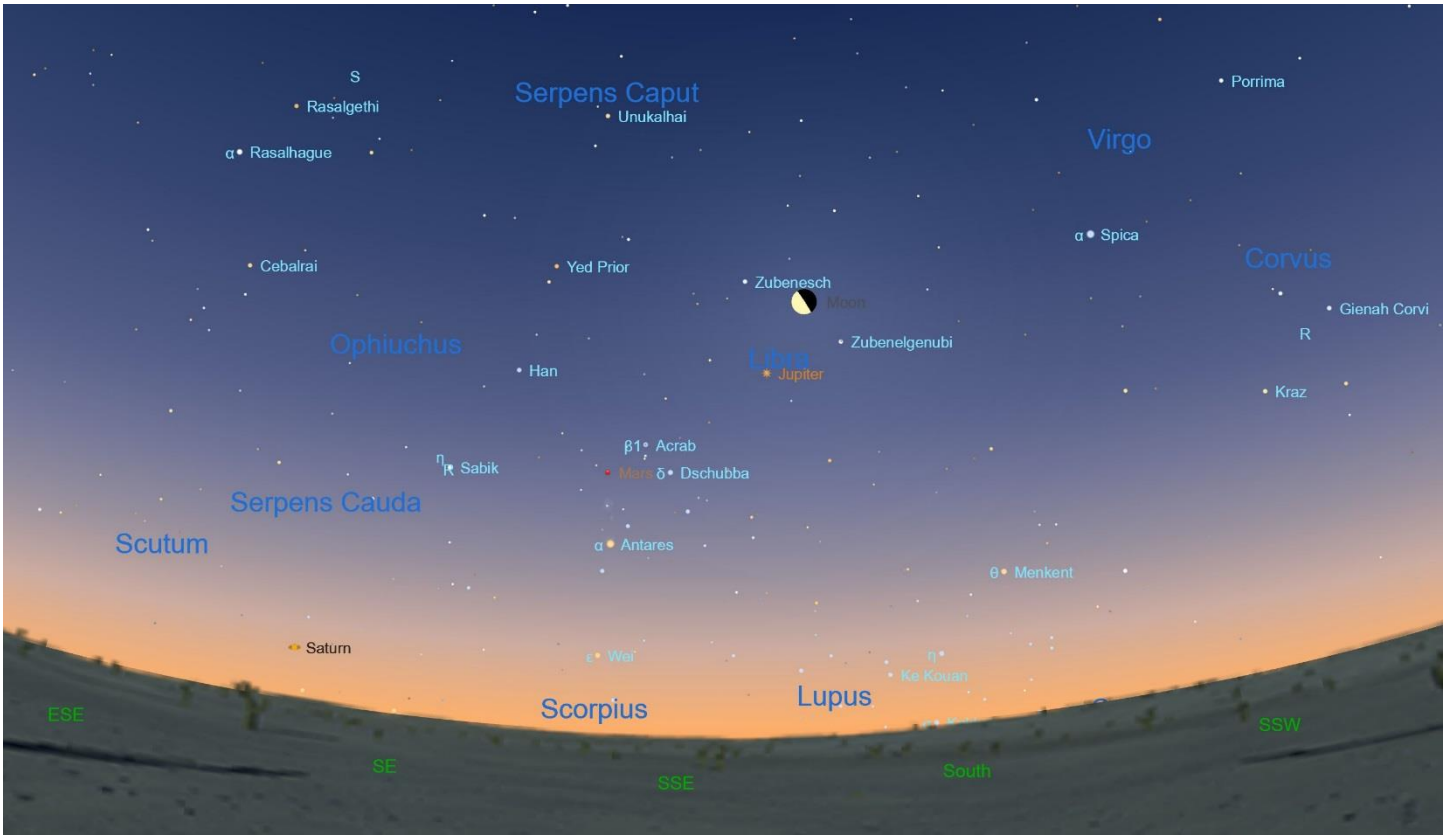
On Sol 1809 (9/15/17), Curiosity began its ~200 foot ascent of Vera Rubin Ridge and completed it on Sol 1874 upon reaching the boundary between the lower light colored cliff forming rock layer and the darker upper layer observed from orbit. The dark layer covers most of the ridge with a broad gentle uphill slope. Since rock layers vary in color due to differences in chemical content which can be attributed to processes associated with original deposition and post deposition alteration, the next 76 sols were devoted to detailed examination of the rocks, sand, and exposed rock outcrops comprising the upper dark layer. On Sol 1950 (Jan. 30, 2018) Curiosity reached the low-lying area south Vera Rubin Ridge called the Clay Unit or the Phyllosilicate Trough due to detection of clay minerals from orbit.

Planet Plotting

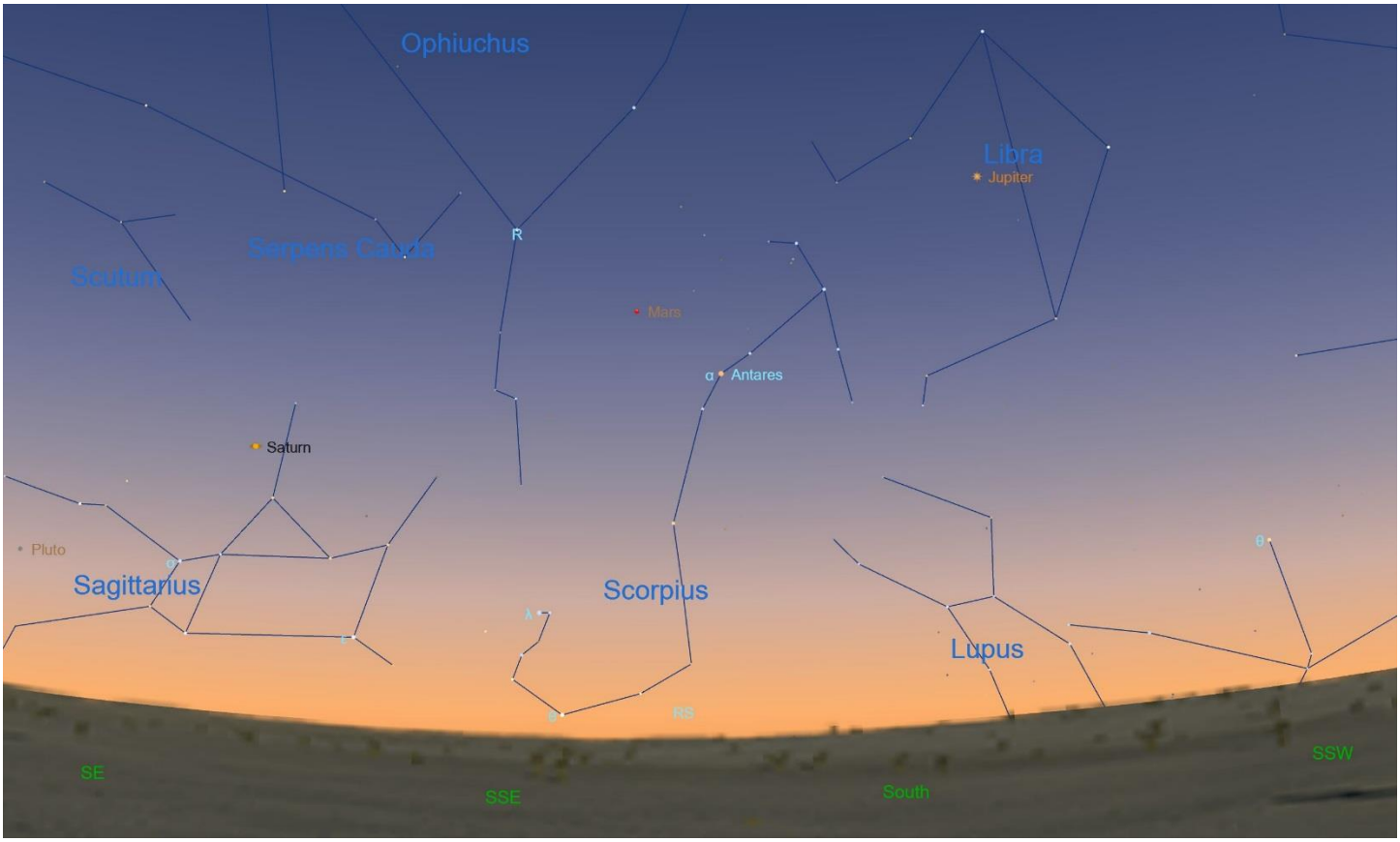
Venus (-3.8) and Mercury (-0.5 to -1.3) in Capricornus and Aquarius are lost in the glow of sunset until February 21st when Neptune (+0.8) in Aquarius is within 1° of Venus. Before its Superior Conjunction with the Sun on the 17th, the Moon passes Mercury and the Sun at New Moon on the 15th. The Waxing Crescent Moon then passes Venus and Neptune on the 16th and Uranus (+5.9) in Pisces on the 20th.

Mars (+1.2 to +0.8) rises before the Sun in Scorpius and Ophiuchus, as does Jupiter (-1.8 to -2.0) in Libra. Saturn (+0.6 in Sagittarius) is closer to the eastern horizon before dawn. The Waning Crescent Moon passes Jupiter on the 7th, Mars on the 9th. and Saturn on the 10th.

Planet	Constellation	Magnitude	Moon Phase	Moon Age
Sun	Capricornus	-26.8	New	0 days
Mercury	Capricornus	-0.2	Waning Crescent	29.15 days
Venus	Aquarius	-3.8	Waxing Crescent	0.33 days
Mars	Ophiuchus	+1.4	Waning Crescent	23.70 days
Jupiter	Libra	-1.7	Waning Crescent	21.82 days
Saturn	Sagittarius	+0.5	Waning Crescent	25.03 days
Uranus	Pisces	+5.8	Waxing Crescent	4.58 days
Neptune	Aquarius	+8.0	Waxing Crescent	1.29 days



The last quarter Moon and the planets, Saturn, Mars, and Jupiter in the pre-dawn sky on Feb. 7, 2018.



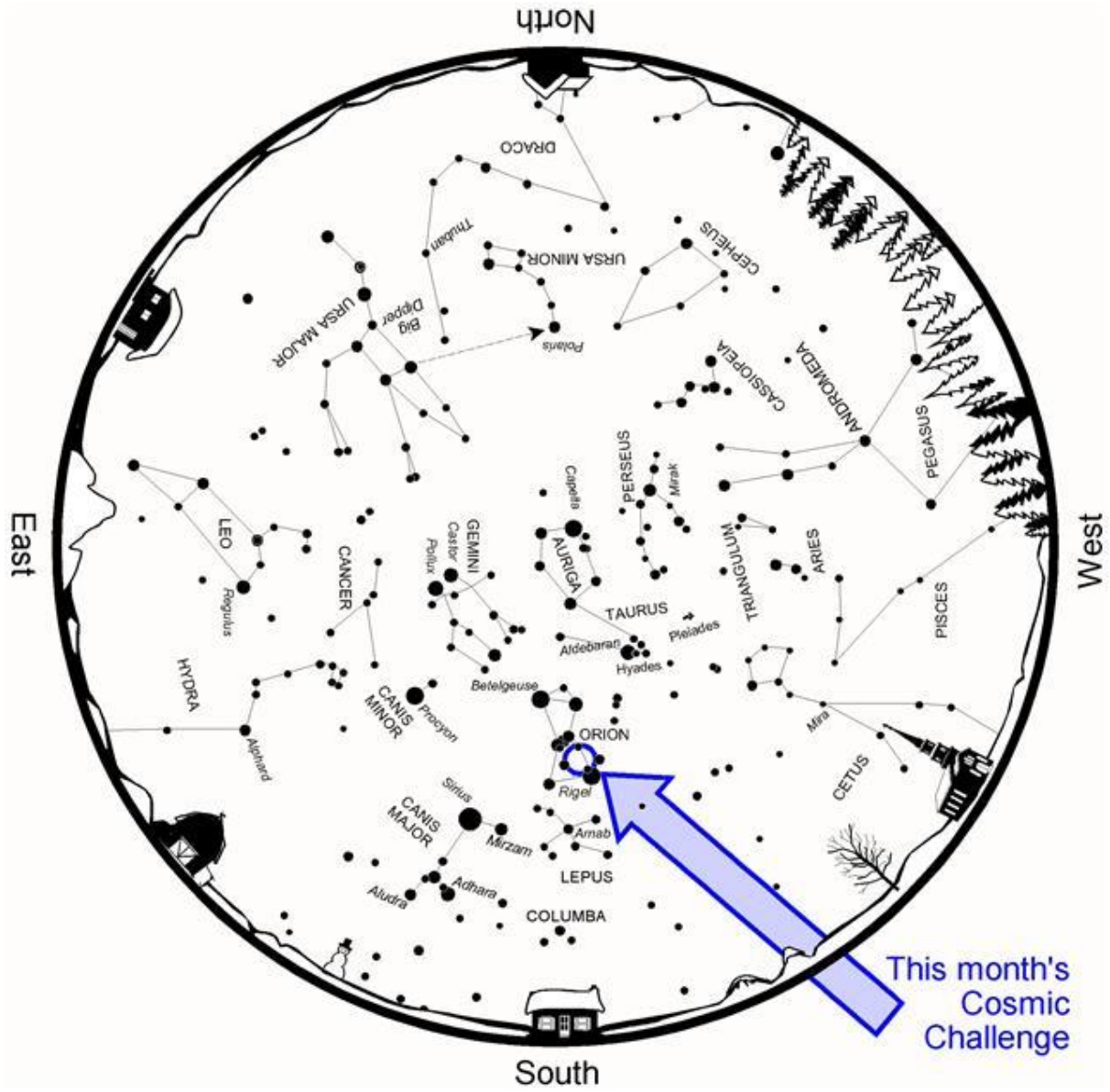
Saturn, Mars, and Jupiter before dawn on Feb. 17, 2018.

Looking Through the Eyepiece

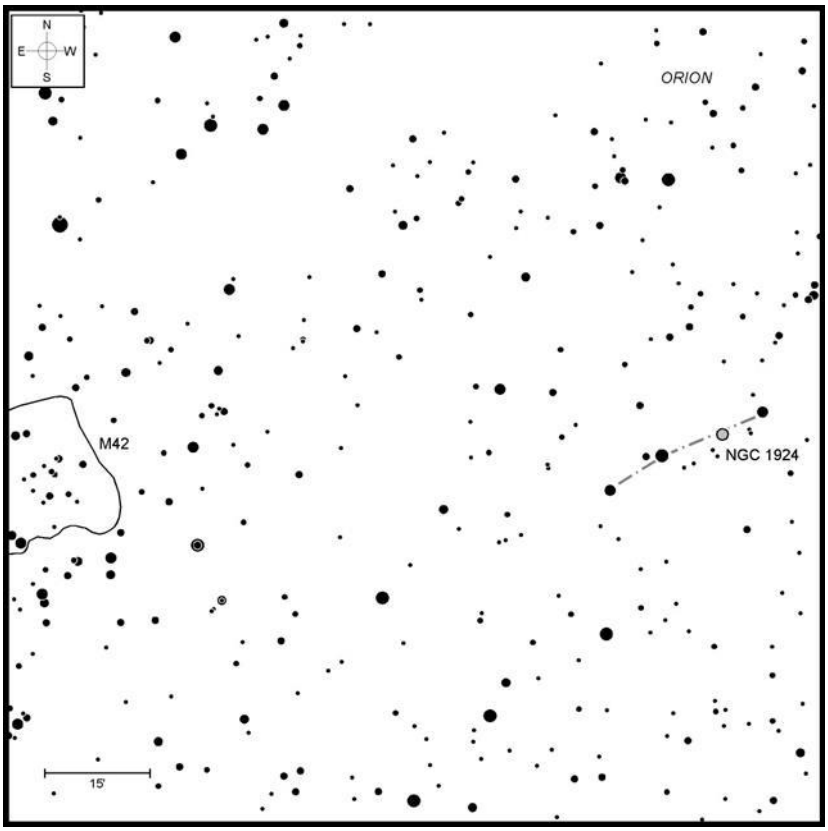
This month's suggested aperture range is 6" to 9.25" telescopes

Target	Type	RA	DEC	Constellation	Magnitude	Size
NGC 1924	Galaxy	05 28 01.9	-05 18 37	Orion	13	1.5'x1.1'

You've heard of the Andromeda Galaxy and the Orion Nebula, but how about the Orion Galaxy? Probably not. But would you believe the New General Catalog lists 21 galaxies in Orion, and the Index Catalog adds another 9? That's a pretty respectable tally. Of those 30 Orion galaxies, I find this month's challenge particularly intriguing because it lies so close to everyone's favorite winter deep-sky object, M42. Yet, I am sure that very few observers have seen it.



Above: Winter star map.
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

NGC 1924, a barred spiral galaxy, was discovered in 1785 by William Herschel using his 18.7-inch (47.5cm) reflector, undoubtedly on an evening when he too was admiring the Orion Nebula. And why not? After all, M42 lies less than 2° to the east. That's pretty good company to keep, but at the same time, it can also be a curse, since the Orion Nebula can be pretty distracting.

Finding NGC 1924 is easy enough by starting at M42 and scanning due west. Some 1½° into your scan, you will come to a diagonal path of three 8th-and 9th-magnitude field stars oriented northwest-southeast from one another. NGC 1924 lies along the path, like a distant galactic steppingstone equally spaced between two of those Milky Way suns.

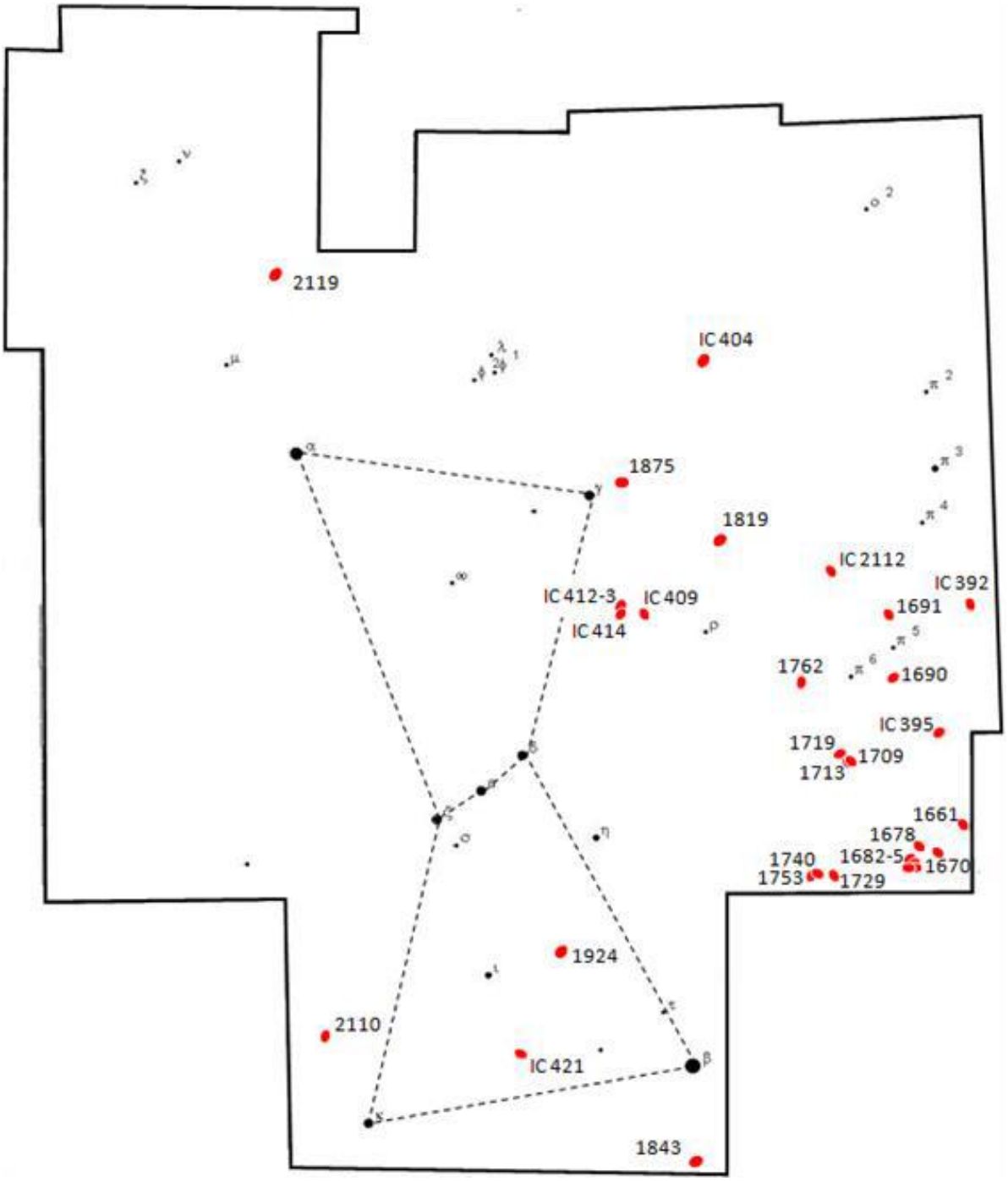
When summarizing its appearance for his New General Catalog, John Dreyer described it as "very faint, pretty large, irregularly round, stars nearby." My 8-inch (20.3cm) Newtonian shows NGC 1924 as a faint, oval disk accented by a stellar nucleus. It lies between two 8th-magnitude stars set amidst a sparkling field of fainter stardust. Larger apertures bring out additional subtle details.

Through my 18-inch (45.7cm) reflector, the galaxy reveals a brighter outer edge and a star-like central core, closely mimicking the look of a planetary nebula. Add in the spectacular surroundings and how they add a faux-3D effect, and the beauty of this little treasure really comes through. It's a challenge that you are sure to return to time and again as you further explore its more affluent neighbor.

Above: NGC 1924 as sketched through the author's 8-inch (20.3cm) reflector.

And what of the remaining NGC and IC galaxies within Orion? Here's the list.

Designation	Coordinates RA h m s Dec ° ' "	Magnitude	Size
IC 392	RA 04 46 25.8 Dec +03 30 20	13	1.4'x0.9'
NGC 1661	RA 04 47 07.7 Dec -02 03 18	13	1.4'x0.9'
IC 395	RA 04 49 34.0 Dec +00 15 10	13	1.3'x1.0'
NGC 1670	RA 04 49 42.6 Dec -02 45 36	13	1.3'x0.7'
NGC 1678	RA 04 51 35.4 Dec -02 37 22	13	1.1'x0.8'
NGC 1682	RA 04 52 19.7 Dec -03 06 19	14	0.9'x0.9'
NGC 1683	RA 04 52 17.5 Dec -03 01 27	15	1.0'x0.4'
NGC 1684	RA 04 52 31.1 Dec -03 06 20	12	2.2'x1.7'
NGC 1685	RA 04 52 34.2 Dec -02 56 59	14	1.3'x0.9'
NGC 1690	RA 04 54 19.3 Dec +01 38 26	14	1.0'x1.0'
NGC 1691	RA 04 54 38.3 Dec +03 16 04	12	2.3'x1.8'
NGC 1709	RA 04 58 44.1 Dec -00 28 42	14	1.0'x0.7'
NGC 1713	RA 04 58 54.6 Dec -00 29 21	13	2.7'x1.8'
NGC 1719	RA 04 59 34.5 Dec -00 15 38	14	1.1'x0.3'
NGC 1729	RA 05 00 15.6 Dec -03 21 11	13	1.7'x1.4'
IC 2112	RA 05 00 30.2 Dec +04 23 11	14	0.5'x0.2'
NGC 1740	RA 05 01 54.7 Dec -03 17 45	13	1.5'x1.2'
NGC 1753	RA 05 02 32.2 Dec -03 20 41	15	1.4'x0.6'
NGC 1762	RA 05 03 37.0 Dec +01 34 24	13	1.7'x1.1'
NGC 1819	RA 05 11 46.0 Dec +05 12 03	13	1.3'x1.0'
IC 404	RA 05 13 19.6 Dec +09 45 1	15	0.8'x0.6'
NGC 1843	RA 05 14 06.1 Dec -10 37 36	13	2.1'x1.7'
IC 409	RA 05 19 33.7 Dec +03 19 04	14	1.3'x1.0'
NGC 1875	RA 05 21 45.7 Dec +06 41 20	14	0.8'x0.7'
IC 414	RA 05 21 55.0 Dec +03 20 31	14	0.7'x0.4'
IC 412	RA 05 21 56.8 Dec +03 29 10	14	1.4'x0.7'
IC 413	RA 05 21 58.8 Dec +03 28 55	14	1.0'x1.0'
NGC 1924	RA 05 28 01.9 Dec -05 18 37	13	1.5'x1.1'
IC 421	RA 05 32 08.5 Dec -07 55 05	14	3.3'x3.2'
NGC 2110	RA 05 52 11.2 Dec -07 27 23	13	1.7'x1.2'
NGC 2119	RA 05 57 26.9 Dec +11 56 56	14	1.2'x1.0'



Above: Orion's NGC and IC galaxies

Notice form the chart above how most are clustered along the constellation's west-southwest border. That's not surprising, since that area is farthest from the obscuring dust clouds that permeate Orion. Further west, the river Eridanus overflows its banks with a flood of faint galaxies. Be aware that many of Orion's galaxies are below the cutoff threshold of this column's self-imposed aperture class. But give them a go anyway. I'd especially draw your attention to two galaxy group. The first is a trio formed by of IC 412, 413, and 414, with a fourth, IC 409, waiting in the wings. You'll find them 3° south-southwest of Bellatrix [Gamma (γ) Orionis]. The second group is a tight pact in the constellation's southwestern corner. NGC 1682, 1683, 1684, and 1685 are so closely spaced that at the chart's scale here, they nearly overlap one another. Notice that the brightest of the four is 12th magnitude, with the others plummeting as low as 15th magnitude. That's a tough test for even the largest amateur telescopes. Be sure to share your results with the rest of us by posting in this article's discussion forum. 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 test. Contact me through my web site 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! 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.

This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit **spaceplace.nasa.gov** to explore space and Earth science!

Sixty Years of Observing Our Earth

By Teagan Wall

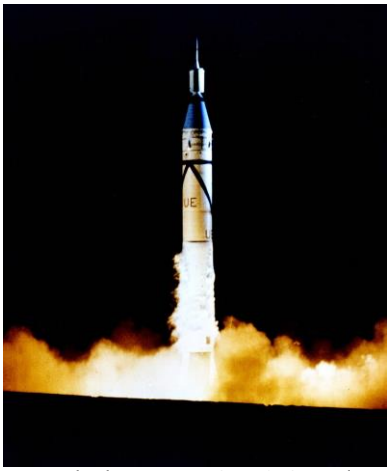
Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster—such as a hurricane or a large fire—they can help track what's happening. Then, communication satellites can help us warn people in harm's way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky. The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet. For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too. When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day. Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer 1—and the decades of hard work and scientific advances since then.



This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age. Image credit: NASA To learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard

Observatories and Planetariums

Bruneau Dunes Observatory – Bruneau Dunes State Park, Mt. Home, ID

The observatory will re-open in March please stay tuned for more details.

CSI Centennial Observatory / Faulkner Planetarium Herrett Center

Event	Date	Time	Admission
Total Lunar Eclipse	Wednesday, January 31st, 2018	4:30 to 7:30 AM	FREE
Astronomy Talk: "Asteroid Shadows by Starlight: Research at the Centennial Observatory"	Wednesday, February 7th, 2018	6:30 to 7:30 PM	Adults: $2.50 Children (7-17) & CSI students, faculty, and staff: $1.50 Ages 0-6: FREE
Astronomy Talk Night Telescope Viewing	Wednesday, February 7th, 2018	7:30 to 9:30 PM	Free with Astronomy Talk admission
Monthly Free Star Party	Saturday, February 10th, 2018	7:00 PM to midnight	FREE
Telescope Tuesday	Tuesday, February 13th, 2018	7:00 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission
Telescope Tuesday	Tuesday, February 27th, 2018	7:30 to 9:00 PM	$1.50 or free with Faulkner Planetarium admission

College of Southern Idaho Campus Twin Falls, ID
Faulkner Planetarium / Show Times
http://herrett.csi.edu/astronomy/planetarium/showtimes.asp

Now Showing

About the Magic Valley Astronomical Society

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

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

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

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

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

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

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

Membership Benefits:
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 circa 1980.