Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, May 12th 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
May 2018

Spring is finally here and I am sure of it since observing does not require a heavy coat. The spring constellations are up with their resplendent galaxies. Jupiter transits at midnight mid-month and charts with the times for transits, eclipses, occultations and shadows on Jupiter's disk for all of 2018 can be found here. Venus is rising in the west throughout the month plus Saturn and Mars are visible after midnight. What a great time to observe!

The best views of any objects are from a dark sky site and the newly designated Central Idaho Dark Sky Reserve is the best place to go for prime observing. I recently spoke to a group of interested people at the Sawtooth National Recreational Area headquarters located north of Ketchum. Among the attendees were representatives of the Idaho Conservation League and Steve Pauly, aka Dr. Dark. He is the prime mover for dark sky compliant lighting and has, over the last two decades, been instrumental in night lighting ordinances throughout the Wood River Valley. In a move to extend these dark skies, the Bellevue City Council decided to proceed with a pilot project of replacing a select number of conventional streetlights with energy efficient, warm light LED's. The recent upsurge in dark sky tourism was one of the reasons cited for Bellevue becoming dark sky compliant. More information about the company offering replacement lighting is here.

Current projects within the reserve include identifying sites for observing. A map of these locations is forthcoming and will be made available to interested parties. Updates on the progress of this project, including maps of the area, can be found on their website. In addition to mapping observing areas, long-range plans include possibly building an observatory. All of these plans are aimed at making the CIDSR a vital part of the state and thus ensuring its continued existence.

There are currently a couple of events scheduled within the reserve. One is a star party by the Boise Astronomical Society on the weekend of June 15-16 and the other is a guided tour of the night sky on July 6 that I am giving for the Sawtooth Association in cooperation with the Stanley Chamber of Commerce. Of course anyone can observe within the CIDSR and wide-angle views of the Milky Way from Redfish Lake with the mountains in the foreground makes a wonderful photograph. Making such images is the topic of this month's meeting as Gary Leavitt gives is second installment of creating great astrophotographs.

One final note, our equipment trailer is finished and ready to use. It was unveiled at our April meeting and will accommodate all our equipment for a good sized star party such as the one on May 11 at Three Creeks School. This event was rescheduled due to cloudy weather.

Enjoy our dark skies,

Tim

Calendar

May 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8 Last Quarter Visible 47% ↓ Age: 22.6 Days 	9	10	11 Three Creek Elementary Star Party at the School at Dusk details via the e-mail list.	12 MVAS Meeting at 7:00pm at the Herrett Center Faulkner Planetarium Public Star Party Centennial Obs.
13 Mother's Day 	14	15 New Moon Lunation 1180 1% Visible ↑ Age: 0.00 Day 	16	17	18	19
20	21	22 First Quarter 55% Visible ↑ 	23	24	25	26
27	28 Memorial Day 	29 Full Moon 100% Visible Flower Moon 	30	31		

Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month.
 Full Moon names follow the traditional Algonquin First Nation history.

Be Safe – Get Out There – Explore Your Universe

Celestial Events Calendar

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

5/1 May Day or Beltane, a cross-quarter day
5/2 The Moon is 8.9 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 11:00; Venus is 6.4 degrees north of the first-magnitude star Aldebaran (Alpha Tauri) at 18:00
5/4 The Moon is 1.7 degrees north of Saturn at 20:00
5/5 The peak of the Eta Aquarid meteor shower (20 per hour for northern hemisphere observers) occurs at 7:00; the Moon, Mars, and Pluto lie within a circle of diameter 4.81 degrees at 23:00
5/6 The Moon is at apogee, subtending 29' 32" from a distance of 404,457 kilometers (251,318 miles), at 0:35; the Moon is 2.7 degrees north of Mars at 7:00
5/7 The Moon is at descending node (longitude 309.6 degrees) at 10:22
5/8 Asteroid 4 Vesta is stationary in Aquila at 10:00; the Curtiss Cross, an X-shaped Clair-obscure illumination effect located between the craters Parry and Gambart, is predicted to be visible at 22:33
5/9 Asteroid 4 Vesta (magnitude +6.3) is at perihelion (2.1517 astronomical units from the Sun) at 0:00; Jupiter is at opposition (angular size 44.8", magnitude -2.5) at 0:00
5/10 The Moon is 2.1degrees south-southeast of Neptune at 10:00; Jupiter is closest to the Earth (4.400 astronomical units) at 12:00
5/12 Mercury is 2.0 degrees south of Uranus at 13:00
5/13 Mercury is at its greatest latitude south of the ecliptic plane (-7.0 degrees) at 17:00; the Moon, Mercury, and Uranus lie within a circle with a diameter of 4.44 degrees at 18:00; the Moon is 4.4 degrees south-southeast of Uranus at 18:00; the Moon is 2.3 degrees south-southeast of Mercury at 19:00
5/14 The equation of time equals 3.65 minutes at 3:00; the Sun enters Taurus (longitude 53.46 degrees on the ecliptic) at 7:00
5/15 The Moon is 8.7 degrees south-southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 22:00; Venus is at perihelion (0.7184 astronomical units from the Sun) at 23:00
5/16 The Moon is 1.2 degrees north of Aldebaran, with an occultation occurring in northernmost central Russia, northwestern Greenland, central and northern Canada, at 13:00
5/17 The Moon is 4.8 degrees south of Venus at 19:00; the Moon is at perigee, subtending 32' 51" from a distance of 363,776 kilometers (226,040 miles), at 21:05
5/19 The Moon is 8.0 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 13:00
5/20 The Moon is 1.4 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 12:00; the Moon is at the ascending node (longitude 128.4 degrees) at 13:15
5/21 Venus is 0.73 degree north of the bright open cluster M35 in Gemini at 10:00
5/22 The Moon is 1.4 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 2:00; the Martian northern hemisphere autumnal equinox occurs at 3:00; Venus is at its greatest declination north (25.1degrees) at 6:00; the Lunar X (also known as the Werner or Purbach 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 7:06; sunrise takes place on the isolated lunar mountain Mons Pico at 16:59
5/23 Sunrise takes place on the isolated lunar mountain Mons Piton at 8:46
5/26 The Moon is 7.0 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 2:00
5/27 The Moon is 3.8 degrees north-northeast of Jupiter at 20:00
5/29 The Moon is 8.8 degrees north of Antares at 19:00
5/30 Mercury is 4.5 degrees south-southeast of M45 at 7:00
5/31 The Moon is 1.9 degrees south of asteroid 4 Vesta at 13:47

Nicolas Lacaille (1713-1762), Joseph Lockyer (1836-1920), Williamina Fleming (1857-1911), and Frank Drake (1930) were born this month. The German astronomers Gottfried and Maria Magarethe Kirch discovered the bright globular cluster M5 on May 5, 1702. On May 1, 1759, the English amateur astronomers John Bevis and Nicholas Munckley observed Comet Halley on its first predicted return. The Italian astronomer Annibale de Gasparis discovered asteroid 11 Parthenope on May 11, 1850. Asteroid 14 Irene was discovered on May 19, 1851 by the English astronomer John Russell Hind. The German astronomer Robert Luther discovered asteroid 26 Proserpina on May 6, 1853. The Australian astronomer John Tebbutt discovered the Great Comet of 1861 on May 13. The English astronomer Norman Pogson discovered asteroid 80 Sappho on May 2, 1864. Norman Pogson discovered asteroid 87 Sylvia on May 16, 1866. The 40-inch Clark refractor at the Yerkes Observatory saw first light on May 21, 1897. The Griffith Observatory opened to the public on May 14, 1935. Nereid, Neptune's third-largest satellite, was discovered on May 1, 1949 by the Dutch-American astronomer Gerard Kuiper.

The Sun, the Moon, & the Planets

The **Sun** is located in Aries on May 1st. It enters Taurus on May 14th.

The **Moon** is 14.8 days old, is illuminated 99.3%, subtends 30.6 arc minutes, and is located in Libra on May 1st at 0:00 UT. The Moon is at its greatest northern declination on May 19th (+20.5 degrees). The Moon is at its greatest its greatest southern declination on May 5th (-20.5 degrees). Longitudinal libration is at maximum (+5.5 degrees) on May 25th and at minimum (-6.6 degrees) on May 12th. Latitudinal libration is at maximum (+6.5 degrees) on May 15th and at minimum (-6.6 degrees) on May 27th. The Moon is at apogee (distance 63.41 Earth-radii) on May 6th and at perigee (distance 57.04 Earth-radii) on May 17th. New Moon occurs on May 15th. The Moon occults Aldebaran from certain parts of the world on May 16th. Consult for http://www.lunar-occ...ota/iotandx.htm more on lunar occultations. Visit http://saberdoesthes...does-the-stars/ for tips on spotting extreme crescent Moons. Times and dates for the lunar light rays predicted to occur this month are available at http://www.lunar-occ...o/rays/rays.htm

Mercury glides eastward through the constellations of Pisces, Aries, and Taurus in May. It brightens from magnitude +0.3 to magnitude -1.6 and shrinks in apparent diameter from 7.8 arc seconds to 5.2 arc seconds over the course of the month. Mercury is just four degrees above the eastern horizon one half -hour before sunrise on May 1st and loses altitude with each passing day.

Venus shines prominently in the evening sky. It increases in angular diameter from 11.5 arc minutes to 13.1 arc seconds while decreasing in illumination from 88% to 81% during the course of the month. Its altitude at sunset increases from approximately 24 degrees to 27 degrees. The brightest planet is located approximately five degrees north of Melotte 20 (the Hyades) and ten degrees east of M45 (the Pleiades) on May 1st. By May 13th, Venus lies halfway between Beta and Zeta Tauri. A thin waxing crescent Moon passes five degrees south of it on May 17th.

Mars doubles in brightness to magnitude -1.2 and grows in apparent size by one third to 15.1 arc seconds during May. It rises just before 1:30 a.m. local time as the month begins. At that time, Mars is situated about fifteen degrees east of Saturn in eastern Sagittarius. The waning gibbous Moon passes almost three degrees to the north of Mars on May 6th. The Red Planet passes less than one-half of a degree south of the globular cluster M75 on May 14th. The planet's prograde or direct motion takes it from Sagittarius to Capricornus on May 15th. The Martian southern hemisphere vernal equinox occurs on May 22nd. As a result, the south polar ice cap will begin to shrink. The dark triangular surface feature known as Syrtis Major is on the Martian central meridian (CM) in early May. Mare Cimmerium is prominent a week later. In the middle of the month, the volcanic Tharsis region is at the center of the planet's disk. Solis Lacus, the Eye of Mars, is on the CM by May 21st. Mars rises a bit after midnight by month's end.

On May 1st, **Jupiter** lies four degrees to the east of the third-magnitude Zubenelgenubi (Alpha Librae). By the end of the month, it is somewhat less than one degree from the star. When Jupiter reaches opposition on the night of May 8th, it will rise at sunset and set at sunrise. On that date, the gas giant shines at magnitude -2.5 and subtends 44.8 arc seconds from a position 37 light minutes distant and 16 degrees south of the celestial equator. At the time of opposition, Europa subtends 1.0 arc second, Io 1.1 arc seconds, Callisto 1.5 arc seconds, and Ganymede 1.7 arc seconds. A shadow transit by Io begins at 10:56 p.m. EDT on May 7th, followed by a transit of Io two minutes later. On the night of May 8th, Io, Europa, and Callisto lie to the east of the planet and Ganymede lies to the west. Io begins to transit Jupiter at 10:37 p.m. EDT on May 30th and is joined by its shadow at 11:07 p.m. EDT. The waxing gibbous Moon passes four degrees to the north of Jupiter on May 27th.

At mid-month, **Saturn** shines at magnitude +0.3 and has an apparent equatorial diameter of 18 arc seconds. Its rings are inclined by 26 degrees and subtend 40 arc seconds. In late May, Saturn transits the meridian at about 3:00 a.m. local time. It lies less than four degrees northeast of the third-magnitude star Lambda Sagittarii and 1.7 degrees north of the bright globular cluster M22 on May 1st. The Ringed Planet's retrograde motion takes it to position 1.8 degrees northwest of M22 by the end of May. The waning gibbous Moon passes less than two degrees north of Saturn on May 4th.

Uranus is 2.2 degrees south-southeast of Mercury at dawn on May 13th but is too faint to be seen.

Neptune is located one degree west of the fourth-magnitude star Phi Aquarii this month. The Moon passes two degrees south of the ice giant on the morning of May 10th. Neptune rises at about 2:00 a.m. local daylight time on May 31st.

Pluto lies in northeastern Sagittarius and transits the meridian before dawn.

Asteroids

The dwarf planet/asteroid 1 Ceres dims from magnitude +8.4 to magnitude +8.7 as it travels southeastward through Cancer and Leo this month. Ceres passes just south of Kappa Leonis (magnitude +4.5) on the evening of May 18th. Asteroid 4 Vesta (magnitude +6.3) is stationary on May 8th and is at perihelion on May 9th. Asteroid 472 Roma occults a 10.8-magnitude star in Serpens Caput during the early morning of May 11th and asteroid 201 Penelope occults a 9.9-magnitude star in Virgo on the night of May 21st-May 22nd for observers in certain parts of the United States. See http://asteroidoccultation.com/ for additional information. Asteroids brighter than magnitude +11.0 that reach opposition this month include 39 Laetitia (magnitude +10.4) on May 3rd, 15 Eunomia (magnitude +9.8) on May 8th, 16 Psyche (magnitude +10.7) on May 10th, and 13 Egeria (magnitude +10.7) on May 19th.

Carbon Star

Notable carbon star for May: **SS Virginis** Right Ascension: $12^{h}\ 25^{m}\ 14.3949^{s}$ Declination: +00° 46′ 10.921″

Comets

Comet C/2016 R2 (PanSTARRS) passes northeastward through Auriga in May. The comet is at perihelion on May 9th. It lies some two degrees south of the first-magnitude star Capella (Alpha Aurigae) in the early part of the month. On May 21st, Comet PanSTARRS passes about two degrees north of the second-magnitude star Beta Aurigae. Visit http://cometchasing.skyhound.com/ and http://www.aerith.ne...ly/current.html for information on these and other comets visible this month.

Orbiting Earth

Information on Iridium flares and passes of the ISS, the Tiangong-2, the USAF's X-37B, the HST, and other satellites can be found at http://www.heavens-above.com/

Meteors

The broad peak of the Eta Aquarid meteor shower centered on May 6th is compromised by a waning gibbous Moon. Southern hemisphere observers are favored. Eta Aquarid meteors are debris from the famous periodic comet 1P/Halley. See https://www.amsmeteo...hower-calendar/ for additional information.

A wealth of current information on solar system celestial bodies is posted at http://www.curtrenz.com/astronomy.html and http://nineplanets.org/ Various events taking place within our solar system are discussed at http://www.bluewater...ed-4/index.html

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

The Deep Sky

One hundred and sixty-five **deep-sky objects** for May: NGC 5248 (Bootes); M3, M51, M63, M94, M106, NGC 4111, NGC 4138, NGC 4143, NGC 4151, NGC 4214, NGC 4217, NGC 4244, NGC 4346, NGC 4369, NGC 4449, NGC 4485, NGC 4490, NGC 4618, NGC 4631, NGC 4656, NGC 4868, NGC 5005, NGC 5033, NGC 5297, NGC 5353, NGC 5354, Up 1 (Canes Venatici); Mel 111, M53, M64, M85, M88, M91, M98, M99, M100, NGC 4064, NGC 4150, NGC 4203, NGC 4212, NGC 4251, NGC 4274, NGC 4278, NGC 4293, NGC 4298, NGC 4302, NGC 4314, NGC 4350, NGC 4414, NGC 4419, NGC 4448, NGC 4450, NGC 4459, NGC 4473, NGC 4474, NGC 4494, NGC 4559, NGC 4565, NGC 4651, NGC 4689, NGC 4710, NGC 4725, NGC 4874, NGC 5053 (Coma Berenices); NGC 4027, NGC 4038-9, NGC 4361 (Corvus); M68, M83, NGC 4105, NGC 4106, NGC 5061, NGC 5101, NGC 5135 (Hydra); M40, NGC 4036, NGC 4041, NGC 4051, NGC 4062, NGC 4085, NGC 4088, NGC 4096, NGC 4100, NGC 4144, NGC 4157, NGC 4605, NGC 5308, NGC 5322 (Ursa Major); M49, M58, M59, M60, M61, M84, M86, M87, M89, M90, M104, NGC 4030, NGC 4073, NGC 4168, NGC 4179, NGC 4206, NGC 4215, NGC 4216, NGC 4224, NGC 4235, NGC 4260, NGC 4261, NGC 4267, NGC 4281, NGC 4339, NGC 4343, NGC 4365, NGC 4371, NGC 4378, NGC 4380, NGC 4387, NGC 4388, NGC 4402, NGC 4429, NGC 4435, NGC 4438, NGC 4517, NGC 4526, NGC 4535, NGC 4536, NGC 4546, NGC 4550, NGC 4551, NGC 4567, NGC 4568, NGC 4570, NGC 4593, NGC 4596, NGC 4636, NGC 4638, NGC 4639, NGC 4643, NGC 4654, NGC 4666, NGC 4697, NGC 4698, NGC 4699, NGC 4753, NGC 4754, NGC 4760, NGC 4762, NGC 4866, NGC 4900, NGC 4958, NGC 5044, NGC 5054, NGC 5068, NGC 5077, NGC 5084, NGC 5087, NGC 5147, NGC 5170, NGC 5247, NGC 5363, NGC 5364 (Virgo)

Top ten deep-sky objects for May: M3, M51, M63, M64, M83, M87, M104, M106, NGC 4449, NGC 4565

Top ten deep-sky binocular objects for May: M3, M51, M63, M64, M84, M86, M87, M104, M106, Mel 111

Challenge deep-sky object for May: 3C 273 (Virgo)

The objects listed above are located between 12:00 and 14:00 hours of right ascension.

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

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

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 http://www.cambridge..._april-june.htm

Telrad finder charts for the Messier Catalog and the SAC's 110 Best of the NGC are posted at http://www.astro-tom...charts/map1.pdf and http://www.saguaroas...k110BestNGC.pdf respectively.

Information pertaining to observing some of the more prominent Messier galaxies can be found at http://www.cloudynig...ur-astronomers/

Stellarium and Cartes du Ciel are two excellent 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 http://tonightssky.com/MainPage.php

Freeware sky atlases can be downloaded at http://www.deepskywa...-atlas-full.pdf and http://astro.mxd120....ee-star-atlases

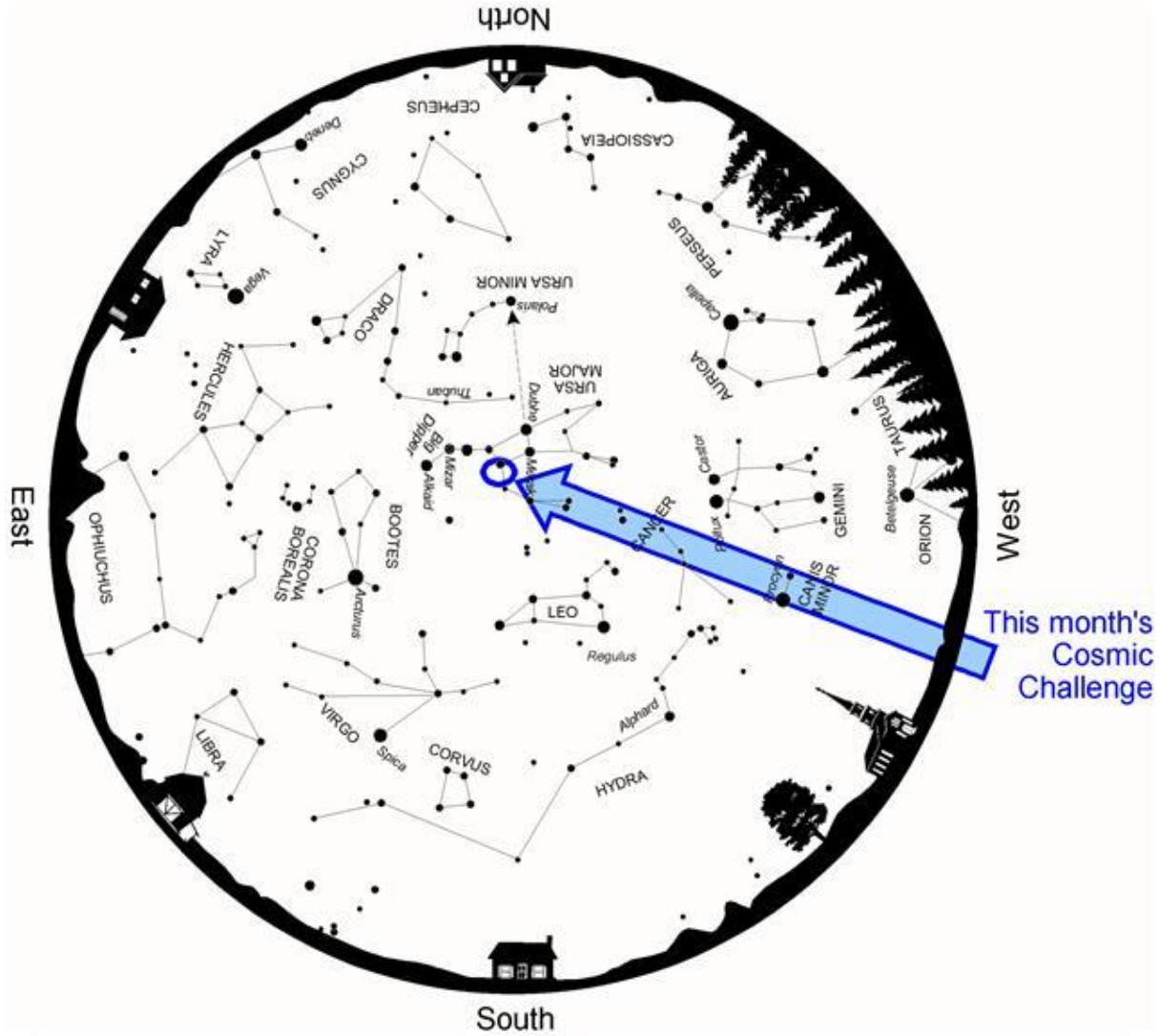
Looking Through the Eyepiece

Phil Harrington's Cosmic Challenge: M109

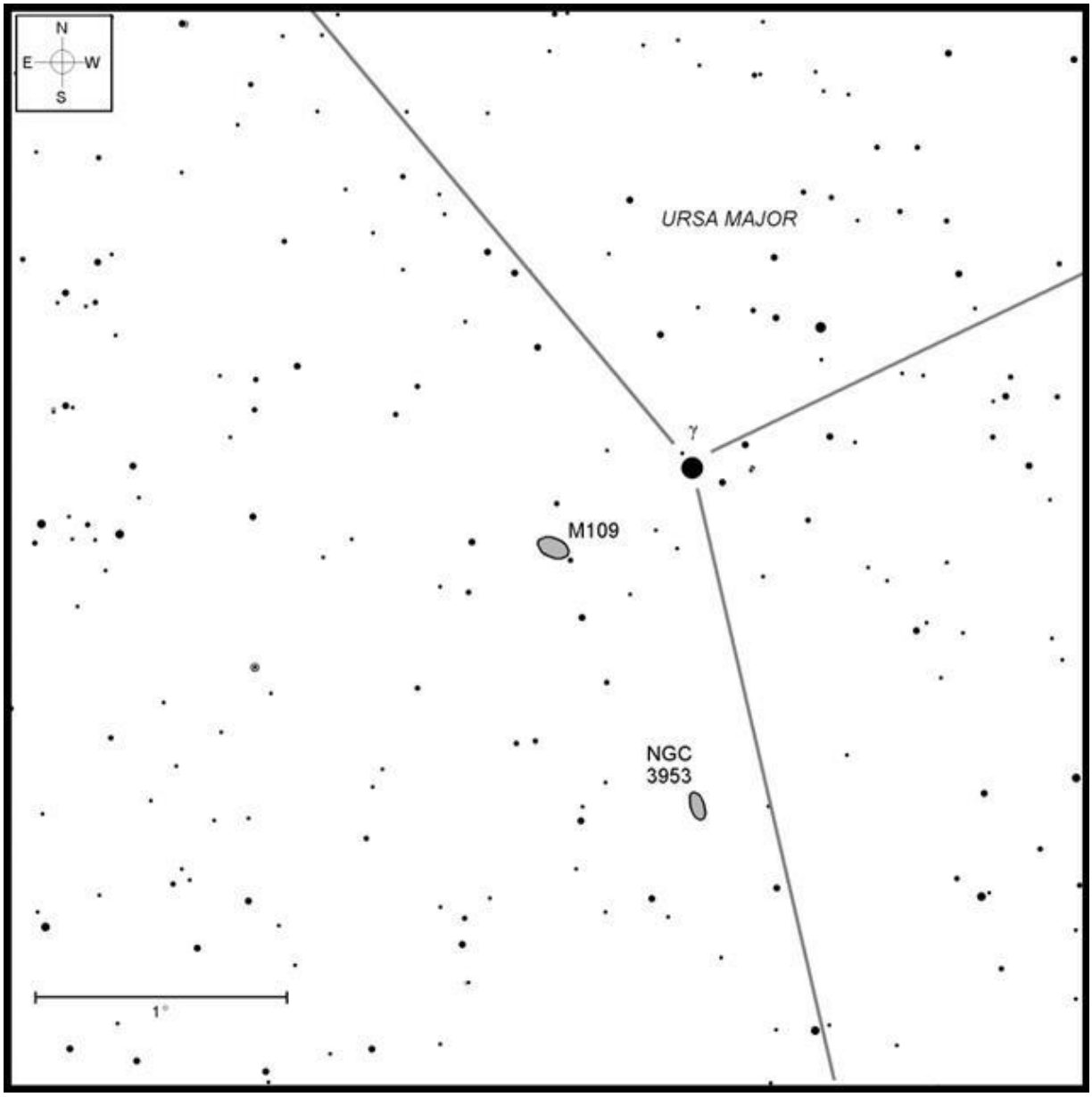
This month's suggested aperture range: Giant Binoculars and Small Scopes 2-inch (5cm) and up.

Target	Type	RA	DEC	Constellation	Magnitude	Size
M109	Galaxy	11 57.6	+53 22.5	Ursa Major	11	7.6'x4.6'

The galaxy we know today as M109, cross-identified as NGC 3992 in John Dreyer's 1888 New General Catalogue of Nebulae and Clusters of Stars, was first spotted by Messier's contemporary, Pierre Méchain, on March 12, 1781. He subsequently reported his new find to Messier as "close to Gamma in the Great Bear." Unfortunately, this was after Messier had submitted his original *"Catalogue des Nébuleuses et des Amas d'Étoiles"* ("Catalogue of Nebulae and Star Clusters") of 103 objects for publication in the annual French journal of astronomical ephemerides Connoissance des Temps (translated "Knowledge of the Times"). Messier did not live to see a second edition of his catalog, but objects 104 through 110 have been added posthumously by others. M109 joined the ranks in 1953, when astronomy historian Owen Gingerich noted Messier's observations of six additional "Méchain objects," now known as M104 through M109.



Above: Spring 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

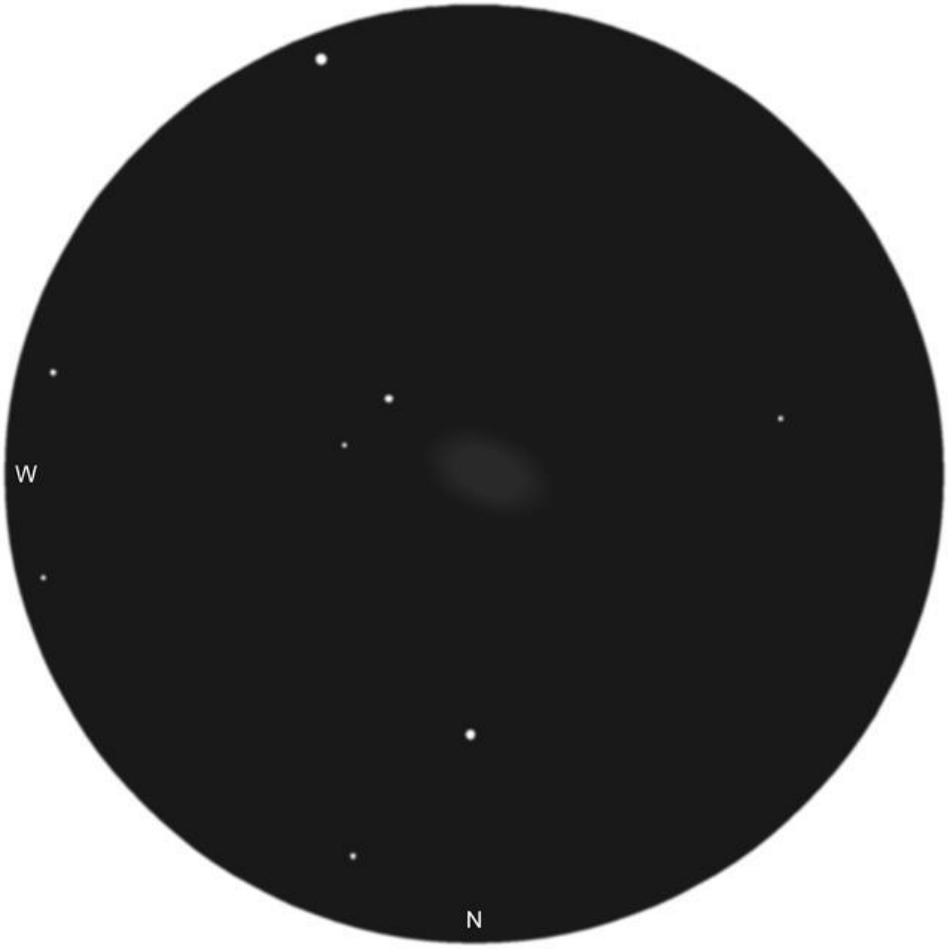
Not only is M109's history a little cloudy, spotting it represents one of the toughest challenges in this chapter. Indeed, many a seasoned observer has trouble seeing M109 through far larger telescopes. The low magnifications of binoculars only confound the situation. M109, a nearly face-on barred spiral galaxy, lies just 38' southeast of Phecda [Gamma (γ) Ursae Majoris], the star marking the southeastern corner of the bowl. At magnitude 2.4, Phecda's starlight easily washes out the dim glow of M109 at low power, especially if viewing with less than perfectly clean optics.

That's only part of the problem, however. M109 is one of those objects that, by their nature, have a very low surface brightness. The open structure of M109's spiral disk make it so dim that spotting it through anything smaller than a 6-inch telescope is all but impossible. As a result, smaller instruments reduce M109 to only its central nucleus, which appears as little more than a dim point.

These two facts led the creators of the Astronomical League's Binocular Messier Program to list M109 as a challenge object for an 80-mm binocular. Through my pair of 16x70 binoculars, it only shows up as a dim field "star" with perhaps the slightest hint of fuzziness. Increasing to a 20x80 binocular helps to single out the galaxy from among the few field stars in its immediate area.

The higher magnifications possible through my 4-inch f/10 refractor help to isolate M109's dim glow from the background. At 102x, the galaxy's nucleus appears decidedly lopsided, elongated roughly east-northeast/south-southwest. With averted vision, I can also detect a subtle, somewhat mottled hint of the galaxy's central bar protruding in the same direction, but any trace of the spiral arms that curl away from the ends of that bar remain in the realm of larger apertures and/or more skillful eyes.

While you are in the area, try to spot NGC 3953, another barred spiral set 1.4° due south of Phecda. Some have suggested that Messier may have missed Méchain's reported galaxy and actually saw NGC 3953 instead. Although that conjecture is generally dismissed today, NGC 3953 is often spotted first by observers seeking M109 because of its slightly greater surface brightness.



Above: M109 as sketched through the author's 4-inch (10.2cm) refractor.

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. Until next month, remember that half of the fun is the thrill of the chase. Game on!

What's It Like Inside Mars?

By Jessica Stoller-Conrad

Mars is Earth's neighbor in the solar system. NASA's robotic explorers have visited our neighbor quite a few times. By orbiting, landing and roving on the Red Planet, we've learned so much about Martian canyons, volcanoes, rocks and soil. However, we still don't know exactly what Mars is like on the *inside*. This information could give scientists some really important clues about how Mars and the rest of our solar system formed.

This spring, NASA is launching a new mission to study the inside of Mars. It's called Mars InSight. InSight—short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport—is a lander. When InSight lands on Mars later this year, it won't drive around on the surface of Mars like a rover does. Instead, InSight will land, place instruments on the ground nearby and begin collecting information.

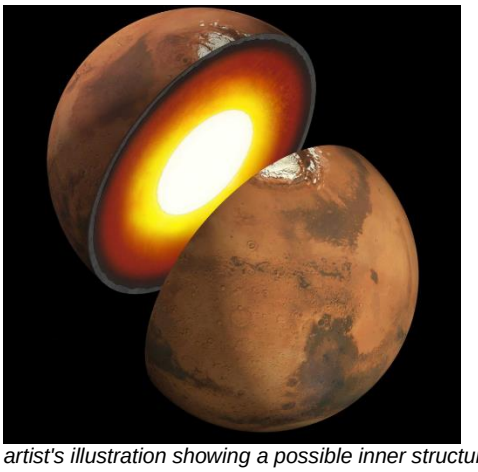
Just like a doctor uses instruments to understand what's going on inside your body, InSight will use three science instruments to figure out what's going on inside Mars. One of these instruments is called a seismometer. On Earth, scientists use seismometers to study the vibrations that happen during earthquakes. InSight's seismometer will measure the vibrations of earthquakes on Mars—known as marsquakes. We know that on Earth, different materials vibrate in different ways. By studying the vibrations from marsquakes, scientists hope to figure out what materials are found inside Mars.

InSight will also carry a heat probe that will take the temperature on Mars. The heat probe will dig almost 16 feet below Mars' surface. After it burrows into the ground, the heat probe will measure the heat coming from the interior of Mars. These measurements can also help us understand where Mars' heat comes from in the first place. This information will help scientists figure out how Mars formed and if it's made from the same stuff as Earth and the Moon.

Scientists know that the very center of Mars, called the core, is made of iron. But what else is in there? InSight has an instrument called the Rotation and Interior Structure Experiment, or RISE that will hopefully help us to find out.

Although the InSight lander stays in one spot on Mars, Mars wobbles around as it orbits the Sun. RISE will keep track of InSight's location so that scientists will have a way to measure these wobbles. This information will help determine what materials are in Mars' core and whether the core is liquid or solid. InSight will collect tons of information about what Mars is like under the surface. One day, these new details from InSight will help us understand more about how planets like Mars—and our home, Earth—came to be.

For more information about earthquakes and marsquakes, visit: https://spaceplace.nasa.gov/earthquakes



Caption: An artist's illustration showing a possible inner structure of Mars.
Image credit: NASA/JPL-Caltech

Observatories and Planetariums

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

You're invited to star gaze at the Bruneau Dunes Observatory! See the night sky as you've never seen it before. Observatory tours and solar viewing (through a specially adapted telescope) begin one hour before sunset, and are free of cost. Visitors can view a short orientation program and then have the chance to survey the heavens through the observatory's collection of telescopes. There is a per person viewing fee (children 5 and under are free of cost). Check event listings for fees. The observatory is open on Friday and Saturday nights only, weather permitting. For presentation times, call 208-366-7919, or check the kiosk when you arrive at the park.

CSI Centennial Observatory / Faulkner Planetarium Herrett Center

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, May 12th, 2018	9:45 PM to midnight	FREE
Summer Solar Session #1	Centennial Observatory	Wednesday, May 30th, 2018	1:30 to 3:30 PM	FREE

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

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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.