Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, July 14th 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

MVAS President's Message

July 2018

Summer . . . finally! Good observing weather has arrived and with it a host of events and objects. Mars reaches opposition late this month and both Jupiter and Saturn are in prime viewing locations. The summer Milky Way is resplendent in the south and brings the rich star fields of Scorpio, Sagittarius and Scutum into view. There are literally not enough hours of night to fully explore these wonders.

We have several events this month that take full advantage of the warm summer evenings: summer sky presentation and observing in Stanley on July 6, the Pomerelle Star Party on the 7th, our annual barbeque-in-lieu-of-meeting July 14 and a Mars event on Monday the 30th at the Herrett Center. Quite a lineup and that first one in Stanley is part of the ongoing effort of the Central Idaho Dark Sky Reserve to promote enjoyment of that resource. It is given in conjunction with the Stanley Chamber of Commerce and is one of many such events planned to bring Astro-Tourism to the area.

Late last month I joined the CIDSR planning board and attended my first meeting. What an amazing group of dedicated individuals. Currently they are promoting the Reserve, working on securing funding for programs, planning observing sessions for various groups in the coming year as well as looking long term toward a number of projects. Some of these proposals include permanent observing facilities for amateurs, even an observatory, and expanding the Reserve's boundaries to include more dark sky. Given the enthusiasm and willingness to work on the difficult challenges facing us, I have no doubt we will succeed. This is what makes astronomy a living, breathing part of a community - the sharing of the interest and joy of nights under a dark sky with the community. I can't wait to see how these nascent programs take shape.

And finally, July brings all the wonderful family events into focus. Picnics, camp outs, fishing, swimming and just simply hanging out that are all part of warm summer days. Looking at the summer constellations should be part of all this as well. Recently I stumbled across a great sky map and guide at the Sun Valley Garden Center. It is a simple, laminated, six-fold brochure that shows the major constellations for the four seasons and a moon map. It is available at the Garden Center or online here.

Regardless of your crowded summer schedule, take time to look up at night and share your excitement with those around you.

Clear skies and warm weather to all,

Tim

Calendar

July 2018

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 Canada Day 	2	3	4 Independence Day 	5	6 Last Quarter Visible 49% ↓ Age: 22.32 Days 	7 Pomerelle Star Party 
8	9	10	11	12	13 New Moon Lunation 1182 1% Visible ↓ Age: 0.00 Day 	14 MVAS Meeting at 7:00pm at the Herrett Center Faulkner Planetarium Public Star Centennial Obs.
15	16	17	18	19 First Quarter 51% Visible ↑ 	20	21
22	23	24	25	26	27 Full Moon 100% Visible Thunder Moon 	28
29	30	31 Mars Closet Approach at 2:00AM MDT 				

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)

7/1 The Moon is five degrees north of Mars at 2:00
7/4 The Moon is 2.4 degrees south-southeast of Neptune at 2:00; Mercury (magnitude +0.1) is 0.39 degree south-southwest of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 13:00
7/5 Asteroid 3 Juno (magnitude +9.7) is 2.8 degrees south of Uranus (magnitude +5.8) at 7:13
7/6 The Earth is at aphelion (152,095,566 kilometers or 94,507,803 miles from the Sun) at 17:00; the Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to be visible at 20:43
7/7 The Moon is 4.7 degrees south-southeast of Uranus at 17:00; the Moon is 1.8 degrees south-southeast of asteroid 3 Juno at 17:38
7/9 The Moon is 8.8 degrees south-southeast of the bright open cluster M45 (the Pleiades or Subaru) in Taurus at 18:00; Venus is 1.1 degrees north of the first-magnitude star Regulus (Alpha Leonis) at 20:00
7/10 Mercury is at the descending node at 1:00; the Moon is 1.1 degrees north-northwest of the first-magnitude star Aldebaran (Alpha Tauri), with an occultation occurring in north-central Russia, most of Greenland, and central and northern North America at 9:00; Jupiter is stationary in longitude at 17:00
7/11 Jupiter is stationary in right ascension, with direct (eastward) motion to commence, at 4:00; the Moon is 3.8 degrees south of the bright open cluster M35 in Gemini at 22:00
7/12 Mercury is at greatest eastern elongation east (26.4 degrees) at 5:00; Pluto (magnitude +14.2, angular diameter 0.1") is at opposition at 10:00
7/13 The Moon is at perigee, subtending 33' 26" at a distance of 357,431 kilometers (222,097 miles).
7/14 The Moon is at ascending node (longitude 125.9 degrees) at 2:52; the Moon is 1.1 degrees south-southwest of the bright open cluster M44 at 6:00; the Moon is 2.1 degrees north-northeast of Mercury at 23:00
7/15 The Moon is 1.7 degrees north-northeast of Regulus at 17:00
7/16 The Moon is 1.6 degrees north-northeast of Venus at 4:00
7/19 The Moon is 7.2 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 14:00.
7/20 The Lunar X, also known as the Werner or Purbach Cross, an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to begin at 6:15; asteroid 88Thisbe (magnitude +9.7) is at opposition at 9:00; Mercury is at aphelion (0.4667 a.u. from the Sun) at 10:00; sunrise takes place on the isolated lunar mountain Mons Pico at 13:00
7/21 The Sun enters Cancer, at ecliptic longitude 118.25 degrees, at 1:00; the Moon is 4.2 degrees north-northeast of Jupiter at 3:00; sunrise takes place on the isolated lunar mountain Mons Piton at 4:21
7/23 The Moon is 8.9 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 7:00
7/24 Mercury (magnitude +1.5) is 7.6 degrees west of Regulus (magnitude +1.4) at 18:00
7/25 The Moon is 2.0 degrees north of Saturn at 6:00; Mercury is stationary in right ascension, with retrograde (westward) motion to commence, at 7:00
7/26 Mercury is stationary in longitude at 5:00; the equation of time equals -6.54 minutes at 6:00
7/27 Mars is at opposition (magnitude -2.8, angular diameter 24.3") at 5:00; the Moon is at apogee, subtending 29' 25" from a distance of 406,223 kilometers (252,415 miles) at 5:44; a total lunar eclipse begins its penumbral phase at 17:14:38; the instant of greatest lunar eclipse occurs at 20:21:45; the Moon is at the descending node (longitude 305.9 degrees) at 22:41
7/28 The Southern Delta Aquarid meteor shower (15 to 20 per hour) peaks at 9:00; the middle of the eclipse season, i.e., when the Sun is at the same longitude as the Moon's ascending node (125.8 degrees), occurs at 23:00
7/30 A double Galilean satellite shadow transit (Io's shadow precedes Europa's) begins at 7:21
7/31 The Moon is 2.4 degrees south-southeast of Neptune at 7:00; Mars is at its closest approach to the Earth (0.385 a.u.) at 8:00

Friedrich Bessel was born this month.

The light from Supernova SN 1054 was first noted by Chinese astronomers on July 4, 1054. The first lunar map was drawn by Thomas Harriot on July 26, 1609. Charles Messier discovered the globular cluster M28 in Sagittarius on July 27, 1764. Comet D/1770 L1 (Lexell) passed closer to the Earth than any comet in recorded history on July 1, 1770. Charles Messier discovered the globular cluster M54 in Sagittarius on July 24, 1778. Caroline Herschel discovered the open cluster NGC 6866 in Cygnus on July 23, 1783. The globular cluster NGC 6569 in Sagittarius was discovered by William Herschel on July 13, 1784. Karl Ludwig Hencke discovered asteroid 6 Hebe on July 1, 1847. The first photograph of a star, namely Vega, was taken on July 17, 1850. The first photograph of a total solar eclipse was taken on July 28, 1851. The Apollo 11 lunar module landed on the Moon on July 20, 1969. Fragments of Comet D/1993 F2 (Shoemaker-Levy) impacted Jupiter on July 16, 1994.

The Sun, the Moon, & the Planets

The **Sun** is located in Gemini on July 1st. The Earth is farthest from the Sun on July 6th, when it is 3.3% more distant than it was at perihelion and 1.7% farther than its average distance. The Sun enters Cancer on July 21st.

The Sun is located in Gemini on July 1st. The Earth is farthest from the Sun on July 6th, when it is 3.3% more distant than it was at perihelion and 1.7% farther than its average distance. A partial solar eclipse visible from extreme southeastern Australia, the South Pacific Ocean, the South Indian Ocean, the Antarctic Ocean, and far northern Antarctica occurs on July 13th. This will be the 69th eclipse of Saros 71. Greatest eclipse takes place at 3:01:07 UT. The Sun enters Cancer on July 21st.

Brightness, apparent size, illumination, distance from the Earth in astronomical units, and location data for the planets and Pluto on July 1st: Mercury (-0.1 magnitude, 6.6", 61% illuminated, 1.02 a.u., Cancer), Venus (-4.1 magnitude, 15.7", 70% illuminated, 1.06 a.u., Leo), Mars (-2.2 magnitude, 20.9", 97% illuminated, 0.45 a.u., Capricornus), Jupiter (-2.3 magnitude, 41.4", 99% illuminated, 4.76 a.u., Libra), Saturn (+0.0 magnitude, 18.4", 100% illuminated, 9.05 a.u., Sagittarius), Uranus (+5.8 magnitude, 3.5", 100% illuminated, 20.01 a.u. on July 16th, Aries), Neptune (+7.8 magnitude, 2.3", 100% illuminated, 29.32 a.u. on July 16th, Aquarius), and Pluto (+14.2 magnitude, 0.1", 100% illuminated, 32.59 a.u. on July 16th, Sagittarius).

The **Moon** is 17.0 days old, is illuminated 93.9%, subtends 29.4 arc minutes, and is located in Capricornus on July 1st at 0:00 UT. The Moon is at its greatest northern declination of +20.6 degrees on July 12th and its greatest southern declination of -20.7 degrees on July 26th. Longitudinal libration is at a maximum of +7.5 degrees on July 20th and a minimum of -7.6 degrees on July 7th. Latitudinal libration is at a maximum of +6.8 degrees on July 8th and a minimum of -6.8 degrees on July 20th. New Moon takes place on July 13th. Large tides will occur afterwards. The Moon is at perigee on July 13th and at apogee on July 27th. The Moon occults Aldebaran from various parts of the world on July 10th. The times and dates for the lunar crater light rays predicted to occur in July are available at http://www.lunar-cc.../rays/rays.htm

Mercury undergoes a somewhat mediocre apparition for northern hemisphere observers this month. The speediest planet passes within one degree of M44 on July 3rd and July 4th. Mercury is at dichotomy on July 7th. Mercury enters Leo on July 14th. A thin crescent Moon passes within two degrees of the planet on that evening.

Venus brightens to a brilliant magnitude -4.3 by the end of July. It passes one degree north of Regulus on the night of July 9th. A three-day-old waxing crescent Moon passes within two degrees of the planet on the night of July 15th/July 16th.

Mars reaches opposition at 5:00 UT on July 27th, the best opposition since the historic 2003 opposition. At that time, it will rise at sunset, shine at magnitude -2.8, and subtend 24.3 arc seconds. Mars will be 57.6 million kilometers (35.8 million miles) or 32 light minutes from Earth and 25.5 degrees south of the celestial equator. Closest approach to the Earth occurs on July 31st. Most unfortunately, a planet encircling/global dust storm is currently obscuring the surface features of the Red Planet.

Jupiter drops in brightness by two tenths of a magnitude and in apparent size by more than three arc seconds this month. Jupiter is situated two degrees from the double star Zubenelgenubi (Alpha Librae) in western Libra when it resumes prograde or direct (eastern) motion on July 11th. The waxing gibbous Moon passes four degrees to the north of Jupiter on the night of July 20th.

Saturn is 4.7 degrees due east of M20 (the Trifid Nebula) and four degrees southwest of the open cluster M25 as July begins. It lies 2.7 degrees east of M20, which is an unusual combination of an open cluster, an emission nebula, a reflection nebula, and a dark nebula, as the month ends. On the night of July 4th/July 5th, Saturn occults the tenth-magnitude star TYC 6277-323-1 (BD-22 4689) beginning around 4:10 UT. Tenth-magnitude Tethys will be a mere 10 arc seconds from the star at 1:45 UT. In mid-July, Saturn's rings span 41 arc seconds and are tilted some 26 degrees with respect to the Earth. The planet's disk subtends 18.3 arc seconds at the equator. On July 25th, a waxing gibbous Moon passes two degrees north of the Ringed Planet. The faint Saturnian satellite Iapetus shines at eleventh magnitude and is positioned 1.7 arc minutes due north of Saturn on the night of July 1st. For further data on Saturn's satellites, browse http://www.skyandtel...watching-tools/

Uranus can be found in southwestern Aries approximately twelve degrees south of the second-magnitude star Hamal (Alpha Arietis). A waning crescent Moon passes less than five degrees south-southeast of Uranus on July 7th. Visit http://bluewaterastr...anus_2018_1.pdf and http://www.nakedeyep....com/uranus.htm for finder charts.

Neptune is located in eastern Aquarius. The eighth planet is situated 0.9 degree west-southwest of the fourth-magnitude star Phi Aquarii at the start of the month. By the end of July, Neptune lies 1.4 degrees from that star. A waning gibbous Moon passes less than three degrees south-southeast of Neptune on July 4th and July 31st. Browse http://bluewaterastr...tune_2018_1.pdf and http://www.nakedeyep...com/neptune.htm for finder charts. Finder charts for Uranus and Neptune are also available at https://www.skyandte...WEB_UrNep18.pdf

On the evening of July 3rd, **Pluto** passes 35 arc seconds west of the sixth-magnitude star 50 Sagittarii. The dwarf planet is at opposition on July 12th. Finder charts can be found on page 43 of the July 2018 issue of Astronomy, pages 48 and 49 of the July 2018 issue of Sky & Telescope, and on page 243 of the RASC Observer's Handbook 2018.

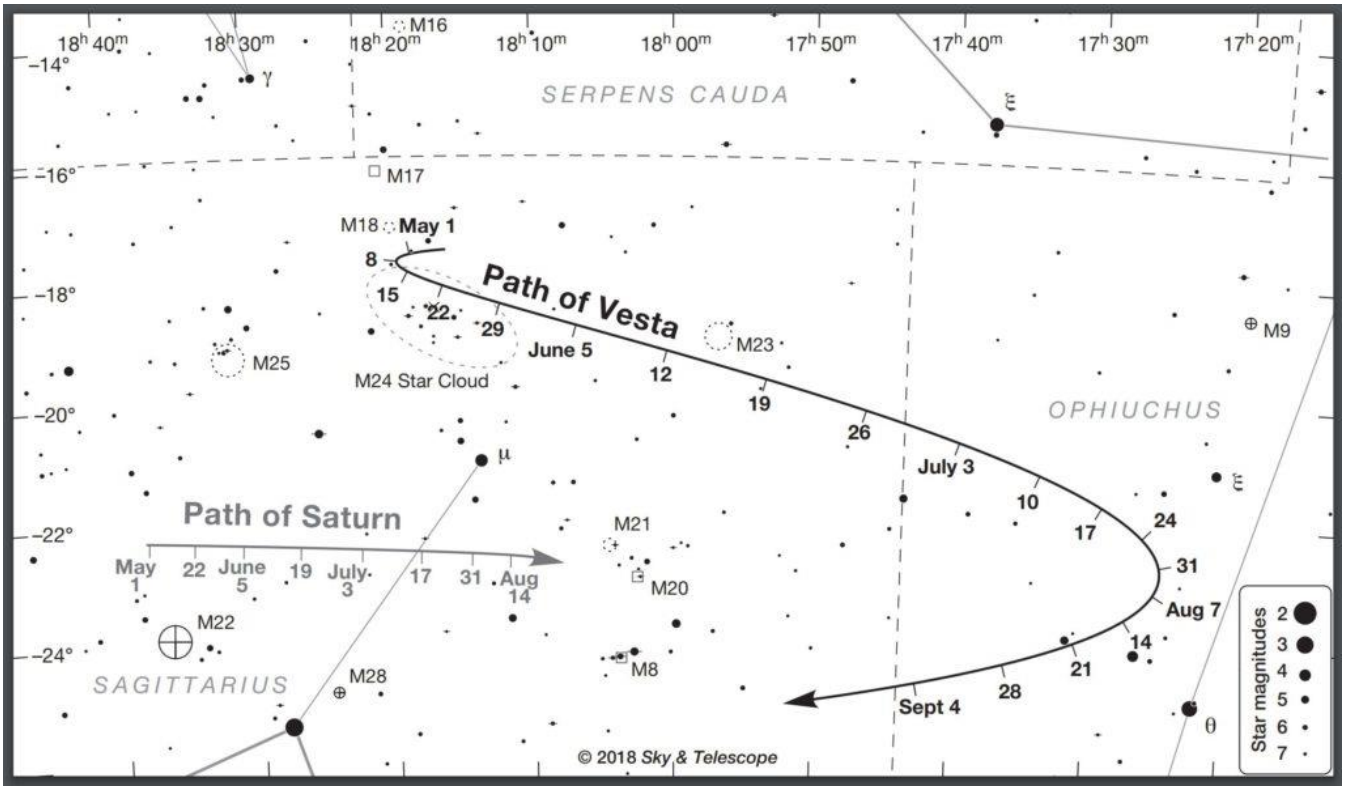
For more on the planets and how to locate them, browse http://www.nakedeyeplanets.com/

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

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

Asteroids

Asteroid 4 Vesta decreases in brightness from magnitude +5.6 to magnitude +6.3 as it travels southwestward through Ophiuchus this month. It passes about one degree north of the sixth-magnitude star 52 Ophiuchi on June 7th. On July 14th, Vesta enters the dark nebula known as the Dark Horse or Prancing Horse Nebula. A finder chart can be found on page 48 of the June 2018 issue of Sky & Telescope. Asteroid 3 Juno passes less than three degrees south of Uranus on the morning of July 5th. A number of asteroids with magnitudes of +11.0 or brighter reach opposition this month including 88 Thisbe, 14 Irene, 26 Proserpina, 197 Ampella, 140 Siwa, and 144 Vibilia. Information on asteroid occultations taking place this month is available at http://www.asteroido.../2018_07_si.htm



A chart showing the position of Vesta (and Saturn) through June and July. Credit: Sky and Telescope.

Carbon Star

Notable carbon star for July: **T Draconis** in Draco the Dragon. R.A. 17 56 23.2 Declination +58 13 07

Comets

The periodic comet 21P/Giacobini-Zinner may shine at tenth magnitude as it travels northeastward from Cygnus into Cepheus. See http://cometchasing.skyhound.com/ and http://www.aerith.ne...t/future-n.html for additional information on 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 peak of the Southern Delta Aquarid meteor shower on the morning of July 30th is compromised by moonlight. The radiant is located northwest of the first-magnitude star Fomalhaut (Alpha Piscis Austrini). Southern hemisphere observers are favored. Click on http://earthsky.org/...d-meteor-shower for further information. Other minor meteor showers with southern radiants occurring this month are the Alpha Capricornids, the Piscis Austrinids, and the Northern Delta Aquarids.

The Deep Sky

Sixty-five deep-sky objects for July: NGC 6140, NGC 6236, NGC 6340, NGC 6395, NGC 6412, NGC 6503, NGC 6543 (Draco); IC 4593, M13, M92, NGC 6106, NGC 6166, NGC 6173, NGC 6181, NGC 6207, NGC 6210, NGC 6229, NGC 6482 (Hercules); B61, B62, B63, B64, B72, IC 4634, IC 4665, LDN 42, LDN 1773, M9, M10, M12, M14, M19, M62, M107, NGC 6284, NGC 6287, NGC 6293, NGC 6304, NGC 6309, NGC 6356, NGC 6366, NGC 6369, NGC 6384, NGC 6401, Tr 26 (Ophiuchus); NGC 6440, NGC 6445 (Sagittarius); B50, B55, B56, Cr 316, M4, M6, M7, M80, NGC 6144, NGC 6153, NGC 6192, NGC 6231, NGC 6242, NGC 6302, NGC 6337, NGC 6451 (Scorpius); NGC 6217, NGC 6324 (Ursa Minor)

Top ten binocular deep-sky objects for July: IC 4665, LDN 1773, M4, M6, M7, M10, M12, M13, M92, NGC 6231

Top ten deep-sky objects for July: M4, M6, M7, M10, M12, M13, M92, NGC 6210, NGC 6231, NGC 6543

Challenge deep-sky object for July: NGC 6380 (Scorpius)

The objects listed above are located between 16:00 and 18:00 hours of right ascension.

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 and https://dso-browser.com/

Freeware sky atlases can be downloaded at http://www.deepskywatch.com/files/deepsky-atlas/Deep-Sky-Hunter-atlas-full.pdf and http://astro.mxd120.com/free-star-atlases

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

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

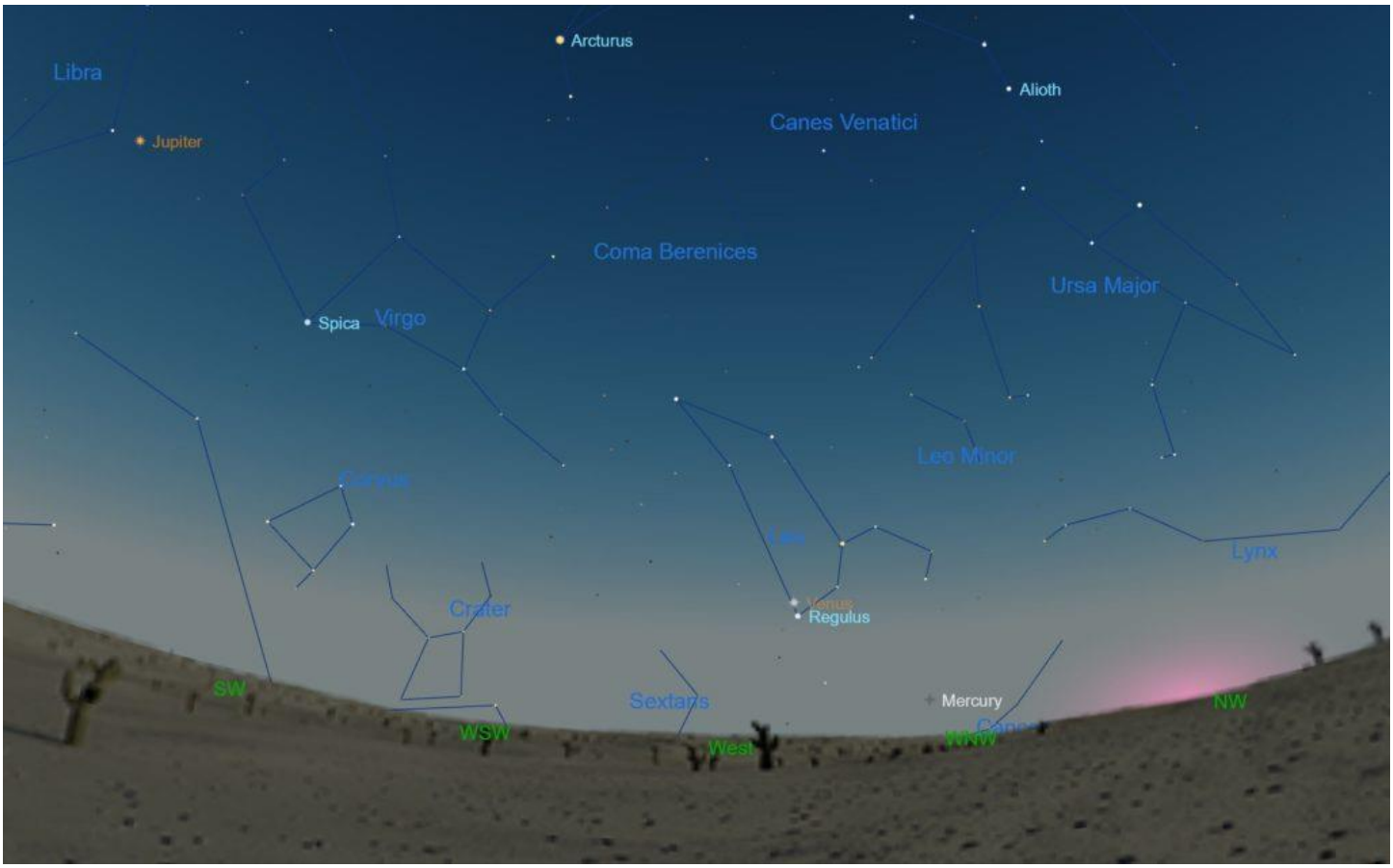
Finder charts for the Messier objects and other deep-sky objects are posted at https://freestarcharts.com/messier and https://freestarcharts.com/ngc-ic and http://www.cambridge..._april-june.htm

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

The multiple star 36 Ophiuchi consists of three orange dwarf stars. For more on this interesting system, see https://stardate.org...orange-triplets and http://www.solstatio...rs/36ophiu3.htm



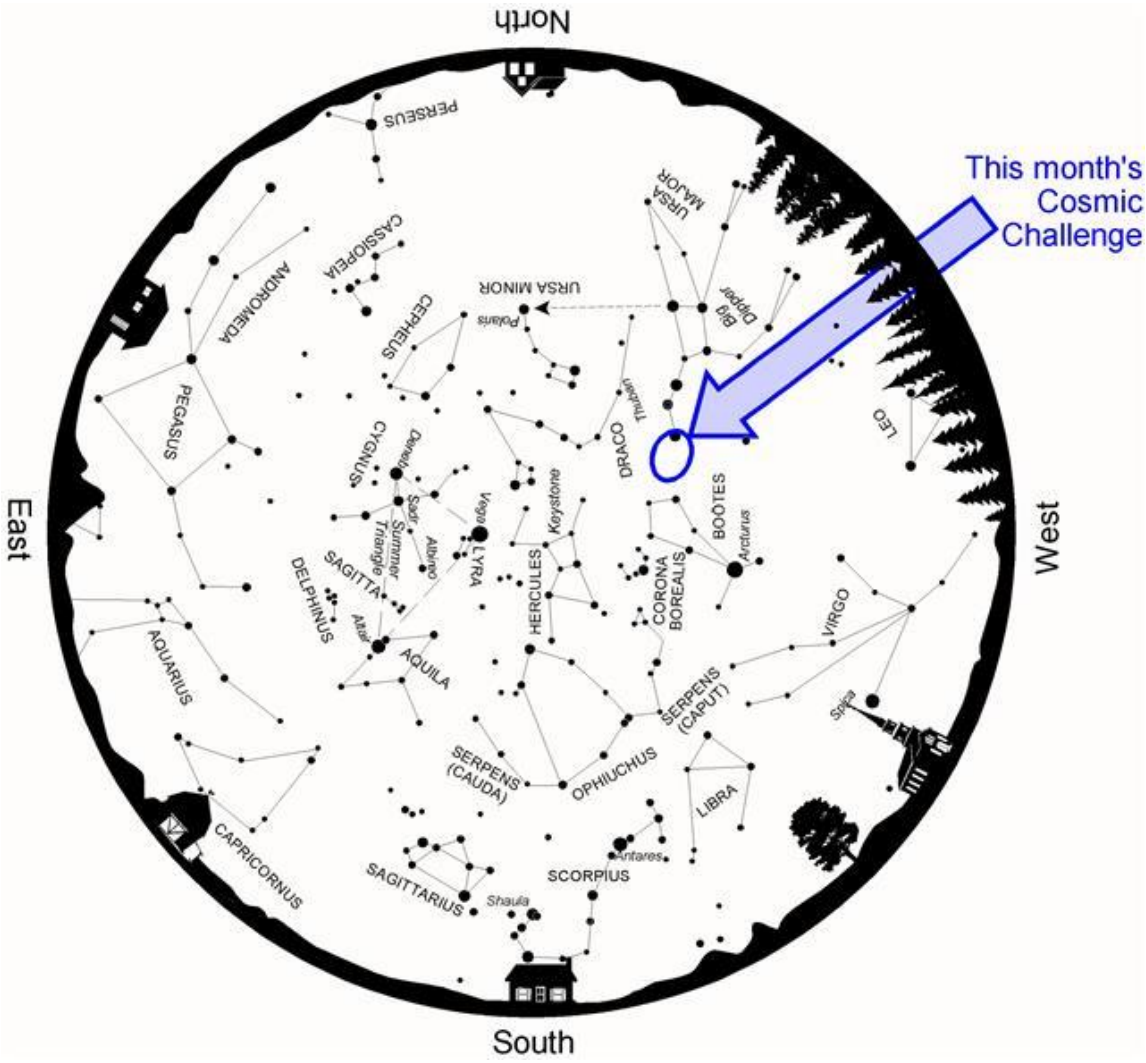
Venus and Mercury in the western sky about 45 minutes after sunset on July 10, 2018.

Cosmic Challenge – Dissecting M101

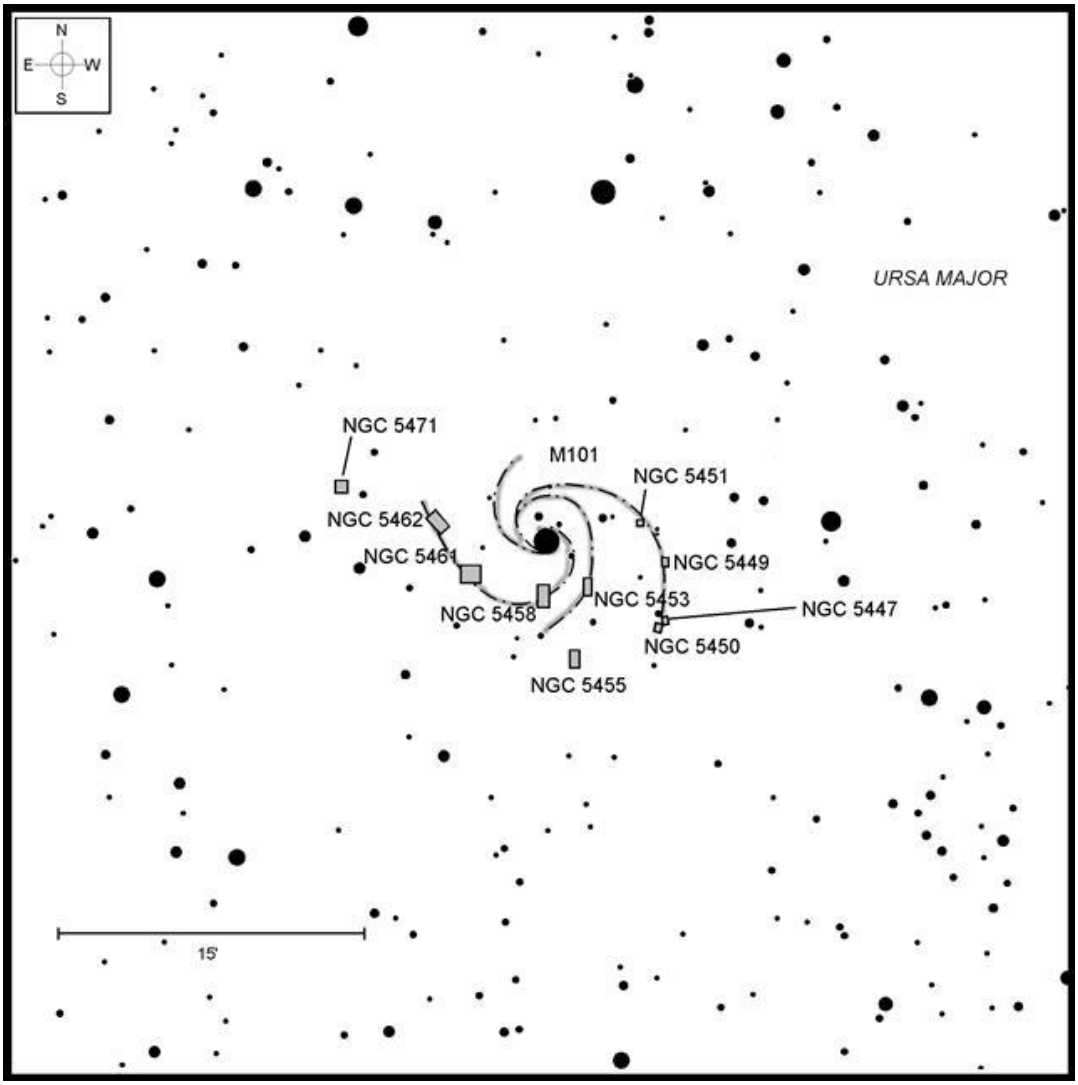
For this month's cosmic challenge you'll need an aperture of 10-inch plus telescopes.

Target	Type	RA	DEC	Constellation	Magnitude	Size
M101's nebulae	Emission nebulae	14 03.2	+54 20.9	Ursa Major	varies	varies

Just spotting the gigantic Pinwheel Galaxy, M101, can sometimes be challenging enough. Its low surface brightness can drive suburban observers crazy, especially when we see photographs that show it so big and bright, or that it is listed as 8th magnitude. It all comes down to surface brightness, or more accurately, lack of surface brightness. Seeing the dim glow of the galaxy's small core, or the even dimmer glimmer of the surrounding spiral arms, can take a concerted effort. But with time and patience, M101 is visible, with difficulty, through 50-mm binoculars even given a suburban sky with a naked-eye limiting magnitude of perhaps 4.5.



Above: Summer 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

For double-digit apertures, the test presented by M101 is not only seeing the galaxy, but also finding latent structural details hidden within. Pierre Méchain may have discovered the Pinwheel in 1781, but it took the trained eye of William Herschel gazing through his 18.5-inch telescope to begin to crack M101's galactic vault and find the first hidden gems, three of the galaxy's interior clouds.

That was a good beginning, but by no means was the end of the story. The next chapter opened in 1845 when William Parsons, the third Earl of Rosse, first examined the galaxy through his monstrous 72-inch reflector at Birr Castle in Parsonstown, Ireland. Lord Rosse was the first to spot nine knots scattered throughout the galaxy's amazing spiral arms.

Rosse's discoveries were added to John Herschel's General Catalog in 1864 and subsequently, to John Dreyer's 1888 New General Catalog. Today, the M101 family of hydrogen-II regions holds eleven entries in the NGC, more than any other single object. Each of these clouds is a huge expanse of ionized hydrogen surrounding embedded stars, like the Orion Nebula (M42) and the Lagoon Nebula (M8), among others.

Use a wide-field eyepiece producing no more than 75x to find M101 initially and to trace out the full breadth of its spiral-arm disk. Can you repeat Lord Rosse's historic observation by spotting the subtle serpentine arms curving away from the galactic core? One arm branches off the southern tip of the core, curling around the core and twisting toward the west and south. The second major arm curves away from the northern edge of the core, hooks to the west, and then comes around the other side, where it divides.

There has been long-standing confusion over the exact locations of many of the NGC targets within M101 dating back to a drawing that Lord Rosse made in 1861. John Herschel subsequently used that drawing to determine the positions of those objects for inclusion in his General Catalog, which ultimately resulted in errors that have been carried over to the present day. After more than a century, these galactic boo-boos were finally corrected by Harold G. Corwin, Jr. of the California Institute of Technology. The positions and labels listed in the table below as well as plotted on the chart above are based on Corwin's research.

Table: Nebulae within M101

Target	RA	DEC	Magnitude	Size
NGC 5450	14 02.5	+54 16.2	13	20"x6"
NGC 5447	14 02.5	+54 16.8	14	8"
NGC 5449	14 02.5	+54 19.8	14	~15"
NGC 5451	14 02.6	+54 21.8	14	~10"
NGC 5453	14 02.9	+54 18.5	14	<10"
NGC 5455	14 03.0	+54 14.5	13	15"
NGC 5458	14 03.2	+54 17.9	14	~20"
NGC 5461	14 03.7	+54 19.1	14	25"x15"
NGC 5462	14 03.9	+54 21.9	14	60"x18"
NGC 5471	14 04.5	+54 23.8	15	25"

Our first stop is NGC 5471 at the far end of the eastern arm, 11.5' northeast of the core. Heinrich Louis d'Arrest was the first to spot it in 1863. Its isolation so far from the heart of M101 led many 20th-century observers to conclude that NGC 5471 was actually a separate galaxy, and in fact, its appearance through my 10-inch at 254x mimics a small elliptical galaxy perfectly, with an amorphous glow surrounding a brighter central core. Today, there is no longer any question as to its true nature. Photos taken with the Hubble Space Telescope reveal a glowing area some 200 times as vast as the Orion Nebula with several brighter regions embedded within. Detection of extremely strong X-ray emissions emanating from with have led researchers to conclude that NGC 5471 is home to no fewer than three supernova remnants.

Traveling inward along the same spiral arm, we next come to NGC 5462, one of Herschel's trio of discoveries. Unlike NGC 5471, which appears nearly circular, NGC 5462 looks quite distended, oriented northeast-southwest. It is slightly dimmer than NGC 5471, but should still be apparent in a 10-inch telescope. NGC 5462 shows little improvement with a narrowband or O-III nebula filter.

Closer in along the same spiral arm, we next come to NGC 5461, another of Herschel's finds. NGC 5461 is about 5' south-southeast of the galaxy's nucleus and looks like a faint, slightly fuzzy star through my 10-inch. My 18-inch at 411x begins to hint at some of the cloud's subtle structure, including what appears to be a stellar brightening at its northeastern edge. Again, a narrowband filter offers only a modicum of help.

Finally, NGC 5458 is situated along the same spiral arm, just prior to where it wraps into M101's nucleus. Look for a very small, very faint glow measuring less than 30" across set 5' directly south of the core.

M101's western arm also offers a variety of H II regions. Working out from the galactic nucleus, we first come to NGC 5451, found about 5' to its west. This is a tough catch. Unless your skies and optics are close to perfect, the low surface brightness of this nebulous tuft will probably escape unnoticed. A pair of faint field stars is only 1' to the cloud's west, so use them as a guide. But unless you can see those stars and the nebula, odds are good that you are only seeing the stars. NGC 5449, about 2' further south along the arm, is also a difficult target. Use high power for both.

A close-set pair of nebulous knots, NGC 5447 and NGC 5450, is found toward the southern tip of the western arm. Less than ideal seeing conditions will merge these into a single, elongated blur, but under steady skies, each can be resolved as a separate glow just south of a 14th-magnitude Milky Way star. NGC 5447 is a huge association of hot O- and B-type stars, while NGC 5450 is an H II region that may eventually evolve to resemble its neighbor.

Following a fork in the western arm that hooks back toward the galactic center brings us to NGC 5453. Look for its tiny presence about 2' west-northwest of NGC 5458.

NGC 5455 is found nearly half a degree south of M101's core, near the outskirts of the galaxy's vast spiral arm halo. Curiously, some computer software programs plot NGC 5455 as just another field star, failing to recognize its true extragalactic nature. It forms the southern point in an equilateral triangle with two 14th-magnitude field stars, one to its northeast and the other to its northwest.

Above: M101 as sketched through the author's 18-inch (46cm) reflector.

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!

A Close-Up View of Mars

By Jane Houston Jones and Jessica Stoller-Conrad

In July 2018, skywatchers can get an up close view of Mars—even without a telescope! In fact, on July 31, Mars will be closer to Earth than it has been in 15 years. Why is that? Like all the planets in our solar system, Earth and Mars orbit the Sun. Earth is closer to the Sun, and therefore it races along its orbit more quickly. Earth makes two trips around the Sun in about the same amount of time that Mars takes to make one trip.

Sometimes the two planets are on opposite sides of the Sun and are very far apart. Other times, Earth catches up with its neighbor and passes relatively close to it. This is called Mars's closest approach to Earth, and it's happening this year on July 31. The Moon will be near Mars on that night, too!

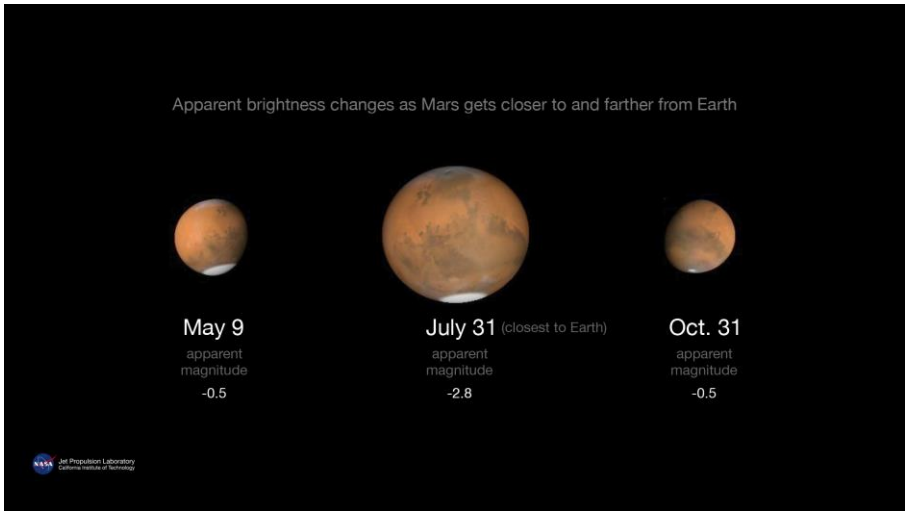
Keep in mind that even during its closest approach, Mars is still more than 35 million miles away from Earth. That's really far. So, Mars won't appear as big as the Moon in the sky, but it will appear bigger than it usually does.

July and August will be a great time to check out Mars. Through a telescope, you should normally be able to make out some of the light and dark features of the Red Planet—and sometimes even polar ice. However, a huge Martian dust storm is obscuring these features right now, so less planetary detail is visible. There is another important Mars date in July: Mars opposition. Mars opposition is when Mars, Earth and the Sun all line up, with Earth directly in the middle. This event is happening on July 27 this year. Although you may see news focusing on one of these two dates, Mars will be visible for many months. For about three weeks before and three weeks after opposition and closest approach, the planet will appear the same size to a skywatcher.

From July 7 through September 7 Mars will be the third brightest object in the sky (after the Moon and Venus), shining even brighter than Jupiter. The best time to view Mars during this time is several hours after sunset, when Mars will appear higher in the sky. Mars will still be visible after July and August, but each month it will shrink in size as it travels farther from Earth in its orbit around the Sun.

If you're wanting to look ahead to next month, prepare for August's summer Perseid meteor shower. It's not too early to plan a dark sky getaway for the most popular meteor shower of the year!

You can catch up on NASA's missions to Mars and all of NASA's missions at www.nasa.gov



Caption: In 2018, Mars will appear brightest from July 27 to July 30. Its closest approach to Earth is July 31. That is the point in Mars' orbit when it comes closest to Earth. Mars will be at a distance of 35.8 million miles (57.6 million kilometers). Credit: NASA/JPL-Caltech

Observatories and Planetarium

CSI Centennial Observatory / Faulkner Planetarium Herrett Center

Event	Place	Date	Time	Admission
Pomerelle Mountain Star Party (12th annual)	Pomerelle Ski Mountain	Saturday, July 7th, 2018	3:00 PM to 12:00 AM	FREE
Summer Solar Session #6	Kinney Court (east side of the museum)	Wednesday, July 11th, 2018	1:30 to 3:30 PM	FREE
Monthly Free Star Party	Centennial Observatory	Saturday, July 14th, 2018	9:45 PM to midnight	FREE
Summer Solar Session #7	Centennial Observatory	Wednesday, July 18th, 2018	1:30 to 3:30 PM	FREE
Summer Solar Session #8	Centennial Observatory	Wednesday, July 25th, 2018	1:30 to 3:30 PM	FREE
Mars Close Approach Viewing Party	Centennial Observatory	Monday, July 30th, 2018	11:00 PM to 2:00 AM	FREE

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.