Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

www.mvastro.org

Membership Meeting

Saturday, September 9th 2017 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

Dear Colleagues,

It has been a rewarding September. Cassini descended, and the Centennial Observatory caught a couple of asteroids occulting stars. The data gathered from these events will certainly prove to be rewarding. Meanwhile, the skies at Hagerman Fossil Beds National Monument continue to surprise. The site at the Oregon Trail Overlook would lead one to believe that the skies aren't that good, but in reality, views continue to be surprisingly nice, as was witnessed by our semi-annual star party over there at the end of this month. I realize the fall version of the party requires dealing with cold weather, but if you can ever manage to come during a fall session, you will find it worth it.

President's Message

October has a few significant developments as well. The monthly meeting on Oct. 14th will have two: Paul Verhage returns to discuss the use of CubeSats during the great Solar Eclipse of Aug. 21st, and MVAS will hold elections for a new board. This meeting will mark the end of my tenure as president, a span that has been quite rewarding and inspiring for me, and sometimes my family. However, after five years, I need to step away to focus on other matters. If you are interested in running for any office, or have nominations, please contact either myself or one of the board members.

A week later, we will head down to Three Creek School for our annual visit. Yes, this is a long drive, but the skies are worth it. If you're interested in joining us on Friday, Oct. 20th, please chime in so we can make ride arrangements.

Always grateful for your support,

Rob Mayer

Calendars

October 2017

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5 Full Moon Hunter's Moon 100% Visible	6	7
8	9 Columbus Day (US) Thanksgiving Day (Canada)	10	11	12 Last Quarter Visible 51% ↓	13	14 MVAS Meeting at 7:00pm at the Herrett Center Public Star Party Centennial Obs.
15	16	17	18	19 New Moon Lunation 1172 1% Visible↓	20	21
22	23	24	25	26	27 First Quarter 46% Visible ↑	28 International Observe the Moon Night Centennial Observatory
29	30	31 Halloween				

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Be Safe – Get Out There – Explore Your Universe

Celestial Calendar

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

10/2 The Moon is at the descending node (longitude 323.4 degrees) at 2:06

10/3 Venus is at perihelion (0.7184 astronomical units from the Sun) at 5:00

10/6 Uranus is 4.0 degrees north-northwest of the Moon at 19:00

10/7 Mars is at aphelion (1.6661 astronomical units from the Sun) at 22:00

10/8 The peak of the Draconid meteor shower (10 to 30 per hour) occurs at 9:00; Mercury is in superior conjunction with the Sun at 21:00

10/9 The Moon is 9.1 degrees south-southeast of the bright open cluster M45 (the Pleiades) at 2:00; the Moon is at perigee, subtending 32' 34" from a distance of 366,856 kilometers (227,954 miles), at 5:33; the Moon 0.6 degree north of the first-magnitude star Aldebaran (Alpha Tauri),

10/11 The Moon is 4.8 degrees south of the bright open cluster M35 in Gemini at 8:00

10/12 The Moon is 1.5 degrees north of asteroid 8 Flora at 0:00; the Moon is 9.2 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 21:00

10/13 Mercury is 2.7 degrees north-northeast of the first-magnitude star Spica (Alpha Virginis) at 20:00; the Moon is 2.6 degrees south of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 20:00; the Curtiss Cross, an X-shaped illumination effect located between the craters Parry and Gambart, is predicted to be at a midpoint at 22:14 10/14 Moon is at the ascending node (longitude 142.6 degrees) at 22:11

10/15 The Moon is 0.20 degree north of the first-magnitude star Regulus (Alpha Leonis), with an occultation taking place in western Africa, Cape Verde, most of the Caribbean, and most of North America, at 11:00

10/17 Mars is 1.7 degrees south-southwest of the Moon at 11:00

10/18 Venus is 1.9 degrees south-southwest of the Moon at 2:00; Mercury is 0.93 degree south-southwest of Jupiter at 8:00

10/19 Mercury is at the descending node through the ecliptic plane at 3:00; the Moon is 6.5 degrees north-northeast of Spica at 14:00; Uranus (magnitude +5.7, apparent size 3.7") is at opposition at 18:00. 10/20 Jupiter is 3.7 degrees south-southwest of the Moon at 5:00; Mercury is 5.0 degrees south-southwest of the Moon at 11:00

10/21 The peak of the Orionid meteor shower (15 per hour) occurs at 12:00

10/23 The Moon is 9.3 degrees north of the first-magnitude star Antares (Alpha Scorpii) at 8:00; Mars (heliocentric longitude 163.1 degrees) and Neptune (heliocentric longitude 343.1 degrees) are at heliocentric opposition at 10:00 10/24 Saturn is 3.2 degrees south of the Moon at12:00; Venus is at its greatest latitude north of the ecliptic plane (3.4 degrees) at 23:00

10/25 The Moon is at apogee, subtending 29' 29" from a distance of 405,152 kilometers (251,750 miles), at 2:00 10/26 Jupiter is in conjunction with the Sun at 18:00; Mars crosses the celestial equator and enters the southern celestial hemisphere at 23:00

10/27 The Lunar X, also known as 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 occur at 10:51; Comet 96P/Machholz is at perihelion (0.1239 astronomical units from the Sun) at 23:00

10/28 Asteroid 2 Pallas (magnitude +8.3) is at opposition at 16:00

10/29 The Moon is at the descending node (longitude 321.1 degrees) at 6:43; Mercury is at aphelion (0.4667 astronomical units from the Sun) at 12:00; asteroid 7 Iris (magnitude +6.9) is at opposition at 14:00

10/30 Neptune is 0.84 degree north-northwest of the Moon, with an occultation taking place in far southern Africa and most of Antarctica, at 21:00

10/31 The Sun enters Libra (longitude 217.78 degrees on the ecliptic)

Ejnar Hertzsprung and Henry Norris Russell were born this month.

The first recorded solar eclipse took place on October 22, 2136 BCE. Supernova SN 1604 (Kepler's Supernova) became visible to the naked-eye on October 9, 1604. Giovanni Cassini discovered Saturn's odd satellite lapetus on October 25, 1671. M51 (the Whirlpool Galaxy) was discovered by Charles Messier on October 13, 1773. William Lassell discovered Triton, Neptune's brightest satellite, on October 10, 1846. Marie Mitchell discovered Comet C/1847 T1 (Miss Mitchell's Comet) on October 1, 1847.

Asteroid 8 Flora was discovered by John Russell Hind on October 18, 1847. Two of the satellites of Uranus, Ariel and Umbriel, were discovered by William Lassell on October 24, 1851. Edwin Hubble discovered Cepheid variable stars in M31 (the Andromeda Galaxy) on October 5, 1923. Charles Kowal discovered 2060 Chiron, the first Centaur asteroid, on October 18, 1977. Michel Mayor and Didier Queloz announced the discovery of the exoplanet 51 Pegasi b (Dimidium) on October 6, 1995.

The Sun, the Moon, & the Planets



The Moon is 10.8 days old, subtends 30.4 arc minutes, is illuminated 76.4%, and is located in Virgo on October 1st at 0:00 UT. The Moon reaches its greatest northern declination (+19.6 degrees) on October 12th and its greatest southern declination (-19.7 degrees) on October 26th. Longitudinal libration is at a maximum of +5.2 degrees on October 17th and a minimum of -5.5 degrees on October 4th and -6.7 degrees on October 31st. Latitudinal libration is at a maximum of +6.6 degrees on October 9th and a minimum of -6.6 degrees on October 22nd. The waxing gibbous Moon occults Neptune from certain parts of the world on October 3rd. The waning gibbous Moon occults Aldebaran from certain parts of the world on October 3th. The waning crescent Moon occults Regulus from most of North America on the morning of October 15th. The waxing gibbous Moon occults Neptune again from certain parts of the world on October 30th. Consult http://www.lunar-occultations.com/iota/planets/planets.htm and http://www.lunar-occultations.com/iota/bstar/bstar.htm for further information on these events.

The Sun is located in Virgo on October 1st at 0:00 UT. It enters Libra at 0:00 UT on October 31st.

Mercury is in superior conjunction with the Sun on October 7th. It reenters the evening sky in late October and reaches perihelion on October 29th. Mercury decreases in apparent size and magnitude this month.

During October, **Venus** grows a bit less prominent in the morning sky as it heads sunward. On October 5th, Venus and Mars enter into a close conjunction. Venus lies about two degrees sooth of the Moon on October 18th.

Mars is visible at dawn. It is reaches aphelion on October 7th. The Red Planet exits Virgo and enters Leo on October 12th. Mars and Neptune are at heliocentric opposition on October 23rd.

Jupiter lies very low in the southwestern sky in early October. Jupiter is in conjunction with the Sun on October 26th.

Saturn is low in the southwest in early evening. It lies south of the waxing crescent Moon on October 23rd.

Uranus reaches opposition on October 19th. At that time, the seventh planet is located at a declination of +9.6 degrees, shines at magnitude +5.7, subtends 3.7 arc seconds, and is 2.6 light-hours (2.9 billion kilometers or 1.8 billion miles) from the Earth. At the time of opposition, it is located about two degrees west-northwest of the fourth-magnitude star Omicron Piscium. Browse http://bluewaterastronomy.info/resources/uranus-finder-chart-2017.png for a finder chart.

Neptune is occulted by the waxing gibbous Moon from certain parts of the world on October 3rd and October 30th. The eighth planet continues its retrograde motion through Aquarius this month. It's positioned less than a degree to the southeast of the fourth-magnitude star Lambda Aquarii. A finder chart is posted at http://bluewaterastronomy.info/resources/neptune-finder-chart-2017.png

The dwarf planet **Pluto** is located in northeastern Sagittarius near the Teaspoon asterism. Articles on observing Pluto are available on pages 48 and 49 of the July issue of Sky & Telescope and pages 64 and 65 of the July issue of Astronomy. See page 243 of the RASC Observer's Handbook 2017 for a paper finder chart. A detailed finder chart is posted at http://www.cdn.skyandtelescope.com/wp-content/uploads/Pluto_2017.pdf

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

Current information on solar system celestial bodies is posted at http://www.curtrenz.com/astronomy.html and http://www.

The zodiacal light may be visible in the pre-dawn eastern sky from a dark site after October 15th. Articles on the zodiacal light appear at http://www.atoptics.co.uk/highsky/zod1.htm and http://earthsky.org/astronomy-essentials/everything-you-need-to-know-zodiacal-light-or-false-dawn



Venus and Mars are just 1/4-degree apart in the eastern sky before sunrise on October 5, 2017. The star sigma Leonis, fainter than Mars, lies nearby.



Asteroid 2 Pallas (magnitude +8.3) is at opposition on October 28th. Asteroid 7 Iris (magnitude +6.9) is at opposition on October 29th. Browse https://in-the-sky.org/findercharts.php?objtxt=A2&duration=5 and https://in-the-sky.org/findercharts.php?objtxt=A2&duration=5 respectively for finder charts. For information on this year's bright asteroids and upcoming asteroid occultation events respectively, consult http://www.curtrenz.com/asteroids.html and <a href="http://



For information on comets visible in October, browse <u>http://cometchasing.skyhound.com/</u> and <u>http://www.aerith.net/comet/future-n.html</u>

Meteors



The Draconid (formerly the Giacobinid) meteor shower peaks on October 8th. The Draconids are quite variable and have produced meteor storms in 1933 and 1946. Comet 21P/Giacobini-Zimmer is the parent comet of the Draconids. Consult http://earthsky.org/astronomy-essentials/everything-you-need-to-know-draconid-meteor-shower for additional information on the Draconid meteor shower. The Southern Taurid shower, debris from Comet 2P/Encke, may produce five meteors per hour when it peaks on October 10th. The Orionid meteor shower peaks on the night of October 21st. Orionid meteors are fragments of Comet 1P/Halley. Browse http://www.timeanddate.com/astronomy/meteor-shower for more on the Orionid.



Notable carbon star for October: RZ Pegasi / Right Ascension: 22 05 52 Declination: +33 30 24



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



Seventy-five deep-sky objects for October: NGC 7640, NGC 7662, NGC 7686 (Andromeda); NGC 7180, NGC 7183, NGC 7184, NGC 7293, NGC 7392, NGC 7585, NGC 7606, NGC 7721, NGC 7723, NGC 7727 (Aquarius); Cz43, K12, M52, NGC 7635, NGC 7788, NGC 7789, NGC 7790, St12 (Cassiopeia); B171, B173-4, IC 1454, IC 1470, K10, Mrk50, NGC 7235, NGC 7261, NGC 7354, NGC 7380, NGC 7419, NGC 7510 (Cepheus); IC 1434, IC 5217, NGC 7209, NGC 7223, NGC 7243, NGC 7245 (Lacerta); NGC 7177, NGC 7217, NGC 7320 (the brightest galaxy in Stephan's Quintet), NGC 7331, NGC 7332, NGC 7339, NGC 7448, NGC 7454, NGC 7479, NGC 7619 (the brightest member of Pegasus I), NGC 7626, NGC 7678, NGC 7742, NGC 7769 (Pegasus); NGC 7541, NGC 7562, NGC 7611 (Pisces); IC 5156, IC 5269, IC 5271, NGC 7172, NGC 7173, NGC 7174, NGC 7176, NGC 7201, NGC 7203, NGC 7214, NGC 7221, NGC 7229, NGC 7314, NGC 7361 (Piscis Austrinus); NGC 7507, NGC 7513, NGC 7713, NGC 7755, NGC 7793 (Sculptor)

Top ten binocular deep-sky objects for October: M52, NGC 7209, NGC 7235, NGC 7243, NGC 7293, NGC 7510, NGC 7686, NGC 7789, NGC 7790, St12

Top ten deep-sky objects for October: K12, M52, NGC 7209, NGC 7293, NGC 7331, NGC 7332, NGC 7339, NGC 7640, NGC 7662, NGC 7789

Challenge deep-sky object for October: Jones 1 (PK104-29.1) (Pegasus)



Jones 1 Image Credit © 2013 Michael A. Siniscalchi Backyard, Abbott Observatory- Long Island, NY

The objects listed above are located between 22:00 and 24:00 hours of right ascension.



The red circle shows the position of the planet Uranus at opposition on October 19, 2017. The star lies just 2 degrees northwest of the star omicron Piscium.

Cosmic Challenge

Stephen's Quintet

Target	Туре	RA	DEC	Constellation	Magnitude	Size
Stephan's Quintet	Galaxy group	22 36.0	+33 57.0	Pegasus		~3'

The canvas on which our picture of the universe is painted relies on the unwavering acceptance of Hubble's Law. Hubble's Law states that a relationship exists between the distance to a galaxy and the speed at which it is receding from us. The farther away a galaxy is, the greater the speed of its recession and farther its spectral lines are shifted toward the red end of the spectrum.



Above: Autumn star map from <u>Star Watch</u> by Phil Harrington.



Above: Finder chart for this month's <u>Cosmic Challenge</u>. Chart adapted from <u>Cosmic</u> <u>Challenge</u> by Phil Harrington. Click on the chart to open a printable PDF version.

For Hubble's Law and the Red Shift Principal to be valid, it must work for not just a few galaxies, but for all. And indeed, it does -- well almost. In the observable universe, there are a few notorious exceptions to these rules. One of the best-known paradoxes is found high in the autumn sky, less than half a degree south of the bright galaxy NGC 7331 in Pegasus. Stephan's Quintet was discovered in 1877 by the director of Marseille Observatory, Édouard Stephan (1837-1923). This group has been the subject of many detailed studies and heated debates ever since.

As the name implies, five galaxies comprise Stephan's Quintet. The first, NGC 7317, has been classified as an E2 elliptical because of its slightly oval disk. Next, NGC 7318 was thought to be a single object when Stephan first spotted it, but it is now known to be two separate, overlapping systems. NGC 7318a is labeled as an E2 elliptical like NGC 7317, whereas NGC 7318b is a SBb barred spiral. NGC 7320 has also been found to be a SBb barred spiral, while NGC 7319 is a wide armed Sd spiral. All are crammed within a tight 20' area. The table below lists them all.

Target	RA	DEC	Magnitude	Size
NGC 7317	22 35.9	+33 56.7	13.6	0.8'x0.7'
NGC 7318a	22 35.9	+33 57.9	14.3b	0.8'x0.6'
NGC 7318b	22 36.0	+33 58.0	13.9b	1.4'x0.9'
NGC 7319	22 36.1	+33 58.6	13.1	1.5'x1.1'
NGC 7320	22 36.1	+33 56.9	13.2	2.3'x1.1'

The controversy surrounding these five galaxies stems from measured differences in their spectral red shifts, indicating that they lie at radically different distances away. Four of the galaxies (NGC 7317, 7318a, 7318b, and 7319) appear to be moving away from us at an average of 6,000 km/sec, placing them about 270 million light years away. The fifth, NGC 7320, has a measured red shift of only 800 km/s, indicating it to be about 35 million miles distant. What's going on here?

Further examination of detailed photographs of the group show partial resolution of NGC 7320, with a level of detail similar to relatively nearby galaxies. The other four galaxies in the Quintet show only blurred features that seem to say they lie at much greater distances. From this evidence, along with the difference in red shifts, many astronomers feel that NGC 7320 is simply a chance foreground object superimposed in front of a more distant galaxy quartet. In fact, it turns out that its red shift matches that of NGC 7331, which means that the two may be gravitationally associated.

Additional studies by Mariano Moles from the <u>El Instituto de Fisica Fundamental</u> in Madrid also suggest that NGC 7318B is just passing by and not bound to the group either.

Just as it challenges cosmological theories, Stephan's Quintet also challenges the observing skills of amateur astronomers. Can you spot them?

The double galaxy NGC 7318a/b strikes me as the brightest in the group. Through my 10-inch reflector, NGC 7318a/b appears as a small 13th-magnitude glow measuring about $1'x1_2'$ of arc across. Its twin nuclei are only visible with averted vision, and then just barely at magnifications greater than 250x. Controversial NGC 7320 seems slightly fainter than NGC 7318a/b, but over twice as large. Visually, its disk spans about 2'x1', with a faint central nucleus seen fleetingly.



Above: A sketch of Stephan's Qunitet through the author's 18-inch (46cm) reflector at 171x.

Of the final two galaxies, NGC 7317 measures less than 0.5 arc minute across and looks like a slightly fuzzy "star" even at high power. The existence of its tiny 14th-magnitude disk is further masked by the "glare" of a 12th-magnitude star found only a few seconds of arc away.

Lastly, we come to NGC 7319. Though largest of the lot, this galaxy impresses me as the hardest to see. Even though it shines at 13th magnitude, its surface brightness is very low, which makes detection difficult. A star like central hub might be seen, but only after an extended examination with averted vision. I find it is best not to strain when trying to see faint, diffuse objects like this. Any stress will generate "noise" between the observer's eye and brain, causing enough distraction to miss a subtle target entirely.

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 <u>web site</u> or post to this e-column's discussion forum.

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

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Centennial Observatory and Faulkner Planetarium

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, October 14 th , 2017	8:00 PM to midnight	FREE
International Observe the Moon Night	Centennial Observatory	Saturday, October 28 th , 2017	7:00 to 09:00 PM	FREE



CSI Centennial Observatory / Faulkner Planetarium Herrett Center College of Southern Idaho Campus Twin Falls, ID

Faulkner Planetarium / Show Times

http://herrett.csi.edu/astronomy/planetarium/showtimes.asp



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.