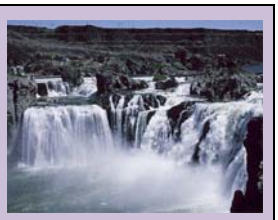
Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society
October 2012



www.mvastro.org

Membership Meeting

Saturday, October 13th 2012
7:00 p.m. at the Herrett Center for Arts and Science CSI Main Campus
Robert Mayer will be the Speaker

Elected Board

Terry Wofford, President
terrywofford@hotmail.com

David Olsen, VP / Newsletter Ed.
editor@mvastro.org

Jim Tubbs, Treasurer / ALCOR Rep.
jtubbs015@msn.com

Rick Widmer, Secretary / Webmaster
rick@developersdesk.com

-ELECTIONS-

This month we have are general elections. Please be thinking about who you want to vote for any of the following positions:

1. President
2. Vice President
3. Secretary
4. Treasurer

The other positions are by nomination once the new board meets in January.

Until next month – Clear Skies

Welcome to the society and hello. We hope you have a good time, enjoy the hobby and bring good skies with you.

We hold indoor meetings each month at the Herrett Center for Arts & Science College of Southern Idaho campus in Twin Falls, ID, USA. Our meetings start at 7:00 pm on the second Saturday of the month. There will always be a very interesting program, class or presentation at these meetings, as well as good fellowship. There is always something new to learn.

Following our meetings we have a star party (weather permitting) at the Centennial Observatory, also at the Herrett Center.

Our star parties are free and you don't have to bring your own telescope. Telescopes are also set up outside on the stargazer's deck. Star Parties are held year round, so please dress accordingly as the Observatory is not heated, nor air conditioned.

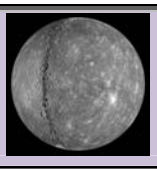
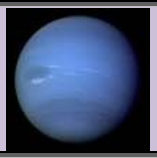
Wishing you dark skies and clear nights! MVAS Board

In this Issue

Calendar for October

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	1	2	3	4 55th Anniversary of the Sputnik Launch	5 Moon at Apogee Jupiter .9° N of the Moon 	6 Moon at Greatest North Declination +21° 
7 Ceres .9° N of the Moon	8 Columbus Day Thanksgiving Day (Canada) Last Quarter Moon 	9	10	11	12	13 Membership Meeting at the Herrett Center 7:00 pm Monthly free star party at 8:00pm at the Centennial Observatory
14 Zodiacal Light visible in the east before twilight next two weeks	15 New Moon 	16	17 Moon at Perigee Mercury 1.3° south of Moon Mars 2° south of the Moon	18	19 Moon at Greatest South Declination -21° 	20
21 First Quarter Moon 	22	23	24	25	26	27
28	29 Full Moon 	30	31 Halloween 			

Solar System Highlights

	**Mercury**, the innermost planet in our solar system, has a poor evening apparition for observers in the Northern Hemisphere, though an excellent one in the Southern Hemisphere. Despite reaching a greatest elongation of 24.1° from the Sun on October 26, Mercury stays low for mid-northern viewers. Look for it just above the horizon due southwest about 30 minutes after sunset. Binoculars will prove immensely helpful.
	**Venus** is the gorgeous Morning Star, far outshining all other planets and stars with its brightness of magnitude -4.1. Look for it blazing in the east during and after morning twilight. If you watch carefully from week to week, you will notice that Venus is losing a little height in October. By month's end it rises around 4:30 A.M. local daylight time, only 90 minutes before twilight commences.
	**Mars** moves its residence from Libra into Scorpius on the 6th and shifts into Ophiuchus after midmonth, where it shines at magnitude +1.2. Look for it about half an hour after sundown, low in the southwest. The planet currently treks eastward relative to the background stars. This so-called direct motion continues until March 1, 2014, when Mars makes a hairpin turn and starts moving to the west (or retrograde).
	**Jupiter** is the first bright planet to rise during October nights. It comes up around 10 P.M. local daylight time in early October and two hours earlier by month's end. Still, give it another hour or two to get well clear of your eastern horizon obstructions and low-altitude haze.
	**Saturn** the ringed planet is lost in the solar glare until early November, when it re-emerges in the morning sky.
	**Uranus** is well up in the southeast during evening and by midnight it reaches a peak altitude of about 50° and lies due south. The planet is just visible with the naked eye if you know where to look for it, but of course it appears exactly like a star; the magnitude is +5.7, and it is not surprising that it was not known in ancient times.
	**Neptune**, the eighth planet reached opposition and peak visibility in late August, but it remains a fine target through binoculars and small telescopes. Neptune lies higher in the late- evening sky, among the stars of Aquarius, less than 0.5° south of 5th-magnitude 38 Aquarii all month. Use your telescope and a high-power eyepiece to see the planet's 2.5"- diameter disk and blue-gray color.
	**Pluto**, The dwarf planet Pluto lies in northwestern Sagittarius and is highest above the horizon in the early evening. It glows at magnitude +14, and as a result, it is a challenge to spot.
	**Asteroid** from a suburban backyard, Vesta, is easy to find if you have a good view of the eastern sky after midnight. Jupiter serves as a good guidepost for locating it; the asteroid sits about 10° south of the planet, near the bright star Zeta Tauri. If you return every three or four nights, you will surely notice Vesta's telltale displacement against the background stars.
	**Comets:** There are two comets to view in October C/2012 A2 LINEAR should be visible in the far northern sky about halfway between Polaris and the bowl of the Big Dipper. C/2011 F1 LINEAR should be visible as an 11th-magnitude object in the western sky as night sets in. Situated in the constellation Serpens and moving slowly southeastward, F1 LINEAR will keep observable in good condition for a long time.
	**Meteors:** One of the best meteor showers to occur each year, the Orionids begin on October 2 and last until November 7. This display may produce 10 to 25 shooting stars per hour, but numbers vary greatly from year to year and the shower is above quarter strength for just two or three days centered on October 21. Also the Delta Aurigids remain active until October 23.

Planisphere for October

This Planisphere should be used as a guide for the month of October, mid-month, end of evening twilight (10:00 PM)

This month's highlight: **NGC 891** is one of the most striking examples of a spiral galaxy seen exactly edge-on. This ghostly spindle of light is located about midway between Gamma Andromedae and the open star cluster M34 in Perseus. Although NGC 891 is a generous 14' by 3', it suffers from low surface brightness. On nights with poor seeing, NGC 891 is a wavering apparition suspended in a bowl of glittering stars. However, if your sky is dark and steady the big galaxy takes magnification surprisingly well.

NGC 891's signature feature is a prominent equatorial dust lane. The dark band clearly bisects the galaxy in 8-inch telescopes at 150x. Using averted vision note the mottled extensions of the galaxy, and even a central bulge of sorts.

NGC 891 has an optical diameter of about one hundred thousand light years and the dust lane has a width of about 1.5 thousand light years. Professional telescopic studies indicate that the galaxy is not perfectly edge-on, but instead the eastern side is inclined just slightly toward us and the western side just slightly away from us (the rotation axis is inclined at an angle of 89° from our line-of-sight; 90° would be exactly edge-on).

(Editor's Note: "This month's highlight" will now be a feature of the monthly newsletter.)

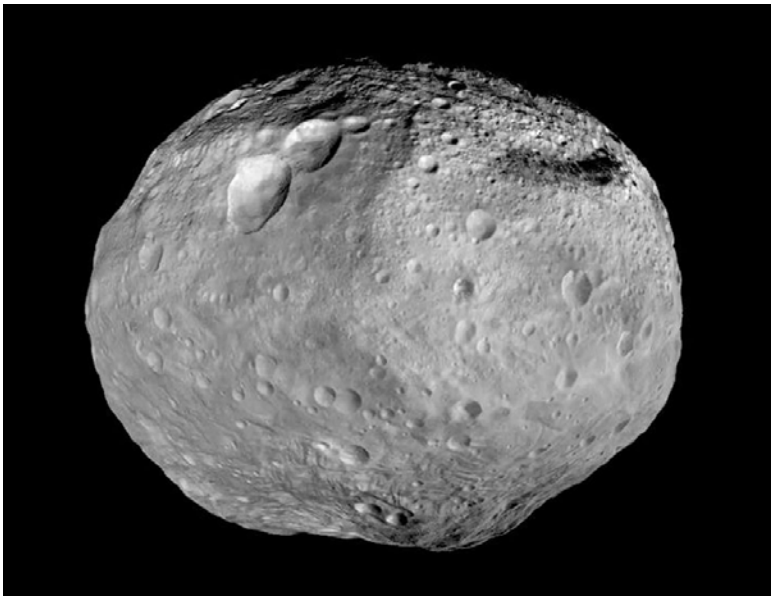
Do You Know – Trivia Time

On the fifth anniversary of the beginning of its ambitious interplanetary adventure, Dawn can look back with great satisfaction on its spectacular exploration of the giant protoplanet Vesta and forward with great eagerness to reaching dwarf planet Ceres. Today Earth's robotic ambassador to the main asteroid belt is in quiet cruise, gradually reshaping its orbit around the sun so it can keep its appointment in 2015 with the mysterious alien world that lies ahead.

This anniversary resembles the first three more than the fourth. Its first years in space were devoted to spiraling away from the sun, ascending the solar system hill so it could gracefully slip into orbit around Vesta in time for its fourth anniversary. One year ago, Dawn was in the behemoth's gravitational grip and preparing to map its surface in stereo and make other measurements. The subsequent year yielded stunning treasures as Dawn unveiled the wondrous secrets of a world that had only been glimpsed from afar for over two centuries. While at Vesta, it spiraled around the massive orb to position itself for the best possible perspectives. Its final spiral culminated in its departure from Vesta earlier this month. Now for its fifth anniversary, it is spiraling around the sun again, climbing beyond Vesta so that it can reach Ceres.
In its five years of interplanetary travels, the spacecraft has thrust for a total of 1060 days, or 58 percent of the time (and about 0.000000021 percent of the time since the Big Bang). While for most spacecraft, firing a thruster to change course is a special event, it is Dawn's wont. All this thrusting has cost the craft only 267 kilograms (587 pounds) of its supply of xenon propellant, which was 425 kilograms (937 pounds) on September 27, 2007.

The fraction of time the ship has spent in powered flight is lower than last year (when it was 68 percent), because Dawn devoted relatively little of the past year to thrusting. Although it did change orbits extensively at Vesta, most of the time it was focused on exactly what it was designed and built to do: scrutinize the ancient world for clues about the dawn of the solar system.

Dawn is not actually traveling this much faster than when it launched. But the effective change in speed remains a useful measure of the effect of any spacecraft's propulsive work. Having accomplished slightly more than half of the thrust time planned for its entire mission, Dawn has already far exceeded the velocity change achieved by any other spacecraft under its own power



The giant asteroid Vesta, as imaged by the Dawn spacecraft. Dawn studied Vesta from July 2011 to September 2012.
Credit: NASA/JPL-Caltech/UCAL/MPS/DLR/IDA

Doing Science with a Spacecraft's Signal

Mariner 2 to Venus, the first interplanetary flight, was launched August 27 fifty years ago. This was a time when scientists were first learning that Venus might not harbor jungles under its thick atmosphere after all. A Russian scientist had discovered that atmosphere during the rare Venus transit of 1761, because of the effects of sunlight from behind.

Mariner 2 proved interplanetary flight was possible, and our ability to take close-up images of other planets would be richly rewarding in scientific return. But it also meant we could use the spacecraft itself as a "light" source, planting it behind an object of our choosing and making direct measurements.

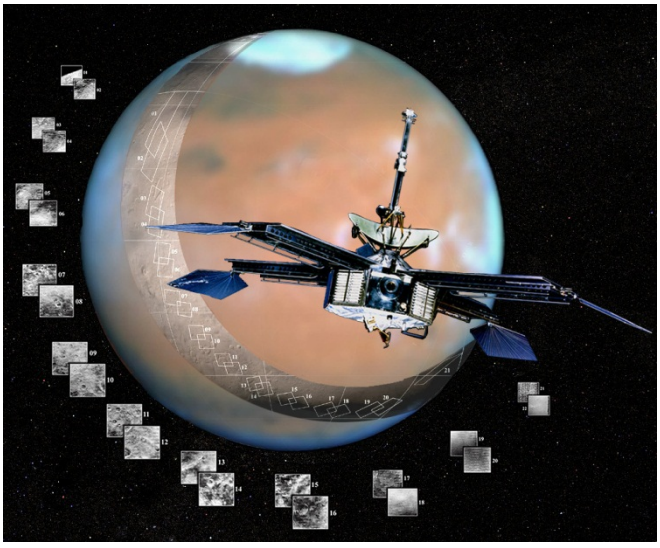
Mariner 4 did the first occultation experiment of this sort when it passed behind Mars as seen from Earth in July 1965. But, instead of visible light from the Sun, this occultation experiment used the spacecraft's approximately 2-GHz radio signal.

The Mariner 4 experiment revealed Mars' thin atmosphere. Since then, successful radio science occultation experiments have been conducted at every planet and many large moons. And another one is on schedule to investigate Pluto and its companion Charon, when the New Horizons spacecraft flies by in July 2015. Also, during that flyby, a different kind of radio science experiment will investigate the gravitational field.

The most recent radio science occultation experiment took place September 2, 2012, when the Cassini spacecraft carried its three transmitters behind Saturn. These three different frequencies are all kept precisely "in tune" with one another, based on a reference frequency sent from Earth. Compared to observations of the free space for calibration just before ingress to occultation, the experiment makes it possible to tease out a wide variety of components in Saturn's ionosphere and atmosphere.

Occultation experiments comprise only one of many categories of radio science experiments. Others include tests of General Relativity, studying the solar corona, mapping gravity fields, determining mass, and more. They all rely on NASA's Deep Space Network to capture the signals, which are then archived and studied.

Find out more about spacecraft science experiments in "Basics of Space Flight," a website and book by this author, http://www2.jpl.nasa.gov/basics. Kids can learn all about NASA's Deep Space Network by playing the "Uplink-Downlink" game at http://spaceplace.nasa.gov/dsn-game.



Caption: *In this poster art of Mariner 4, you can see the parabolic reflector atop the spacecraft bus. Like the reflector inside a flashlight, it sends a beam of electromagnetic energy in a particular direction. Credit: NASA/JPL/Corby Waste.*

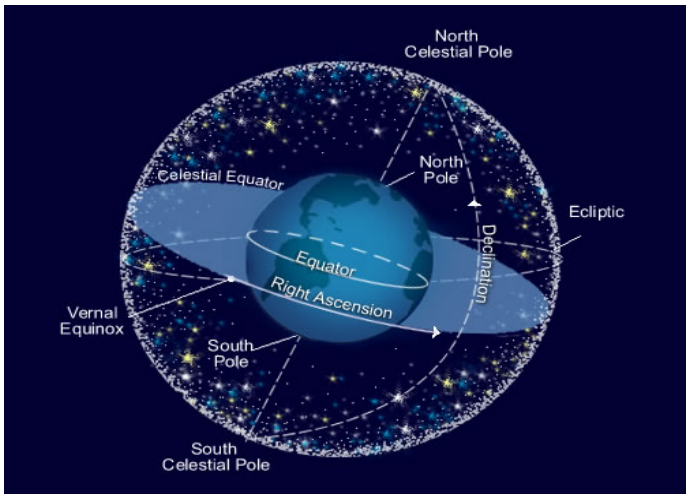
Looking Through the Eyepiece

How to Read Star Charts

At first glance star charts may appear to be filled with a confusing web of thousands of dots and a criss-cross of lines. All this and a maze of mysterious acronyms and foreign sounding jargon make celestial maps appear to the novice like an encoded treasure map. Star charts however can be just that, a guide to hidden riches of the starry skies – if you know how to decipher them. Filled with a bounty of maps of the entire sky, star atlases can easily point out hundreds if not thousands of celestial jewels visible from the naked eye, through binoculars to telescopes. There are a number of good atlases in print today, and below is a quick run down on how to plunder this essential tool of the amateur astronomer.

Marks the Spot – Dialing up the Heavens

Before using even the most basic of sky maps it's important to understand how we pinpoint the positions of stars in the sky. As the Earth spins on it's axis, all stars appear fixed in place in relation to each other and move together across the night sky from east to west. Picture the Earth at the center of a huge imaginary celestial sphere. With all the stars visible on its inside surface, this sphere's Celestial North is marked by the North Star, Polaris. Therefore, when reading star charts always remember that Celestial North is not up but towards Polaris.



If we then transfer the familiar coordinate system of latitude and longitude used on the Earth's surface onto this star globe, we have a celestial grid system that mimics its terrestrial counterpart. In the sky, "latitude" is called declination while the "longitude" equivalent is right ascension, so that every star, nebulae, and galaxy has a fixed address in the sky – just as every house, town or city has its precise location back on Earth. Declination (abbr. DEC) is measured in degrees, minutes and seconds starting from 0 degrees at the "celestial equator" to 90 degrees at the poles. Declinations north of this equator are listed as positive while south is negative. Right ascension (abbr. RA) is measured in hours, minutes and seconds where a complete 24 hours marks a full rotation equal to 360 degrees. The baseline of 0 hour RA (equivalent of Earth's Greenwich meridian of longitude) is marked by the point where the Sun's path passes through the celestial equator.

Universally all star charts use this grid system. Celestial coordinates do change over time however, as the Earth slowly shifts its orientation slightly over the years. You might notice that in many atlases the coordinates are accompanied by a year date. This means that X marks the position precisely for that particular year.

Choosing the Right Map

Maps of the night sky may have lesser or greater details. At the lower end, maps of the entire seasonal sky may only show the brighter stars and constellations suitable for the casual or backyard stargazer. More advanced skywatchers with binoculars and telescopes will need higher resolutions to unveil fainter stars and many deep sky objects like star clusters, nebulae and galaxies. These magnified, more detailed charts may be a bit confusing at first, but by taking note of only the brightest of stars, familiar constellations can still be recognized. As a rule of thumb the fainter the stars plotted on a chart, the more crowded it becomes. Wil Tirion's Sky Atlas 2000, for instance, has over 40 000 stars while Uranometria 2000 plots an astounding 280,000! The main reason for such a difference is magnitude.

Star Light, Star Bright
Size is important when it comes to reading star atlases, especially when comparing the brightness of celestial objects. It's easy to notice on star charts the graded series of dot sizes- some are large circles while others are mere specks. Based on a scale first proposed in the beginning of the second century B.C. , the brilliance of stars is measured in terms of magnitude (abbr. Mag.). The fainter a star in the sky the tinier it's counterpart "dot" on a star chart, with each size representing a whole magnitude. Also the higher the magnitude numbers the fainter the star. As mentioned earlier, atlases vary greatly in the amount of plotted stars. For example the Cambridge Star Atlas plots objects as faint as the unaided eye can see from super dark skies (approx. 6.0 Mag.). While Uranometria 2000 displays objects down to the limit of today's popular 7x 50 binoculars (9.0 Mag.).

What's in a Name?
All 88 official constellations boundaries are clearly outlined in major atlases, while their constituent stars can be identified in a number of different ways. The brightest may be accompanied by their proper names derived from ancient Greek, Roman or Arabic languages, others simply by Greek letters only, as started in 1603 called the Bayer system (i.e. brightest star in constellation is Alpha). Another is the Flamsteed system, which numbers the stars of a constellation from west to east (i.e. Deneb is 50 Cygni). Other star catalogs that are in use include Henry Draper (HD), Smithsonian Astrophysical Observatory (SAO) and Aitken's Double Stars (ADS). Brighter variable stars, usually marked by empty circles, are identified by a letter designation.

Star clusters, nebulae and galaxies are mainly identified by either their number in the Messier catalog (M) or their designation in the more extensive New General Catalog (NGC) and its extension Index Catalog (IC). Certain individual objects may be accompanied by their popular names such as the Orion nebula. Major atlases may mark these deep-sky objects with various symbols like ovals, circles with cross-hairs, and squares, all graded according to their size.

Recommendations
Once you've explored the standard naked-eye objects found on most all-sky maps, it's time to turn to a star atlas that can offer greater detail and higher accuracy. With a comfortable limiting magnitude of 6.5 and a manageable 9,500 stars, the Cambridge Star Atlas is great for showing beginners the pathways between constellations, finding well known double stars and clusters. With more experience and higher magnification, hopping from one star to the next using binoculars or a finder's scope, Star Atlas 2000 offers more of a challenge with an 8.1 magnitude limit and more than a four time increase in stars with 2,500 deep sky objects. Of course neither of the above are able to show all that would be actually visible through a small or medium sized scope. For that, Uranometria 2000 with its fainter 9.5 magnitude limit, hundreds of thousands of stars and over 10 000 deep-sky objects, make it easier to zero-in on your favorite, gem-like planetary nebula or far-flung galaxy. Regardless of experience use an atlas where the labeling and lettering are the most clear and least confusing. As you become more comfortable cruising among the constellations and locating ever-fainter deep-sky challenges, star atlases will remain your key to charting your next course among the starry skies.

Editor's Note: There was a recent inquiry from a few members requesting this simplified information.

Bruneau Dunes Observatory

The Observatory is now open Friday and Saturday nights through **October 13th**. Solar viewing begins at 6:30 pm. At 8:30 pm join park staff for an introductory astronomy presentation followed by sky viewing, through a variety of telescopes, until 11:30 pm. Volunteers are always needed to fulfill our clubs commitment at the park. After the 13th, the Bruneau Dunes Observatory will close for the winter season and reopen in the early spring. Stay tuned for the opening announcement in this newsletter.

Centennial Observatory and Faulkner Planetarium Events

The Centennial Observatory - Upcoming Events

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, October 13th, 2012	8:00 PM to midnight	FREE

Faulkner Planetarium Schedule
October 2nd through October 31st 2012
October 2nd – October 13th, 2012

Day	Time	Show
Tuesdays	7:00	Anthems of Ghoulish Delight
	8:00	Anthems of Ghoulish Delight
Fridays	7:00	Anthems of Ghoulish Delight
	8:00	Anthems of Ghoulish Delight
Saturdays	2:00	Cosmic Colors: An Adventure Along the Spectrum
	4:00	Cosmic Colors: An Adventure Along the Spectrum
	7:00	Anthems of Ghoulish Delight
	8:00	Anthems of Ghoulish Delight

October 16th – October 30th, 2012

Day	Time	Show
Tuesdays	7:00	Anthems of Ghoulish Delight
	8:00	Anthems of Ghoulish Delight
Fridays	7:00	Anthems of Ghoulish Delight
	8:00	Anthems of Ghoulish Delight
	9:00	Anthems of Ghoulish Delight
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	8:00	Anthems of Ghoulish Delight
	9:00	Anthems of Ghoulish Delight

Membership Information

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,
$10.00 for students.

Contact Treasurer Jim Tubbs for dues information via e-mail: jtubbs015@msn.com or home telephone: 736-1989 or mail directly to the treasurer at his home address. 550 Sparks Twin Falls, ID 83301

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

M-51 viewed in this newsletter was imaged with the Shotwell Camera and the Herrett Telescope at the Centennial Observatory by club members Rick Widmer & Ken Thomason. Unless otherwise stated all photos appear in the public domain and are courtesy of NASA.

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

"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.

Membership Benefits

Sky and Telescope group rates. Subscriptions to this excellent periodical are available through the MVAS at a reduced price of $32.95.

Astronomy Magazine group rates. Subscriptions to this excellent periodical are available through the MVAS at a reduced price of $34.00

Receive 10% discounts on other selected Astronomy Publications.

For periodical info. and subscriptions Contact Jim Tubbs, Treasurer

Lending Library: Contact, the current board for information.

Lending Telescopes: The society currently has two telescopes for loan and would gladly accept others. Contact Rick Widmer, Secretary for more information.