



Snake River Skies

The Monthly Newsletter of the
Magic Valley Astronomical Society
October 2013



www.mvastro.org

Membership Meeting

Saturday, October 12th

Herrett Center
Join us at 7:00 pm



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Letter from the President – Rob Mayer

Colleagues,

Have you seen ISON yet?

The comet that has been the subject of great anticipation is now starting to come into view. Over the next couple of months, we will finally learn if it's going to be brighter than the recent PANSTARRS. Early bird astronomers are invited to let us know what they find.

As for this month, we have a couple of items on the agenda. The weekend of Oct. 4-5 may feature an MVAS-only star party, but members are asked to stay tuned for further announcements as we look to see if the weather cooperates.

In addition, Saturday, Oct. 12 is a big night. We'll have our annual 12-Months-In-Review, and we'll also help out at the Centennial Observatory for International Observe the Moon Night.

Lastly, November is election-month. If you have any nominations for MVAS officers for the upcoming year, please send them to any one on the board before Oct. 12.








Clear Viewing

Editor's Note: Information on Comet ISON can be found on page 10.

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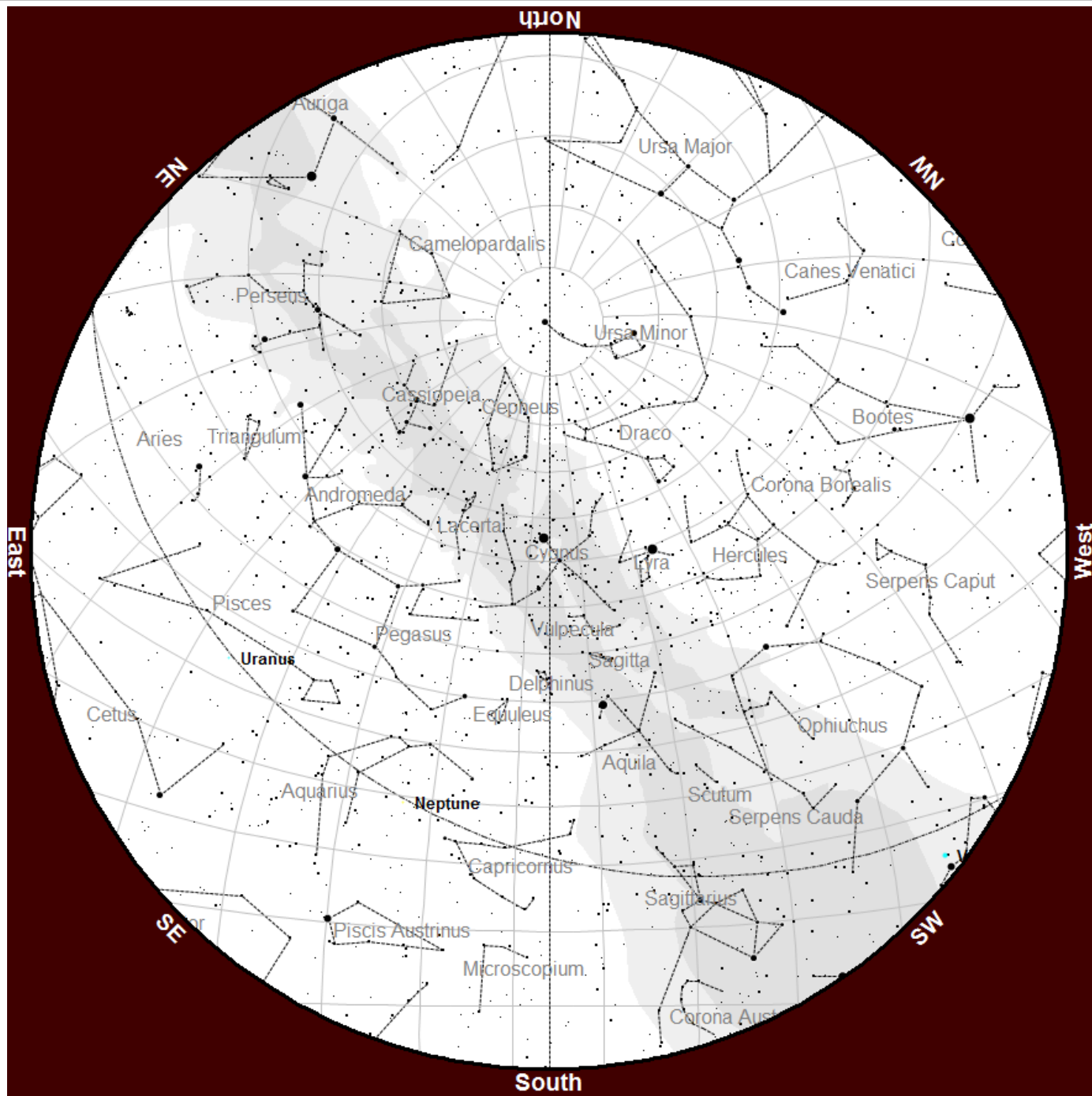
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Calendar for October

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5 New Moon 1% Visible 
6	7	8	9 Greatest S. Declination -19.5° 24% Visible Waxing 	10	11 First Quarter Moon 45% Visible 	12
13	14 Columbus Day Thanksgiving Day - Canada	15	16	17	18 Full Moon 100% Visible 	19
20	21	22	23 Moon at Greatest N. Declination +19.5° 81% Visible Waning 	24	25	26 Last Quarter Moon 55% Visible Waning 
27	28	29	30	31 Halloween 		

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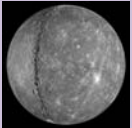





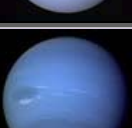




Planisphere for October



Planisphere should be used as a guide for the month of October, mid-month, end of astronomical twilight (20:30) Planisphere is provided as a courtesy from Chris Anderson, Coordinator, Centennial Observatory, Herrett Center for Arts & Science - College of Southern Idaho, Twin Falls, ID

Be Safe, Get Out There, and Explore Your Universe!


Solar System Highlights


	Mercury Throughout the first half of October, Mercury should be an obvious +0-magnitude point low in the west, if you look 30 to 40 minutes after sunset. The innermost planet reaches greatest elongation from the Sun on October 9 th . Unfortunately, as viewed from mid-northern latitudes this elongation translates more into distance along the horizon and not into altitude, placing the planet only 4° high.
	Venus becomes visible soon after sunset, about 10° high in the southwest for skywatchers at mid-northern latitudes. The planet is by far the brightest point of light in the sky, shining at magnitude -4.3 against the background stars of Libra, the Balance before crossing into Scorpius the Scorpion on October 7.
	Mars rises around 3 A.M. local daylight time and glows at a modest magnitude +1.6, making it a mere footnote in the morning sky this month. Although Mars will not overwhelm you with its brightness, it does have some fine conjunctions with a star, three galaxies, and Comet ISON.
	Jupiter rises in the east shortly after midnight local daylight time on October 1 and in the late evening by mid-month. You will have no problem identifying the gas giant, which gleams at magnitude -2.3 and easily outshines every other point of light in the sky. In a telescope, Jupiter swells from 38 to 41 arcseconds-wide during October, large enough to show a lot of surface features.
	Saturn is a dying ember, now slowly leaving our skies after many months of impressive display. In the first days of October, the planet is still visible low in the southwest as twilight fades. However, each evening finds it a little deeper in the glow of the Sun; you will probably lose track of Saturn soon after mid-month.
	Uranus reaches opposition on October 3, when it lies opposite the Sun in our sky and remains visible from sunset to sunrise. This configuration also brings Uranus closest to Earth, so it glows brighter (magnitude +5.7) and appears larger (3.6 arcseconds across) through a telescope than at any other time this year.
	Neptune Wait until the sky darkens fully before setting your sights on Neptune. The distant planet lies in the sparsely populated constellation Aquarius, a region that appears due southeast once twilight fades away. Neptune glows at magnitude +7.9, bright enough to show up through binoculars, although a telescope makes identification easier. A good medium-size scope at moderately high power should reveal the planet's 2.5 arcseconds disk and blue-gray color.
	Pluto The dwarf planet Pluto wanders far from the ecliptic, where the major planets reside. It lies in northwestern Sagittarius following a number of years in Ophiuchus and Serpens. Look for it due southeast of the conspicuous open star cluster M25 at the following distances: 1° 42' (October 1); 1° 51' (October 15); and 2° 4' (October 31).
	Asteroid 324 Bamberga is the largest main-belt asteroid discovered so late and numbered so high, and holds the distinction of being the highest-numbered asteroid that is visible with binoculars. Throughout October, your signpost to 324-Bamberga is the 5th-magnitude star Rho Pegasi. The asteroid remains within 2° of Rho all month.
	Comet C/2012 S1 ISON was discovered a year ago by two Russian astronomers, using data from the International Scientific Optical Network (ISON). Based on the comet's preliminary orbit, it appeared to be on track to provide the show of a lifetime during November and December 2013. Comet 2P/Encke is back into our inner solar system, after its last return in August 2010. This is Encke's 62nd documented appearance, making it one of the best-studied comets on the sky.
	Meteors: Taurid shower there are two radiant to this stream, one 8° north of the other. The southern radiant peaks before dawn on October 10, and its northern cousin on November 12th Both radiants first appear in Cetus, drift across Aries, and move into Taurus in late October. 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

Idaho Skies for October

Idaho Skies is a column for beginning amateur astronomers and those interested in astronomy. Suggestions about the column are gladly accepted by the columnist at streetastro@gmail.com. Check the Idaho Skies Twitter page for notices and images at www.twitter.com/IdahoSkies.

This month look for the star Enif, the Lucida (brightest star) of Pegasus the flying horse. Astronomers call Enif Epsilon Pegasi, which would lead you to believe it's the fifth brightest star in Pegasus (but it's not). Pegasus is the flying horse of Greek mythology. Pegasus came from the blood of the dying Gorgon, Medusa. Note that the hero Perseus did not ride the Pegasus to rescue Andromeda as some stories have said. Enif is Arabic for Nose, since the star represents the nose of Pegasus. This name doesn't make sense until you realize that Pegasus is upside down in the sky.

Enif is 12 times more massive than our sun. As a result of its immense gravity, it fuses its hydrogen fuel more rapidly than the sun fuses its hydrogen fuel. Enif's fusion overdrive pushes its outer layers over 78 million miles away from its core. That's so large that Enif would engulf Mercury and Venus if it replaced our sun. Since our sun spans $\frac{1}{2}$ degree in the sky, Enif would span roughly half of our sky if it replaced our sun. In other words, Enif would appear significantly larger than the Great Square of Pegasus.

While the core of Enif is hotter than our sun's, its bloated atmosphere dilutes that heat until the star takes on an orange color. That means each square inch of Enif produces less light than each square inch of the sun. However, since the star is so huge, it's still 12,250 times more luminous than the sun. Enif will end its life as a supernova or, if it can shed some of its mass, a very hot white dwarf. Enif is 690 light years away, so we're seeing the star as it was in 1323.

October 1 – 7

The very thin crescent moon is located between Regulus, the brightest star of Leo the Lion and Mars on the 1st. You'll need to go outside at 6:00 AM to see this. The moon will so thin that binoculars won't make out much detail on its surface.

The far side of the moon remained a mystery until October 3, 1959. That's when the 950 pound, solar-powered Luna 3 flew behind the moon and snapped several poor quality (by our standards) images of the far side. The Soviet Union launched Luna 3 into a very elliptical orbit around Earth. The apogee, or farthest point in its orbit, was 6,000 mile beyond the moon. The timing of the launch was such that when Luna 3 reached apogee, the moon was between it and Earth. A film camera onboard then recorded several images of the moon's far side. The spacecraft developed the negatives as it approached Earth. Once Luna 3 was close enough to Earth again, the spacecraft scanned the negatives and transmitted the images as a fax.

The moon is new on the 4th. This means the first week of October is a great time for observing faint fuzzy objects through your binoculars or telescope. Unfortunately, it also means that the moon will be near full at the peak of the Orionid meteor shower. In place of observing meteors, try observing the Zodiacal Light. It appears as a faint glowing pillar of light in the east at least two hours before sunrise. You'll have until the 17th to see the Zodiacal Light. By then, the moon's light will interfere.

October 8 – 14

Early on the evening of the 8th, the young crescent moon is located seven degrees above the brightest star of Scorpius, Antares, and brilliant Venus. That distance is right at the field of your binoculars. The trio will be very low southwest at 8:00 PM. You'll need a clear horizon in order to maximize your viewing time of this alignment. This is not the end of the action in the low west. Venus and Antares will continue approaching closer to each other. So you might want to keep an eye on this pair after the moon has left the scene.

The moon is passing through a thick section of the Milky Way on the 10th. So after it gets dark, scan the region to the west (or to the right of the moon) for nebula and star clusters. Be sure to scan high and low from a dark location. In binoculars, star clusters and nebula will appear as hazy spots while stars will remain pin points of light.

The moon is first quarter on the 11th. This is great phase to observe in binoculars and a small telescope.

October 15 – 21

Mars is on the move all autumn. On the 15th, the red planet is less than one degree from Regulus. That's less than two lunar diameters. This is a morning event. Look 1/3rd of the way above the eastern horizon at 6:00 AM. Regulus will be the slightly brighter star while Mars will be the slight orange one.

Venus appears just above Antares on the evening of the 16th. Look very low in the southwest at 7:45 PM to see them. Their distance apart is 1½ degrees, a perfect separation for viewing in your binoculars.

The moon is full on the 18th. We usually call the full moon in October the Hunter's Moon. That's because in October, farmers have harvested and cleared their fields of crops. This allows the moon's light to show prey animals to hunters walking through the fields.

The moon appears between two star clusters on the evening of the 20th. Get your binoculars out and you'll find the Pleiades star cluster or Seven Sisters to the left of the moon and the larger, sparser Hyades to the moon's lower left. The seeing ought to get good starting around 10:00 PM. You'll find the moon and two star splatters in the low east.

The Orionid meteor shower peaks on the night of October 20th and morning of the 21st. Typically, 21 meteors per hour are visible from this shower. The moon is just past full this morning however, so 2013 is not a great year to watch this meteor shower.

The moon traverses the outer edge of the Hyades star cluster on the night of the 21st. Point your binoculars at the moon and you'll see that this star cluster is significantly larger than the moon.

October 22 – 31

The moon is just below Gemini on the morning of the 26th (or just after midnight of the 25th). To the moon's left, you will see a very bright star that's not a part of this constellation (you can't miss it). It's Jupiter. Now look at Jupiter through your binoculars and you will see three fainter stars forming a line with the brighter planet. From the bottom-left to the top-right, you will see Callisto, Europa, Jupiter, and finally Io and Ganymede so close together they can't be resolved as individual satellites. On the eve of war in Europe in 1938, Orson Welles and his Mercury Theatre on the Air broadcast a play based on H. G. Wells' War of the World on October 30th. Except this Martian invasion occurred in Grover's Mill, New Jersey rather than in Woking, England. Some radio listeners didn't catch on that this was a radio play and they didn't try confirming the news reports that they were listening to on other radio stations. The panic that ensued was not as large as some stories have made it out to be.

Dark Skies and Bright Stars,
Your Interstellar Guide
Dr. Paul Verhage, PhD

This Month's Sources

This column is a compilation of other peoples' notes. I would like to acknowledge the following sources this month.

The Encyclopedia of Soviet Spacecraft, Hart, Douglas, Exeter
Enif, http://en.wikipedia.org/wiki/Epsilon_Pegasi
Observer's Handbook 2013, Chapman, David, The Royal Astronomical Society of Canada
The Old Farmer's Almanac 2013, Dublin, NH
The War of the Worlds, Wells, H. G., Bantam Classics
The War of the Worlds (radio drama), [http://en.wikipedia.org/wiki/War_of_the_Worlds_\(radio\)](http://en.wikipedia.org/wiki/War_of_the_Worlds_(radio))

Did You Know

Operation Moonwatch (also known as Project Moonwatch and, more simply, as Moonwatch) was an amateur science program formally initiated by the Smithsonian Astrophysical Observatory (SAO) in October 1956. Moonwatch's origins can be traced to two sources. In the United States, there was a thriving culture of amateur scientists including thousands of citizens who did astronomy for an avocation. During the Cold War, the United States also encouraged thousands of citizens to take part in the Ground Observer Corps, a nationwide program to spot Soviet bombers. Moonwatch brought together these two activities and attitudes, melding curiosity and vigilance into a thriving activity for citizens. Moonwatch, in other words, was an expression of 1950s popular culture and fixed properly within the context of the Cold War. This group was tasked with observing and tracking Sputnik 1, which was launched on 4 October 1957.

Today, one remaining Ground Observer Corps Observatory may be seen at Geyser Park in Soda Springs, ID.

Deep Sky Highlight by Steve Bell

Some Binocular Gems in the Queen's Jewel Box

The familiar "W" of the constellation Cassiopeia, *The Queen*, is home to many fine open clusters and nebulae. In this article, we will look at five examples of open clusters that are readily accessible in binoculars. All are large and bright. An interesting aside is to compare the view through binoculars with that through a low power, wide field view in a telescope. All the objects are on AL binocular lists (Messier, Binocular Deep Sky), so remember to log for these observing clubs.



We will start our exploration in western Cas with **Messier 52**. Charles Messier discovered this cluster in 1774. It is one of the richest clusters in the northern hemisphere, containing around 100 stars in its quarter-degree diameter. It lies about 4600 light years from the sun. Through binoculars a few stars are resolved and the rest appear as a nebulous mass. In 10X70 glasses it is granular, but not resolved.

Moving eastward, our next target is **NGC 7789**, known as *Caroline's Rose*, named after its discoverer Caroline Herschel. Around 300 stars are estimated in its 25 arc minute diameter, although most are not resolvable in binoculars, as they are mag 10.7 and dimmer. Instead, there is a nebulous glow floating on a fairly dense star field. This cluster is some 5900 light years distant.

Our next target is **NGC 129**, a large bright open cluster about 5300 light years distant. Binoculars resolve several brighter stars against an unresolved background of about 35 stars. It is irregular in shape and 19 arc minutes in diameter.

Continuing, we now look at a favorite cluster, **NGC 457**, the *Owl or ET Cluster*. Although the orientation varies with position in the sky, this cluster resembles nothing so much as the Spielberg ET character from the movie of the same name. The two brightest stars are the creature's eyes, with a long-armed stick figure forming the rest. This 20 arc minute cluster lies about 7900 light years from the sun.

Our final target is an interesting but not well-known cluster, **Stock 2**, the *Headless Strongman*. Lying about two degrees from the more spectacular and familiar *Double Cluster*, this cluster is often passed over. It is large at about one degree in diameter, with the brighter stars forming a stick figure of a headless strongman flexing his muscles. This is a close cluster, lying about 990 light years from the sun. It contains about 50 stars with the brightest at 8th magnitude. Because it is not a member of the Messier or NGC lists, this is one of the more interesting clusters that almost no one looks at.

	RA	DEC	Magnitude	Size
M 52	23h 25m 26s	+61° 39' 26"	6.9	15'
NGC 7789	23h 58m 07s	+56° 46' 39"	6.7	25'
NGC 129	00h 30m 48s	+60° 17' 36"	6.5	19'
NGC 457	01h 20m 20s	+58° 21m 20"	6.4	20'
Stock 2	02h 15m 44s	+59° 32' 48"	4.4	60'

Both images on this page *SkySafari Pro 1.8* for Mac



How to hunt for your very own supernova!

By Dr. Ethan Siegel



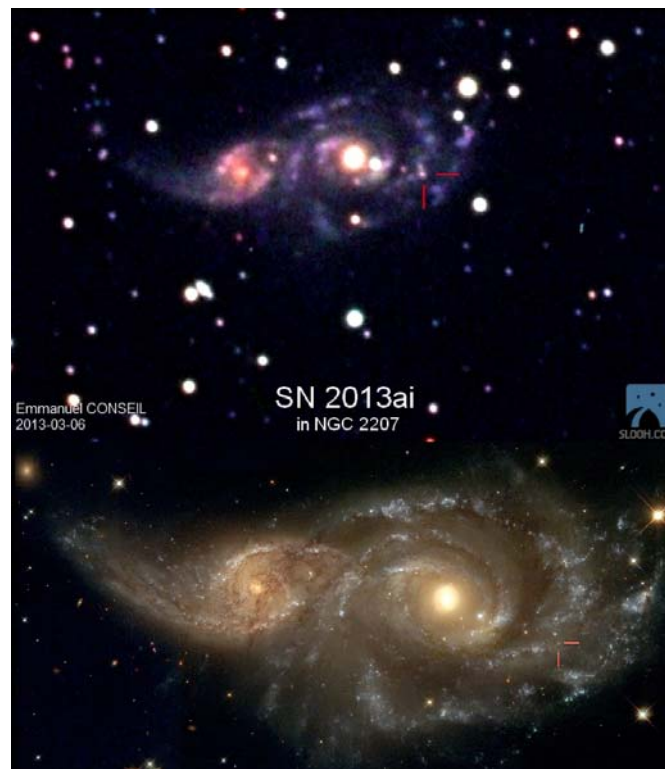
In our day-to-day lives, stars seem like the most fixed and unchanging of all the night sky objects. Shining relentlessly and constantly for billions of years, it's only the long-term motion of these individual nuclear furnaces and our own motion through the cosmos that results in the most minute, barely-perceptible changes.

Unless, that is, you're talking about a star reaching the end of its life. A star like our Sun will burn through all the hydrogen in its core after approximately 10 billion years, after which the core contracts and heats up, and the heavier element helium begins to fuse. About a quarter of all stars are massive enough that they'll reach this giant stage, but the *most* massive ones -- only about 0.1% of all stars -- will continue to fuse leaner elements past carbon, oxygen, neon, magnesium, silicon, sulphur and all the way up to iron, cobalt, and, nickel in their core. For the rare ultra-massive stars that make it this far, their cores become so massive that they're unstable against gravitational collapse. When they run out of fuel, the core implodes.

The inrushing matter approaches the center of the star, then rebounds and bounces outwards, creating a shockwave that eventually causes what we see as a core-collapse supernova, the most common type of supernova in the Universe! These occur only a few times a century in most galaxies, but because it's the most massive, hottest, shortest-lived stars that create these core-collapse supernovae, we can increase our odds of finding one by watching the most actively star-forming galaxies very closely. Want to maximize your chances of finding one for yourself? Here's how.

Pick a galaxy in the process of a major merger, and get to know it. Learn where the foreground stars are, where the apparent bright spots are, what its distinctive features are. If a supernova occurs, it will appear first as a barely perceptible bright spot that wasn't there before, and it will quickly brighten over a few nights. If you find what appears to be a "new star" in one of these galaxies and it checks out, report it *immediately*; you just might have discovered a new supernova!

This is one of the few cutting-edge astronomical discoveries well-suited to amateurs; Australian Robert Evans holds the all-time record with 42 (and counting) original supernova discoveries. If you ever find one for yourself, you'll have seen an exploding star whose light traveled millions of light-years across the Universe right to you, and you'll be the *very first* person who's ever seen it!



SN 2013ai, via its discoverer, Emmanuel Conseil, taken with the Slooh.com robotic telescope just a few days after its emergence in NGC 2207 (top); NASA, ESA and the Hubble Heritage Team (STScI) of the same interacting galaxies prior to the supernova (bottom).



Observatory and Planetarium Events



Schedule for the Centennial Observatory – Herrett Center Twin Falls herrett.csi.edu

Event	Place	Date	Time	Admission
Monthly Free Star Party & International Observe the Moon Night	Centennial Observatory	Saturday, October 12 th , 2013	8:00 PM to midnight	FREE

Faulkner Planetarium – Herrett Center Twin Falls

Opened in November 1995, the Faulkner Planetarium is the largest planetarium theater in Idaho, and one of the best equipped in the northwestern U.S. The theater seats 144 under a 50' dome.

Now it's out with the old, and in with the new! On September 29th, 2013, the Faulkner Planetarium will close for a major technology upgrade. Gone will be the Digistar II calligraphic star/graphics projector, fifty Kodak slide projectors, two CRT video projectors, D-ILA video projector, numerous special effects projectors, incandescent cove lighting, and an aging audio system. Replacing them will be a state-of-the-art Digistar 5 full dome projection system from Evans & Sutherland, and 10,200W Dolby 5.1 surround sound and programmable LED cove lighting systems from Bowen Technovation.

From an audience standpoint, the difference will be dramatic. Monochrome, wireframe images will be replaced with photo-realistic, rendered images, in full color, texture, light and shadow. The Digistar 5 sky will faithfully reproduce star colors, the Milky Way, Sun, Moon, planets, deep-sky targets, and atmospheric effects (including twilight, aurora, and clouds). A flight through Saturn's rings will surround you in a cloud of orbiting, icy particles, as if you were really there. A journey beyond the Milky Way will display far-flung galaxies in every direction, as far as the eye can see. In short, programs will transport you to cosmic destinations with greater realism than ever before.

As the number of full dome theaters worldwide grows rapidly, so does the number of available programs. Hundreds of titles, covering a wide range of topics and genres, have been produced for full dome theaters, with more appearing every day. Some large-format (e.g. IMAX) films have also been converted to full dome, making them available to Magic Valley audiences for the first time.

The next generation of the Faulkner Planetarium is about to begin. Join us when the upgraded theater reopens, for the most realistic tour of the universe you've ever seen, on **Tuesday, November 19th, 2013**.



Bruneau Dunes Observatory



You're invited to star gaze at the Bruneau Dunes Observatory. See the night sky as you've never seen it before. Visitors watch a short orientation program and then have the chance to survey the heavens through the observatory's collection of telescopes. The observatory will close on October 12th for the season. This is your final two-weeks before the closure takes place.

Comet ISON

In October, the comet will remain a morning object. Seen in the frigid predawn darkness early in the month, Comet ISON will steadily brighten and slowly move day by day against the background stars of the constellation Leo the Lion. Mars will be very close by, just 2° to the lower right of ISON.

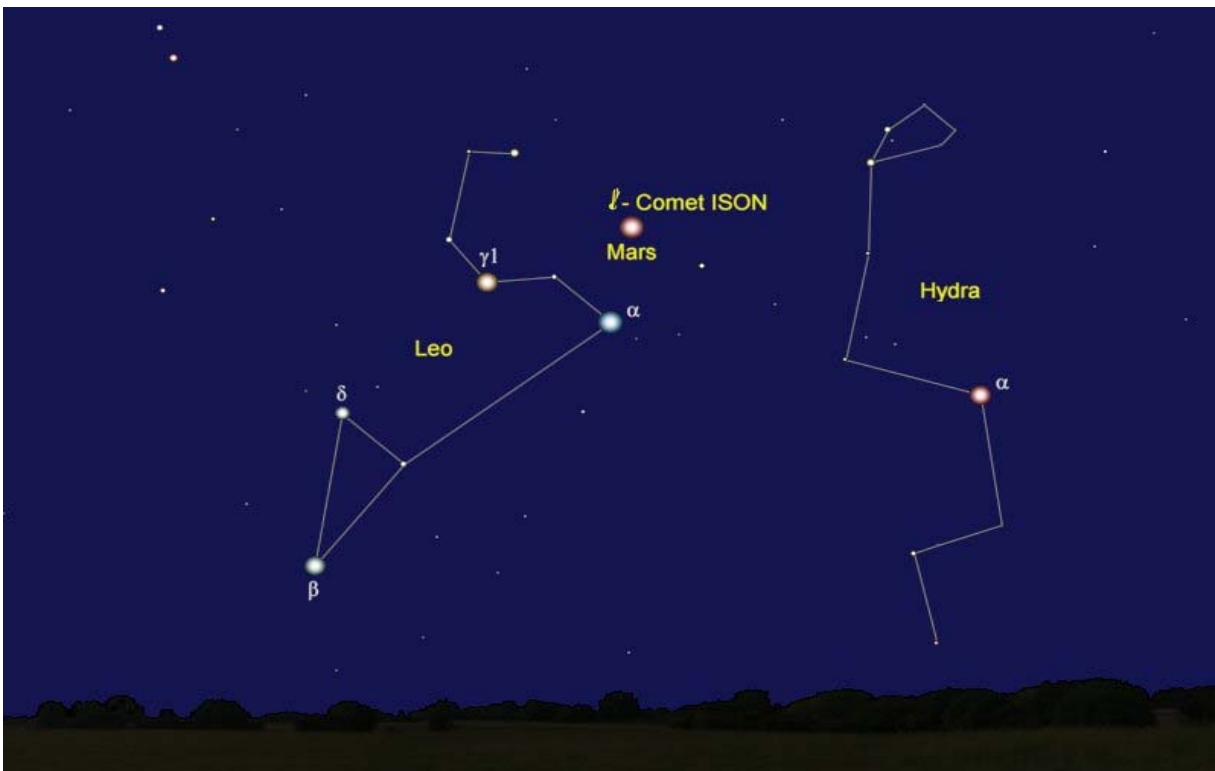
Around October 1, when Comet ISON will make its closest approach - 6.7 million miles (10.8 million kilometers) - to Mars, the scientists at NASA will point the cameras onboard the Curiosity and Opportunity rovers on the comet. Mars Odyssey and the Mars Reconnaissance Orbiter will also snap pictures from orbit.

By October 15, Comet ISON will clear the eastern horizon around 3 A.M. local daylight time. As the morning twilight will start to bathe the eastern part of the sky, the comet will have already climbed to an altitude of 40° . ISON, Mars and Regulus (Leo's brightest star) will be very tightly grouped, sharing the same telescopic field of view. You should really make an effort to get up early for this stunning celestial scene! The comet may well reach magnitude +5 by mid-October, becoming marginally visible to the unaided eye.

Starting October 15, ISON will enter the field of view of one of the two nearly identical STEREO orbiting solar observatories. The Hubble Space Telescope and the orbiting Chandra X-Ray Observatory will also study the comet during this period, so we should look forward to some amazing pictures!

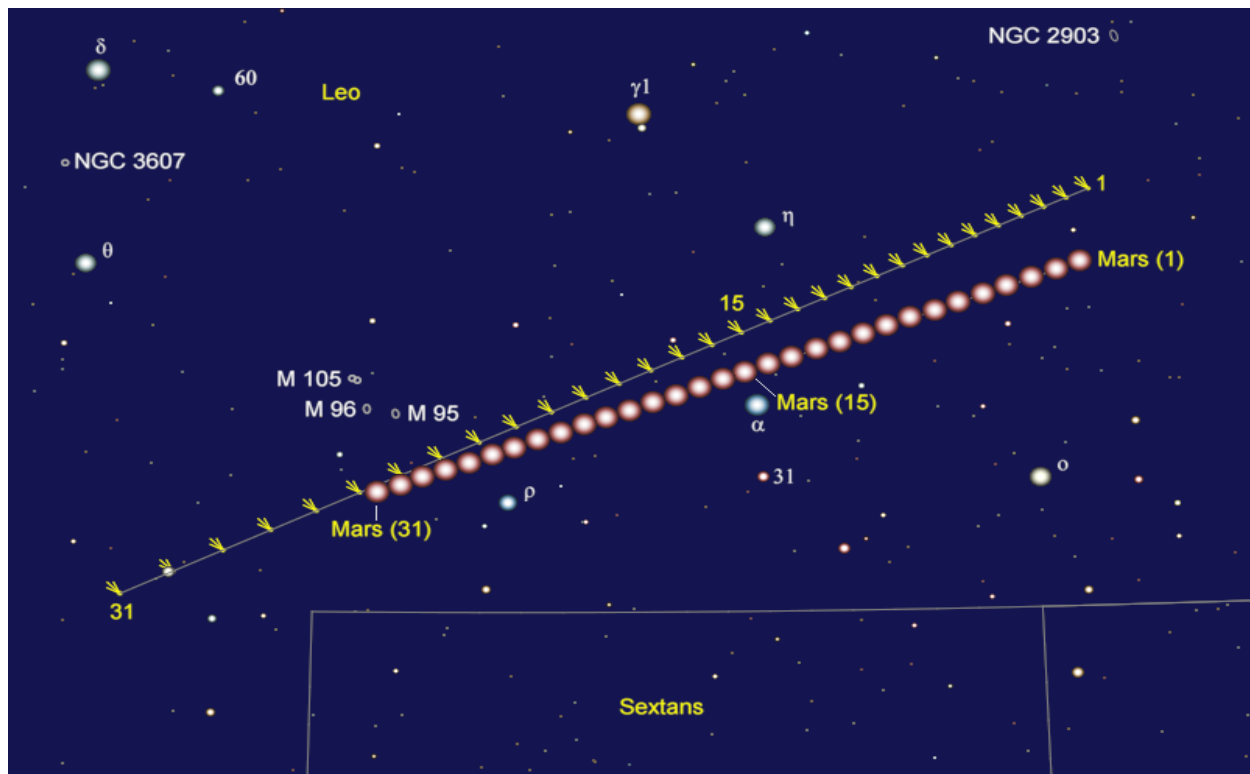
In late October, C/2012 S1 ISON will have moved to the southern part of Leo and will appear more than 15° to the lower left of Regulus. Mars will sit 5° above the comet, and on the 29th and 30th the crescent Moon will join the scene. Even though ISON will head towards the dawn, to its perihelion in late November, it will still appear high in the southeast one hour before sunrise.

Comet ISON Naked eye map for early October looking east.



Date	RA	Dec	Mag	Distance
Oct 01	09h36m	+17°28'	+5.0(?)	2.138
Oct 15	10h10m	+13°52'	+5.0(?)	1.719
Oct 31	11h10m	+06°39'	+5.0(?)	1.246

Comet ISON Telescope map for all of October.



Date	RA	Dec	Mag	Distance
Oct 01	09h36m	+17°28'	+5.0(?)	2.138
Oct 15	10h10m	+13°52'	+5.0(?)	1.719
Oct 31	11h10m	+06°39'	+5.0(?)	1.246



Comet ISON on the morning of September 24, at the border between the constellations Cancer and Leo still far from the Sun, there remain strong hopes that ISON will thrill us this winter. [Damian Peach](#)



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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"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 three telescopes for loan and would gladly accept others. Contact Rick Widmer, Webmaster for more information.