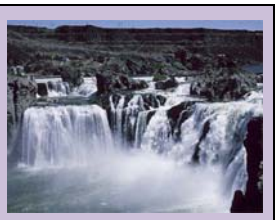
Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society

November 2012



www.mvastro.org

Membership Meeting

Saturday, November 10th 2012
7:00 p.m. at the Herrett Center for Arts and Science CSI Main Campus
This will be a business meeting

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President's Message

Hello Members,

This is the first month under a new board of officers. In October, Jim Hoggatt (Vice-President), Gary Leavitt (Secretary), and myself were voted in, with Jim Tubbs staying on as Treasurer.

Such changes mean two things. First, we've really got to say thanks to the outgoing officers, Terry Wofford (President), David Olsen (Vice-President), and Rick Widmer (Secretary). There's no doubt that what they have done for MVAS over the years has been invaluable. I myself know that they have played a significant role in my own developing interests in astronomy, and there are indeed other members who can say the same.

To give you an idea of their service, all three have agreed to continue to help out in some capacity. Terry is willing to help out with the City of Rocks and Pomerelle Star Parties in his role as Past President, David is continuing his great work on the newsletter, and Rick will again maintain the club's website.

Meanwhile, we as a new officers board look forward not only to maintaining MVAS' great traditions such as the City of Rocks Star Party, but look also to find ways to progress as a club. For example, we hope to continue our recent string of private club star parties: In September, we were at the Jerome Gun Club, and in October, we were introduced to not only a new site at Thorn Creek ridge north of Gooding, but were also recipients to its great dark skies. Right now, the plan is to hold another private club star party on Friday, Nov. 9. Although the initial plan is to go back to Thorn Creek, weather could dictate where we will go, so keep an eye on the club's e-mail posts the closer we get to the date.

The next night, Saturday, Nov. 10, is just as important. That's our regularly scheduled monthly MVAS meeting. For November, we plan on holding a business and planning meeting. Of all the meetings we hold, this will be one of the most important for all of us to attend, as we need ideas for subjects, speakers and activities. Just as our recent private star parties have gone, so do we want this Nov. 10th meeting to go: We want to have a meeting in which everyone helps out for all of us to construct a great year.

I look forward to both hearing your ideas and striving to implement those ideas. May you have clear skies, beautiful views, and plenty of new discoveries.

Rob Mayer, President

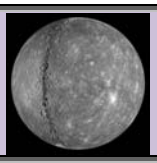
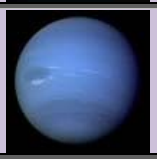
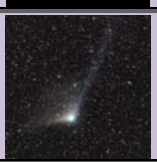
In this Issue

Calendar for November

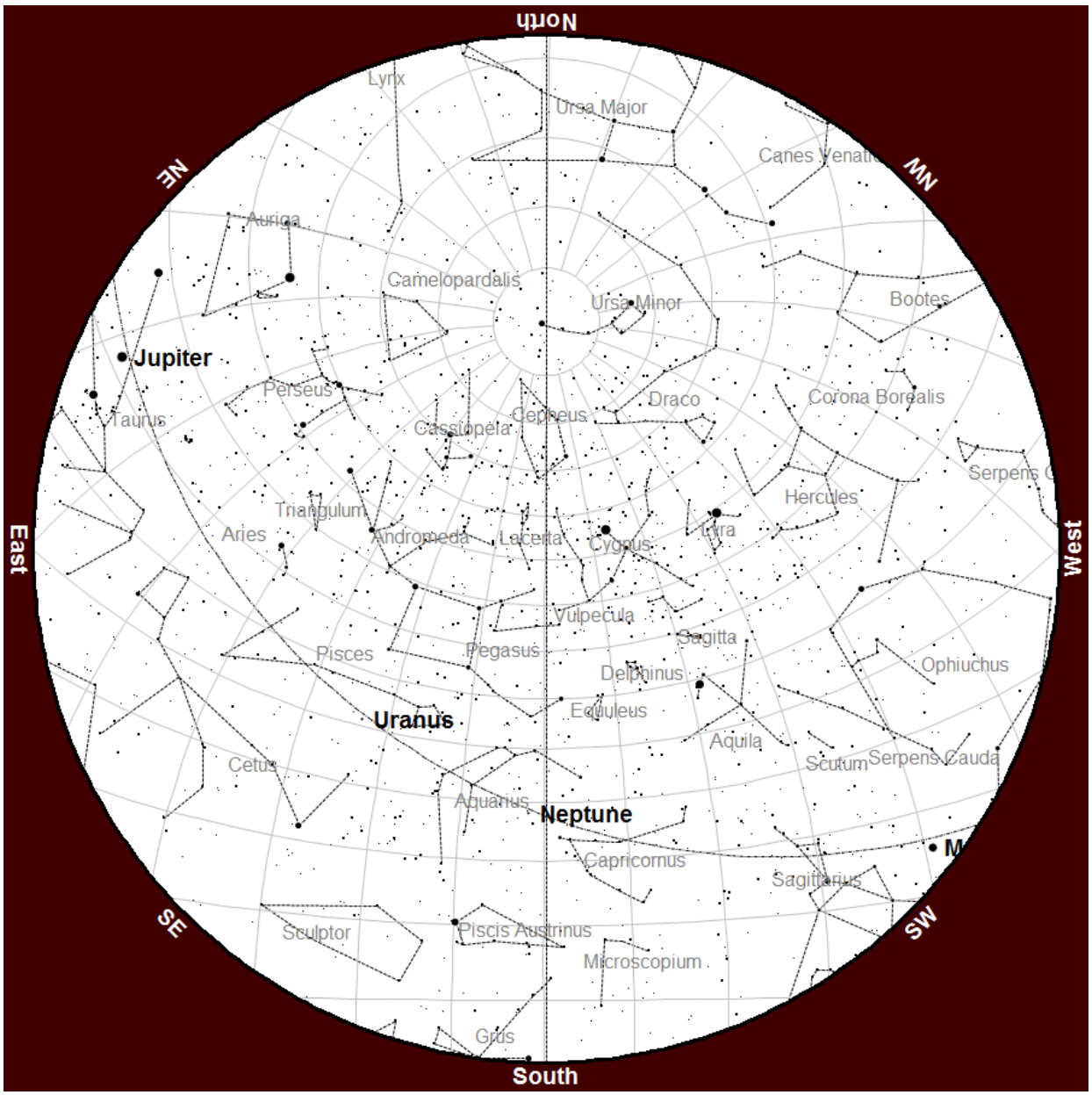
Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	3
4 Daylight Savings Time ends 2:00 AM 	5	6	7	8	9 Club Star Party Location TBA 	10 Membership Meeting at the Herrett Center 7:00 pm Monthly free star party at 6:15 PM - 12:00 AM at the Centennial Observatory
11 Veterans' Day Remembrance Day 	12	13 New Moon Telescope Tuesday Centennial Observatory 	14	15	16 Astronomy Talk Night Telescope Viewing 8:15p – 10:15p	17
18	19	20 First Quarter Moon 	21	22 Thanksgiving Day 	23	24
25	26	27 Telescope Tuesday Centennial Observatory 	28 Full Moon 	29	30	

 M51 image explanation on the back page. Shoshone Falls on the Snake River in Idaho; prominent landmark in the Magic Valley

Solar System Highlights

	**Mercury:** For most of the month, Mercury is lost in the evening twilight and sets only minutes after the Sun. However, in November's final week, the planet leaps into view in the morning sky. It rises 90 minutes before our star and climbs 10° high in the southeast one hour later (use Venus as a guide - it appears to Mercury's upper right and about twice as high).
	**Venus:** The gorgeous “Morning Star,” far outshining all other planets and stars with its brightness of magnitude -4. Look for it blazing in the southeast during and after morning twilight. If you watch carefully from week to week, you will notice that Venus is losing a little height in November. By month's end it rises around 4 A.M. local time, only two hours before twilight commences.
	**Mars** moves its residence from Ophiuchus into Sagittarius on November 12, where it shines at magnitude +1.2. Look for it about half an hour after sundown, low in the southwest (a perfect scene for wide-angle photography - for the best results, include some photogenic foreground trees or buildings). The planet currently treks eastward relative to the background stars.
	**Jupiter** is the first bright planet to rise during November nights. It comes up around 7 P.M. local time in early November 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** Throughout November, Saturn slowly pulls away from the Sun. On the 1st, it lies just 5° away and remains lost in the morning twilight. By November 30, its elongation increases to 32° and can be spotted low in the southeast about 30 minutes before sunrise.
	**Uranus** is well up in the southeast during early evening and by 9 P.M. local time 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 early- 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** Vesta, the fourth of the large asteroids discovered in the first decade of the 19th century, ever becomes close and bright enough for us to spot with the unaided eye. From your backyard, it is easy to find the asteroid 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.
	**Comets:** 168P Hergenrother: Astronomers expected 168P Hergenrother to reach about magnitude +15 but due to an outburst it currently glows at 9th-magnitude, making it a modestly challenging object in a small telescope from country skies. Look for it in the western part of the constellation Andromeda, high above the southern horizon in the evening.
	**Meteors:** See the column Idaho Skies for information on Meteor showers.

Planisphere for November



Planisphere should be used as a guide for the month of November, mid-month, end of astronomical twilight (6:55 PM)

Planisphere is provided as a courtesy from Chris Anderson, Coordinator, Centennial Observatory, Herrett Center for Arts & Science
College of Southern Idaho, Twin Falls, ID

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 150 x. Using averted vision note the mottled extensions of the galaxy, and even a central bulge of sorts.

Idaho Skies for November - 2012

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 close to the southern horizon just after dark to see the Solitary Star, Fomalhaut (pronounced fo-ma-low). It's the brightest star south of Pegasus and the 17th brightest star overall. The word Fomalhaut is Arabic for Mouth of the Fish and it's the Lucida (the brightest star) of the constellation of Piscis Austrinus, the Southern Fish (which is a faint constellation). Fomalhaut is a young star 16 times brighter than the sun. Fomalhaut is a lot like the brightest star in Lyra, Vega. Vega appears slightly brighter than Fomalhaut even though they are both the same distance away from our solar system. If you were born in 1987, then Fomalhaut is your birthday star this year, because the light you see tonight left the star 25 years ago. Fomalhaut emits excess infrared radiation in comparison to other stars of its type. This extra infrared radiation is an indication to astronomers that a cool disk of dust and gas surrounds the star. Recent images from the Hubble Space Telescope shows a hollow in the center of the disk of dust and gas, possibly caused by a Neptune-sized planet called Fomalhaut b. This doughnut of dust and gas is evidence that Fomalhaut is currently forming a solar system.

November 1 – 7

Just after it gets dark on the 1st, look for Jupiter just above the moon. The moon was full three days ago and so is a thick gibbous shape. Further to the right is the Hyades star cluster. The moon, Jupiter, and Hyades star cluster are all excellent objects for your binoculars.

The 100 inch telescope on Mount Wilson saw its first star light 95 years ago on the 2nd. At the time, the telescope (which is named the Hooker telescope) was the largest in the world. Sitting above what was a much smaller Los Angeles, the telescope was located in the high clear mountain air. Before World War II it was the most powerful astronomical instrument in the world. Astronomers took advantage of the blackouts of World War II to make long exposures of the deep sky. Astronomers Hubble and Humason discovered with these images that the more distant a galaxy appeared, the faster its velocity away from Earth. It was this observation that lead to the discovery of the expansion of the cosmos and indirectly to the Big Bang.

Did you know that you can visit the observatory and look through the 60 inch telescope? This telescope preceded the 100 inch telescope and was instrumental in the discovery of the shaped of the galaxy. The observatory is open to the public from March 30th to November 30th from 10:00 AM to 5:00 PM. There's more information at, the observatory's website, http://www.mtwilson.edu

The Taurid meteor shower reaches it peak on the night of the 4th and morning of the 5th. The shower actually consists of two branches, a northern and a southern branch. Astronomers first noticed meteors from this shower in 1869, but it was not identified as a meteor shower until 1918. The cloud of dust that is the source of this shower has an orbit very similar to that of comet Encke. Therefore, astronomers believe the source of the shower is the comet. An analysis of the orbit of the comet and the gravitation effects of the mighty planet Jupiter indicate that the meteoroids in the shower were created by the ejection of a large quantity of dust from Comet Encke some 4,700 years ago. Because of the size and shape of the shower's orbit, the planets Mercury, Venus, and Mars probably experience this shower also.

The Taurids display a maximum hourly rate of seven meters per hour, which is not much greater than the nightly rate of random meteors (called sporadic meteors). However, in 2012, the moon will be three days past full. Its light will therefore interfere with observations of this shower, making meteor rates appear even smaller.

Fifty-five years ago on the 3rd, the Soviet Union launched the second satellite into Earth orbit. The spacecraft was called Sputnik 2. The United States had not yet launched a satellite, so this launch was another shock to our nation. The impact was even greater once the United States learned the weight of the spacecraft. The 13-foot tall cone-shaped Sputnik 2 weighed over 1,000 pounds. Reasoning in the US went that if the Soviet Union could put over half a ton into orbit, then they could send an even heavier nuclear warhead on a suborbital trajectory to the United States. One reason Sputnik 2 was so large and heavy is that it carried a passenger, a dog named Laika (Russian for Barker).

The top of the cone-shaped Sputnik 2 was a duplicate of Sputnik 1, a large diameter sphere containing batteries and a radio transmitter. Near the base of Sputnik 2 was an airtight cylindrical compartment housing Laika and her life support equipment. The Soviets explained that Laika was doing well in space and would be painless euthanized before the reentry of the satellite. However, it was learned in 2002 that Laika did not survive very long in space. The aerodynamic shield covering Sputnik 2 did not separate from the satellite as designed. As a result, Laika died after her cabin began overheating due to improper exposure to the sun.

On the night of the third, be sure to set your clocks back one hour. Daylight-saving time ends at 2 AM on the 4th and you'll want to take advantage of the extra hour of sleep.

The moon is at last quarter on the 6th. That's a good phase to observe in your binoculars, but you'll need to go outside after midnight to see it.

The fourth American unmanned spacecraft to land on the moon did so on November 4, 1967. That's 45 years ago. The spacecraft's name was Surveyor 6 and it was created at the Jet Propulsion Laboratory in Pasadena, California. NASA used the Surveyor program to prepare for the manned Apollo moon landings. After landing, Surveyor 6 transmitted images of the lunar surface through its television camera. Besides a television camera, Surveyor 6 also carried a magnet for detecting magnetic particles in the lunar soil and an alpha-scattering instrument for measuring the abundances of the elements in the lunar soil (all elements except for hydrogen, helium, and lithium).

Surveyor 6 was also the first spacecraft to lift off from the moon. Although in this case, it was only for a few feet. After firing its engines to rise 12 feet above the surface, Surveyor 6 drifted horizontally before setting back down 10 feet away from its initial landing site.

Surveyor 6 operated for the two-week lunar day but did not function properly after the two-week long lunar night.

November 8 – 14

The Boise Astronomical Society, your local astronomy club, holds its November meeting on Friday the 9th. The meeting is held at the Discovery Center of Idaho and begins at 7:00 PM. It is opened to the public.

The Magic Valley Astronomical Society, another astronomy club for Idahoans, holds its monthly meeting on Saturday, the 10th. The club meets at the Herrett Center on the campus of the College of Southern Idaho. Meetings start at 7:00 PM and are followed by a star party at the center's observatory.

The next Boise Astronomical Society star party is on the night of the 10th. The star party takes place at Dedication Point, south of Kuna. It's held under dark skies and is opened to the public. There is no cost to attend and look through the telescopes. If you have a telescope and you are not sure about how to use it, bring it to the start party to get some help.

The moon rises near brilliant Venus on the morning of the 11th. The thin crescent moon will only be two days from new. Be prepared to use binoculars and search for the moon to the lower right of more easily found Venus. The best view will be around 6:00 AM. Much earlier than 6:00 AM and the pair will be too low and much later and the morning sky will be too bright.

The 11th is the 440th anniversary of Tycho Brahe's discovery of a type 1a supernova. Although seen by other astronomers before him, Tycho's observations were among the best. Astronomers therefore refer to it as his supernova. Other names for the supernova include SN1572 and 3C 10 (for its radio emissions).

SN 1572 was the result of a star similar to the sun, a yellow G type star, dumping matter onto a smaller white dwarf companion star. Once enough matter accumulates on the tiny white dwarf (equal to approximately 1.4 times the mass of the sun), it becomes too massive to support its new weight. The result is a runaway fusion reaction involving a sizeable fraction of the dwarf star. The energy released is large enough to blow the star apart (think global hydrogen bomb).

Tycho's supernova kick started modern astronomy. At the time, philosophers argued that the cosmos were perfect and unchanging. Therefore, any changes observed in the heavens must actually lie within the Earth's atmosphere. The new star was as bright if not brighter than Venus was and was unmistakably new. Tycho's measurements of the position of the supernova indicated that it must lie beyond the moon, or well within the cosmos. The presence of the supernova also argued for the need for better star charts. Tycho resolved to make those measurements in order that future astronomers could make more accurate predictions of planetary positions. The rest they say is history.

On the 13th, the moon is new. It also passes between Earth and the sun creating a solar eclipse. Unfortunately, it will be night in Idaho leaving the eclipse for the Australians.

How soon after new can you see the moon? The youngest moon ever seen was less than 24 hours old.

The moon reaches the perigee of its orbit on the 14th. Perigee is the point closest of an orbit to earth. The moon will only be a measly 221,679 miles away. Say, what does the odometer of your car show? Has it driven to the moon?

November 15 – 21

Do you want to know where Mars is located? Look for the yellow orange star below and to the right of the moon on the evening of the 16th. Mars will not be very bright since Earth is traveling away from the planet. This will be a some what difficult observation because Mars will be located low in the southwest. Use your binoculars.

The night of the 17th and morning of the 18th is the peak of the Leonid meteor shower. In clear dark skies, observers can see around 40 meteors per hour during a good shower. The shower was first noticed (at least in the western world) during its peak in 1833. That night nearly 1,000 meteors per hour were seen at times. Some believed it was a sign that the world was about to end. The source of the Leonid meteors is comet Tempel-Tuttle. Since the comet has a 33 year period, the Leonid meteor shower tends to have higher peak rates every 33 years. However, gravitational perturbations by the planets are altering the orbit of the comet's dust. As a result, Earth may not see another strong shower from this comet for many decades to come. Since the moon is only four days old tonight, you will have dark skies to enjoy this shower. Look low in the east after midnight for the radiant or apparent source of the meteors in this shower. Leonids are swift meteors that enter the atmosphere at speeds approaching 44 miles per second. The dust also has a high share of large particles, leading to a particularly high incidence of bright fire balls.

The moon is at first quarter on the 20th. That's a good time to look at it with your binoculars. Hold them steady by using a prop, like a fence post, and you will be able to see a splendid number of craters along the moon's terminator, especially in the south. The north is known more for the mountain ranges surrounding the Maria like the Sea of Serenity.

November 22 – 30

Are you a morning person? Well here's a reason to be one. For several days around the 27th, Venus approaches closer and closer to Saturn. One the morning of the 27th, brilliant Venus and more somber Saturn appear their closest together in the sky. The two will have the same right ascension in the sky and are therefore in conjunction (to use the astronomical term). Since they are planets, their conjunction is particularly close together; less than one degree apart in this case. One degree is roughly the width of 3/8 of an inch when held out at arm's length.

You ask what is that bright star near the moon on the evening of the 28th? That's Jupiter. Get your binoculars out and look for its satellites. If you prop your binoculars to they remain steady, you can see several of its largest satellites, the Galilean satellites. From left to right, binoculars will probably show you Europa, Io, Jupiter, and Callisto.

The moon is full on the 28th. The full moon in November is called the Beaver Moon. At the same time, the moon passes through the shadow that the Earth casts from the sun. The result is a lunar eclipse. The eclipse is visible in its entirety in the Pacific Ocean. We in Idaho will see the lunar eclipse as the moon sets. The eclipse won't be the best kind, as the moon doesn't travel through the central portion of Earth's shadow. The eclipse begins at 5:55 AM, reaches its deepest at 7:33 AM, and exits at 9:51 AM. In Idaho, the moon sets at 7:55 AM. This means we will see the first half of the eclipse, however in brightening skies. The moon is also at apogee today. Therefore, this will be the smallest full moon of the year.

This Month's Sources

Observer's Handbook 2012, The Royal Astronomical Society of Canada
Space Calendar, Baalke, Ron, <www.jpl.nasa.gov/calendar/>
Night Sky Explorer (software)
Stars, Kaler, James, <www.astro.uiuc.edu/~kaler/sow/>
http://meteorshowersonline.com/showers/taurids.html
http://en.wikipedia.org/wiki/Surveyor_6
http://en.wikipedia.org/wiki/SN_1572
http://meteorshowersonline.com/leonids.html
http://en.wikipedia.org/wiki/Leonids
The Old Farmer's Almanac 2013
Skywatch 2012

Dark Skies and Bright Stars, *The Street Astronomer*

The Twin Falls School District would like to invite you to attend a special presentation by:

NASA Astronaut Stephen Bowen

Thursday, November 15, 2012

Roper Auditorium
7:00 p.m.

Stephen Bowen is the first Submarine Officer selected by NASA as a mission specialist. He reported for training at the Johnson Space Center in August 2000. Following the completion of two years of training and evaluation, he was initially assigned technical duties in the Astronaut Office Station Operations Branch. A veteran of three spaceflights, STS-126 in 2008, STS-132 in 2010, and STS-133 in March 2011, Bowen has logged a total of 40 days, 10 hours, 4 minutes and 37 seconds in space, including 47 hours and 18 minutes of EVA in 7 spacewalks.

His most recent mission, the STS-133 mission, delivered the Permanent Multi-purpose Logistics Module (PMM) and an Express Logistics Carrier (ELC4) to the International Space Station.

Do You Know – Trivia Time

As astronomer's we often get many messages throughout each year from people who've just spotted a ring around the sun or moon. The night before Hurricane Sandy made landfall on the U.S. mainland on October 29, 2012, for example, many *on the U.S. East Coast* saw a lunar halo. The night of the landfall itself, as clouds from Sandy covered the U.S. East, many *in the U.S. Midwest and West* (as well as Canada) saw a halo. We do not know if Sandy was responsible for these halos, but in fact lunar and solar halos are associated with nearby storms. Solar and lunar haloes are pretty common, but they're so mysterious-looking that people often express amazement upon seeing them. They want to know: what causes a halo around the sun or moon?

There's an old weather saying: *ring around the moon means rain soon.* There's truth to this saying, because high cirrus clouds often come before a storm. Notice in this photo that the sky looks fairly clear yet halos are a sign of high thin cirrus clouds drifting 20,000 feet or more above our heads. These clouds contain millions of tiny ice crystals. The halos you see are caused by both *refraction*, or splitting of light, and also by *reflection*, or glints of light from these ice crystals. The crystals have to be oriented and positioned just so with respect to your eye, in order for the halo to appear.

On the night Hurricane Sandy made landfall, lunar halos were seen as far west as Vancouver Island, Canada

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.

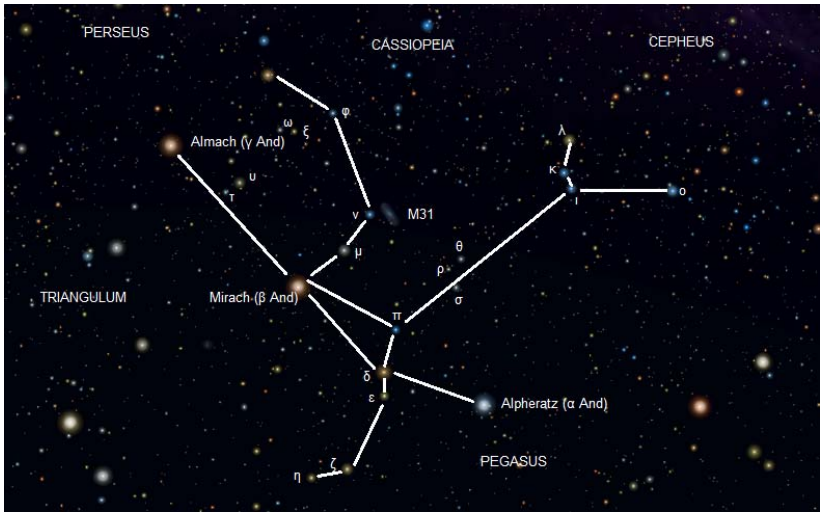
Our star parties are free and you don't have to bring your own telescope. Telescopes are also set up outside on the stargazer's deck. Star Parties are held year round, so please dress accordingly as the Observatory is not heated, nor air conditioned.

Wishing you dark skies and clear nights! MVAS Board

Looking through the Eyepiece - Andromeda

Andromeda constellation is located in the northern sky. It was named after the mythical princess Andromeda, the wife of the Greek hero Perseus, and is sometimes referred to as the Chained Maiden, Persea (wife of Perseus), or Cepheis (daughter of Cepheus). The constellation was originally catalogued by the Greek astronomer Ptolemy in the 2nd century.

FACTS, LOCATION & MAP



Andromeda Constellation Map

Andromeda is the 19th biggest star constellation in the night sky, occupying an area of 722 square degrees. It is located in the first quadrant of the northern hemisphere (NQ1) and can be seen at latitudes between +90° and -40°. Cassiopeia, Lacerta, Pegasus, Perseus, Andromeda contains three Messier objects – M31 (Andromeda Galaxy), M32 and M110 – and has seven stars with known planets. The brightest star in the constellation is Alpheratz. The Andromedids meteor shower (also known as the Bielids) in mid-November appears to originate from this constellation.

Andromeda belongs to the Perseus family of constellations, along with Auriga, Cassiopeia, Cepheus, Cetus, Lacerta, Pegasus, Perseus, and Triangulum.

MYTH

In Greek mythology, Andromeda was the daughter of King Cepheus of Ethiopia and Queen Cassiopeia, who offended the Nereids (sea nymphs) by claiming that she was more beautiful than they were. The nymphs complained to the sea god Poseidon and he sent a sea monster, Cetus, to flood and destroy Cepheus' lands as punishment for his wife's boastfulness. When the king sought advice from the Oracle of Ammon on how to prevent complete destruction of his lands, he was told that the only way to appease the gods and nymphs was to sacrifice his daughter to Cetus. Subsequently, Andromeda was chained to a rock and would have been left to the monster if Perseus had not come along and saved her. The two were later married and had six children, including Gorgophonte, who fathered Tyndareus, the famous Spartan king, and Perses, who was an ancestor of the Persians. In the story, it was the goddess Athena who commemorated Princess Andromeda by placing her image among the stars, next to the constellations representing her husband Perseus and her mother Cassiopeia.


Alpheratz

MAJOR STARS IN ANDROMEDA

Alpheratz – α Andromedae (Alpha Andromedae)
The brightest star in Andromeda is Alpheratz, Alpha Andromedae. It is sometimes also known as Sirrah. It lies 97 light years from Earth. Alpheratz is a binary star with an apparent visual magnitude of +2.06. It is a hot blue star classified as a B8 subgiant. The brighter of the two stars forming the binary has an unusual chemical composition, with extremely high levels of mercury, manganese, and other elements. Its mass is approximately 3.6 solar masses and its surface temperature is about 13,800 K. With a luminosity 200 times that of the Sun, Alpheratz is the brightest mercury-manganese star known. The companion star is also more massive than the Sun and has a luminosity 10 times that of the Sun. The two stars orbit each other within a period of 96.7 days.

Andromeda Galaxy, Alpheratz and the Great Square of Pegasus, photo by Betelgeuse Alpheratz was once considered to be a part of the Pegasus Constellation along with being designated Alpha Andromedae, and it had the second designation, Delta Pegasi. Both of its names, Alpheratz and Sirrah, are derived from the Arabic phrase al surrat al-faras, which means the navel of the horse. The horse refers to Pegasus. Arabian astronomers also call the star *al ras al mar'ah al musalsalah*, which means "the head of the chained woman." Alpheratz is the northeastern star of the Great Square of Pegasus. The three other stars that form the square are Alpha, Beta and Gamma Pegasi (Markab, Scheat, and Algenib respectively). Alpheratz connects the Andromeda constellation with Pegasus, the horse Perseus rode to Andromeda's rescue.

Mirach – β Andromedae (Beta Andromedae)


Mirach and NGC 404

Mirach, Beta Andromedae, has roughly same apparent magnitude as Alpheratz, as it varies from +2.01 to +2.10. It is classified as a suspected semi-regular variable star. Mirach is a cool, bright red class M giant, approximately 200 light years distant. It is 1,900 times more luminous than the Sun and 3-4 times more massive. It has a magnitude 14 hydrogen fusing star for a companion. Mirach is part of an asterism called the girdle. The name Mirach is a corrupted derivation from the Arabic word for girdle, Mizar, referring to the star's placement at Andromeda's left hip. Mirach lies only seven arc-minutes away from the galaxy NGC 404. The galaxy is sometimes called Mirach's Ghost because its proximity to the star makes it difficult to observe and photograph. NGC 404 is a lenticular galaxy, more than 10 million light years away.

Almach – γ Andromedae (Gamma Andromedae)
Almach, Gamma Andromedae, is the third brightest star in the constellation and also another binary star. Its name derives from the Arabic *al-'anaq al-'ard*, which means "caracal," or "the desert lynx." Almach is approximately 350 light years distant. The brighter component of Almach, Gamma-1, is a golden yellow giant, while the companion is blue. They lie approximately 10 arc seconds apart. The primary star is a class K bright giant. It has an apparent magnitude of 2.26 and is about 355 light years distant. It is 2,000 times more luminous than the Sun. The fainter companion star, Gamma-2, is itself a binary star, consisting of fifth and sixth magnitude white dwarf stars. The brighter component, a spectrograph will reveal, is also a double star.

δ Andromedae (Delta Andromedae)
Delta Andromedae is a double star with an apparent magnitude of 3.28, approximately 101 light years distant from our solar system. The brighter component is a K-type giant, while the dimmer companion is either a G-type main sequence star or a white dwarf.

ι Andromedae (Iota Andromedae)
Iota Andromedae is a B-type main sequence dwarf, bluish white in colour. It has a magnitude of +4.29 and is 503 light years distant.

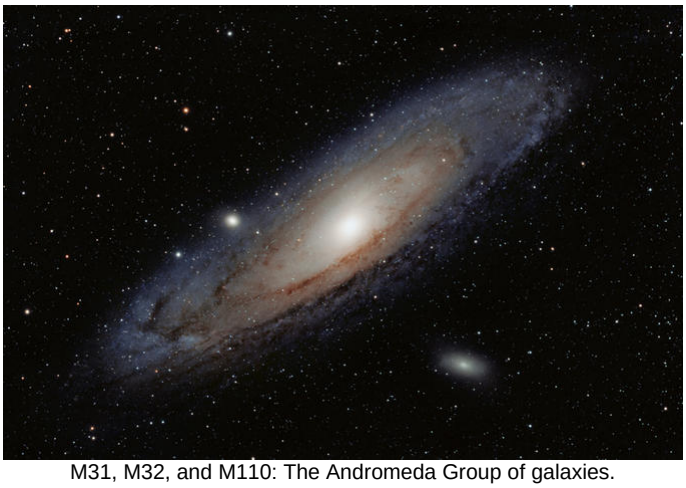
υ Andromedae (Upsilon Andromedae)
Upsilon Andromedae is another binary star system in the Andromeda constellation, composed of a yellow-white dwarf and a fainter red dwarf. The primary star, Upsilon Andromedae A, has four planets in orbit, presumed to be jovian planets (similar to Jupiter). It is approximately 3.1 billion years old, which is to say younger than the Sun, as well as more massive and more luminous. Upsilon Andromedae B is a red dwarf that lies 750 AU from the primary star. It is both less massive and less luminous than the Sun. Upsilon Andromedae is 44 light years distant. It is ranked 21st on the list of the top 100 target stars for the NASA Terrestrial Planet Finder mission.

Adhil – ξ Andromedae (Xi Andromedae)
Adhil, or Xi Andromedae, is also a double star. Its name derives from the Arabic word *al-dhayl*, which means "train" (or literally "tail"). Adhil is approximately 196 light years distant and has an apparent visual magnitude of +4.875. Its spectral class is G9.

Nembus – 51 Andromedae
With an apparent magnitude of 3.57, Nembus, or 51 Andromedae, is the fifth brightest star in the constellation. It is an orange K-type giant 177 light years distant. Even though Ptolemy originally included the star in the Andromeda constellation, Johann Bayer later moved it to Perseus as Upsilon Persei. English astronomer John Flamsteed moved it back to Andromeda, where it stays to this day.

μ Andromedae (Mu Andromedae)
Mu Andromedae is a white A-type dwarf that lies approximately 136 light years from Earth. It has an apparent magnitude of +3.86.

DEEP SKY OBJECTS IN ANDROMEDA
Andromeda Galaxy (Messier 31, M31, NGC 224)



M31, M32, and M110: The Andromeda Group of galaxies.

Messier 31 (NGC 224) is better known as the Andromeda Galaxy. It is a spiral galaxy approximately 2.5 million light years distant. In the past, it was also referred to as the Great Andromeda Nebula. Andromeda Galaxy is the closest spiral galaxy to the Milky Way, and also the farthest object in the night sky visible to the naked eye. It has an apparent visual magnitude of 3.4, which makes it one of the brightest Messier objects. The galaxy contains a trillion stars. This is significantly more than the Milky Way Galaxy, which has approximately 200-400 billion stars. Only the brightest central region of the Andromeda Galaxy is visible through a small telescope but, when observed through a larger telescope, the Andromeda Galaxy is about six times as wide as the full Moon. Andromeda belongs to the Local Group of galaxies, along with the Milky Way, Triangulum Galaxy, and 30 or so smaller galaxies. Andromeda is the largest of the group. Its mass is estimated to be roughly equal to that of the Milky Way Galaxy, which it is expected to collide in about 4.5 billion years. The Andromeda Galaxy contains a notable deep sky object in itself: NGC 206, a bright giant star cloud. It also has 14 known dwarf galaxies as its satellites. The ones that are easiest to find in the night sky are Messier 32 and Messier 110.

Messier 32 (Le Gentil, NGC 221)

Messier 32, a dwarf elliptical galaxy approximately 2.65 million light years distant, was originally discovered by the French astronomer Guillaume Le Gentil in 1749. The galaxy is still occasionally known by the astronomer's last name, Le Gentil. Messier 32 was the first elliptical galaxy ever discovered. It is a satellite galaxy to the Andromeda Galaxy. M32 is small, but quite bright, and can easily be seen in a small telescope. It is located 22 arc minutes south of Andromeda's central region. It appears spread over Andromeda's spiral arms and is believed to be on the side that is closer to us. M32 does not contain any globular clusters. The galaxy is suspected to have been much larger at one point, but then lost its outer stars and globular clusters when it collided with the Andromeda Galaxy. M32 is about 6.5 kly in diameter and mostly contains old stars, with no star formation going on inside the galaxy. It has a supermassive black hole in its centre: The mass of the black hole is estimated to be between 1.5 and 5 million solar masses.

Messier 110 (NGC 205)

Messier 110 is a dwarf elliptical galaxy. It is often classified as a dwarf spheroidal galaxy. It contains eight globular clusters in the halo that surrounds it. Atypical for a dwarf elliptical galaxy, M110 is showing signs of recent star formation. It does not appear to have a supermassive black hole, or at least there is no evidence that one exists at the centre of the galaxy. Messier 110 was observed and described by Charles Messier in 1773 together with the Andromeda Galaxy and other objects he discovered, but M110 was not included on his original list of objects. The galaxy was independently discovered by Caroline Herschel a decade later. Her discovery was then noted by her brother William Herschel in 1785, but it was not given a Messier number until 1967, when Kenneth Glyn Jones finally gave it one. M110 is about 2.9 million light years distant.

Other notable deep sky objects:

NGC 752 is an open cluster in Andromeda. It is also sometimes known as Caldwell 28. The cluster is 1,300 light years distant.

NGC 891 is an edge-on spiral galaxy which can be seen four degrees east of Almach (Gamma Andromedae). It is visible in 4.5-inch telescopes.

NGC 7662 (The Blue Snowball Nebula or Caldwell 22) is a planetary nebula with a faint variable star, a bluish dwarf, at its centre and a blue disk surrounding it. It is located a degree west of Kappa Andromedae, a magnitude 4 star. The Blue Snowball Nebula is estimated to be about 1,800 light years away. It can be seen in a small refractor telescope, but only appears as a star-like object with some nebulosity.

NGC 7686 is an open cluster with an apparent magnitude of 5.6. It is 900 light years distant.

NGC 7662 (The Blue Snowball Nebula) Wikimedia Project

A Cosmic Tease:
Trials of the Herschel Space Telescope Science Teams

By Dr. Marc J. Kuchner

Vast fields of marble-sized chunks of ice and rock spun slowly in the darkness this week, and I sat in the back of a grey conference room with white plastic tables spread with papers and laptops. I was sitting in on a meeting of an international team of astronomers gathered to analyze data from the Herschel Infrared Observatory. This telescope, sometimes just called Herschel, orbits the Sun about a million miles from the Earth.

The meeting began with dinner at Karl's house. Karl charred chorizo on the backyard grill while the airplanes dribbled into Dulles airport. Our colleagues arrived, jetlagged and yawning, from Germany, Sweden, and Spain, and we sat on Karl's couches catching up on the latest gossip. The unemployment level in Spain is about twenty percent, so research funding there is hard to come by these days. That's not nice to hear. But it cheered us up to be with old friends.

The meeting commenced the next morning, as the vast fields of ice and rock continued to spin—shards glinting in the starlight. Or maybe they didn't. Maybe they didn't exist at all.

You see, this team is looking at a series of images of stars taken by a device called a bolometer that is blind to ordinary starlight. Instead, the bolometer inside Herschel senses infrared light, a kind of light that we would probably refer to as heat if we could feel it. But the idea of pointing the bolometer at the stars was not to collect ordinary starlight. It was to measure heat coming from the vicinity of these stars, like an infrared security camera, in case there was something else to be found lurking nearby. Lo and behold, for a handful of stars, the bolometer measurements were off the charts! Maybe something was orbiting these stars. From the details of the bolometer readings—which channels lit up and so on—you would guess that this stuff took the form of majestic fields or rings of icy and rocky particles. It would be a new kind of disk, a discovery worth writing home to Madrid about.

There are several teams of astronomers analyzing data from the Herschel Space Telescope. They call themselves by oddly inappropriate sounding acronyms: GASPS, DUNES, DEBRIS. For the time being, the scientists on these teams are the only ones with access to the Herschel data. But in January, all the data these teams are working on will suddenly be released to the public. So they are all under pressure to finish their work by then. The team whose meeting I was sitting in on would like to publish a paper about the new disks by then. But it's not so simple. The stars that this team had measured were relatively nearby as stars go, less than a few hundred light years. But the universe is big, and full of galaxies of all kinds—a sea of galaxies starting from maybe a hundred thousand light years away, and stretching on and on. Maybe one of those background galaxies was lined up with each of the stars that had lit up the bolometer—fooling us into thinking they were seeing disks around these stars.

The team argued and paced, and then broke for lunch. We marched to the cafeteria through the rain. Meanwhile, vast fields of marble-sized chunks of ice and rock spun slowly in the darkness. Or maybe they didn't.

What else did Herschel recently uncover? Find out at http://spaceplace.nasa.gov/comet-ocean.

Dr. Marc J. Kuchner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at http://www.science.nasa.gov/astrophysics/. Image: *Samuel Pierpoint Langley, who developed the bolometer in 1878. His instrument detects a broad range of infrared wavelengths, sensitive to differences in temperature of one hundred-thousandth of a degree Celsius (0.00001 C). In 1961, Frank Low developed the germanium bolometer, which is hundreds of times more sensitive than previous detectors and capable of detecting far-infrared radiation.*

Centennial Observatory and Faulkner Planetarium Events

The Centennial Observatory - Upcoming Events

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, November 10th, 2012	6:15 PM to midnight	FREE
Telescope Tuesday	Centennial Observatory	Tuesday, November 13th, 2012	6:15 PM to 9:00 PM	$1.50 per person Free - children 6 & under Free to all with paid planetarium admission
Bimonthly Astronomy Talk: "Earth in the Crosshairs"	Rick Allen Room	Friday, November 16th, 2012	7:15 to 8:15 PM	$2.50 adults $1.50 students (incl. CSI) Free - children 6 & under
Astronomy Talk Night Telescope Viewing	Centennial Observatory	Friday, November 16th, 2012	8:15 to 10:15 PM	$1.50 per person Free - children 6 & under Free to all with paid astronomy talk or planetarium admission
Telescope Tuesday	Centennial Observatory	Tuesday, November 27th, 2012	6:15 PM to 9:00 PM	$1.50 per person Free - children 6 & under Free to all with paid planetarium admission

Faulkner Planetarium Schedule

November 2nd through 20th, 2012

Day	Time	Show
Tuesday	7:00	Cosmic Colors: An Adventure Along the Spectrum
Friday	7:00	Cosmic Colors: An Adventure Along the Spectrum
	8:15	U2
Saturday	2:00	Rusty Rocket's Last Blast
	4:00	WSKY: Radio Station of the Stars/Live Sky Tour
	7:00	Cosmic Colors: An Adventure Along the Spectrum
	8:15	Pink Floyd: Dark Side of the Moon

For schedule and show times past the 20th please contact the Herrett Center at 208-732-6655.

Bruneau Dunes Observatory

Note: The Bruneau Dunes Observatory is now closed until March 2013.

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.

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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, Webmaster for more information.