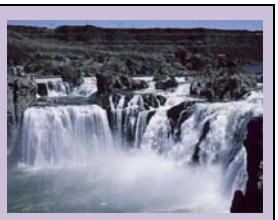
# Snake River Skies

The Monthly Newsletter of the Magic Valley Astronomical Society

December 2012



**www.mvastro.org**

Membership Meeting

Saturday, December 8th 2012
7:00 p.m. at the Herrett Center for Arts and Science CSI Main Campus
Annual Christmas Party

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## Letter from the President – Robert Mayer

Colleagues,

This month is our annual Christmas party. As always, here's an invitation for a shot at some door prizes and an evening with friends who share the same interest you do: astronomy. It's also a chance to look back on the year that was. I invite you all to mark your calendars for the party on Saturday, Dec. 8.

With the year winding down, it's a chance to look forward as well. Last month, we spent our November (see page 9) meeting brainstorming ideas. We're committed to carrying out the private star parties and booking solid presentations. Many great ideas were presented, so expected to see more about what we've come up with in the future editions of the newsletter. In addition, activities such as a moon party and a club planetarium visit are under discussion.

For this month, plans for a private star party are of course dependent on the weather. However, if we can come up with something for Dec. 14th, we will let you know.
Again, thank you for reading this. We look forward to seeing you at the party.

Sincerely,

Rob Mayer
MVAS President.

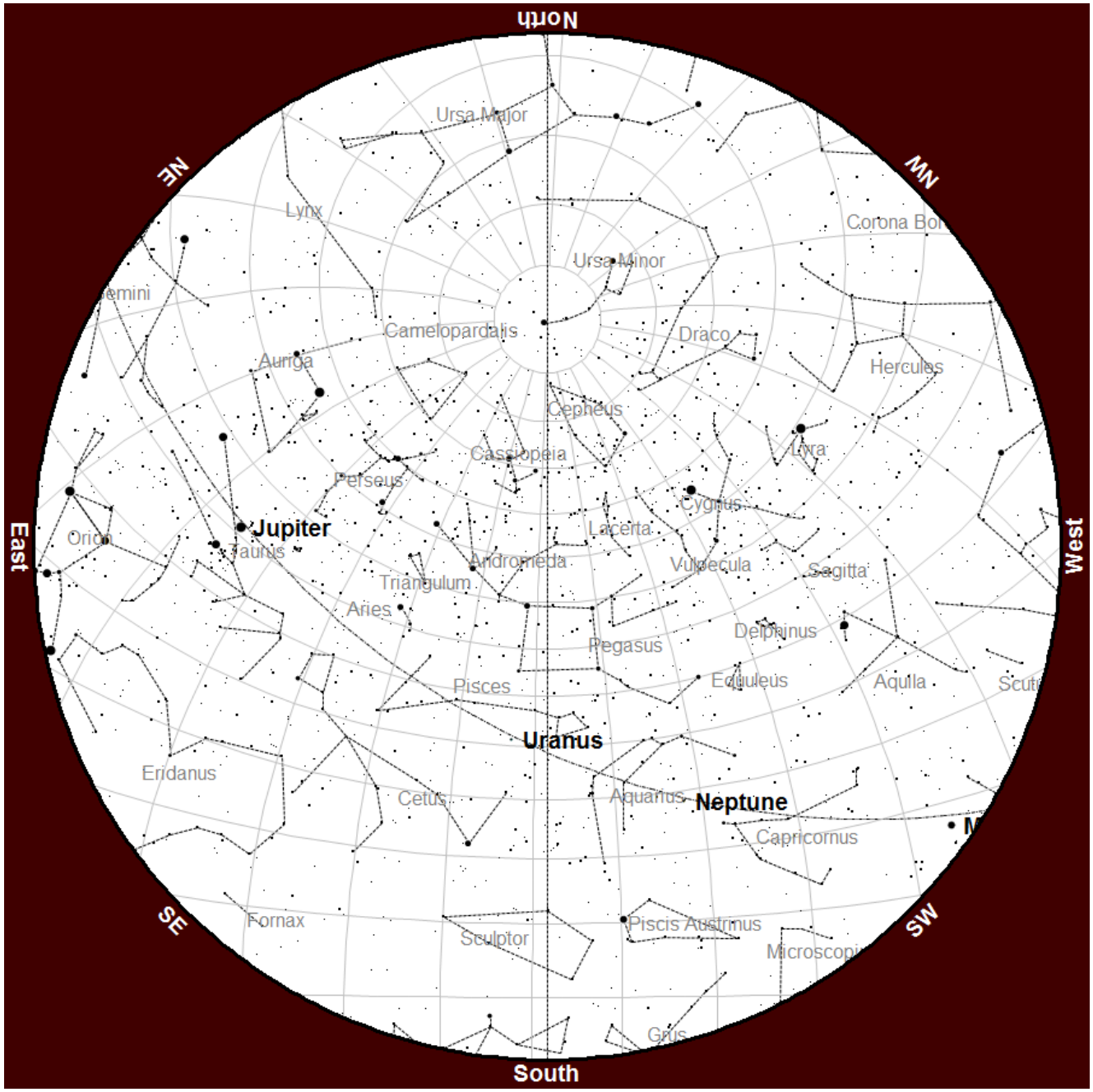
**In this Issue**

## Calendar for December

| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 Last Quarter Moon  | 7 | 8 Membership Meeting at the Herrett Center 7:00 pm<br><br>Monthly free star party at 6:00 PM - 12:00 AM at the Centennial Observatory |
| 9 | 10 | 11 Telescope Tuesday Centennial Observatory | 12 | 13 New Moon Greatest South Declination -21°  | 14 Club Star Party Location TBA  | 15 |
| 16 | 17 | 18 | 19 | 20 First Quarter Moon  | 21 Winter Solstice  EEK! | 22 |
| 23 | 24 | 25 Christmas   | 26 Moon at Greatest North Declination +21°  | 27 | 28 Full Moon  | 29 |
| 30 | 31 New Year's Eve | | | | | |

 The image of M51 image is explained on the back page. The Shoshone Falls on the Snake River in Idaho; prominent landmark feature in the Magic Valley near Twin Falls, ID

## Planisphere for December



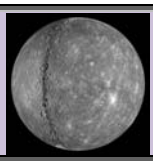
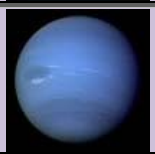

Planisphere should be used as a guide for the month of December, mid-month, end of astronomical twilight (6:45 PM)

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

## Trivia Time

The observable universe contains between 10 sextillion and 1 septillion stars (between $10^{22}$ and $10^{24}$ stars) if you divide this among the people on the Earth we would each have about 422-trillion stars or 422,000,000,000,000 (4.22 × 10^14) which is more than the red blood cells in our bodies ≈ 21-trillion (2×10^13) and still more than the U.S. National Debt of $16,323,083,449,604.98 (1.632308344960498×10^13).

## Solar System Highlights

| | |
|---|---|
|  | **Mercury** is only 10° high 20 to 30 minutes before sunrise, and even though it shines at magnitude -0.5 it will probably require optical aid to be spotted. Binoculars will help you find it, and a telescope will show the planet's 7"-wide disk, about 80- percent illuminated. |
|  | **Venus** shines like a beacon in the southeastern morning sky. At magnitude -4 the planet is still close to peak brightness, but it is rapidly losing altitude and gets closer and closer to the horizon with each passing day. At the beginning of the month, Venus spans 11.8" across and shows a disk 88-percent lit. By late December, the disk has shrunk to 10.9" and the phase has grown to 93-percent illumination. |
|  | **Mars** has faded in the past few months, but it is still visible about half an hour after sundown, low in the southwest (a perfect scene for wide-angle photography). Because of its small angular diameter of only 4" this December, Mars is a challenging object to observe. High magnification with a good telescope and a steady atmosphere are required to see some details on the surface. |
|  | **Jupiter** reaches opposition to the Sun on December 2, when it is closest to Earth and at its largest and brightest. The gas giant rises shortly after sunset, remains visible all night and looks stunning through a telescope. It shines at magnitude -2.8 and resides in Taurus, close to Aldebaran, the brightest star in the constellation and one of the brightest in the nighttime sky. |
|  | **Saturn** shines close to Venus in the southeast during dawn. It begins the month only 5° to Venus's upper right, but by December 31 the two planets are separated by more than 40°. A small telescope will reveal Saturn's system of rings which span 36", surrounding a disk about 16" in diameter. |
|  | **Uranus** is technically at the threshold of vision at magnitude +5.8, and can be found among the stars of the constellation Pisces immediately after dark. For a proper identification, however, you will need binoculars and a current finder map with a good telescope and a power of 100x or more are needed to make the planet's disk obviously non-stellar. |
|  | **Neptune** is in the constellation Aquarius, just 2° northeast of the 4th-magnitude star Iota Aquarii. The planet is rather faint, at magnitude +8, but can be found with binoculars provided that the night is very dark, very clear, and you are far from sources of light pollution. |
|  | **Pluto** The dwarf planet is not currently observable. It will return to view in February 2013, low in the morning sky. |
|  | **Asteroid** 9 Métis, looks like an ordinary field star glowing at magnitude +9. This rock, 145 miles across, lies in Gemini the Twins and will be fairly easy to track with a small telescope. You can find it the same way its discoverer, Andrew Graham, did April 25, 1848: by noting its displacement against the starry background. Métis moves about 15' per night, half the apparent diameter of the Full Moon. |
|  | **Comets** Astronomers expected 168P Hergenrother to reach about magnitude +15 but due to an outburst it currently glows at 10th- magnitude, making it a modestly challenging object in a small telescope from country skies. Look for it high above the northeastern horizon in the evening, within the borders of the constellation Andromeda close to M31, the Great Andromeda Galaxy or the Andromeda Nebula. |
|  | **Meteors** The Geminids are active from December 4 to 17th and peak very quickly on the night of December 13 - 14. The Ursid shower is active from December 17 to December 26, and peaks on the morning of December 22. The radiant lies near the bright star Kochab (Beta Ursae Minoris), which appears below the Pole Star in the evening and above it before dawn. |

## Idaho Skies for December - 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.**

At the beginning of the month, look for the star Aldebaran, the lucida of Taurus, the Bull. It's half way up in the sky when you face towards the east. The star is orange in color and forms the apex of the "V" of Taurus (where it represents the eye of the bull). If you were born in 1947 then Aldebaran is your birthday star this year because the light you see tonight left Aldebaran 65 years ago. While Aldebaran is consisted to be the eye of a bull, its name is however Arabic and means the follower. Arab astronomers probably gave it this name because it follows the Pleiades star cluster. The star appears as the brightest member of the Hyades star cluster, a widely spaced cluster of stars that forms the "V" of Taurus. However, this is just a chance alignment. Taurus is only half as far away as the Hyades.

Aldebaran is a giant orange star with a spectral classification is K5. The star, being more massive than the sun, has consumed most of the hydrogen in its core. The star's core is contracting as a result and growing hotter as it does so. Eventually the core of Aldebaran will grow hot enough begin fusing its helium ash into hydrogen. This release of fusion energy will stave off the further collapse of its core. Currently the temperature of its core has expanded the star to a size 44 times greater than the sun's diameter.

### December 1 – 7

On the 1st, get outside by 6:30 AM to see a nice alignment of three planets in the east. From the horizon up, Mercury, Venus and Saturn form a line 13 degrees long. This is small enough that you can cover them all up with your spread out hand. Tiny Mercury will be the most difficult to see and you will need a clear east-southeast horizon if you want a glimpse. You can be certain that you are seeing Mercury however because it will be the brightest star forming a line from Saturn to Venus.

Thirty-eight years ago on the 3rd, the plucky Pioneer 10 spacecraft tweaked a dragon's tail. The spacecraft flew very close to Jupiter and through its intense radiation belts. The intensity of the trapped radiation surrounding Jupiter far exceeded the design of the spacecraft. In fact, if there had been a human onboard, the radiation dose would have been lethal. Pioneer 10 was the first spacecraft to fly pass through the asteroid belt and the first to visit the outer planets. All previous space missions had only explored Venus, the moon, and Mars.

Pioneer 10 and its sister Pioneer 11 were pathfinders. Their goals were to explore the atmosphere, magnetic field, and moons of the solar system's largest planet. During their missions, the spacecraft also explored the interplanetary dust and radiation filling the solar system. After a successful Jupiter encounter, NASA put Pioneer 11 on a trajectory across the solar system to encounter Saturn.

Pioneer 10 was over 7 billion miles away when we last heard from in 2003. The radioisotope thermal generators powering the spacecraft may be generating enough power to operate its radio. However, its antenna no longer points closely enough to Earth for our antennas to acquire the spacecraft's very weak radio signal. Today the spacecraft continues its voyage towards the star Aldebaran. The closest approach will occur in about two million years. In the off chance that extraterrestrials find the spacecraft, it carries with it a plaque depicting the location of its home and builders.

The 3rd also marks the day when Jupiter is at opposition. The planet is at its closest to Earth today. This means the planet spans its largest diameter and its face appears fully illuminated by the Sun. Opposition is the best time to view the planets and their satellites.

Thirty-four years ago on the 4th, Pioneer Venus 1 entered into orbit around Venus. It was the first spacecraft to orbit the planet as every other spacecraft had made a flyby or direct landing.

The mission was mainly a study of the planet's atmosphere, magnetic field, and ionosphere. Since the planet is cloud shrouded, its experiments focused primarily on observing the planet's clouds in infrared and ultraviolet light – rather than in visible light. However, the spacecraft did make an attempt to peak under the clouds using radar. Pioneer Venus' images of the planet were eventually surpassed in quality when the Magellan spacecraft arrived at Venus

The tiny planet Mercury reaches its highest elevation above the horizon on the morning of the 4th. Look low in the east-southeast this morning and follow the planets Saturn and Venus downward to Mercury. It will be the brightest "star" close to the horizon. You need a clear eastern horizon and should begin looking around 6:30. Too early and the planet's low altitude makes it difficult to see and too late and the brightening sky makes it difficult to see.

Where were you in 1972? The 7th marks the 40th anniversary of the launch of Apollo 17, the last manned mission to the moon. Apollo 17 was the sixth moon landing. The region NASA selected as the landing site included a mix of what scientists believed to be old highland material and younger volcanic material. Astronauts Gene Cernan and Harrison Schmidt spent three days exploring the region around the Taurus-Littrow Valley. To enhance the mission, they carried an electric powered lunar rover. The rover's speed and carrying capacity enabled the astronauts to visit many locations that were too far for them to visit all of them. They still hold the unofficial lunar speed record of 11 mph. Their haul was 244 pounds of lunar rock and dust, including unexpected tiny orange-colored volcanic glass bead.

**December 8 – 14**

For you early birds, the moon passes very close to Spica on the morning of the 9th. Spica rises around 3:30 AM and will be just over one degree above the moon. That's about twice the moon's apparent diameter. This should be nice in binoculars especially since the moon is a waning crescent this morning.

The moon's not finished yet. On the morning of the 10th, the moon is within a binocular field of view of Saturn. Your best views of Saturn are through a telescope, even a small one. Saturn will be the brightest star (although not all the bright compared to nearby Venus) above the moon.

The moon has another trick up its sleeve. On the morning of the 11th, it appears near the brilliant Venus. This one is trickier than seeing the moon near Saturn because both Venus and the moon will be very close to the horizon as dawn breaks. A pair of binoculars is helpful in finding the very thin crescent moon. Venus appears just below the moon and both will fit within the field of view of standard 7X50 binoculars. Look closely and you may be able to locate Mercury. It will be much closer to the horizon, however it will be the only "star" you can see near the horizon.

The moon is new on the 13th at 2:42 AM. Beginning tonight, the moon will appear higher in the western horizon after sunset. Don't get too eager to hunt it down. You need a day or two before the thin crescent moon is enough away from the sun to be visible. A nice challenge is to search for your youngest moon. How soon after the new moon can you see it again after sunset?

Since the moon is new, we have a good opportunity to see the Geminid meteor shower. Without the moon's light to brighten the sky, more of the shower's fainter meteors will be visible. Dress for the cold if the sky is clear on the night of the 14th. Also, be prepared to spend at least 20 minutes letting your eyes become adapted to the dark. We can expect around 50 meteors per hour form this shower. Since the constellation Gemini is high above the horizon on December nights, you can expect to begin seeing meteors right away. If you can wait until 2:00 AM when Gemini is overhead, you might be able to glimpse meteors at twice the rate.

When you observe Venus on December mornings, remember that the first American interplanetary spacecraft visited the planet on December 14, 1962. Mariner 2 coasted past the planet at a distance of 22,000 miles, making several measurements in the process. The spacecraft could not carry enough propellant to brake into orbit around the planet, especially with the launch vehicles of its day.

Since this was uncharted territory of the United State's space program, the spacecraft also carried a micrometeoroid sensor and solar plasma sensor for solar studies. For its encounter with Venus, the spacecraft carried radiometers to measure the heat emitted by the planet, a charged particle sensor to detect radiation trapped around the planet, and a magnetometer to measure the strength of a possible planetary magnetic field. The mission took 3½ months to traverse the distance between Earth and Venus.

The radiometers scanned the day, night, and terminator portions of the planet. The radiometer data indicated the planet appeared a nearly uniform 460 degrees Fahrenheit. Of course, this is the temperature of clouds; the surface is one heck of a lot hotter. Any hope that the clouds originated from a steamy, swampy planet filled with dinosaurs went up in smoke (so would any dinosaurs that tried to walk on Venus' hot surface). The magnetometer data indicated Venus had only a tiny magnetic field. As expected, without an appreciable magnetic field, Venus did not trap solar radiation into a Van Allen belt like Earth. Therefore, any solar storm activity is likely to blast Venusian atmosphere into space. Only the planet's incredibly thick atmosphere keeps it from turning into a near vacuum like Mars.

**December 15 – 21**

Science fiction author Arthur C. Clarke was born 95 years ago on the 16th. While many consider him one of the three big science fiction writers, he was also a promoter of science and space travel. Arguably, his greatest work was the story 2001: A Space Odyssey. The movie and book, where were written at the same time, attempted to realistically portray spaceflight. It is difficult to find errors in the movie, although a few do exist. Try looking for the science errors the next time you watch Star Wars.

On the spaceflight side, Clarke was instrumental in designing and promoting the concept of positioning communication satellites in geostationary orbit. Geostationary orbit is located approximately 22,300 miles above Earth. At geostationary orbit, a satellite's period, or the time it takes the satellite to orbit Earth once is 24 hours. Therefore, from a point on Earth below the satellite, it appears to be fixed in the sky, or motionless. This makes it very easy for an antenna to maintain a fix on the satellite. Clarke was able to show that three satellites spaced 120 degrees apart would provide communications between any two places on Earth, except at the poles. Today communication satellites fill geostationary orbit. Locations, or slots in the geostationary belt are regulated by an international body. This regulation prevents conflicts between satellites and their owners. Geostationary obit represents valuable real estate and is frequently referred to as the Clarke Belt. By the way, the other two big science fiction writers are Robert Heinlein and Isaac Asimov. While the Street Astronomer can't say much about Heinlein, he vigorously supports Asimov as one of the big three.

Get your telescope and binoculars warmed up, as the 19th is the night of the first quarter moon. When the moon appears half full, the craters and mountains along the terminator of the moon stand out in their starkest relief. This is the result of two factors. First, the sun is just rising along the terminator and its low elevation casts the longest shadows. Second, the terminator at first quarter moon is facing directly at Earth. Since the terminator is perpendicular to us mere mortals, there is no foreshortening of the shadows from our perspective. We see them stretched out in all their glory. Tiny changes in elevation, otherwise invisible to us, become visible. With a telescope, you can detect changes in elevation on the order of 100 feet of less. That's not bad for a celestial body some 238,000 miles away.

The winter solstice arrives at 5:12 AM on the 21st (the Street Astronomer's 4.5th anniversary is about 14 hours later). Today the Earth's South Pole points as directly towards the sun as possible. Earth's axis of spin tilts 23.5 degrees with respect to the plane of its orbit around the sun. That axis remains fixed in space; and is in fact, pointed towards Polaris, the North Star. As Earth revolves around the sun, its North Pole points towards the sun in June and away form the sun in December. When the South Pole points most directly towards the sun, its summer in the southern hemisphere and winter in the northern. Please remember that Earth's distance from the sun is irrelevant to the seasons. By the way, the winter solstice of 2012 is the easiest solstice since 1896.

**December 22 – 30**

The Ursid meteor shower reaches its peak on the night of the 22nd. This is not normally a strong shower and the nights can be cold around this time. Therefore, the Ursids are not a popular shower. Adding insult to injury, the moon is a thick gibbous that night. Any Ursids meteors that you might see will appear to originate from the bowl of the Little Dipper, properly called the Little Bear or Ursa Minor.

For a shower that typically produces less than 10 meteors per hour, the Ursids have occasionally produced outbursts of 100 meteors per hour. If you want to observe the shower in the off-chance that it will produce an outburst like this, plan to observe it after midnight when the moon has set.

Did you get a new telescope for Christmas? You have an excellent opportunity to try it out Christmas night. There's a brilliant star above the gibbous moon that night. So after looking at the moon, point your new telescope towards the star. Even at low power, you will discover that it is round and accompanied by four tiny stars. What you are seeing is the mighty planet Jupiter and three of its retinue of satellites. The fourth star really is a distant star. The four largest satellites were discovered by Galileo 403 years ago and are collectively named in his honor. The Galilean Satellites are roughly the size of our moon (give or take). They are a diverse population of moons ranging from Io, the most volcanic body in our solar system to Europa, an icy satellite possibly covering a deep ocean. Watch them over several nights as they perform their dance around Jupiter. From left to right in a telescope that inverts images, you will see Io (look very carefully and you may notice that Europa is very close to Io), Jupiter, Ganymede, Callisto, and the star HIP 20785. The star will be brighter than the satellites.

The moon is full on the morning of the 28th. The full moon in December is called the Cold Moon. Terrain shadows are not visible on the full moon, except possibly for a few on the edge of the moon opposite the sun. Therefore, what we notice the most on the full moon is albedo features. These features include dark lunar maria and bright crater aprons and rays.

Lunar Maria are old oceans of lava. After the moon's formation, its core remained hot from gravitational collapse and radioactive decay. That led to pockets of magma, or molten rock deep beneath its surface. Also at this time, the collision between the moon and the remaining building blocks of the solar system, the planetesimals created large impact basins. Later magma filled in the basins with sheet after sheet of thin runny lava. In some basins, there is evidence for layers of lava over a mile thick. The bright streaks, which we call rays, are the result of material ejected from crater-creating impacts being thrown radially outward.

Dark Skies and Bright Stars,
*The Street Astronomer*

This Month's Sources:

2012 Ursid meteor shower active around winter solstice, http://earthsky.org/tonight/ursid-meteor-shower-active-around-wintter-sosltic
Aldebaran, http://en.wikipedia.org/wiki/Aldebaran
Apollo 17, http://en.wikipedia.org/wiki/Apollo_17
EarthSky's meteor shower guide for 2012 http://earthsky.org/astronomy- essentials/earthskys-meteor-shower-guide
Lunar Roving Vehicle http://en.wikipedia.org/wiki/Lunar_Roving_Vehicle
Mariner 2, http://en.wikipedia.org/wiki/Mariner_2
NASA Science, http:///www.nasa.gov/mission_pages/pioneer/
Night Sky Explorer (software)
Pioneer Venus Project Information, http://nssdc.gsfc.nasa.gov/planetary/pioneer_venus.html
The Pioneer Missions, http://www.nasa.gov/centers/ames/missions/archive/pioneer.html
Sea Sky, www.seasky.org
Space, www.space.com
Space Calendar, Baalke, Ron, www.jpl.nasa.gov/calendar/
Stars, Kaler, James, <www.astro.uiuc.edu/~kaler/sow/>
Skywatch 2012, Sky Publishing
The Old Farmer's Almanac 2013

Image: Full Moon rising above the Snake River Canyon with Pillar Falls (foreground) and Shoshone Falls (back) visible. MVAS © 2012 by Gary Leavitt

## Deep Sky Highlight

NGC 2169 in Orion nicknamed "The 37 Cluster" due to its striking resemblance to the number 37 is located about 3,600 light years away from us. As far as open star clusters go, NGC 2169 is a small one, spanning only 7 light years across. Its stars are about 8 million years old and are expected to disperse over time as they encounter other stars, interstellar clouds, experience gravitational tides. NGC 2169 contains 11th-magnitude GSC 00742–02169, a chemically peculiar variable "AP" star. Its variations (of less than 0.1 magnitudes) are caused by misalignment between the magnetic field poles and the rotation axis, which is a common phenomenon with AP stars. Coordinates: Right ascension $06^h\ 8.4^m$ Declination +13° 57′

## Club Announcements

We had quite a fruitful discussion Saturday, Nov. 10, about what to do for next year. In essence, five "categories" came up:

**1. The Two Big Star Parties.**
Pomerelle: July 6
City of Rocks: Aug. 9-10

The Pomerelle Star Party still needs to be cleared with Pomerelle management, and my plans are to talk to management sometime between Wednesday and Friday. My math tells me that Chris could end up with an astronomy talk the night before, so I'd like to hear his input. The City of Rocks date was set with the idea of having Terry Wofford available to show me where to hammer posts in. In order for that to work, we need one more volunteer to cover for Chris Anderson at the Centennial Observatory on Aug. 10 (Richard Sexton has already volunteered -- thanks, Richard). There will be no regular club meeting at the Herrett Center that weekend.

**2. Private Club Star Parties.**
Based on activities in September and October, we'd like to keep that tradition going. With that in mind, I asked Paul McClain to come up with a list of dates that mean the moon won't be interfering. At the same time, we realize that cold weather does a number on early star parties, so we came up with these ideas:

- January-March, July, August: See below
- April 5 (Messier Marathon?)
- May 3rd
- June 7th
- Sept 6th -- My math also tells me another astronomy talk is scheduled. We may have to move this to Sept. 7th
- Oct. 4th
- Currently, there are no plans for November or December. Stay tuned.

*Notes about the Private Star Parties --*

- January-March: That's cold weather, so we had a couple of ideas that need to be worked through:
    - In October, David Olsen pointed out that the Boise Astronomical Society has devoted a night to going to the planetarium as a club. Those present at this month's meeting did invite me to check into that for January.
    - For February and March, most of us can handle a quick look, but our toes don't help. The idea that was bounced around was a Half-Moon Party at the Magic Valley Aeromodelers site. It's close to Twin Falls, and we're looking at a half moon, so you can just grab your scope and head on over to help each other out for a quick view. I am still checking out dates for that, and any ideas on making this more feasible would be great. Of course, snow changes everything.
- July and August: The private star parties would be replaced by the Pomerelle and the Castle Rocks State Park star parties.
- Locations: When that discussion came up, two points became clear. First, we want to rotate locations for everyone. Among the sites that came up were Thorn Creek Ridge, Sid Butte, MV Aeromodelers, and Jerome Gun Club. I need to talk to Tony Reusser about a spot south of Twin Falls, and would love to hear other ideas, especially about sites closer to Twin Falls. Secondly, weather and other conditions will dictate where. My impression is that we as a club via e-mail will start discussing the location about sometime between 10 days and a month before the star party.

**3. The Monthly Saturday Club Meeting.**
*Right now, this is what we have set in sheet rock:*
January: Telescope Clinic
February: Richard Beaver, who spoke to BAS earlier this year about his experiences with NASA.

March: Show-And-Tell. This is an activity some other clubs carry out, so let's try it out. Members are invited to share 5-20 minutes letting us know what they've been working on -- either in a formal presentation or an informal presentation. Discussions are likely to happen afterwards. In February, I'll put out an inquiry/announcement in the newsletter to see who wants to be involved. At our Saturday meeting, Jim Tubbs suggested that too many of us underestimate our contributions, so please let us know what you're doing. If it's really popular, I won't rule out doing another one, especially since I saw other clubs doing that.

April, May, September: See below
July: Club Bar-b-q
August: Castle Rocks Star Party
October: Back by popular demand, the multi-media MVAS Year-In-Review. Officer elections
November: Club business and planning meeting.
December: Christmas Party

As you can see, we need speakers for April, May and September. Ten names were brought up, including inviting a guest speaker from BSU, Jo Dodds of TFHS regarding her NASA activities, and Dr. Wright of TFHS, the astronomy instructor. After talking to the club, I'm also going to try Mark Daily of the CSI Physics Department. The names Chris Anderson and Wallace Blacker did also come up, but it might be nice to give Chris a break this year and get him back next year. If I'm missing someone, let me know.

We'd love to hear from other members within our club. In addition to brainstorming names, we came up with some ideas that might trigger some ideas: constellations, DIY, technical know-how and training, astrophysics, history, astrophotography, meteor shower observation via radio, and even the Mars Rover Curiosity. Perhaps the Show-And-Tell will get something going. Let me know if you have any ideas.
Based on what I'm seeing, I do believe we will have a great line-up of Saturday speakers and activities. I will really try to help David Olsen out by publicizing these speakers in the newsletter.

**4. Other Events.**
Quadrantids (early Jan.)
Astronomy Day (April 20)
Craters of the Moon: June and September
Perseids (Aug. 12)
Idaho Star Party: September
Joint Party with BAS: June would be the best shot for our club.
International Observe the Moon Night: Oct. 12
Penumbral Lunar Eclipse: Oct. 18

**5. Other Ideas.**

- Paul has proposed we as a club participate in NASA's Near-Earth Objects program. My understanding is that it would take a couple of nights to take pictures of asteroids et al. (http://neo.jpl.nasa.gov/programs/)
- Radio-Meteor Shower Observation Evening
- Remote Star Party: Instead of gathering in one place, we simply go into our backyards or places of choices and make observations of our own on a particular evening, then share those findings the next morning on e-mail, provided we don't blow away the bandwidth.

**Last Note.**

I realize many of us are busy. With that in mind, the goal is to try to hold no more than two activities a month. The more important key is that we hear from each other. We'd love to have as many people as possible at the Saturday meetings or the private star parties, and if that doesn't work, check in with us via e-mail and Facebook. I'd much rather post your links and pictures than wade through something on the internet.

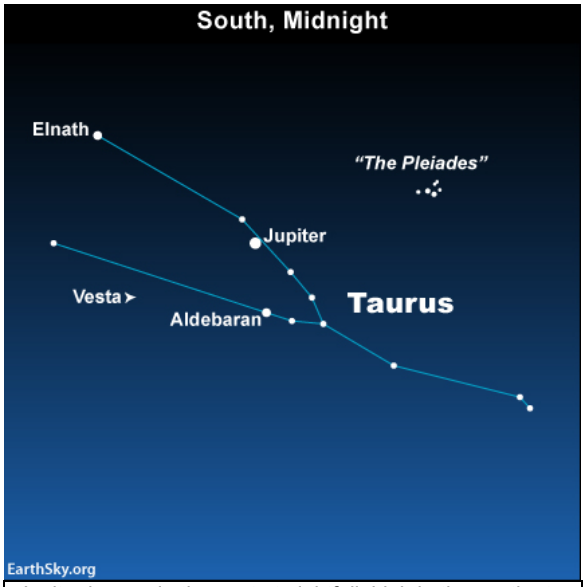
Robert Mayer, President

## Looking Through the Eyepiece

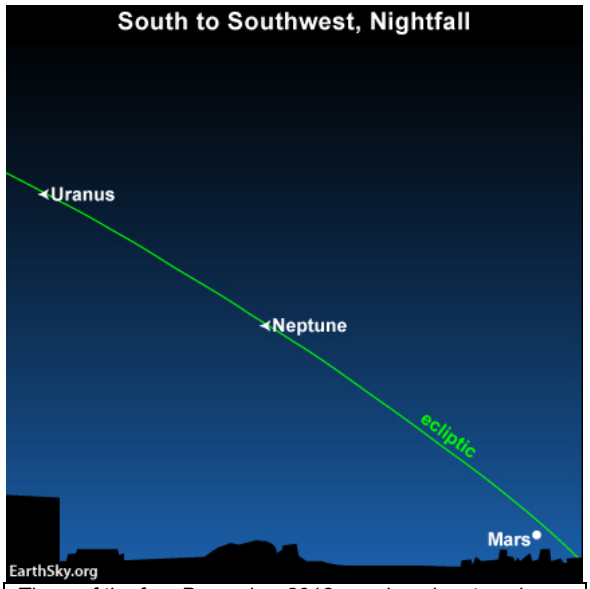
All of the Solar System Planets Visible in the December 2012 Night Sky

Yes, it'll be possible to see every planet of the solar system on these December 2012 nights. With the International Astronomical Union reclassifying Pluto as a *dwarf planet* in 2006, that leaves a total of eight known full-fledged planets inhabiting our solar system. In their outward order from the sun, these planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Given clear skies – and optical aid in the case of Uranus and Neptune – our sun's family of planets will be yours to behold.

Four of these planets are found in the evening sky, starting at nightfall. Going from west to east, these planets are Mars, Neptune, Uranus and Jupiter. (See charts below.) The farther west the planet is at nightfall, the sooner it sets after the sun. You can't miss dazzling Jupiter in your eastern sky at nightfall, but the three other evening planets in the south to southwest sky – Mars, Uranus and Neptune – will pose much more of a challenge.




Jupiter beams in the east at nightfall, high in the south at midnight and low in the west at dawn.



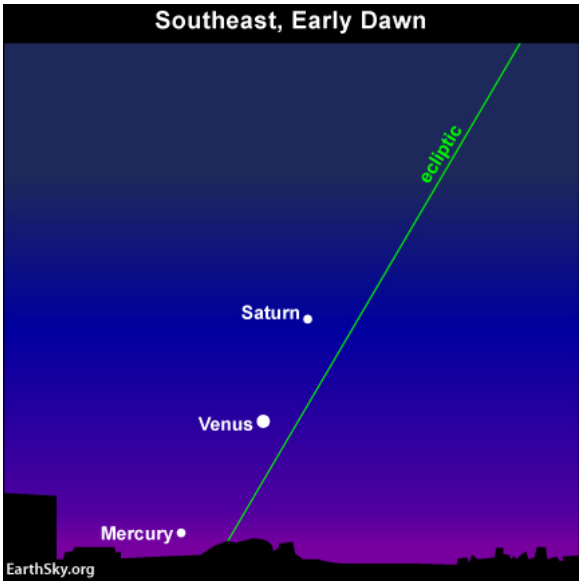

Three of the four December 2012 evening planets going from west to east: Mars, Neptune and Uranus. You'll need an optical aid to see Neptune and Uranus

Mars follows the sun beneath the horizon shortly after nightfall, so it might behoove you to search for the red planet low in the southwest as soon as darkness falls. Although about the same brightness as the Summer Triangle star Deneb, the near-horizon view of Mars could be murky. If you have binoculars, they may help you to see Mars in a sky that's less than crystal-clear. Or if you miss Mars tonight, let the waxing crescent moon be your guide on December 14 and 15.

Uranus and Neptune are well positioned for viewing at nightfall and early evening, though you'll need good binoculars and/or a telescope, and a detailed sky chart to see them. You'll have no trouble seeing Jupiter, the fourth-brightest celestial body after the sun, moon and Venus. Jupiter shines all night long whereas Venus rises above the southeast horizon shortly before the onset of morning dawn.

Because the planets revolve around the sun on nearly the same plane that the Earth revolves around the sun, the planets are always found on or near the ecliptic – Earth's orbital plane projected onto the dome of sky – the same pathway traveled by the sun throughout the year. Even without an optical aid, you can imagine seeing Uranus and Neptune with the *mind's eye*, lining up on the ecliptic in between Mars and Jupiter.

As the Earth spins eastward under the heavens tonight, Mars sets shortly after nightfall, followed by Neptune at late night, and Uranus after midnight. As for Jupiter, it'll be out all night long. When Jupiter shines low in the west during the wee hours before sunrise, look for the morning planets – the ringed planet Saturn, Venus and Mercury – to light up the southeast sky. Saturn rises first, followed by Venus and then Mercury. Early December presents the best time of the month to catch Venus, the sky's brightest planet, and Mercury, the innermost planet, in the predawn darkness or early dawn. Whereas Venus and Mercury fall toward the glare of morning twilight throughout the month, Saturn climbs away from it, rising several hours before dawn by the end of the month.




The December 2012 morning planets from west to east (top to bottom): Saturn, Venus and Mercury. You don't have to stay up all night to view all the planets. The four evening planets – Mars, Neptune, Uranus and Jupiter – can be viewed at nightfall, and all three morning planets – Saturn, Venus and Mercury – are visible some 90 to 60 minutes before sunup as darkness starts to give way to dawn, look for Saturn, Venus and Mercury in the southeast sky. Take advantage of these December 2012 nights to see every planet of our solar system!

## It Takes More Than Warm Porridge to Make a Goldilocks Zone

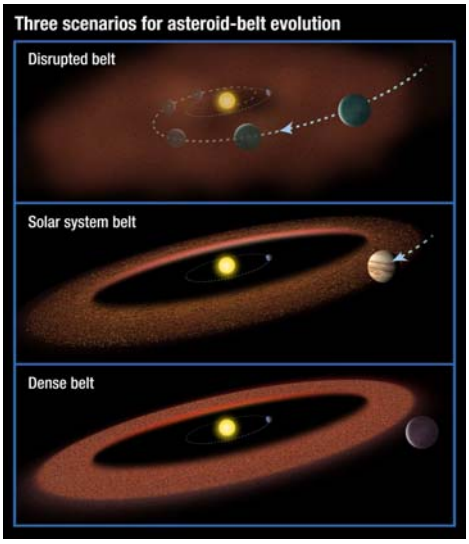
The “Goldilocks Zone” describes the region of a solar system that is just the right distance from the star to make a cozy, comfy home for a life-supporting planet. It is a region that keeps the planet warm enough to have a liquid ocean, but not so warm that the ocean boils off into space. Obviously, Earth orbits the Sun in our solar system’s “Goldilocks Zone.”
But there are other conditions besides temperature that make our part of the solar system comfortable for life. Using infrared data from the Spitzer Space Telescope, along with theoretical models and archival observations, Rebecca Martin, a NASA Sagan Fellow from the University of Colorado in Boulder, and astronomer Mario Livio of the Space Telescope Science Institute in Baltimore, Maryland, have published a new study suggesting that our solar system and our place in it is special in at least one other way.

This fortunate “just right” condition involves Jupiter and its effect on the asteroid belt. Many other solar systems discovered in the past decade have giant gas planets in very tight orbits around their stars. Only 19 out of 520 solar systems studied have Jupiter-like planets in orbits beyond what is known as the “snow line”—the distance from the star at which it is cool enough for water (and ammonia and methane) to condense into ice. Scientists believe our Jupiter formed a bit farther away from the Sun than it is now. Although the giant planet has moved a little closer to the Sun, it is still beyond the snow line.

So why do we care where Jupiter hangs out? Well, the gravity of Jupiter, with its mass of 318 Earths, has a profound effect on everything in its region, including the asteroid belt. The asteroid belt is a region between Mars and Jupiter where millions of mostly rocky objects (some water-bearing) orbit. They range in size from dwarf planet Ceres at more than 600 miles in diameter to grains of dust. In the early solar system, asteroids (along with comets) could have been partly responsible for delivering water to fill the ocean of a young Earth. They could have also brought organic molecules to Earth, from which life eventually evolved.
Jupiter’s gravity keeps the asteroids pretty much in their place in the asteroid belt, and doesn’t let them accrete to form another planet. If Jupiter had moved inward through the asteroid belt toward the Sun, it would have scattered the asteroids in all directions before Earth had time to form. And no asteroid belt means no impacts on Earth, no water delivery, and maybe no life-starting molecules either. Asteroids may have also delivered such useful metals as gold, platinum, and iron to Earth’s crust.

But, if Jupiter had not migrated inward at all since it formed father away from the Sun, the asteroid belt would be totally undisturbed and would be a lot more dense with asteroids than it is now. In that case, Earth would have been blasted with a lot more asteroid impacts, and life may have never had a chance to take root.

The infrared data from the Spitzer Space Telescope contributes in unexpected ways in revealing and supporting new ideas and theories about our universe. Read more about this study and other Spitzer contributions at spitzer.caltech.edu. Kids can learn about infrared light and enjoy solving Spitzer image puzzles at spaceplace.nasa.gov/spitzer-slyder.
This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.



## Centennial Observatory and Faulkner Planetarium Events

| Event | Place | Date | Time | Admission |
|---|---|---|---|---|
| Monthly Free Star Party | Centennial Observatory | Saturday, December 8th, 2012 | 6:00 PM to midnight | FREE |
| Telescope Tuesday | Centennial Observatory | Tuesday, December 11th, 2012 | 6:00 to 9:00 PM | $1.50 per person<br>Free - children 6 & under<br>Free to all with paid planetarium admission |

**2012 Faulkner Planetarium - Holiday Show Schedule**

| DATE | DAY | SHOW | TIMES (pm) |
|---|---|---|---|
| | | | |
| December 1st | Saturday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| | | | |
| December 4th | Tuesday | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 7th | Friday | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 8th | Saturday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| | | | |
| December 11th | Tuesday | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 14th | Friday | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 15th | Saturday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 16th | Sunday | A Rockin' Family Christmas | 2:00 |
| | | Steamrolling | 3:00 |
| | | A Rockin' Family Christmas | 4:00 |
| | | | |
| December 18th | Tuesday | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 21st | Friday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |

| | | | |
|---|---|---|---|
| | | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| | | A Rockin' Family Christmas | 2:00 |
| | | Steamrolling | 3:00 |
| | | A Rockin' Family Christmas | 4:00 |
| | | | |
| December 26th | Wednesday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| December 27th | Thursday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| December 28th | Friday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |
| December 29th | Saturday | Santa Snork Saves the Seasons | 1:30 |
| | | A Rockin' Family Christmas | 2:30 |
| | | Steamrolling | 4:00 |
| | | A Rockin' Family Christmas | 7:00 |
| | | The Christmas Star | 8:15 |

**Whittenberger Planetarium (Caldwell, Idaho) show for December (public show)**

The long nights and cold weather that define Idaho's winter months will be explained to audiences during this month's Whittenberger Planetarium public show, set for 7 p.m. Dec. 4 inside Boone Science Hall on The College of Idaho campus in Caldwell. Adults and older children will learn about **the Winter Solstice** and its effects on winter weather as well as the wide variety of constellations and planets visible in the chilly Idaho night sky this month.

Tickets cost $4 for adults and $2 for children ages 4-17. As space is limited, reservations are required and may be made by calling Kinga Britschgi at (208) 459-5211. For more information, please visit http://www.collegeofidaho.edu/planetarium

Free parking for Whittenberger Planetarium patrons is available in the lot between Boone Science Hall and Jewett Auditorium on the corner of 20th Avenue and Fillmore Street. Click to view the campus map.

RESERVATIONS ARE REQUIRED, walk-ins can get in under two conditions: the show doesn't fill up or we have people not show up for reservations. CASH or CHECK REQUIRED. We don't have any means for taking credit or debit cards.

## 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.