

Snake River Skies

*The Newsletter of the Magic Valley Astronomical Society
March 2014*

Membership Meeting

Saturday April 12th 2014
7:00pm at the
Herrett Center for Arts & Science
College of Southern Idaho
Public Star Party follows the
General Mtg. at Centennial Obs.

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Magic Valley Astronomical Society
is a member of the
Astronomical League

Message from the President – Robert Mayer

Dear Colleagues,

Our meeting this month is hopefully the continuation of a new tradition we started last year. Taking a page from the script of other astronomical societies, last year we held what's called a "Show and Tell." We got an opportunity to learn what you were working on, ranging from recent efforts in pictures to a studying of a Jovian calendar. The event was clearly a success in 2013, and we're hoping for similar results this year. For example, one of the things you could share with us is what you did during late March's Messier Marathon window.

If you're interested, please contact me by E-mail (mayerbrt@gmail.com). If you're still not sure, be aware that these presentations can be as long as 20 minutes, or they can be as short as five. You can use multimedia, or you can simply stand up and talk. We just want to hear from you.

Clear Views,

Robert Mayer

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April Overview







- 4/1** Jupiter is at eastern quadrature today
- 4/2** Uranus is in conjunction with the Sun
- 4/4** The moon is 2 degrees north of the first-magnitude star Aldebaran (Alpha Tauri)
- 4/6** Jupiter is 5 degrees north of the Moon
- 4/7** The Lunar X (also known as the Werner or Purbach Cross), an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to begin.
- 4/8** The Moon is at apogee, subtending 29'32" from a distance of 404,500 kilometers (251,344 miles); Mars is at opposition (magnitude -1.48, apparent size 15.16")
- 4/9** Mercury is at its greatest heliocentric latitude south today.
- 4/11** Venus is at the descending node today; asteroid 3 Juno is in conjunction with the Sun.
- 4/12** Venus is 0.7 degree north of Neptune.
- 4/13** Asteroid 4 Vesta (magnitude 5.8) is at opposition.
- 4/14** Mars is at closest approach (92.4 million Km or 57.4 million miles distant); Mars is 3° north of the Moon
- 4/15** Pluto is stationary at 1:00; the Moon is 1.7 degrees north of the first-magnitude star Spica (Alpha Virginis); Asteroid 1 Ceres (magnitude 7.0) is at opposition.
- 4/17** Saturn is 0.4 degree north of the Moon, with an occultation occurring in southern South America and French Polynesia, at 7:00
- 4/22** The peak of the Lyrid meteor shower (20 per hour).
- 4/23** The Moon is at perigee, subtending 32'19" from a distance of 369,765 kilometers (229,762 miles).
- 4/24** Neptune is 5 degrees south of the Moon
- 4/26** Mercury is in superior conjunction.
- 4/27** Uranus is 2 degrees south of the Moon.
- 4/28** Mercury is at the ascending node today.

- During April, the sun rises earlier and farther north each morning and sets later and farther north each evening. As a result, the sun travels higher across the sky, the days are getting longer, and the nights are getting shorter. At the beginning of the month, the Sun rises at around 8:00 AM and sets around 6:00 PM, making the day 10 hours long. By the end of the month, the Sun rises at about 7:25 AM and sets around 6:30 PM, making the day just over 11 hours long.
- Mars is bright all month long
- The moon is first quarter on the 6th when it appears near Jupiter
- There's a total lunar eclipse on the night of the 14th and morning of the 15th.

The first photograph of the Sun was taken on April 2, 1845. The Hubble Space Telescope was placed in orbit on April 25, 1990. The Compton Gamma Ray Observatory achieved orbit on April 7, 1991.

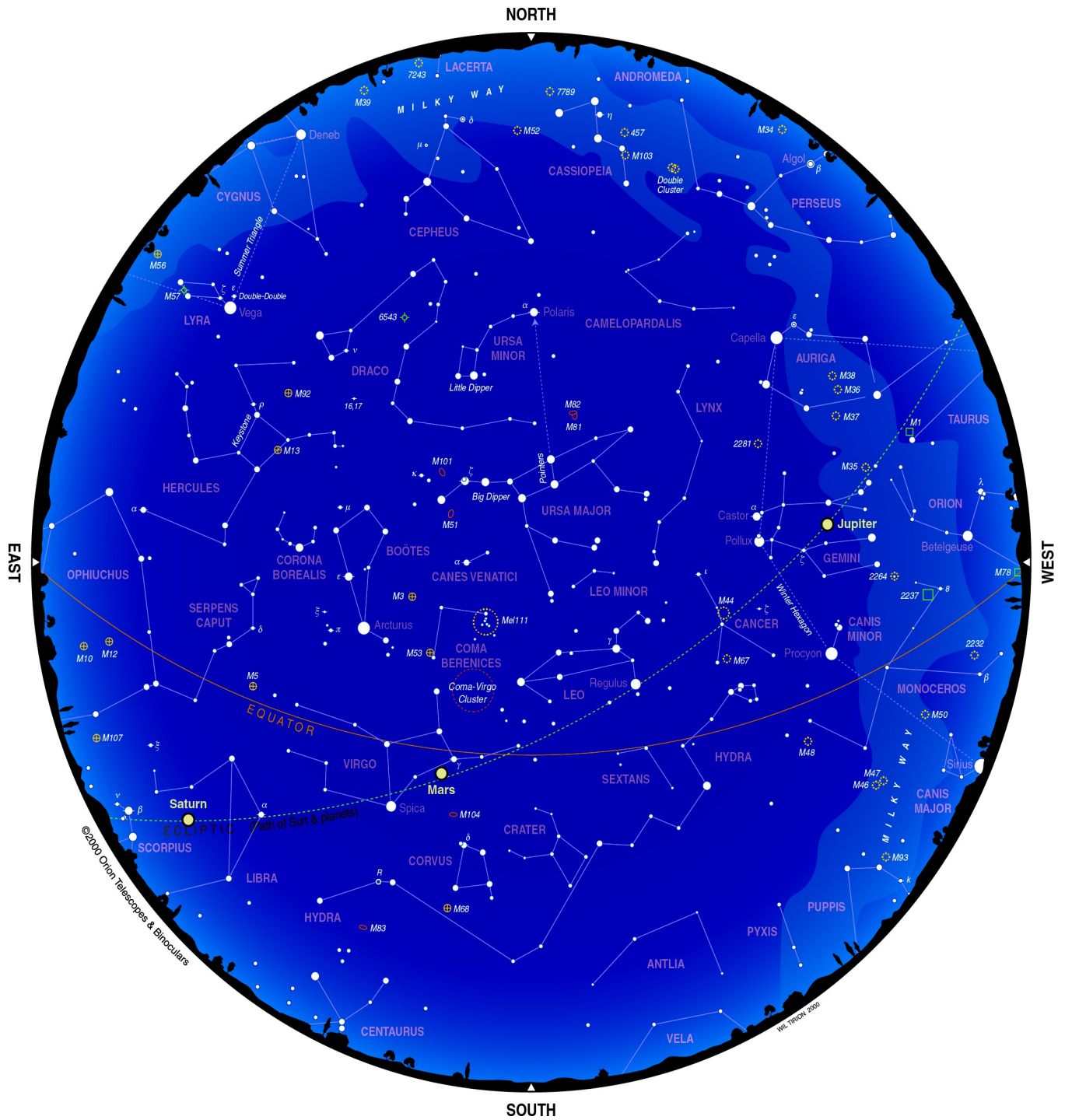
Calendar

April 2014

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1 April Fool's Day	2	3	4	5
6	7  First Quarter Moon Visible: 50%	8	9	10	11	12 General Membership Mtg at 19:00 Public Star Party at 20:45 Centennial Observatory
13	14  Total Lunar Eclipse 22:45 - 4:30	15  Full Moon Visible: 100%	16	17	18	19
20  Easter	21	22  Earth Day Last Quarter Moon	23	24	25	26
27	28	29  New Moon Visible: 1% ↓	30			

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Planisphere



Be Safe – Get Out There – Explore Your Universe!

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 nearsys@gmail.com

This month look for the star Dubhe, the alpha star of the constellation Ursa Major or the Big Dipper. On April evenings, when the Big Dipper is upside-down and pouring water into the Little Dipper, Dubhe is the lower left star in the bowl of the Big Dipper. Dubhe, which is Arabic for "The Bear" is 124 light years away. The light you see tonight left the star in 1890.

Dubhe is a multiple star system consisting of two pairs of stars orbiting each other. Dubhe A and Dubhe B are the star pair we see in the Big Dipper. Dubhe B and A are orbiting each other at a distance a little greater than the distance between the Sun and Uranus. At 124 light years away, Dubhe A and B are too close together to allow most telescopes to see them as separate stars. The second pair of stars is Dubhe C and Dubhe D and they too are also too close together for telescopes to see as separate stars. They orbit the A and B pair at a distance of 1 trillion miles. This means light takes two months to travel the distance between the A & B pair and the C & D pair.

Dubhe A is an orange star, that's 30 times larger and 300 times brighter than our sun. It's an old star and its core is fusing helium ash into carbon and oxygen. Outside of its core lies a shell of fusing hydrogen. Unlike Earth, the helium inside Dubhe sinks downwards in the core. That's because helium is heavier than the hydrogen from where it originated. Dubhe is one half of the Pointer Stars in the Big Dipper, the other star being the star above it. Follow the Pointers and you'll run into Polaris, the brightest and closest star to the north celestial pole.

April 1 – 7

The very thin crescent moon is visible in the low west on the evening of the 1st. You'll need to search for it just after its getting dark if you want to see it. Binoculars will help greatly in finding this astronomical treat.

The moon passes through the edge of the Hyades star cluster on the night of the 3rd. Take a peek and you'll see that the star cluster is much larger than the moon. This might be a nice photographic target for a digital camera. You'll need an exposure of several seconds long in order to record the stars in your picture. This will also over-expose the moon unfortunately. However, the moon is still a crescent and the picture may show signs of Earthshine.

Got Jupiter? It's the brightest star above the moon's upper right on the evening of the 6th. In a pair of binoculars (if held steady), you should be able to detect the moon's Callisto and Europa. Callisto will be the star farthest away from Jupiter's left and Europa is about half way between Callisto and Jupiter. The remaining Galilean satellites are too close to Jupiter to see in your binoculars.

The moon is first quarter on the 6th. This is an excellent time to observe it in binoculars or small telescope.

April 8 – 14

One of our larger star clusters, the Beehive, is located near the moon on the evening of the 8th. The Beehive is large and bright enough that the ancients noticed it at night in their dark skies. To observe it by unaided eye, you'll need to go south of Boise for sufficiently dark skies. In town, you should be able to see it easily through a pair of binoculars. Center your binoculars on the moon and then follow terminator going north. The star cluster is just three degrees above the moon. Therefore, if the moon is at bottom of your binocular's field of view, the Beehive star cluster will appear at the center of your binocular's image.

Mars reaches opposition on the 8th. At opposition, Mars is opposite the sun in our sky and it's closest to Earth. This also means Mars appears at its brightest for the year. It will be every bit as bright as the brightest real star, Sirius. The major differences being that Mars won't twinkle like Sirius and Mars will be distinctly orange in color (Sirius is a white star that throws off colored sparks of starlight). Even at its closest to Earth, Mars is just too small to show much detail. You'll need a decent telescope with good quality optics to see the planet's faint markings. You'll also need practice.

On the night of the 10th, the brightest star of Leo the Lion, Regulus, is the star above the moon.

The very large and diffuse star cluster, Melotte 111 (Mel 111) is located above the nearly full moon on the night of the 12th. This star cluster is so large that it will fill your binoculars. To see it, place the moon at the bottom of binocular's field of view. At top is the beginning of a large inverted "V" shaped star cluster. Your best views are available outside of town. Be sure to raise your binoculars high enough to move the moon outside the field of view of your binoculars.

The 14th is the 385th birthday of Christiaan Huygens (1629-1697). Huygens was a Dutch polymath. As an astronomer, he determined the true nature of Saturn's rings and discovered its largest satellite, Titan. Prior to this time, telescopes were of such poor quality that Saturn's rings would appear as two large blobs on the sides of Saturn. Early astronomers like Galileo believed them to be giant satellites of the planet. In the last years of his life, Huygens wrote a book discussing the possibility of extraterrestrial life. His book is named *New Conjectures Concerning the Planetary Worlds, Their Inhabitants and Productions*. It was finally published three years after his death.

Earth is its closest to Mars on the 14th. That night the bright orange Mars also appears above the full moon. This is a nice photographic opportunity for anyone with a digital camera with optical zoom. To record this scene, place your camera on a tripod and aim it at the moon. Set the zoom to its maximum amount and record several images lasting one to several seconds. Keep the one appearing the best.

April 15 – 21

The moon is full on the 15th. Many Americans name April's full moon the Egg Moon. However, this year the Egg Moon will be a bit different. We get to see it in a total lunar eclipse! Beginning around 11:30 PM on the 14th, you should detect a darkening on the left edge of the moon. Over the next 90 minutes, the moon will drift deeper into Earth's shadow and eventually turn red or orange. The exact shade depends on the clarity of Earth's atmosphere. The eclipse will be over by 4:00 AM on the morning of the 15th. The eclipse is another wonderful opportunity to record an astronomical image with your digital camera. Follow the same procedures as described on the 14th, but extend the length of the camera's exposure time as the moon becomes darker.

The double Zubenelgenubi appears to the moon's left on the night of the 16th. Your binoculars will resolve Zubenelgenubi into a pair of stars. Farther to the left is brighter Saturn. The bright star between the moon's right and orange Mars is Spica.

On the 17th, the moon occults or covers Saturn. Unfortunately, for us this occurs before the moon rises over Idaho. We'll instead see Saturn as the star just right of the moon.

You can locate the constellation of Scorpius the Scorpion on the morning of the 18th with the help of the moon. The moon is just above the constellation and its brightest star Antares. Look low in the south at 4:00 AM to locate Scorpius.

April 22 – 31

The Lyrid meteor shower peaks on the morning of the 22nd. Unfortunately, this is also the same time the moon reaches third quarter phase. As a result, strong moonlight drowns out the many fainter meteor members of this shower. Since it has been a while since our last good meteor shower, you may want to take a chance observing this shower. Lyrids will appear to originate in the northeast after midnight.

Do you drive to work early in the morning? As you drive to work on the morning of the 25th, look in the low east for the moon and the Morning Star. The moon is a thin crescent and Venus is the bright star just below the moon.

On the morning of the 26th, you'll find that the moon moved farther to the left of Venus since yesterday. However, both still close enough together to form an interesting pair.

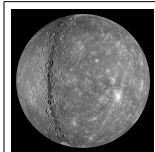
The moon is new on the 29th. Begin looking for the young crescent moon at the beginning of May.

This Month's Sources

Astronomical Events for 2014, <http://www.universetoday.com/107259/101-astronomical-events-for-2014/>
Night Sky Explorer
Space Calendar, <http://www.jpl.nasa.gov/calendar/>

Dark Skies and Bright Stars,
Your Interstellar Guide

Solar System



Mercury disappears from view by the middle of April and reaches superior conjunction on April 26th.



Venus is positioned low in the east at dawn. It rises about two hours before sunrise in early April. The planet dims in magnitude from -4.4 to -4.2 and decreases in apparent size from 22 to 17 arc seconds, while increasing in illumination from 54 to 66% during April.



Mars pokes above the horizon during evening twilight, among the background stars of Virgo, and is high up in fine view in the south by midnight local daylight time. Through a telescope, the planet measures 15 arc-seconds across - nowhere near the record-breaking apparent diameter of 25 arc-seconds in August 2003. Mars will appear bigger again in August 2016 even bigger than a full Moon¹.



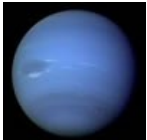
As darkness falls, gas giant Jupiter rides above the western horizon, more than 60° high from mid-northern latitudes. The planet lies in Gemini, near the ecliptic's northernmost point, so it remains visible well after midnight despite being three months past opposition.



The north side of Saturn's ring plane is tilted almost 22 degrees with respect to the Earth this month. The planet shines at magnitude +0.1 and its rings span 42 arc seconds. On the morning of April 18th, the waning gibbous Moon passes 0.4 degree south of the Ringed Planet. Iapetus, which varies in brightness from magnitude 10.1 to magnitude 11.9, reaches its farthest distance west of the planet - nine arc minutes - at the middle of the month. At that time, Iapetus shines at tenth mag.



Uranus is in conjunction with the Sun on April 2 and impossible to view all month. The distant world will again be visible in backyard telescopes starting around mid-May.



Seek out Neptune just before dawn, in central Aquarius, 1° northeast of the 5th-magnitude star Sigma Aquarii. The planet lies 2.8 billion miles (4.5 billion kilometers) from Earth and glows dimly at magnitude +7.9. A 4-inch diameter telescope is probably the minimum required to see the planet and resolve its disk, only 2.4 arc-seconds across.



The dwarf planet lies in northern Sagittarius and stands 25° high in the south shortly before dawn. It glows dimly at magnitude +14, which means you will need at least an 8-inch telescope to have a decent chance of spotting this glimmer of light. The reward for spying Pluto comes not from viewing any detail but from the mere accomplishment of locating this small icy world.



Asteroid 4 Vesta (magnitude 5.8) is at opposition on April 13th. Two days later asteroid 1 Ceres (magnitude 7.0) reaches opposition. Both asteroids are heading north-westward through Virgo. On April 2, Pallas passes just 0.5° west of 5th-magnitude 2 Hydrae, a spectral class "K" star located three hundred light years away. The asteroid moves due NE from there, and by late April it lies 3° west of Regulus, Leo's brightest star.



Comet C/2012K1 (PANSTARRS) travels north-westward through Corona Borealis and Bootes and into Ursa Major. The ninth-magnitude comet begins April in the vicinity of the globular star cluster M13 in Hercules. Throughout all of April, C/2012 X1 LINEAR should remain around 8th or 9th magnitude, making it an easy target for 6-inch telescopes. The comet cuts through the constellation Aquarius



The **Lyrid shower** is the oldest meteor shower for which observations have been found. Recorded sightings go back more than 2,000 years, when the shower was much more abundant. Despite the low annual rate, the Lyrids have the capacity for impressive displays - over 50 falling stars per hour. This last happened in 1982, when the rate unexpectedly reached 90 meteors per hour. More information in Idaho Skies.

1. No it won't, I am just seeing if you are paying attention. - Editor

Deep Sky

The famous eclipsing variable star Algol (Beta Persei) is at a minimum, decreasing in magnitude from 2.1 to 3.4, on April 2nd, 4th, 7th, 10th, 13th, 16th, 19th, 22nd, 24th, 27th, and 30th.

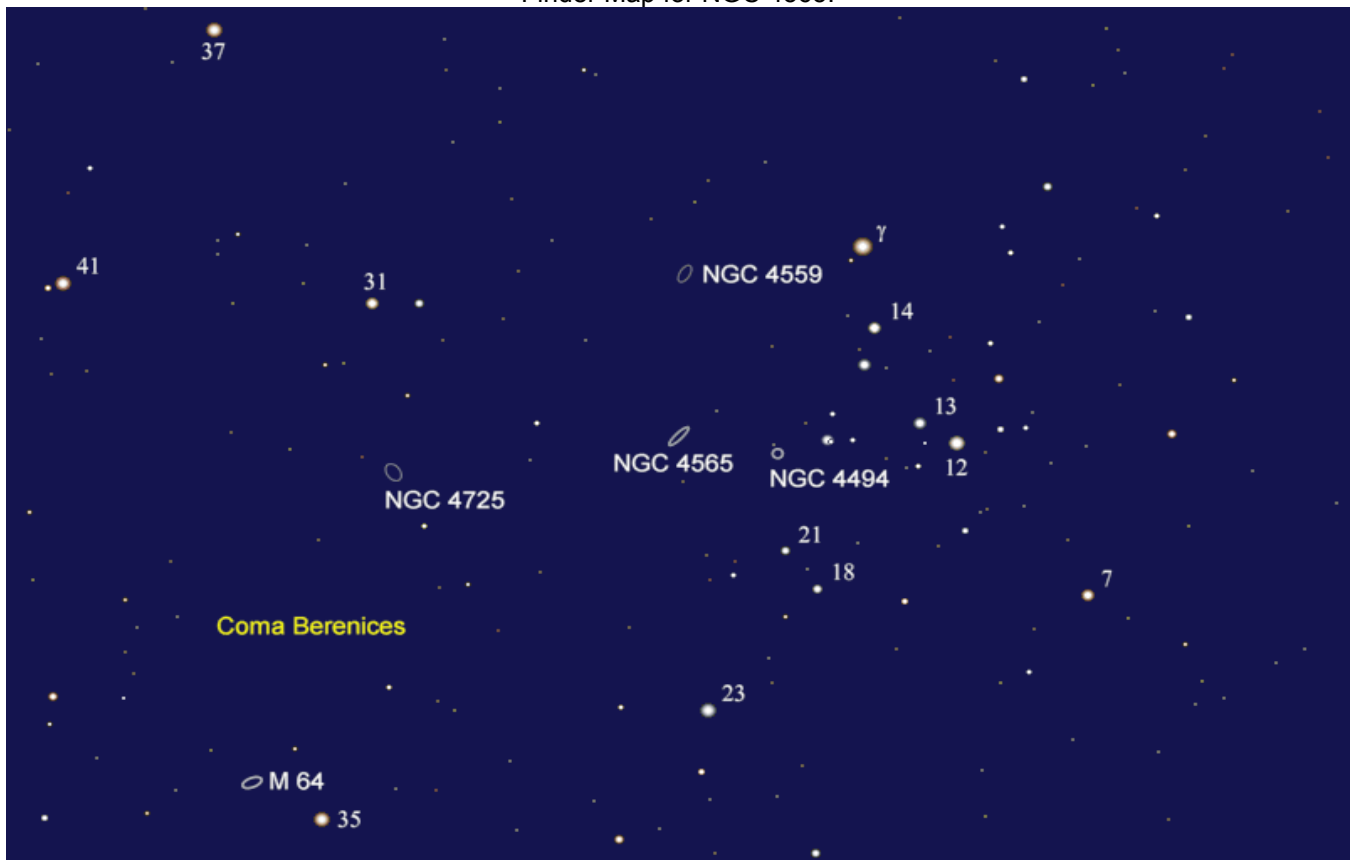
Ten deep-sky objects for April: M65, M66, M95, M96, M97, M105, M108, NGC 3115, NGC 3242, NGC 3628

Ten binocular deep-sky obj. for April: M65, M66, M95, M96, M97, M105, M108, M109, NGC 3115, NGC 3242

Challenge deep-sky object for April: NGC 4565, also known as the Needle Galaxy or Caldwell 38, is the largest edge-on spiral galaxy in the night sky. It is quite similar to our Milky Way, although NGC 4565 is slightly more massive (our Galaxy has a mass of about eight hundred billion suns). The Needle Galaxy contains at least two hundred globular clusters and is thought to have a dark matter halo with a mass of several hundred billion suns.

A dark dust lane runs the entire length of the galaxy, masking much of the arms' brightness. The central region features a small bulge, and that is the easiest place to detect the dust lane. The dark streak is offset a little to the north of center because NGC 4565 is inclined to an angle of 87° , 3° from edge-on.

Finder Map for NGC 4565:



Notable carbon star for April: V Hydrae (Hydra) RA $10^{\text{h}} 51^{\text{m}} 37.3^{\text{s}}$ Dec. $-21^\circ 15' 0''$

Club Announcements

Win This Telescope!



**Meade 8" f/10 Schmidt-Cassegrain OTA with UHTC coatings
brand new in the box. (No tripod or mount)**

Accessories included: Mounting saddle, visual back, 1.250" prism diagonal, 26mm Meade Super Plossl eyepiece, red dot finder and front OTA cover. (OTA = Optical Tube Assembly)

How to Enter

The **Meade OTA Drawing** is open only to current members of the **Boise Astronomical Society, Magic Valley Astronomical Society, Idaho Falls Astronomical Society, Palouse Astronomical Society** and registered attendees of the 2014 Idaho Star Party.

You may obtain **Meade OTA Drawing** tickets from the **Boise Astronomical Society** between now and Saturday, September 20, 2014. Donations for tickets are \$1.00 each or 6 for \$5.00. Tickets may be obtained at **Boise Astronomical Society** meetings or at the **Idaho Star Party** at Bruneau Dunes State Park, September 19-20, 2014. You may obtain tickets by mail by sending your request with donation (check), along with a self-addressed stamped return envelope to:

**Boise Astronomical Society,
P. O. Box 7002,
Boise, ID 83707.**

Ticket orders by mail must be received by August 31, 2014.

The winning ticket will be drawn on Saturday afternoon, September 20, 2014, at the **Idaho Star Party**. You do not have to be present to win. The winner is responsible for shipping charges if required. Results will be announced on www.boiseastro.org.

Looking Through the Eyepiece

Gamma Leonis Group – Hickson 44 A Leo Galaxy Quartet

Article by Steve Bell

Lying roughly halfway between Gamma and Zeta Leonis is a largely unheralded galaxy quartet in a half-degree field. Two of the galaxies, NGC 3190 and NGC 3193 are fairly easy at magnitudes 11.0 and 10.9, respectively, and should be detectable in a 6" or larger instrument. The other two, NGC 3187 and NGC 3185, are a bit more difficult at magnitude 13.1 and 12.2, but should be relatively easy in an 8" or larger. Some magnitude estimates for these objects are dimmer, so at least 8" apertures are recommended.

The two bracketing stars, Gamma and Zeta Leonis, are nice double stars that are well worth a look when targeting the galaxy group. Gamma Leonis, also known as *Algieba*, has a 4.6" separation at position angle 126 degrees of two bright stars at magnitudes 2.23 and 3.43. Although of a similar color, the two stars have been described as orange and yellow. This is a true binary. Zeta, also known as *Adhafera*, while a bit dimmer, is composed of two widely separated stars (325.9") at PA 340 degrees with magnitudes 3.44 and 5.94. This double is a line of sight "optical double", not a true binary.

Also known as (galaxy cluster) Hickson 44, the Gamma Leonis Group should fit into a single wide field for initial detection, but each should be examined separately at higher power to bring out details. These galaxies show a wide variety of taxonomic type and interesting details. Hickson 44 is some 60 million light years away and would make a very nice astrophotographic target with four galaxies in the field of view.

<i>Gamma Leonis Group Hickson 44</i>					
Object	RA	Dec	Mag	Size	Pos Angle
NGC3190	10 18 06	+21 50 00	11	4.4x1.5	125
NGC3193	10 18 24	+21 54 00	10.9	2.8	0
NGC3187	10 17 48	+21 52 00	13.1	3.6x1.6	115
NGC3185	10 17 36	+21 41 00	12.2	2.1x1.4	130

NGC 3190: NGC 3190 is a prototypical spiral galaxy angled to our line of sight. It has a fairly prominent dust lane that needs averted vision and reasonable aperture to discern. On a night of average transparency in a 14" Newtonian at 182X, it appeared oval, 3:1 NW-SE with a bright oval central region and a non-stellar core with averted vision. The dust lane was not detected.

NGC3193: NGC 3193 appeared essentially circular at 182X in the 14" Newtonian, with a broad, brighter center. Other than that, it was essentially featureless, like most ellipticals.

NGC 3187: NGC 3187 is a dim oval. In a 14" Newtonian at 182X, it was just visible with averted vision with average transparency. The "tails" seen in images were not detected. With larger apertures and better seeing, these should be at least detectable. It is a barred spiral and looks almost like a pinwheel in images.

NGC 3185: NGC 3185 appeared as a relatively dim oval with 14"/182X, but was brighter than 3187. It appeared 2:1 SE-NW with a broad, brighter center region. It is a barred spiral that is almost face on.

Hickson 44

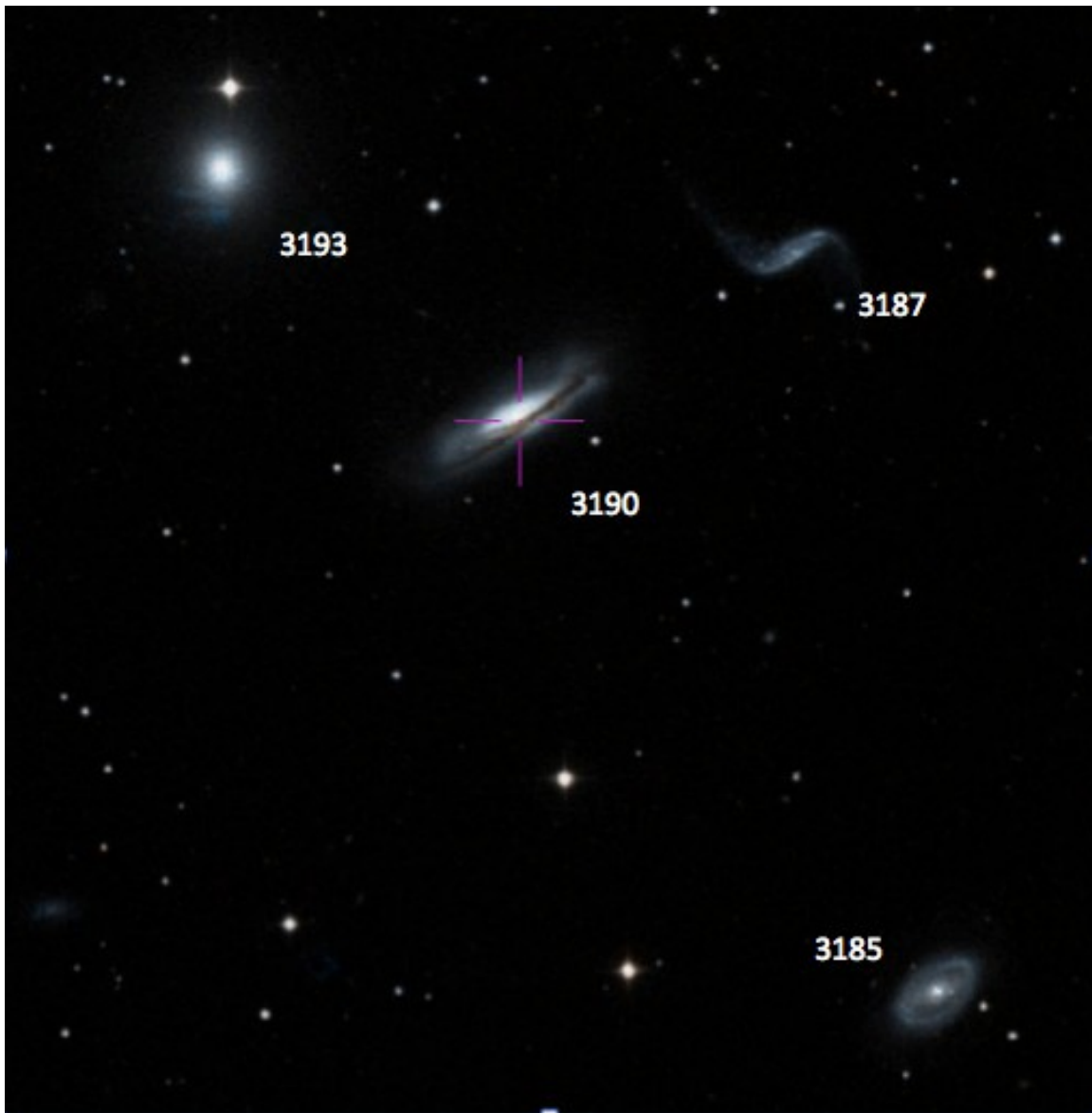


Image from ALADIN; orientation is N up, E left. Lying between Gamma and Zeta Leonis in Leo's "sickle", this galaxy quartet is not difficult to find.

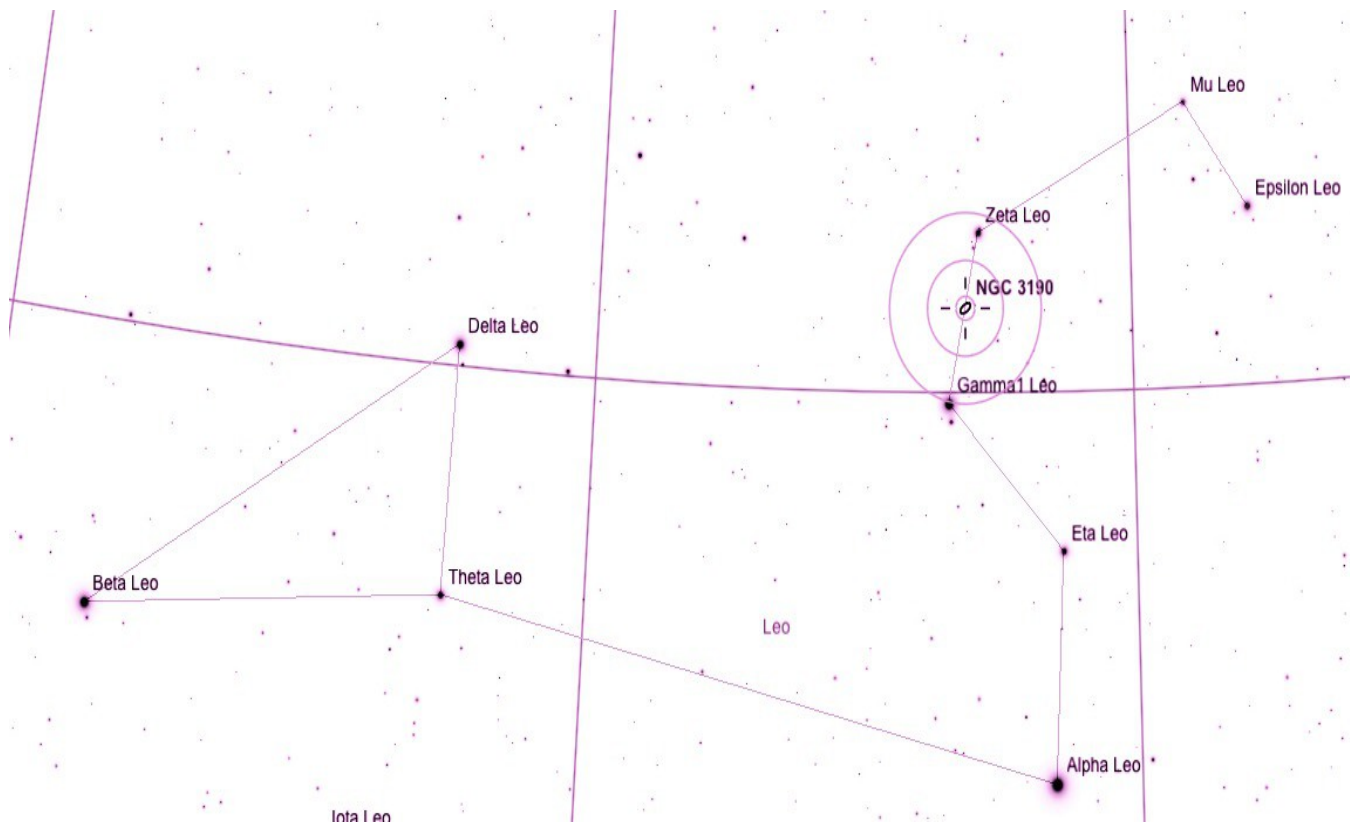


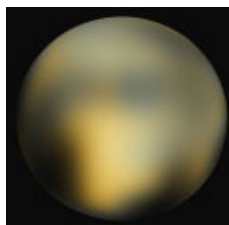
Chart from Sky Safari 1.8 for Mac

TRIVIA

Pluto is smaller than the width of the United States. The greatest distance across the contiguous United States is 2696 Miles measured from Cape Alava, WA to West Quoddy, ME. By the best current estimates, Pluto is just over 1485 miles across¹, less than half the width of the U.S. To put this in a better perspective begin measuring from the Boise, Idaho Capitol building then extend east to Hobart, IN that is 1485 miles. Certainly in size it is much smaller than any major planet, perhaps making it a bit easier to understand why a few years ago it was “demoted” from full planet status. It is now known as a “dwarf-planet, or a Trans-Neptunian Object (TNO). Pluto is the largest object in the Kuiper Belt, so it must be debated; was Pluto demoted or promoted, or both.

Another way to look at the size of Pluto is to place the planet inside Alaska. Yes, the dwarf-planet Pluto would fit entirely into Alaska as the southern most point is Amatignak Island in the Aleutian Archipelago and measuring to Point Barrow you would have 1550 miles. Alaska is 2,262 miles across, but because of irregularities in the shape there would be some overlap. Pluto has five satellites (Moons) Charon, Nix, Hydra, Kerberos and Styx more than our planet, which there is one.

1. Source: Universe Today



NASA Space Place

Old Tool, New Use: GPS and the Terrestrial Reference Frame By Alex H. Kasprak

Flying over 1300 kilometers above Earth, the Jason 2 satellite knows its distance from the ocean down to a matter of centimeters, allowing for the creation of detailed maps of the ocean's surface. This information is invaluable to oceanographers and climate scientists. By understanding the ocean's complex topography—its barely perceptible hills and troughs—these scientists can monitor the pace of sea level rise, unravel the intricacies of ocean currents, and project the effects of future climate change.

But these measurements would be useless if there were not some frame of reference to put them in context. A terrestrial reference frame, ratified by an international group of scientists, serves that purpose. "It's a lot like air," says JPL scientist Jan Weiss. "It's all around us and is vitally important, but people don't really think about it." Creating such a frame of reference is more of a challenge than you might think, though. No point on the surface of Earth is truly fixed.

To create a terrestrial reference frame, you need to know the distance between as many points as possible. Two methods help achieve that goal. Very-long baseline interferometry uses multiple radio antennas to monitor the signal from something very far away in space, like a quasar. The distance between the antennas can be calculated based on tiny changes in the time it takes the signal to reach them. Satellite laser ranging, the second method, bounces lasers off of satellites and measures the two-way travel time to calculate distance between ground stations.

Weiss and his colleagues would like to add a third method into the mix—GPS. At the moment, GPS measurements are used only to tie together the points created by very long baseline interferometry and satellite laser ranging together, not to directly calculate a terrestrial reference frame.

"There hasn't been a whole lot of serious effort to include GPS directly," says Weiss. His goal is to show that GPS can be used to create a terrestrial reference frame on its own. "The thing about GPS that's different from very-long baseline interferometry and satellite laser ranging is that you don't need complex and expensive infrastructure and can deploy many stations all around the world."

Feeding GPS data directly into the calculation of a terrestrial reference frame could lead to an even more accurate and cost effective way to reference points geospatially. This could be good news for missions like Jason 2. Slight errors in the terrestrial reference frame can create significant errors where precise measurements are required. GPS stations could prove to be a vital and untapped resource in the quest to create the most accurate terrestrial reference frame possible. "The thing about GPS," says Weiss, "is that you are just so data rich when compared to these other techniques."

You can learn more about NASA's efforts to create an accurate terrestrial reference frame here: <http://space-geodesy.nasa.gov/>.

Kids can learn all about GPS by visiting <http://spaceplace.nasa.gov/gps> and watching a fun animation about finding pizza here: <http://spaceplace.nasa.gov/gps-pizza>.



Artist's interpretation of the Jason 2 satellite. To do its job properly, satellites like Jason 2 require as accurate a terrestrial reference frame as possible. Image courtesy: NASA/JPL-Caltech.



Observatories & Planetariums

Bruneau Dunes Observatory – Bruneau, ID

You're invited to star gaze at the Bruneau Dunes Observatory! See the night sky as you've never seen it before. Observatory tours and solar viewing (through a specially adapted telescope) begin one hour before sunset, and are free of cost.

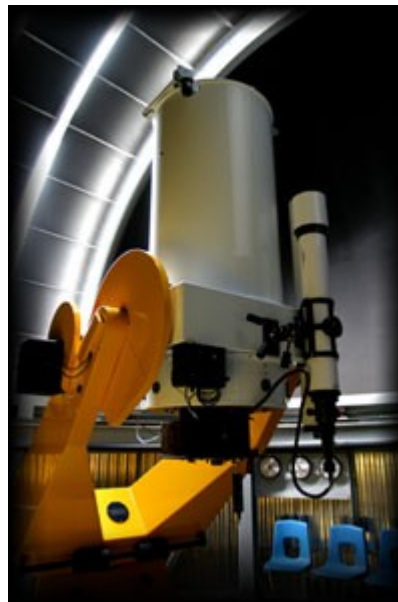
Following that, visitors can view short orientation program and then have the chance to survey the heavens through the observatory's collection of telescopes. There is a viewing fee of \$3 per person (children 5 and under are free of cost) for this.

The observatory is open to the public from early April through mid-October on Friday and Saturday nights only, weather permitting. For presentation times, call 208-366-7919, or check the kiosk when you arrive at the park.



Centennial Observatory – Herrett Center – Twin Falls, ID

The observatory features one of the world's largest fully wheelchair-accessible public telescopes. The main instrument is the Norman Herrett telescope, a 24" Ritchey-Chretien reflector on a computer-controlled fork mount, manufactured by DFM Engineering of Longmont, Colorado, USA. The observatory features an elevator to take visitors to its second-story location at the south end of the museum. Once there, a wheelchair elevator is available to lift visitors with limited mobility to the observing deck under a six meter (20 foot) motorized dome manufactured by Observa-Dome of Jackson, Mississippi, USA. The ARE-125 an optical "periscope" designed by DFM, allows unprecedented access to the telescope for wheelchair bound or limited mobility visitors. An Apogee Alta E47 + CCD Camera is available for imaging, a generous gift of Dick and Jody Shotwell.



herrett.csi.edu/observatory

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, April 12 th , 2014	8:45 PM to midnight	FREE
Total Lunar Eclipse	Centennial Observatory	Monday, April 14 th , 2014	10:45 PM to 4:30 AM	FREE

The Earl & Hazel Faulkner Planetarium – Herrett Center – Twin Falls, ID

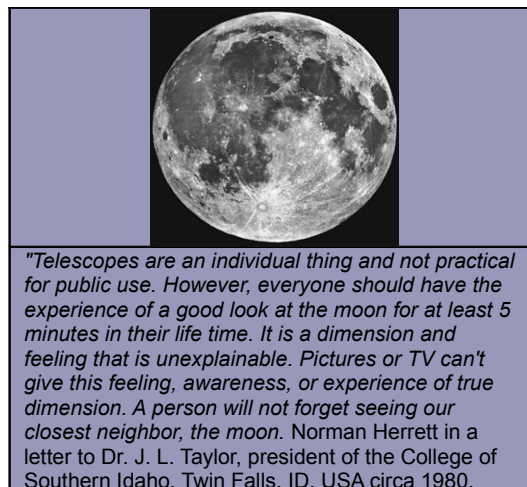
Opened in November 1995, the Faulkner Planetarium is the largest planetarium theater in Idaho, seating 144 under a 50' dome. It features a state-of-the-art **Digistar 5** full-dome projection system, 10,200 Watt Dolby 5.1 surround audio, and programmable LED dome lighting.



Faulkner Planetarium February Show Schedule

Check our Website for Current Shows and Times herrett.csi.edu/planetarium
208-732-6655

Due to a Formatting Error the Faulkner Schedule is currently not available.



About the Magic Valley Astronomical Society

Magic Valley Astronomical Society
P.O. Box 445
Kimberly, ID, USA 83341
www.mvastro.org

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

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

M-51 (On this page) 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.



Membership Benefits:

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

Astronomy Magazine group rates. Subscriptions to this excellent periodical are available 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 Telescopes: The society currently has three telescopes for loan and would gladly accept others. Contact President Robert Mayer, for more information.