Snake River Skies

A Publication of the Magic Valley Astronomical Society

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President's Message

Here we are at the start of a new year. I will say we have had an interesting 2005 with our first Video Messier Marathon and the fireworks of July third.

We have an active year behind us now, but what lies ahead? I foresee a year where we can have our regular meetings without competition from major star parties. I see us getting the SHARE system up and running, soon; with a new Stellacam 2 video camera. We have other plans but are trying to confirm some stuff before we get the cart before the horse. It will be a big year if everything we have in the works goes through.

I am working with the Jerome club to get some quarterly dark sky viewing sessions planned.

We still have Family Viewing nights during the winter and Solar Viewing during the summer. Astronomy day will be May 6th. Messier Marathon March 31 and April 1.

Editor's corner

With the new year we have a number of new officers, and a new editor for the newsletter. Many thanks to Tom Gilbertson for his effort last year.

Starting this month, we will be including Paul Verhage's column "Boise Skies" in the newsletter. Thanks Paul!

The newsletter will only be available by email or download from the club web site. If you want to print the newsletter, you should download the larger file with better image quality.

If you have anything you would like to see in the newsletter please email it to Rick Widmer no later than the monthly board meeting.

The club web site is undergoing substantial changes. Its not done yet, but hopefully there are enough changes to make it worth a visit!

http://www.mvastro.org

M-51 Whirlpool Galaxy

May 3rd., 2005. 3 - 36 minute exposures (R-G-B) combined using Maxim DL.

Shotwell Camera, Herrett Telescope.

This and almost all other images taken with the Herrett Telescope are available for download from the MVAS web site If you want to try your hand at processing any of these images, the raw FITS files are available. If you create a better looking image from our raw files, we will gladly display it on our site, giving you credit.

Boise Skies

January 2006

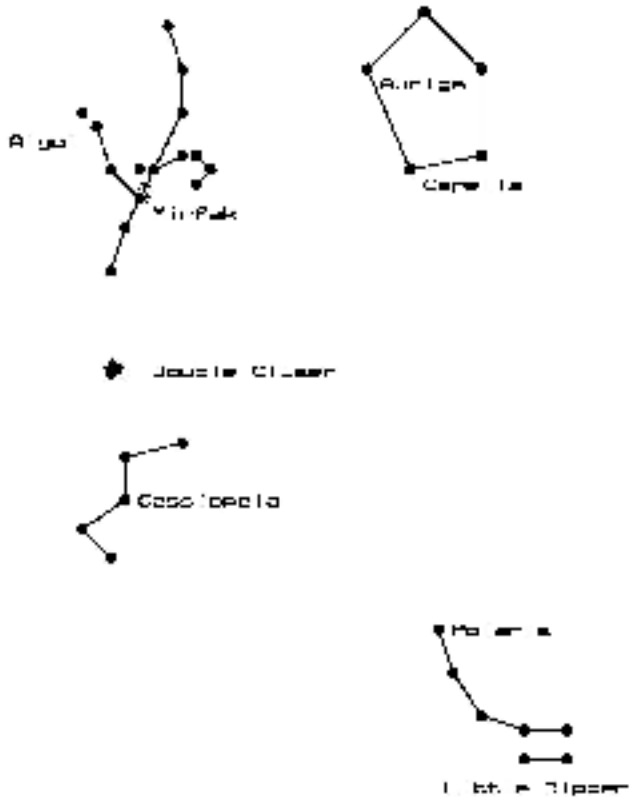
Boise Skies is a column for beginning amateur astronomers and those interested in astronomy. Suggestions about the column are gladly accepted by the columnist, at paul.verhage@boiseschools.org

This month look for the star, Mirfak, the lucida of Perseus, the Hero. Mirfak is also known as Alpha Persei. Perseus is the hero that slayed Medusa and rescued Andromeda. At a distance of 593 light years, you're seeing star light that left Mirfak in the year 1413, the year King Henry IV died and King Henry V was crowned king of England.

Mirfak is eight times more massive than the sun. Its greater mass increases the pressure in the center of Mirfak and makes its core hotter. The increased heat and pressure fuses fuel more rapidly. This greater energy production creates a larger and brighter star. Mirfak is 62 times larger and 5000 times more luminous than the sun. But, Mirfak's greater mass means it won't live anywhere near as long as the sun. Our sun will live for billions of years while Mirfak will only live for tens of millions. While the sun is still fusing hydrogen into helium, Mirfak is either fusing the last of its helium or has already finished. Mirfak is already near the end of its life.

In dark skies, you'll see a faint haze surrounding Mirfak. In binoculars, the haze turns into a loose cluster of stars called the Alpha Persei Association. Associations are small, loose clusters of stars. The association was born around 50 million years ago, or 15 million years after the dinosaurs went extinct.

Perseus passes nearly overhead in the north during January . Perseus and Mirfak are easy to find, but you need to be familiar with the northern region of the sky. The diagram below will help you. You should be familiar with Ursa Minor (or the Little Dipper) and Cassiopeia, so use these constellations as your starting point. When you find Mirfak, put your binoculars on it and you should see that it is surrounded with the diamond dust of fainter stars.



Capella is the brightest star in this part of the sky.

After you find Perseus and Mirfak, look for the Double Cluster with your binoculars. You'll see two hazy star clusters separated from one another by twice the moon's diameter. Then put your telescope on it and be prepared to say, wow!

January Overview

One of the year's best meteor showers takes place on the night of the 2nd and morning of the 3rd.

The moon will almost cover the Pleiades on the night of the 8th. Get your binoculars out for this one.

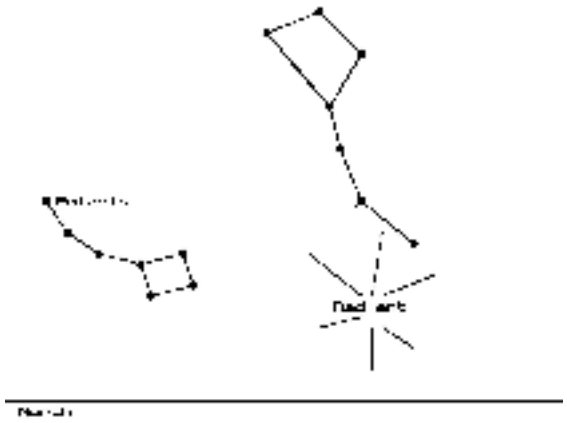
The moon, Saturn, and the Beehive cluster make a nice grouping on the morning of the 15th.

The moon occults Antares on the morning of the 25th. In Idaho the moon rises after the occultation is over, but while the moon is still very close to Antares.

January 1 – 7

We begin the month with the moon at perigee. Planets, moons, and satellites seldom orbit in perfectly circular orbits. Instead, their orbits tend to be slight squashed, or oval shaped. Astronomers call these orbits elliptical and think of the perfectly circular orbit as a special case of the elliptical orbit. There are many characteristics used to describe elliptical orbits. Two of them are the orbit's farthest and closest distance from the planet. The closest point is called the perigee and the farthest the apogee. Technically, apogee and perigee only refer to orbits around Earth. If the orbit is around the sun then these two points are perihelion and aphelion and if the orbit is around a distant star then the names are periastron and apastron. The moon's perigee on the 1st is 224,781 miles away from the center of the earth.

The Quadrantid meteor shower reaches its peak on the night of the 2nd and morning of the 3rd. Moonlight won't interfere with this shower because the moon will only be 18% illuminated and will set at around 10:30 PM. The Quadrantids will be one of the best meteor showers this year (the others are drowned out by moonlight). In dark skies you may see over a dozen meteors per hour. The radiant of the shower, or point at which its meteors appear to originate, is located between the two dippers. Here's a simple map of the location of the shower's radiant at 1:00 AM.



Earth is at perihelion on the 4th at 8:00 AM (9:00 AM for the Midwest). Earth will be 91,405,767 miles away from the center of the sun at that time. That's the same as 3,683 trips around Earth or 384 trips to the moon. Notice that this is the closest we get to the sun, but it's the coldest time of the year for the northern hemisphere. This is evidence that it's the tilt of the Earth's spin axis that controls the seasons and not our distance from the solar system's central furnace.

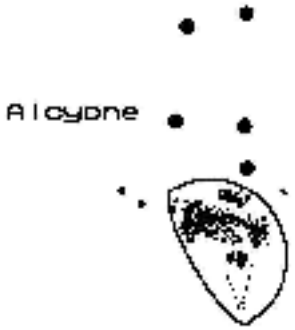
The moon reaches the first quarter phase on the 6th at 11:56 AM (12:56 PM for the Midwest).

Robert Wilson is 70 years old on the 10th. Wilson, along with Arno Penzias, was working for Bell Labs in the early 1960s. Their research involved trying to get the best

microwave signals from communication satellites in Earth orbit. But try as they would, they couldn't get rid of a persistent hiss from the system, even after thoroughly cleaning the radio's antenna. Wilson and Penzias discussed the issue with a physicist at Princeton who was familiar with the then current debate on the origins of the universe. The Steady State theory claimed that the expanding universe was slowly being filled with new hydrogen atoms. In the Steady State theory the universe never thinned out as it expanded. It also had no beginning and so was infinitely old. The Big Bang theory accepted the fact that the universe appeared to have originated at a point in time when all matter and space was compressed into a single point. The Big Bang theory predicted that the universe had been incredibly hot at its beginning. The expansion of the universe cooled the universe and changed its ultra-hot radiation into microwave radiation with a temperature of about 455 degrees below zero Fahrenheit (or three Kelvins - a metric temperature scale). The microwave hiss Wilson and Penzias detected was a relic of the universe's beginning and the last nail in the coffin for the Steady State theory. A small fraction of the snow on your TV when it's tuned to a blank channel is relic radiation from the Big Bang.

January 8 – 14

On the 8th you'll find the moon right next to the Pleiades. This should be an incredible sight in binoculars, if the moon's glare doesn't wipe out the cluster. Expect to see something like the drawing below. Alcyone is the name of the brightest star in the Seven Sisters.



If everything goes to plan, the New Horizons spacecraft will launch on the 11th. New Horizons is the first science mission to distant Pluto. Spacecraft have visited every planet, some asteroids, and some comets, but not Pluto and the Kuiper Belt. After flying pass Pluto and its moon Charon in July 2015, New Horizons will be targeted at other Kuiper Belt Objects (KBOs) so we can get an idea of the variety of bodies in this icy region. You can learn more about this mission at its website, http://pluto.jhuapl.edu/.

The moon is full on the 14th at 1:48 AM (2:48 AM for the Midwest). The full moon of January is called the Old Moon.

January 15 – 21

On the morning of the 15th, the moon, Saturn, and Beehive cluster make a nice grouping. All three will fit within the view of your binoculars and you'll see something like this.

Four days after the planned launch of New Horizons, Earth will receive samples of interstellar dust and a comet. On the 15th, the Stardust spacecraft will pass close to Earth and jettison its sample return capsule (SRC). After reentering the atmosphere, the small conical SRC will parachute to a landing in Utah. Inside will be samples of dust collected from a comet and interplanetary space. Stardust spent close to five years in space collecting dust. It flew pass the comet Wild 2 last year and collected dust samples ejected from the comet. This is the first time samples have been collected from beyond the moon. In the past, dust samples from space could only be collected high in the atmosphere by balloons and high altitude aircraft. But, we couldn't determine the origin of dust collected in this way. You can read more about this mission at its website, http://stardust.jpl.nasa.gov/.

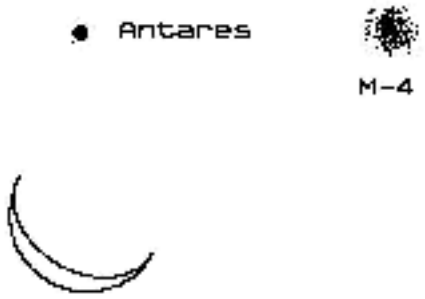
The moon is at apogee on the 17th at noon (1:00 PM for the Midwest) and will be 252,205 miles away. If you point a flashlight at the moon, it will take 1.35 seconds for your flashlight beam to reach the moon and 2.7 seconds for the beam to come back. Of course by the time your flashlight beam travels to the moon, let along back, its light will be too spread out to detect. Laser retro-reflectors left on the moon by some of the Apollo astronauts and the Lunokhod rover make it possible for astronomical observatories on Earth to shoot lasers at the moon and measure its distance from Earth.

January 22 – 30

The moon is at third quarter on the 22nd at 8:14 AM (9:14 AM for the Midwest). The third quarter moon doesn't rise after midnight, so its not observed as frequently as the first quarter moon.

Twenty years ago on the 24th, Voyager 2 became the first spacecraft to fly pass the planet Uranus. Prior to that day, we had never seen the planet or its moons in much detail. Voyager 2 flew 50,000 miles above the cloud tops of Uranus. Uranus was shown to be pale green in color and very featureless. The bland looking planet was discovered to have a 17 hour and 14 minute long day. Because of the small size of the Uranian satellites, it was expected that they would be geologically dead. Instead, some of them turned out to be filled with terrain modifications, indicating that they have been geologically active. Voyager 2 returned images on the five known Uranian moons and discovered an additional ten. The Voyager spacecraft (1 and 2) have enough speed to escape the solar system. They're leaving the sun's sphere of influence and beginning to see more interstellar cosmic rays.

The moon covers Antares on the 25th. Antares is a red giant star and represents the heart of the scorpion, Scorpius. We'll miss the occultation itself, but as the moon rises on the morning of the 25th, the moon will be only 1 degree from Antares and 2 degrees away from the globular star cluster M-4. In binoculars you'll see something like this.



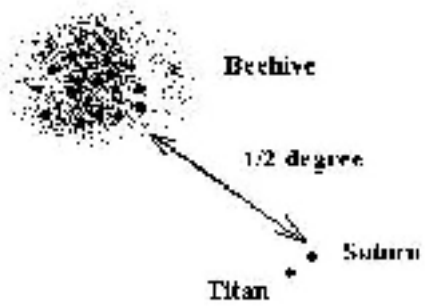
Saturn is at opposition on the 27th, or opposite the sun in the sky. So Saturn will rise at sunset and set at sunrise. Saturn now becomes an evening planet. Because of its 29 year orbital period, Saturn reaches opposition every 12-1/2 months.

The moon is new on the 29th at 7: 15 AM (8:15 AM for the Midwest). At New Moon, the moon is located as close to the sun as its orbit will allow it to get. November is not a good time of the year to look for young moons. So don't expect to see the moon again until the beginning of February.

The moon is at perigee on the 30th at 1:00 PM (2:00 PM for the Midwest). The moon is 222,313 miles away from Earth during this perigee (the perigee distance varies from month to month). Since the moon is closer to Earth today, it raises larger than average tides. Earlier this month Earth passed its closest point to the sun. So the sun is also creating larger than average tides. Remember that the moon is just passed new, so it's also closely aligned with the sun. The result is that the combined gravity and alignment of the sun and moon will produce larger high tides than usual today.

Saturn bumps up against the Beehive cluster at the end of the month. Look for Saturn and the Beehive close together on the 30th. You'll have to wait until a little after 8:00 PM

before Saturn rises high enough to see it and the cluster clearly. The nearest "star" to the lower left of Saturn is its moon, Titan and is four ring diameters away.



We end the month with three space anniversaries.

Thirty-five years ago on the 31st, Apollo 14 was launched to the moon. Apollo 14 was the first flight after the successful failure of Apollo 13. Apollo 14 went to Fra Mauro, a region believed to have formed during the impact that created the Sea of Rains. The Apollo 14 astronauts performed two moon walks during their 33-1/2 hours on the moon. Astronauts Alan Shepard and Ed Mitchell collected 94 pounds of rocks and set up the Apollo Lunar Surface Experiment Package (ALSEP) before returning back to the command module in orbit around the moon. The Apollo 14 astronauts returned to Earth on February 9th.

The 31st is also the 40th anniversary of the launch of the soviet Luna 9, the first successful moon lander. The 23 inch diameter spherical capsule weighed 220 pounds and was carried to the lunar surface on a crasher stage. The crasher stage carried a rocket engine to slow it down, but it didn't have the capability to actually soft land on the moon. So just before the crasher stage smashed into the lunar surface, it ejected the Luna 9 capsule, which free fell to the lunar surface. After landing, the capsule opened its four petals and rolled into an upright position. Luna 9 was the first manmade object to land on another celestial body. You'll read more about Luna 9 in next month's Boise Skies.

Finally, Ham the chimpanzee was launched into space 45 years ago on the 31st. Ham was almost 4 years old when he took his 17 minute space flight. His flight was the final test of the Mercury spacecraft and its Redstone booster. The Redstone booster over-performed and sent Ham higher and faster than engineers planned. He flew 1500 miles per hour faster, 43 miles higher, and experienced three additional gee's of acceleration. Adding to the problems, the spacecraft began taking on water after splashing down in the ocean. Ham was recovered safely from the capsule, but he was obviously unhappy with the mission. By the way, Ham stands for Holloman Aerospace Medical Center, the facility where he lived and trained for his mission.

This Month's Topic
Getting Help Using Your Telescope

So did you get a telescope for Christmas? If so, you can get help using it from one of Idaho's five astronomy clubs or from clubs in the Midwest. Most clubs meet monthly and their members are very happy to help out. Even if you didn't get a telescope, or don't have a telescope, visit your local astronomy club and see what's happening in the night sky.

A List of Idaho Astronomy Clubs

Boise Astronomical Society

Boise
http://www.boiseastro.org
The BAS meets on the second Friday of the month at the Discover Center of Idaho. Meetings are usually held in the back classroom and begin at 7:30 PM. Occasionally BAS holds a beginner's astronomy class. Check the website for details.

Idaho Falls Astronomical Society

Idaho Falls
http://www.allidaho.net/users/skygaz/ifas/ifas.html

Magic Valley Astronomical Society

Twin Falls
http://members.tripod.com/mvas/
http://www.mvas.net
The MVAS meets on the second Saturday of the month at the Herrett Center classroom. Meetings begin at 7:00 PM and are followed by a public mini-star party in front of the planetarium.

Pocatello Astronomical Society

Pocatello
Dick Williams, President
denndonn@allidaho.com

Snake River Astronomical Association

Jerome
Ryan Showers, President
324-7606

Kansas

Northeast Kansas Amateur Astronomers League

Topeka
www.nekaal.org
The NEKAAL meets on the fourth Thursday of the month at Washburn University, Stoffer Science Hall, Room 103. NEKAAL operates Far Point Observatory which is opened to the public.

Nebraska

Omaha Astronomical Society

Omaha
http://www.omahaastro.com/
The OAS meets on the first Friday of the month at the UNO campus, Durham Science Center, Room 169. OAS holds public star parties at the golf driving range at Mahoney State Park. The Mahoney State Park is just off the Ashland exit of I-80, between Omaha and Lincoln.

January's Website

This month check out the webpage of the International Meteor Organization (IMO). The IMO is an amateur organization of meteor observers which officially began in 1988.

There are four major links on their homepage. Each link takes you to a page with the same 4 major topics at the top, but with new links listed below them. I found this format a bit aggravating, since it increases the number of links needed to navigate the site.

The first major link is called the International Meteor Organization. It has links to meteor science and to information about the IMO organization. You'll find links to meteor observing clubs around the world and short tutorials on doing meteor science. The link also has an introduction to IMO and information on their conference and journal.

The second link is the Organization Link and has links to publications, journals, the IMO conference, a mailing list, who's who in the organization, and how to join the IMO. The short introduction to the IMO explains their commissions. Commissions are specialty groups that focus on particular aspects of meteor observing, like visual, radio, or photographic. Here's where you'll discover that IMO publishes a journal (called WGN) and proceedings from their conferences. You can subscript to their publication and attend their annual conferences (which appear to be held in Europe). To share information and help members make plans, the IMO maintains an email list. The who's who is a list of dozens of people from around the world. Their occupation and interests are listed along with an email address. This section finishes up with information on joining IMO, which is $20 per year.

The third major link is called Meteor Science. It contains links to observations, meteor shower data, a calendar of meteor showers, software, and a glossary. The Meteor Science link explains how to observe and count meteors in minor and major showers. IMO has published its own book on photographing meteors. The book is currently sold out, but is available from IMO as a PDF file. There's a database of over one million meteor observations that you can download, along with software to analyze the data. You can also learn how to record meteors using video and radio equipment.

The meteor calendar is available in six languages and is divided into quarters of the year. The meteor showers listed are those visible to the naked eye. You'll also find calendars from past years in this link. The calendars contain a simple sky chart along with information on the shower's position in the sky and the expected number of meteors visible per hour. The calendar evaluates the amount of moonlight interference you can expect for each shower. In the software page are ten programs you can download. The programs are for recording and analyzing visual and radio observation of meteors.

The fourth major link is the access to their search engine. Type a term and press enter, and your results are listed at the end of the webpage that the search engine generates.

You'll find the International Meteor Organization's website at, http://www.imo.net/

This Month's Sources

Observer's Handbook 2006, The Royal Astronomical Society of Canada
Space Calendar, http://www.jpl.nasa.gov/calendar/
Night Sky Explorer (software)
Stars, http://www.astro.uiuc.edu/~kaler/sow/
Astronomy Picture of the Day http://antwrp.gsfc.nasa.gov/apod/ap970907.html
http://www.hq.nasa.gov/office/pao/History/SP-4214/ch11-7.html
http://www.bell-labs.com/project/feature/archives/cosmology/
http://www2.jpl.nasa.gov/calendar/luna9.html
http://en.wikipedia.org/wiki/Luna_9
http://www.svengrahn.pp.se/trackind/jodrell/jodrole2.htm
http://www.daviddarling.info/encyclopedia/H/Ham.html
http://www.friends-partners.org/partners/mwade/lvs/redrcury.htm
http://aa.usno.navy.mil/data/

Dark Skies and Bright Stars,
Your Interstellar Guide