# Snake River Skies

The Newsletter of the Magic Valley Astronomical Society

Membership Meeting Saturday, April 10, 7:00 pm

**Centennial Observatory** Due to the need to maintain social distance during the Covid-19 pandemic, access to the observatory dome is one small group at a time.

> Faulkner Planetarium See inside for Details www.mvastro.org

Club Officers

Robert Mayer, President mayerrbrt@gmail.com

Gary Leavitt, Vice President leavittg@cableone.net

Dr. Jay Hartwell, Secretary

Jim Tubbs, Treasurer, AL-Cor jtubbs015@msn.com 208-404-2999

David Olsen, Newsletter Editor Loretta J Cannon, Guest Editor editor@mvastro.org

Rick Widmer, Webmaster rick@developersdesk.com

Magic Valley Astronomical Society is a member of the Astronomical League





Rick Widmer & Ken Thomason Herrett Telescope - Shotwell Camera April 2021

President's Message

Colleagues,

On a recent trip to Phoenix, I was invited by the Phoenix Astronomical Society to join them for an observing session at one of their dark sky sites. It was "only" 90 miles west of the city and still suffered from Phoenix's light dome. Regardless of the tools we have as amateur astronomers – the optics, mounts, eyepieces, software, etc. – their use is dependent on clear, dark skies. We can't control the weather and finding dark skies is becoming a challenge.

We are so fortunate to enjoy dark skies so close to home, particularly those in the Central Idaho Dark Sky Reserve (<u>CIDSR</u>). The quality of those night skies is ranked as some of the best in the world but they require monitoring and protection. Each year an annual report is filed with the International Dark-Sky Association proving our reserve deserves its gold tier status. Two of the big challenges in providing this data are what to collect and how to do it.

Recently a group of UCLA undergraduate students spent a couple of weeks gathering light pollution data inside the CIDSR and developing strategies for continued monitoring of its night skies. They were under the direction of Prof. Travis Longcore of the Institute of Environment and Sustainability at UCLA. Using an infrared camera and satellite images, they created a map of the reserve showing the effects of light sources in and around the reserve. This includes the light domes from Boise, Twin Falls, Stanley and even Fairfield as well as the changes in the light pollution from the nearby Thompson Creek Mine. The lighting at that particular facility was recently upgraded to dark sky compliant warm LEDs, which are much better for animals and humans. The impact of this change was a noticeable reduction of the mine's lighting footprint. Other mines are considering similar lighting improvements, and future monitoring will show the impact of these efforts.

A final report and a summary of the findings of the UCLA study are forthcoming. In addition to the presentation of their findings, they are developing procedures for gathering the needed information for reports to the IDA (International Dark-Sky Association). This will streamline the reporting process and make any changes of the sky quality more readily apparent.

Until then, Clear Views,

Rob Mayer



Snake River Skies is the Newsletter of the Magic Valley Astronomical Society and is published electronically once a month. Snake River Skies © 2021 by David Olsen & Loretta J Cannon for the Magic Valley Astronomical Society, All Rights Reserved. Images used in this newsletter, unless otherwise noted, are in the public domain and are courtesy of NASA, Wikimedia, or from MVAS File Photos. Names of the Full Moon are from the legends of various cultures.

Be Careful - Be Safe - Get Out There - Explore Your Universe

# April 2021 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
				1	2	
					BSU 1 <sup>st</sup> Friday Astronomy see BSU Events & More below	
4	5	6	7	8	9	
Last Quarter Moon Visible: 49% ↓ Age: 22.23 Days						MVAS General Meeting 7:00 pm
11	12	13	14	15	16	
	Visible 0% Age: 0.35 Days			Dept of Physics Virtual Planetarium Show see BSU Events & More below		
18	19	20	21	22	23	
		Visible 52% ↑ Age: 7.60 Days	Lyrid Meteor	Showers see BSU Events & More below		
25	26	27	28	29	30	
		Pink Moon 9:33 pm Visible 100% Age: 15.17 Days	International Astronomy Day			

Flesident's Message	 1
Monthly Calendar	 2
BSU Events & More	 3
Currents in Space	 4
NASA Night Sky Notes	 6

Phil Harrington's Cosmic Challenge	- 7
Dave Mitsky's Celestial Calendar	11
Observatory/Planetarium	14
About the MVAS	15

# **BSU Events & More Boise State Physics First Friday Astronomy** Recent lectures can be accessed online at http://www.astrojack.com: Apr 2, 2021 Seeing the Dark Side of the Universe through Cosmic Lenses" by Prof Ami Choi, Dept of Physics, The Ohio State University Psyche: Journey to a Metallic World Mar 5, 2021 by Prof Lindy Elkins-Tanton, Sch of Earth & Space Exploration, Ariz State University Feb 5, 2021 How to Talk Science so Journalists Will Listen by Lisa Grossman, Science News (www.sciencenews.org) Jan 1, 2021 The Discovery of Neptune by Prof Brian Jackson, Dept of Physics, Boise State University Scheduled for May 7, 2021: Light Pollution in the Central Idaho Dark Sky Reserve by Prof Travis Longcore, UCLA Institute of the Environment & Sustainability

# Saturday, April 10<sup>th</sup> MVAS General Meeting guest speaker – Dr. Jay Hartwell

Dr. Jay Hartwell will be taking us on a guided Virtual Tour of Mars. Please join us at 7:00 pm as this will be great fun!

# Thursday, Apr 15 BSU Dept of Physics presents Virtual Planetarium show



This evening's program will be hosted by the Department of Physics and will start at 7:30 pm. It will be sure to delight and astound. Participation is FREE but you must register to attend. Navigate to <u>http://boi.st/thirdthursday</u> to sign up, and you may leave a question for the moderator. You will be contacted the week before the event and provided with the Zoom link.

# Wednesday & Thursday, Apr 21 & 22 Lyrid Meteor Showers

"The Lyrids display some 15-20 meteors per hour in good conditions. The moon, just two days past first quarter, may get in the way .... The Lyrids trace their apparent paths back to a point between the constellations Hercules and Lyra, both of which rise in the east around midnight. They're visible all night, but you may have more luck after midnight .... They Lyrids have made a regular appearance for at least 2,500 years, longer than any other meteor shower. They happen as Earth passes through a stream of debris left by Comet C/1861 G1 (Thatcher)." From Brian Ventrudo's <u>Cosmic Pursuits for April</u>:

# Tuesday, Apr 27 Full Pink Moon

"April's full moon is widely known as the Full Pink Moon, even though it doesn't actually turn pastel pink as the name suggests. The Full Pink Moon's name comes from the abundance of moss phlox, a common little pink flower that typically begins to spread across the ground in early spring. With that said, this creeping phlox is not the only think that begins blooming during the Full Pink Moon." Read the full story of <u>Pink Moon</u> for more information.

# **Currents in Space**

# Ginny Takes to the Sky

Brian Jackson -- Boise State University, Dept. of Physics bjackson@boisestate.edu -- twitter.com/decaelus -- www.astrojack.com/



Ingenuity emerging from her chrysalis beneath Perseverance. credit: NASA/JPL-Caltech/MSSS

The Perseverance rover, nicknamed "Percy", has so far operated on Mars for 43 Earth days/42 Mars sols (a Mars sol is about 40 minutes longer than an Earth day). The mission has performed equipment checks, planned the rover's traverse across Jezero Crater, and completed its first sevenmeter drive -- one short trip for a rover -- but the mission's next phase will be one giant leap for robot-kind.

#### **Extraterrestrial Eclosion**

Over the last several days/sols, another creature has emerged from Percy's undercarriage. This tiny hitchhiker has sprouted legs and wings and settled gingerly on the Martian surface in Percy's shadow. This robot, named Ingenuity ("Ginny" for short), is a tiny helicopter, specially designed to claw at Mars' thin atmosphere and explore the planet from the air.

This helicopter represents a revolution in planetary exploration because, up until now, almost all *in situ* (meaning

"in place" or surface as compared to orbital) missions involved either stationary landers or wheeled rovers. Ginny is the first planetary explorer capable of powered flight. She can fly about 5 meters above the ground for 90 seconds at a time, which lets her get about 50 meters away from Percy. As a technology demonstration, Ginny has the potential to open new vistas of exploration.

# As the Interplanetary Crow Flies

With the ability to fly across a surface, NASA scientists and engineers will be able to explore worlds from a totally new viewpoint. Other-worldly helicopters like Ginny could provide high-definition images and reconnaissance for robots and even humans and also provide access to terrains difficult for rovers to traverse.

Exploration by air could not only simplify mission planning, but also significantly speed up the pace. Currently, planning even a short rover traverse across Mars can take weeks, given how rugged and rocky the surface can be. The ability to rise above the surface will allow explorers to take much shorter, straight-line paths, saving NASA significant energy and cost (weeks of mission planning by scientists and engineers do not come cheap).

# **Aerial Uprising**

Though first of its kind, Ginny inherits a long legacy of airborne exploration. The first humans to see a planet from the air did so dangling from a silken hot air balloon in France in 1783, just prior to the first French Revolution. (Historians have even suggested the mixing of French nobility and hoi polloi in the crowds drawn by these spectacles may have helped catalyze the revolution.)

In fact, some worlds may be even easier to explore from the air. Venus' thick atmosphere makes it an ideal target, and in 1986, the Russian Vega missions released two balloons into the churning caldron of Venus' atmosphere. Radio telescopes on Earth tracked the balloons for two days, which helped us understand Venus' super-rotating jet stream.

Saturn's icy moon Titan, likewise, has a thick atmosphere but much lower surface gravity than Venus. This combination of cushiony atmosphere and weak gravity means that, with a wing suit and a running start, a person could actually flap their arms and fly on Titan (although our explorer would need an insulated spacesuit to deal with Titan's -300° F surface temperature). Titan will soon host its own robotic aviator -- the Dragonfly mission. Building on Ginny's performance, this NASA copter is slated to land on Titan in the 2030s.

----

Ginny will take her first flight around April 11. You can follow her progress here - https://mars.nasa.gov/technology/helicopter/.

# ASTRONOMY NEWS BRIEFS

# LINK TO VOYAGER 2 BACK ONLINE

Here is some some good news from last month. It all started last year . . . no wait, we have to go back a little further than that. Way back in 1989, after having completed its flyby of Neptune (and Triton), *Voyager 2* swung below the ecliptic and began its journey out of the solar system. After a decade or so, this 'southerly' trajectory meant Earth's <u>Deep Space Network</u> had to rely on the <u>Canberra Deep Space</u> <u>Communication Complex</u> in Australia to communicate with our little interstellar-bound traveler. Of the four big-dish antennae in operation at Canberra, only one – Deep Space Station 43 (DSS43) – is capable



by Loretta J Cannon



of outbound communications with *Voyager 2*. In operation since 1972, DSS43 was upgraded once in 1987 when its 64-meter antenna was extended to a 70-meter. But over the next three decades, no improvements. (image credit above RIGHT: DSN Canberra)

By March 2020, due to a pronounced increase in spacecraft scheduled to launch that year, NASA officials made the decision to take DSS43 offline for the first time in 57 years for some much needed upgrades. Enough progress had been completed by October to allow engineers to 'ping' *Voyager 2* some 11.6 billion miles away (image credit LEFT: NASA/JPL). Then, on schedule, in mid Feb 2021, DSS43 became fully operational. In a <u>NY</u>

<u>Times article</u>, Suzanne Dodd (Voyager Mission Project Manager, JPL Director of Interplanetary Network Directorate) and her team are reported to have estimated that both *Voyager* spacecraft will continue to operate for up to eight more years. But she added, they "always surprise me."

When, or if, we lose contact with the *Voyagers*, it will feel like losing a long-time friend. In the meantime, I can always check the spacecrafts' <u>Mission Status Page</u>. Just now (April 4<sup>th</sup>) is a fun time to watch the counters tick. During specific times of the year, since our planet moves around the Sun, the counters for 'Distance from Earth' actually *tick down* while the counters for 'Distance from Sun' are quickly ticking up as the craft speed away from us. And here's a fun fact: it will take 300 years for *Voyager 1* to reach the edge of the Oort cloud (see April birthdays, p. 11).

"COSMIC PURSUITS" - check out Brian Ventrudo's Cosmic Pursuits for April, where you'll find this image and more.



"The Moon and Mars among the bright stars of Taurus and Gemini on April 16, 2021." [image produced using SkySafari 6 Plus software, <u>https://skysafariastronomy.com/</u>]

# **NASA Night Sky Notes**

# Watch the Lion: Celestial Wonders in Leo

#### by David Prosper

Leo is a prominent sight for stargazers in April. Its famous sickle, punctuated by the bright star Regulus, draws many a beginning stargazer's eyes, inviting deeper looks into some of Leo's celestial delights, including a great double star and a famous galactic trio.

Leo's distinctive forward sickle, or "reverse question mark," is easy to spot as it climbs the skies in the southeast after sunset. If you are having a difficult time spotting the sickle, look for bright Sirius and Procyon - featured in last month's



article – and complete a triangle by drawing two lines to the east, joining at the bright star Regulus, the "period" in the reverse question mark. Trailing them is a trio of bright stars forming an isosceles triangle, the brightest star in that formation named Denebola. Connecting these two patterns together forms the constellation of Leo the Lion, with the forward-facing sickle being the lion's head and mane, and the rear triangle its hindquarters. Can you see this mighty feline? It might help to imagine Leo proudly sitting up and staring straight ahead, like a celestial Sphinx.

At LEFT: The stars of Leo. Note that you may see more or less stars, depending on your sky quality. The brightness of the Leo Triplet has been exaggerated for the purposes of the illustration - you can't see them with your unaided eye.

If you peer deeper into Leo with a small telescope or binoculars, you'll find a notable double star! Look in the sickle of Leo for its

second-brightest star, Algieba - also called Gamma Leonis. This star splits into two bright yellow stars with even a small magnification - you can make this "split" with binoculars, but it's more apparent with a telescope. Compare the color and intensity of these two stars - do you notice any differences? There are other multiple star systems in Leo – spend a few minutes scanning with your instrument of choice, and see what you discover.

One of the most famous sights in Leo is the "Leo Triplet": three galaxies that appear to be close together. They are indeed

gravitationally bound to one another, around 30 million light years away! You'll need a telescope to spot them, and use an eyepiece with a wide field of view to see all three galaxies at once! Look below the star Chertan to find these galaxies. Compare and contrast the appearance of each galaxy – while they are all spiral galaxies, each one is tilted at different angles to our point of view! Do they all look like spiral galaxies to you?

Your view of the three galaxies in the Leo Triplet won't look as amazing as this image taken by the VLT Survey Telescope, unless you have a telescope with a mirror 8 feet or more in diameter! Still, even a small telescope will help your eyes pick up these three galaxies as "faint fuzzies": objects that seem blurry against a background of pinpoint stars. Let your eyes relax and experiment with observing these galaxies by looking slightly away from them, instead of looking directly at them; this is called averted vision, a handy technique that can help you see details in fainter, more nebulous objects.



Image Credit: ESO, INAF-VST, OmegaCAM, Astro-WISE, Kapteyn I.

April is Citizen Science Month, and there are some fun Leo-related activities you can participate in! If you enjoy comparing the Triplets, the "Galaxy Zoo" project (<u>galaxyzoo.org</u>) could use your eyes to help classify different galaxies from sky survey data! Looking at Leo itself can even help measure light pollution: the Globe at Night project (<u>globeatnight.org</u>) uses Leo as their target constellation for sky quality observations from the Northern Hemisphere for their April campaign, running from April 3-12. Find and participate in many more <u>NASA community science programs</u>. Happy observing!

Phil Harrington's Cosmic Challenge

# Abell Galaxy Cluster (AGC) 1060

Large scopes: 10-inch (25 cm) to 14-inch (36 cm)

Target	Туре	RA	DEC	Constellation	Mag	Size
Abell Galaxy Cluster 1060	Galaxy cluster	10h 36.9m	-27° 31.0'	Hydra		168'

Entry number 1060 in the <u>Abell Catalog of Galaxy Clusters</u> (AGC), also known as Hydra 1, covers nearly 3° of our southern spring sky and includes more than 100 individual galaxies. Fourteen of those have assignments in the New General Catalog (NGC), while another belongs to the NGC's supplemental Index Catalog (IC). Six of those NGC galaxies shine brighter than 14th magnitude and lie within a 20' field. The dozens of other cluster members are all too faint to have been included in those catalogs, but instead have individual entries in the European Southern Observatory Galaxy Catalog (ESO), Millennium Galaxy Catalog (MGC), and Principal Galaxies Catalog (PGC).



South

At Left: April evening star map, adapted from <u>Star Watch</u> by Phil Harrington

Finding AGC 1060 is a simple task as long as you can spot 4.5magnitude SAO 179041. This red giant sun overlaps the center of the cluster and lies 41/4° north of Alpha  $(\alpha)$  Antliae. Of course, finding Alpha Antliae presents its own challenge. since it shines at only magnitude 4.2 and lies far from any handy reference stars. My best suggestion is use binoculars and start off from the trapezoidal body of Corvus the Crow. Extending a diagonal line southwestward from Algorab [Delta ( $\delta$ ) Corvi] through Epsilon ( $\epsilon$ ) Corvi and continuing for another 24°, you will come to Alpha Antliae and, a degree to its northeast, Delta ( $\delta$ ) Antliae. SAO 179041 is now about two-thirds of a finder field to their north. Center SAO 179041 in your telescope field, switch to about 100x, and take a moment to orient yourself. In particular, note the 7thmagnitude sun, SAO 179027, 16' to its south-southwest.

An arc of no fewer than six NGC galaxies curves south and west from SAO 179041. How many can you see? The brightest pair is formed by NGC 3309 and NGC 3311. Both lie just west of the midpoint between those two SAO reference stars. My 10-inch scope shows NGC 3309 as a small, circular disk with a concentrated core at its heart. Even though its integrated magnitude is greater, NGC 3311's lower surface brightness makes it less apparent than NGC 3309. It too appears circular, but evenly illuminated.

Another dim galactic ember glows to the east of the halfway point between the two SAO stars and just west of a pair of 12th-magnitude points. NGC 3312 appears quite elongated, oriented almost exactly north-south, and is highlighted by a bright stellar nucleus. Photos of the cluster reveal this to be a classic spiral galaxy tilted partially to our perspective. Monster backyard scopes may also hint at the dark lane that runs along the edge of the spiral arm halo.



Finder chart adapted from Cosmic Challenge: The Ultimate Observing List for Amateurs by Phil Harrington.

# CLICK HERE FOR A PRINTABLE FINDER CHART pdf

NGC 3316 is nestled 8' due east of NGC 3312. This little barred spiral is one of the toughest of the NGC galaxies in AGC 1060, since its tiny disk appears no more than 1' across visually and shines at only 13th magnitude.

Veering off the arc for a moment, try your luck with an even dimmer pair, NGC 3314A and 3314B. Neither breaks the 13thmagnitude barrier, with the latter only managing a weak 14th-magnitude effort. A 14th-magnitude star is superimposed on the northern tip of NGC 3314A, while an even dimmer field star abuts NGC 3314B to the east. Okay, back to SAO 179041. Scan 11' due west for the faint patch of NGC 3308. A good eye will show that its dim disk is slightly oval, oriented south-southwest/north-northeast, and draws to a brighter central nucleus. Now, look 20' northwest of SAO 179041 for the faint glow of NGC 3305, just tucked inside the edge of the cluster. Its small, round disk lies just to the east of a 12th-magnitude star. The 10-inch offers no hint of a centralized core, but rather, shows only a dim, evenly illuminated blur.



NGC 1360 as seen through the author's 10-inch (25cm) reflector.

NGC 3315 is found some 14' north of SAO 179041 and just east of an 11th-magnitude sun. At 106x, my 10-inch reveals a small, faint glow elongated northwest-southeast. Averted vision will likely be needed to see this little 14th-magnitude S0 system.

A tight group of four faint galaxies, cross-listed in Paul Hickson's Galaxy Group catalog as Hickson 48, is found another 9' further northeast still. Brightest of that bunch is IC 2597, a small, 13th-magnitude blur set just east of a faint star. Gathered

round it are galaxies PGC 31588 (magnitude 14.8), PGC 31577 (magnitude 16.3), and PGC 31580 (magnitude 16.7). At those magnitudes, I'm afraid that we will have to leave that trio to the big guns in the next chapter.

Three NGC members guard the western flank of AGC 1060. To find them, move <sup>3</sup>/<sub>4</sub>° due west to 7th-magnitude SAO 178978. NGC 3285 lies just 7' to the star's southwest and reveals a small, oval glow tilted west-northwest to east-southeast. A faint stellar core is centered within. The other two NGC galaxies here, NGC 3285A, 12' to the west-southwest of NGC 3285, and NGC 3285B, 18' to its southeast, are each a paltry 14th magnitude.

Target	ESO	RA	DEC	Magnitude	Size
NGC 3285A		10 32.8	-27 31.4	14.5p	1.1x0.9'
PGC 31212	501-13	10 33.5	-26 53.8	13.9p	1.3x0.5'
NGC 3285		10 33.6	-27 27.3	13.1b	2.5x1.4'
NGC 3285B		10 34.6	-27 39.1	13.9p	1.5x1.1'
PGC 31312	501-20	10 34.8	-27 12.8	14.5b	0.9x0.6'
PGC 31310	436-44	10 34.8	-28 29.8	13.9p	1.1x0.7'
PGC 31316	436-46	10 34.8	-28 35.0	13.4p	2.7x2.0'
PGC 31360	437-4	10 35.4	-28 18.9	13.9p	1.8x1.1'
PGC 31366	501-25	10 35.4	-26 39.8	14.1p	1.7x0.8'
NGC 3305		10 36.2	-27 09.7	13.8b	1.1'
NGC 3307		10 36.3	-27 31.8	14.5v	0.8x0.4'
PGC 31443	501-35	10 36.4	-27 00.0	14.2p	1.5x0.5'
NGC 3308		10 36.4	-27 26.3	12.9b	1.7x1.2'
NGC 3309		10 36.6	-27 31.1	12.6b	1.8x1.5'
NGC 3311		10 36.7	-27 31.6	11.6v	2.1x1.9'
PGC 31488	437-11	10 36.8	-27 55.2	14.3b	1.1x0.5'
PGC 31504	437-15	10 37.0	-28 10.7	13.5p	2.4x0.4'
NGC 3312		10 37.0	-27 33.8	12.7p	3.3x1.2'
NGC 3314B		10 37.2	-27 39.5	13.5	0.3x0.2'
NGC 3314A		10 37.2	-27 41.0	14	1.6x0.7'
NGC 3315		10 37.3	-27 11.5	14.4b	1.1x0.9'
NGC 3316		10 37.6	-27 35.6	13.6p	1.2x1.0'
PGC 31577		10 37.7	-27 03.5	16.4b	0.6'x0.3'
PGC 31580		10 37.7	-27 02.6	17.0	0.3'
IC 2597		10 37.8	-27 04.9	12.8b	2.5x1.7'
PGC 31588		10 37.8	-27 07.3	15.0b	0.9'x0.7'
PGC 31585	501-56	10 37.8	-26 37.8	13.8p	2.0x0.4'
PGC 31638	501-65	10 38.6	-27 44.3	13.7p	1.7x1.0'
PGC 31683	501-68	10 39.3	-26 50.4	14.3p	2.0x0.6'
NGC 3336		10 40.3	-27 46.6	13.0p	1.9x1.5'

Finally, the barred spiral NGC 3336 lies near the eastern edge of the cluster, about <sup>3</sup>/<sub>4</sub>° east-southeast of center. This is a tough catch. Look for a dim, slightly elongated smudge of uniform grayish light.

Completing this challenge will give you 14 more notches in your galaxy belt, but there are still many fainter galaxies lying in wait. The table {at LEFT} includes the central region of AGC 1060, listing galaxies shining at magnitude 14.5 or brighter, while the finder chart here plots them amongst stars to magnitude 15. See how many of these other galactic denizens you can find.

Good luck! And be sure to post your results in this column's online discussion (<u>Phil's April cosmic challenge forum</u>).

Until next month, remember that half of the fun is the thrill of the chase. Game on!



About the Author: Phil Harrington writes the monthly <u>Binocular Universe</u> column in <u>Astronomy</u> magazine and is the author of 9 books on astronomy, including <u>Cosmic Challenge: The Ultimate Observing List for Amateurs</u>.

<u>Phil Harrington's Cosmic Challenge</u> copyright 2020 by Philip S. Harrington. All rights reserved. No reproduction, in whole or in part, beyond single copies for use by an individual, is allowed without written permission of the copyright holder. Permission for use in this newsletter has been granted.

All times, unless otherwise noted, are UT (subtract 7 hours and, when appropriate, 1 calendar day for MDT) 4/2 The Moon is 4.8 degrees NNE of the first-magnitude star Antares (Alpha Scorpii) at 00:00; the Moon is at the descending node (longitude 252.6 degrees) at 3:00 4/3 Mercury is at its southernmost latitude from the ecliptic plane (-7.0 degrees) at 8:00 4/4 Last Quarter Moon occurs at 10:03; asteroid 9 Metis (magnitude +9.5) is at opposition in Virgo at 12:00; Pluto is at its northernmost declination (-22.15 degrees) at 15:00 4/6 The Curtiss Cross, an X-shaped clair-obscure illumination effect located between the craters Parry and Gambart, is predicted to be visible at 00:53: the Moon is 3.9 degrees southeast of Saturn at 11:00 4/7 The dwarf planet/asteroid 1 Ceres is in conjunction with the Sun at 7:00; the Moon is 4.2 degrees southeast of Jupiter at 11:00 4/9 The Moon is 4.0 degrees southeast of Neptune at 15:00 4/11 The Moon is 2.7 degrees southeast of Mercury at 10:00 4/12 New Moon (lunation 1216) occurs at 2:31 4/13 Asteroid 3 Juno is stationary at 2:00; the Moon is 2.3 degrees southeast of Uranus at 14:00 4/14 The Moon is at apogee, subtending 29' 25" from a distance of 406,118 kilometers (252,351 miles), at 17:46 4/15 The Moon is 5.0 degrees southeast of M45 at 9:00; the equation of time is equal to 0 at 9:00 4/16 The Moon is 5.3 degrees north-northwest of the first magnitude star Aldebaran (Alpha Tauri) at 3:00; the Moon is at the ascending node (longitude 71.4 degrees) at 6:00 4/17 The Moon is 0.1 degrees south of Mars, with an occultation taking place in most of the Philippines, Indonesia, southeast Asia, India, the southern portions of the Middle East, and most of central and eastern Africa, at 12:00 4/18 The Moon is 1.0 degrees north-northeast of the bright open cluster M35 in Gemini at 1:00; the Sun enters Aries (longitude 29.1 degrees on the ecliptic) at 23:00 4/19 Mercury is in superior conjunction with the Sun (1.331 astronomical units from the Earth; latitude -2.33 degrees) at 2:00; the Lunar X (the Purbach or Werner Cross), an X-shaped illumination effect involving various rims and ridges between the craters La Caille, Blanchinus, and Purbach, is predicted to be visible at 11:15; the Moon is 6.8 degrees south of the first-magnitude star Castor (Alpha Geminorum) at 14:00; the Moon is 3.2 degrees south of the first-magnitude star Pollux (Beta Geminorum) at 19:00; the longitude of the Sun is 30 degrees at 21:00 4/20 First Quarter Moon occurs at 6:59: the Moon is 3.0 degrees north-northeast of the bright open cluster M44 (the Beehive Cluster or Praesepe) in Cancer at 21:00 4/22 Mercury is at the ascending node through the ecliptic plane at 9:00; the peak of the Lyrid meteor shower (a zenithal hourly rate of 15 to 20 per hour) occurs at 12:00; the Moon is 4.6 degrees north-northeast of the first-magnitude star Regulus (Alpha Leonis) at 14:00; asteroid 4 Vesta is stationary at 18:00; Mars is at its northernmost declination (24.9 degrees) at 22:00 4/23 Venus is 0.2 degrees southeast of Uranus at 2:00 4/24 Mercury is 0.7 degrees north-northwest of Uranus at 7:00; Mercury, Venus, and Uranus lie within a circle with a diameter of 1.7 degrees at 9:00 4/25 Mercury is 1.2 degrees north-northwest of Venus at 18:00 4/26 The Moon is 5.9 degrees north-northeast of Spica at 8:00 4/27 Mars is 0.6 degrees north of the bright open cluster M35 in Gemini at 7:00; the Full Moon, known as the Egg or Grass Moon, occurs at 3:32; the Moon is at perigee, subtending 33' 26" from a distance of 357,381 kilometers (222,064 miles), at 15:22 4/28 Pluto is stationary, with retrograde motion to begin, at 19:00 4/29 The Moon is 4.7 degrees north-northeast of Antares at 9:00; the Moon is at the descending node (longitude 251.0 degrees) at 9:00 4/30 Uranus is in conjunction with the Sun (20.764 astronomical units from the Earth, latitude -0.43 degrees) at 20:00 Kappy Birthdays in April [We added to Dave's list as it was a tad short -your Editors] Apr 11<sup>th</sup> Donald Howard Menzel (1901-1976) Apr 12<sup>th</sup> Edward Walter Maunder (1851-1928) Apr 14<sup>th</sup> Christiaan Huygens (1629-1695) Apr 28<sup>th</sup> Francis Baily (1774-1844) Apr 28<sup>th</sup> Eugene Merle Shoemaker (1928-1997)

Apr 28<sup>th</sup> Jan Oort (1900-1992)

# **Dave Mitsky's Celestial Calendar**

On this date in history  $\ldots$ 

Apr 2, 1845: The first photograph of the Sun was taken.

Apr 5, 1772: Charles Messier discovered the open cluster M50 in Monoceros.

Apr 7, 1959: The first radar signal was bounced off of the Sun.

Apr 7, 1991: The Compton Gamma Ray Observatory achieved orbit.

Apr 11, 1779: Johann Koehler discovered the elliptical galaxies M59 and M60 in Virgo.

Apr 15, 1772: Charles Messier discovered the spiral galaxy M58 in Virgo.

Apr 18, 1790: Caroline Herschel discovered C/1790 H1 (Herschel).

Apr 25, 1990: The Hubble Space Telescope was placed in orbit.



# The Sun, the Moon, & the Planets

The **Sun** is located in Pisces on April 1st. It enters Aries on April 18th.

The **Moon** is 18.4 days old, is illuminated 86.9%, subtends 32.8', and is located in Pisces at 0:00 UT on April 1st. The Moon is at its greatest northern declination of +25.5 degrees on April 19th and its greatest southern declination of -25.4 degrees on April 4th. Longitudinal libration is at a maximum of +6.3 degrees on April 6th and a minimum of -7.9 degrees on April 22nd. Latitudinal libration is at a maximum of +6.7 degrees on April 9th and a minimum of -6.7 degrees on April 24th. Favorable librations occur for the following craters: Pingré (April 26th), Bailly (April 27th), and Boguslawski (April 28th). The Curtiss Cross occurs on April 6th and the Lunar X on April 19th. New Moon occurs on April 11th. Large tides will occur following the Full Moon on April 27th. The Moon is at apogee on April 14th (at a distance 63.68 Earth-radii) and at perigee on April 27th (at a distance of 56.03 Earth-radii). The Moon occults Mars on April 17th from certain parts of the world.

**Mercury** is visible in the morning sky early in the month and returns to the evening sky very late in April. The speediest planet brightens from magnitude -0.5 to magnitude -2.2 and then decreased in brightness to magnitude -1.2 this month. Mercury is at its greatest heliocentric latitude south on April 3rd and achieves superior conjunction on April 19th. It's at the ascending node on April 22nd, is a bit more than one degree north-northwest of Venus on the morning of April 25th, and reaches perihelion on April 27th.

Venus may be visible very low in the west-northwest at evening twilight at the end of the month.

**Mars** heads eastward through Taurus this month. It passes between Zeta Tauri (Alheka) and Beta Tauri (Elnath), the horns of the Bull, on April 12th and April 13th and enters Gemini on April 24th. Mars forms a near isosceles triangle with the similarly colored first-magnitude stars Betelgeuse and Aldebaran on April 15th. On April 16th, a waxing crescent Moon passes just north of Mars, with an occultation taking place in the Eastern Hemisphere. On April 30th, it forms another almost isosceles triangle with Eta Geminorum (Tejat Posterior) and Mu Geminorum (Propus). Mars passes approximately 0.5 degrees north-northwest of the center of the open cluster M35 on the evening of April 27th. The Red Planet decreases in brightness from magnitude +1.3 to magnitude +1.5 and shrinks in angular size from 5.3 arc seconds to 4.7 arc seconds by the end of April.

**Jupiter** increases in brightness to magnitude -2.2 and in apparent diameter from 34.7 to 37.3 arc seconds during April. It rises about half an hour after Saturn in the early part of the month. Jupiter occults 44 Capricorni (magnitude +5.9) on the morning of April 2nd. The star's reappearance on the western limb of the planet will be visible from eastern North

America. The Galilean satellite lo passes just south of the star at 6:21 a.m. EDT. A short article on the event can be found on page 49 of the April 2021 issue of Sky & Telescope. A waning crescent Moon passes four degrees south of Jupiter on the morning of April 7th. Jupiter is positioned two degrees north of the third-magnitude star Delta Capricorni (Deneb Algedi) on that date. Jupiter enters Aquarius on April 25th. A shadow transit by lo ends at 6:28 a.m. EDT (10:28 UT) on the morning of April 9th. A list of mutual Galilean satellite events can be found on page 50 of the April 2021 issue of Sky & Telescope.

Data on other Galilean satellite events is available at http://www.skyandtel...watching-tools/ and page 51 of the April 2021 issue of Sky & Telescope. For information on transits of Jupiter's central meridian by the Great Red Spot. consult https://www.projectp...eve grs.htm#apr or pages 50 and 51 of the April 2021 issue of Sky & Telescope.

Saturn rises just after 4:00 a.m. local daylight time on April 1st. By the end of the month, it's over 20 degrees in altitude at the beginning of twilight. Saturn lies four degrees north of the waning crescent Moon on April 6th. Titan, Saturn's brightest satellite, lies 2.6 degrees east of the planet on April 1st. It passes due south of Saturn on April 5th and April 21st and due north of Saturn on April 13th and April 29th. It may be possible to spot lapetus at greatest western elongation on April 16th when it is positioned eight arc seconds due east of the planet.

Browse http://www.skyandtel...watching-tools/ for information on Saturn's satellites.

**Uranus** is in conjunction with the Sun on April 30th and consequently is not visible after the first few days of this month.

Eighth-magnitude Neptune is very low in the east at dawn in late April. It's located about five degrees east of the fourthmagnitude star Phi Aguarii.

The dwarf planet **Pluto** is still not a viable target this month.

Mercury, Venus, Mars, and Uranus are located in the west in the evening. At midnight, Mars can be found in the west. Jupiter and Saturn are in the southeast and Neptune is in the east in the morning sky. Mercury, Venus, and Uranus lie within a circle with a diameter of 1.7 degrees on April 24th.

For more on the planets and how to locate them, browse Naked Planets.

Information on passes of the ISS, the USAF's X-37B, the HST, Starlink, and other satellites can be found at Heavens Above.





Comet C/2020 R4 (ATLAS) shines at approximately eighth-magnitude as it travels rapidly northwestward from Aquila to beyond Boötes during April. It passes very close to the seventhmagnitude open cluster NGC 6709 on April 12th. For more information on comets visible this month, browse the Comet Chasing site. A historical list of the closest cometary approaches to Earth is posted on Cometography.



There are multiple Asteroids this month:

Asteroid 4 Vesta shines at magnitude +6.6 as it travels northwestward and then southward through Taurus this month. On April 1st, the main belt asteroid is located two degrees east of the fifth-magnitude star 51 Leonis and several degrees southwest of the fourth-magnitude star 60 Leonis. It lies 0.6 degrees southeast of 51 Leonis by the middle of the April and a bit more than one degree southeast of the star as the month ends. Vesta is stationary on April 22nd. Asteroid 9 Metis is at opposition in Virgo on April

4th. Consult https://in-the-sky.o...05\_14\_100\_2.png or page 50 of the April 2021 issue of Sky & Telescope for a finder chart. Asteroid 3 Juno is stationary on April 12th.



[Dave Mitsky didn't include a write-up for the Lyrid meteors so we added a write-up from Ventrudo's Cosmic Pursuits to the Calendar of Events on p. 3]

You are welcome to access the Cloudy Nights site for many more details from Dave Mitsky. https://www.cloudynights.com/topic/764083-april-2021-celestial-calendar/



The Herrett Center has re-opened, with <u>COVID-19 safety protocols</u> for your protection. Check out our <u>reopening video message</u> and we hope to see you soon!

#### **Centennial Observatory Upcoming Events**

Event	Place	Date	Time	Admission
Monthly Free Star Party	Centennial Observatory	Saturday, March 13th, 2021	6:15 to 9:00 PM	FREE
"Earth Hour" Telescope Viewing	Centennial Observatory	Saturday, March 27th, 2021	8:30 to 9:30 PM	FREE

Due to the need to maintain social distance during the Covid-19 pandemic, access to the observatory dome is one small group at a time. Contact the Herrett Center 208-732-6655 for more info.

#### Faulkner Planetarium









Now Showing!

Visit the Herrett Center Video Vault

#### About the Magic Valley Astronomical Society

Magic Valley Astronomical Society 550 Sparks St. Twin Falls, ID

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 both 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: (a) public star parties and events open to anyone interested in astronomy; (b) 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, which enable us to 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. Among the programs that your membership dues support are speakers, public star parties, classes and support for astronomy in schoolrooms, and outreach programs, just to name a few.

Annual Membership dues are \$20.00 for individuals, families, and \$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.

Lending Telescopes: The society currently has three telescopes for loan and would gladly accept others. Please contact President Robert Mayer for more information on these and other benefits.



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.