NIGHTFALL

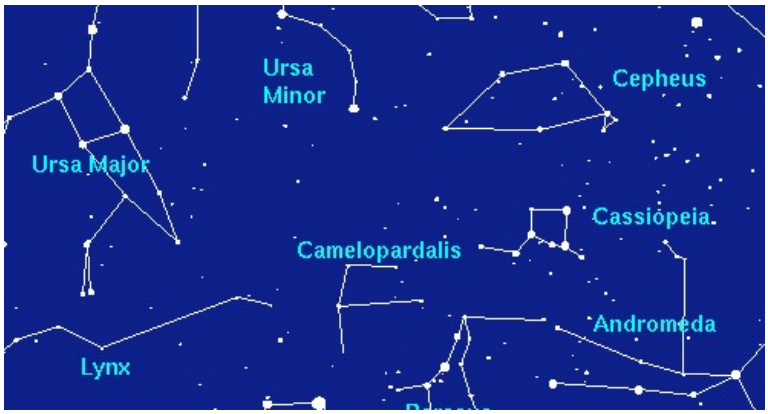
A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

MARCH 2023

MARCH 2023 PRESIDENT'S NOTE

This month's president's note is on a nearby constellation to last month's Camelopardalis. It is much fainter and again of a more "recent" origin and will take good eyesight and optics to see all it has to offer. Those who have done the Herschel challenge will recognize several of the objects found in the Lynx constellation.

LYNX CONSTELLATION



Lynx is one of the several constellations that were introduced by the Polish astronomer Johannes Hevelius in the 17th century. Hevelius created the constellation to fill a relatively large gap between the two neighboring constellations, Auriga and Ursa Major. Hevelius named the constellation Lynx because it was pretty faint and it took the eyesight of a lynx to see it. While it is not known if Hevelius had any myths in mind when he named the constellation, there is a figure in mythology that might be linked to the constellation's name. Lynceus, who sailed with Jason and the Argonauts, was said to have the keenest eyesight of all men and could even see things underground. He and his twin brother Idas were part of the expedition for the Golden Fleece.

Lynx is the 28th constellation in size, occupying an area of 545 square degrees. It lies in the second quadrant of the northern hemisphere (NQ2). The genitive form of Lynx used in star names, is Lyncis. The three-letter abbreviation is Lyn. Lynx belongs to the Ursa Major family of constellations, along with Boötes, Camelopardalis, Canes Venatici, Coma Berenices, Corona Borealis, Draco, Leo Minor, Ursa Major and Ursa Minor.

Lynx contains five stars with known planets and no Messier objects. The brightest star in the constellation is Alpha Lyncis, with an apparent magnitude of 3.13. Other than Alpha Lyncis, the constellation does not contain any stars brighter than fourth magnitude and only 5 of the stars in Lynx have registered names. There are no meteor showers associated with the Lynx constellation. Some of the stars in Lynx were documented by the Greek astronomer Ptolemy in the 2nd century, but only as "unformed" stars near Ursa Major, and not as part of any constellation.

Lynx's stars are interesting because they are larger (many times bigger than the sun) and multiple star systems with documented planets. But more interesting than the stars are the deep sky objects found in the constellation Lynx one of which is the Intergalactic Wanderer – NGC 2419. NGC 2419, a globular star cluster with a visual magnitude of 9.06. Is a Shapley class II cluster, which means that it is highly concentrated at the center. The cluster got its nickname because it was originally believed not to be in orbit around the Milky Way. This has been proven false since: NGC 2419 takes about three billion years to complete an orbit around our galaxy. It is 300,000 light years distant from the galactic center and about 275,000 light years from the solar system. It is one of the most remote globular clusters, both from the galactic center and from the Sun, almost twice as distant as the Large Magellanic Cloud in the constellation Dorado. The cluster was discovered by the German-born British astronomer William Herschel on December 31, 1788. NGC 2419 was originally believed to be a star. It was the American astronomer Carl Lampland who discovered that it was really a globular cluster of stars.

I encourage you during March to check out the Lynx constellation, it's interesting but faint stars and many interesting deep sky objects (i.e. UFO galaxy and Bear Paw galaxy). And I look forward to seeing pictures from HAC photographers of Lynx objects.

Speaker Bio for March

Glen Sanner is an avid wildlife photographer and astrophotographer. He has been a photographer for some 60 years using everything from a box film camera to his current digital camera. He has taught classes to help others improve their photographic skills in the field, and in the digital darkroom. Glen's current digital camera is the Canon R6 which he uses both at the telescope and with various prime, telephoto, wide-angle and macro lenses for his nature photography. He is also using a ZWO ASI533MC Pro to capture astrophotos and uses PixInsight software for his processing which has allowed him to get everything he can out of his attempts at astrophotography.

He photographs the deep sky from his backyard observatory (Discovery Observatory West) using a Vixen Visac 8" modified catadioptric and a Williams Optics 3" GTF APO. His current visual scope is an Astrosystems 12.5" f/6 TeleKit with digital setting circles. Glen is the co-author, with George R. Kepple of The Night Sky Observer's Guide. He has also earned the status of Master Observer from the Astronomical League. In addition to being a long time member of the Huachuca Astronomy Club, Glen is a member of the Tombstone Art Association and the San Pedro River Arts Council. He exhibits his photos in the Tombstone Gallery.

Ode to Astronomy

By Karen Madtes

Degrees, declination, ascension
have great potential to create tension.
Some of the facts just defy comprehension!
Polaris 2000 times brighter than the sun?
Ha, ha, very funny - tell me another one...

Where else in order to see
you're told not to look at it?
There are times I've felt that
I'd like to throw a book at it!!

How dare I speak with derision
when referring to averted vision?!
Consulting a star atlas
would seem a better decision

I've tried them all - Norton, Cambridge and
Sky and Telescope
Didn't work the way I planned,
I could almost lose hope.

I can really relate to Lost in Space,
it's not so difficult to do.
I'm told there's no direction in space
and I can believe that's true!

I'm sure that it could be worse,
is it a blessing or a curse?
So much to discover and know -
better go for another cuppa joe!!

Welcome our new members

Timothy Millea of Sierra Vista and Peter, Elizabeth and Mason Hooper of Herford joined the club in February. Welcome, we are glad you joined.

Upcoming Outreach

Saturday March 11,
Solar Saturday at Patterson Observatory 9-11 am
Thursday March 23,
Public Night at Patterson Observatory 7:30 pm
Thursday March 30.
CAP Cadets at Patterson Observatory 6:00 pm
Saturday April 8,
Solar Saturday at Patterson Observatory, 9-11 am
Thursday April 13,
AZ Art Academy in Hereford, 7-10 pm
Thursday April 20,
Earth Day at Veterans Park S.V. 10 am to 2 pm
Friday April 21,
Cochise College Expo (tentative) 5:30-7:30 pm
Saturday April 22,
Kartchner Star Party, KCSP, noon to 9 pm
Tuesday, April 25,
Faras Elementary in Pirtleville (Douglas), 7 pm
Thursday April 27,
Public Night at Patterson Observatory, 7:30 pm
Saturday, April 29,
Astronomy Day at the Sierra Vista Library, 10 am to 4 p.m

All HAC members are invited and encouraged to participate in our outreach events. For more information visit the calendar on HacAstro (groups.i.o.) or contact Ted Forte

HAASP Observatory

HAC will be coordinating with the staff at Kartchner Cavern's State park to design and build a publicly accessible observatory at the park. David Roemer will be donating a 16-inch Meade SCT as the inaugural scope. We have scouted a location and our park contact reports that the maintenance team has verified that getting power to the site will not be an issue. All of the appropriate permissions have been requested and the park seems eager to proceed.

HAC members that wish to be involved with the planning and construction should inform Ted Forte so you can be kept in the loop.

Are You New to Astronomy?

By Karen Madtes

As a fairly recent newcomer to astronomy, I would like to encourage the "newbies" to jump in with both feet!! When I joined the HAC in January of 2021, I had three different scopes and couldn't figure out how to get any of them to work very well. I had a cheap "800x" wobbly Galileo 60mm refractor, a 70mm Orion Observer refractor that although I didn't know it, had teeth missing on the focuser track, and an early 70s C5 SCT that has a 5x30 finder and not a red dot in sight. I needed HELP!!

The first club meeting I attended was a Zoom meeting and they were still working out the "technical difficulties", so it wasn't the best of venues. When I asked for help with my scopes, I had to type in the request as I have no camera or microphone on my computer. Fortunately for me, Thomas and Penny Brondum were generous enough to invite me to their home for hands-on assistance. They are so patient and knowledgeable and I think that we have quite a few members who are very able and willing to help if you let them know you need it.

When I joined the club, I wasn't even sure which star was Polaris, the North Star. When I found out, I was pretty disappointed. How are you supposed to guide on something you can't even see/find half the time???!! I have since discovered several very easy ways to solve that by utilizing the "pointer" stars in either the Big Dipper or Casseopeia (the big "W"). I knew about eight constellations which I thought was doing pretty good. I had NO idea there were so many more!!! Many of the 88 need "pointer" stars so you can find them, too, and some require a visit to the Southern Hemisphere. We are very fortunate to live so far South here in Arizona as that enables us to see a lot of the Southern constellations. I had never heard of Arcturus, or Spica (from the Big Dipper, "arc to Arcturus and spike to Spica") The only star I could name in Orion was Betelgeuse.

The first time I went to a HAC event was a public night at the Patterson Observatory. It was SO intimidating!! Here were all these knowledgeable people with big, expensive scopes. I brought my C5 but left it in the car. Truthfully, I was embarrassed to have such a lowly scope that I didn't even know how to use. I almost went back home but I'm so glad I didn't!! Let me say right now that our members do not mean to be intimidating. They just want to share with you the best view of some spectacular heavenly sights that these scopes can offer. You do not have to have a big scope to enjoy astronomy! I LOVE astronomy because there's something for everyone. You can view naked eye, with binoculars, with small, medium or large scopes. There is a lot to learn but the learning is fun!! There are so many great resources - club members, books, magazines, websites, YouTube videos to help you learn - enjoy the journey!! Come, let us help you starting with whatever level you are at now.

The Bucket List – March 2023

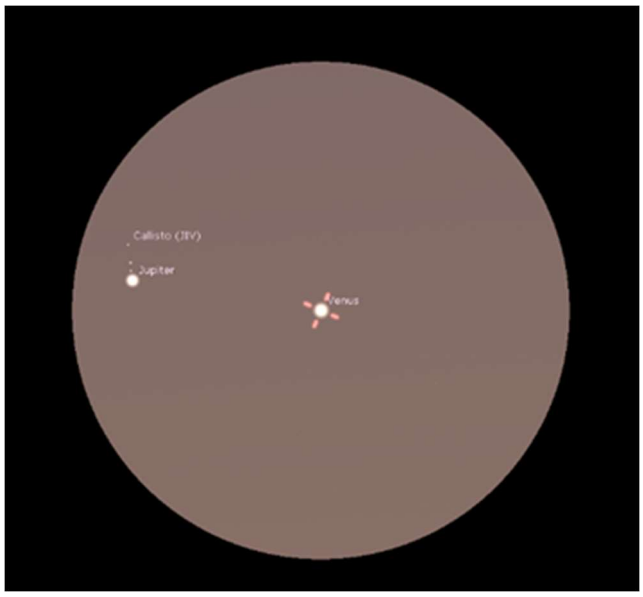
by Vince Sempronio

This column highlights interesting non-seasonal nighttime, and sometimes daytime sky events that the reader may not be aware of and may wish to observer. I'll cover one-off events that are special, rare, or uncommon.

TERM OF THE MONTH: This month's terminology is about the new hemispherically correct words we should now use to describe what we grew up knowing as the Summer and Winter Solstices, and the Spring (Vernal) and Fall (autumnal) Equinoxes. Well, these terms are considered out of vogue since Spring and Summer are from the point of view of the northern hemisphere (how dare we!). Well, the new terms are more somewhat more descriptive since they refer to the direction/position of the Sun. The March equinox is the "Northward Equinox" indicating that the Sun is passing the equator in the northern direction, and likewise the September equinox is now called the "Southward Equinox". The two solstices are now the "Northward" for June and "Southward" for December. Personally, using the same term for the solstices is still misleading since on their respective dates, the Sun is stationary.

IN THE SKY THIS MONTH

March 1st, 6:30pm (MST). Just after sunset towards the west, Venus and Jupiter will be close enough to both be visible in a telescope eyepiece. They are separated by about the width of the full Moon. Can you see Jupiter's moons? Only three are visible, Io, Ganymede, and Callisto in outward order. Shown here is the imagined view through a 5" SCT with a 30mm Plossl eyepiece.



March 23rd, 8:30pm (MST). There is an interesting conjunction of an asteroid and a galaxy. The asteroid (1) Ceres passes across the face of the grand design spiral nebula, M100 in the constellation Coma Berenices. At magnitude 9.3, the galaxy will require a good dark sky to appreciate it, but Ceres is magnitude 7.2, an easy object in

any size telescope. Ceres will appear as a star in one of the outer spiral arms. Perhaps one of our amazing imagers can capture the two together. Ceres may appear as a streak in longer exposures, but that will reinforce the fact that it is moving in relation to the stars. One unexpected side effect of this union is that automated surveys might mistake Ceres for a bright supernova in M100! The red line is the path of Ceres across the sky from left to right.

Messier Marathon – This year, March 18th (primary) or March 25th are the best nights to attempt this ambitious all night event. For more information, here is the Wiki page: https://en.wikipedia.org/wiki/Messier_marathon

TRIVIA QUESTION OF THE MONTH

This month's trivia question is about stars. The stars Aldebaran, Antares, Regulus, and Spica are 1st magnitude or brighter. What is their relationship with the Moon?

The question will also appear as a thread on the HAC user group forum and the first person to answer correctly will receive bragging rights, at least for a month! The user group is located here:

https://hacastro.groups.io/g/main

SCIENCE AT THE PATTERSON

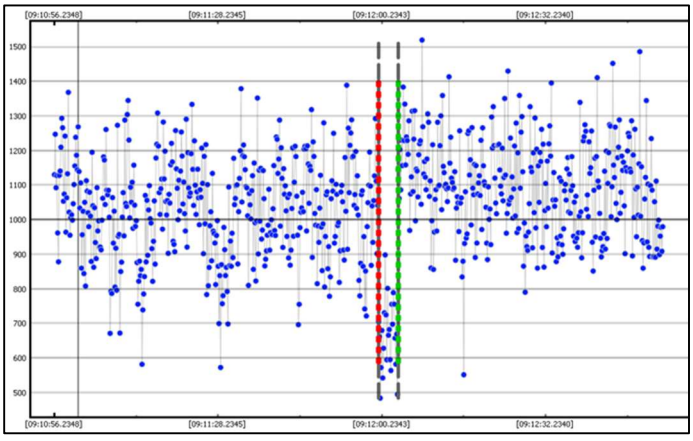
BY VINCE SEMPRONIO

On the early morning hours of Friday, February 17th, my occultation planning software indicated there was a 2:15am occultation of the asteroid (661) Cloelia. Cloelia, at 14th magnitude is a main belt asteroid and at the time of the event was about 2 A.U. away. It would occult star UCAC4 567-043530 in Cancer, also at magnitude 14. This event was too dim for my C8 scope, and since the path crossed over the Sierra Vista area, I planned to use the 20" at the Patterson to record it. Around the time I was planning for this event, an alert was issued to observers there would be an occultation of the binary trans-Neptunian object (38628) Huya that same night. This object, located in the Kuiper belt, is slow moving and don't offer many chances for occultations, so it was a rare opportunity. At 460km wide, this object cast a large shadow, and lucky for me, Sierra Vista was in the path. This event, at 4;15am, now became the featured act with the Cloelia event as the opening act. Huya, at magnitude 19.7 is too dim to image directly using my camera, but the star, UCAC4 411-068931 in Ophiuchus, was visual magnitude 15.9 and well within the capabilities of the 20" and my equipment.

The opening act…

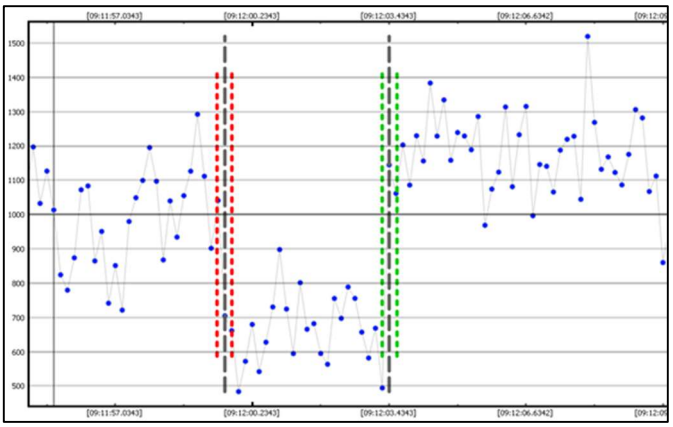
According to Wikipedia, "Cloelia is a member of the dynamic Eos family of asteroids that most likely formed as the result of a collisional breakup of a parent body." It was discovered in 1908 by American astronomer Joel hastings Metcalf.

As occultations go, Cloelia wasn't a difficult event to plan for. At an estimated 40km in diameter, the maximum duration of the event at the center line was 3.5 seconds. The observatory was halfway between the centerline and the path, so I estimated the event duration to be about 2.8s. The big issue for both the night's events was the weather. Clouds were rolling in from the west and I was worried they would arrive before the first event, sending me home early. But the clouds were late to the party and the I was able to find the target area. I had to adjust the exposure time to 160ms per frame (video) in order to see the star. As I mentioned, both objects were 14th magnitude and I was able to see the asteroid, slightly dimmer, slowly approaching the star. When the two objects "merge" on the video, they brighten and if the occultation occurs, the light dims to that of the asteroid. For this event, the change in brightness was only a 0.4 magnitude drop. I have successfully recorded events with less of a drop, so that was not to be a concern. What is always a concern is the probability of success. This is based on the accuracy of the orbit of the asteroid and the accuracy of the location of the star. For this event, I had a 48% probability of success. As we like to say…"so you're saying we have a chance". So, I rolled the dice and bingo, achieved a positive result.

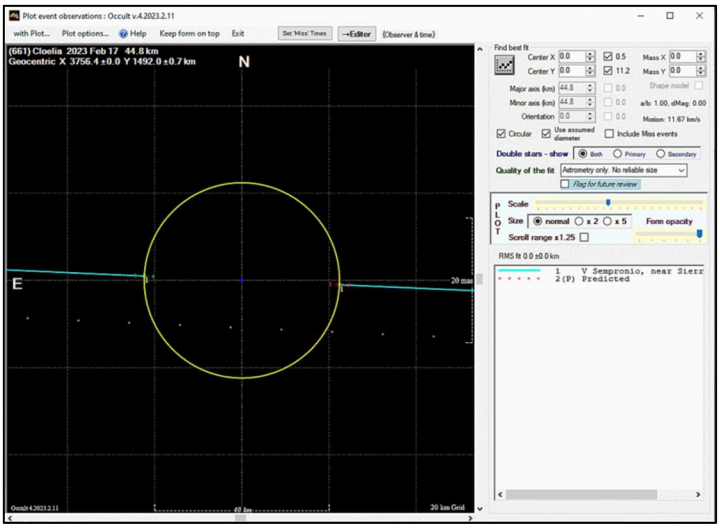


The first figure shows the light curve of the event. The blue dots are the measured intensity of the target star and under ideal conditions, they wouldn't wander up and down so much, but because of the approaching weather front, the

atmosphere was very turbulent. The red/green lines show the calculated times of disappearance and reappearance.



This next figure shows that area enlarged. I don't process these by hand, I use special software that can use complicated statistical techniques to determine the times. My observation recorded a duration of 3.84s, longer than that maximum prediction. How can this happen? Well, it turns out that I was the first person to ever observe an occultation of this asteroid, so prior to that, the size was only an estimation. Being the first to observe it, my observation sets the baseline for the initial estimation of the diameter of the asteroid. Without any other observations, the shape of the asteroid is assumed to be a circle. The next figure is the database entry for the event. The new estimate of the size of the asteroid is 45km, slight larger than the original 40km, which explains the longer duration I recorded. I was also the only person to observe the event that night.



The Main Event….

Well, unfortunately, after Cloelia's warmup act, high thin clouds rolled in, and although I was able to record the event, I had to maximize the exposure time of the camera to 5.12s, which was twice as long as the duration of the event. This renders the data practically useless. I will submit this information to group called "Lucky Stars" who will attempt to find something useful.

Better luck next time.

NASA Night Sky Notes March 2023

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

Spot the Morning and Evening Star: Observe Venus

David Prosper

Venus is usually the brightest planet in our skies, and is called "Earth's Twin" due to its similar size to Earth and its rocky composition. However, Venus is a nightmare version of our planet, featuring a thick, crushing atmosphere of acidic clouds, greenhouse gasses, howling winds, and intense heat at its surface.

This rocky inner world's orbit brings it closer to Earth than any of the other planets, and is the second closest to the Sun after Mercury. Like Mercury, Venus orbits between our planet and the Sun, so Earth-based observers can observe Venus in the morning before sunrise, or in the evening after sunset – but never high in the sky in the middle of the evening, unlike the outer planets. Since Venus is so striking in its twilight appearances, the planet features heavily in sky mythologies worldwide. Venus's bright morning and evening appearances are the origin for its dual nicknames: the Morning Star, and the Evening Star. Some ancient astronomers never made the connection, and assumed the Evening Star and Morning Star were two unrelated objects! Observers can even spot Venus during the daytime, if the sky is very clear and the planet is bright enough. Venus also has phases, similar to the Moon and Mercury. Galileo's observations of Venus's phases helped turn the astronomy world upside down in the early 1600s, and you can see them yourself using a telescope or even a surprisingly low-power pair of binoculars. Warning: Please be very careful when observing Venus with a telescope in the early morning or daytime. Never allow the Sun to enter your instrument's field of view, as you could be permanently blinded.

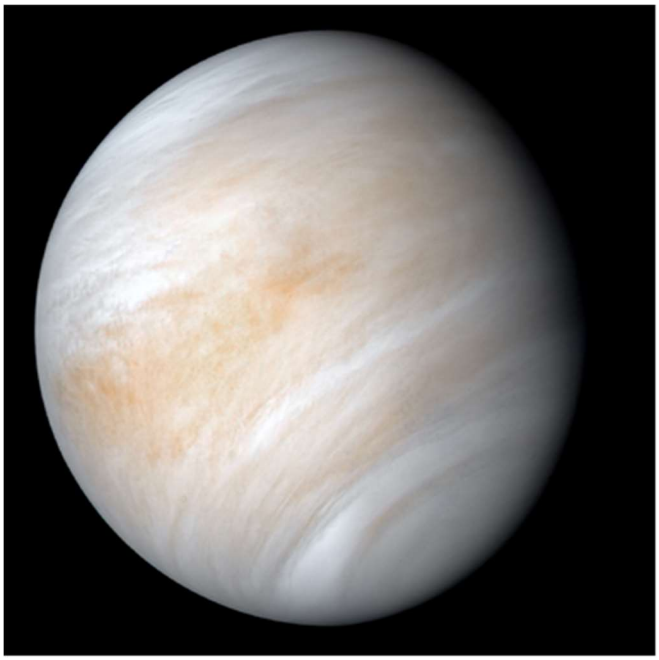
Venus's other moniker of "Earth's Twin" is a bit misleading. In terms of their surface temperatures and atmospheres, Venus and Earth are extremely different! The surface of Venus is warmer than that of Mercury, despite Mercury being many millions of miles closer to the Sun. While Mercury is still a scorching 800 degrees Fahrenheit (427 degrees Celsius),

Venus is even hotter: 900 degrees Fahrenheit (482 degrees Celsius). The vast amount of carbon dioxide in the thick Venusian atmosphere acts as an insulating blanket that retains much of the Sun's heat, creating the runaway greenhouse effect that dominates its present-day climate. The Venusian surface is a crushing 90 Earth atmospheres on top of its absurd temperatures. These extreme conditions mean that the mission life of any past Venusian robotic landers were measured in hours at best – and usually minutes! However, conditions in Venus's upper atmosphere may be much more hospitable, with temperatures and pressures at 30 miles (50 km) above the surface that are much more Earth-like in temperature and pressure. Studies of the Venusian atmosphere, including seasonal appearances of dark streaks and faint signals of suggestive chemistry, intrigue researchers with the possibility that some sort of life may persist in its clouds. But far more evidence is needed to confirm such a claim, since non-biological factors like volcanism and other processes could also be the source for these signals.

Venus's thick sulfuric acid clouds block direct visual observations of its surface from optical telescopes on Earth. Multiwavelength observations from space probes show evidence of active volcanoes and possibly some sort of plate tectonics, but followup missions will be needed to confirm the presence of active volcanism, plate tectonics, and any possible signs of life. In order to do so, NASA is sending two new missions to Venus by the end of this decade: the orbiter VERITAS, which will map the surface in high detail and study the chemistry of its rocks and volcanoes, and DAVINCI+, which will study its atmosphere and possible tectonic surface features via a "descent sphere" that will plunge into Venus's clouds. Follow their development and discover more about Venus at solarsystem.nasa.gov/venus, and of course, continue your exploration of the universe at nasa.gov

Venus and Jupiter continue to move closer together in the evening sky this month. Jupiter will continue its descent towards the horizon while Venus will continue to climb and will be visible in the evenings though mid-summer of 2023. It's a great year for Venus fans!

Image created with assistance from Stellarium



The top layers of Venus's cloud pop in this contrast-enhanced image, reprocessed with modern techniques from Mariner 10 data.

Credit: NASA/JPL-Caltech

Source: https://solarsystem.nasa.gov/resources/2524/newly-processed-views-of-venus-from-mariner-10/

Pictures from HAC Astro

NGC 3338 by Leonard Amburgey

NGC 3338 by Leonard Amburgey

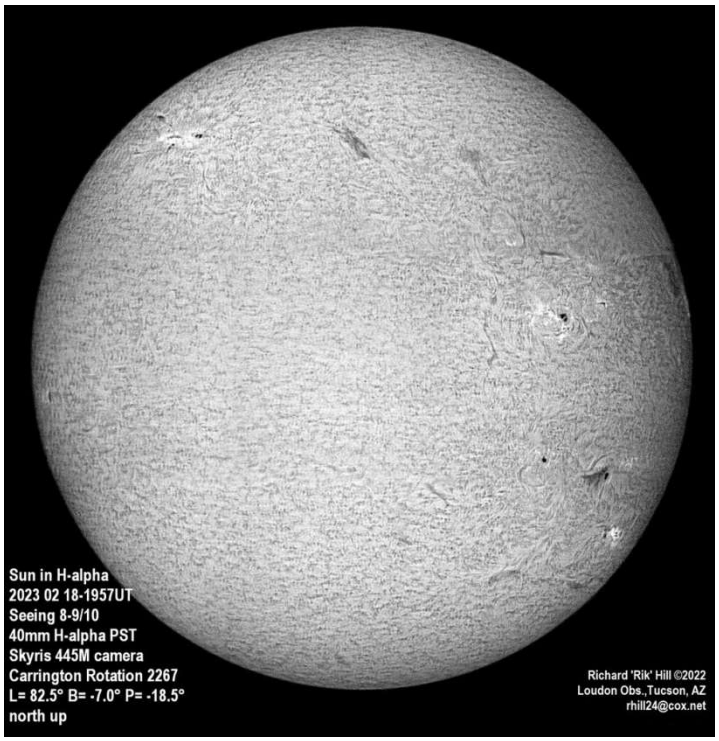
M95 (NGC 3351) by Leonard Amburgey

M33 Triangulum Galaxy by Ed Moss

M74 by Glen Sanner

Comet C/2022 E3 (ZTF) by David Aucain

Comet C/2022 E3 (ZTF) by Jay Leblanc



Sun in H Alpha by Rik Hill

Sun with Prominance by Richard Lighthill

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Farpoint Astronomy *http://www.farpointastro.com/*

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HAC Mar-Apr 2023 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
26	**27** 1:06 AM Mars/Moon 1.1°	**28**	**1 Mar**	**2** Venus/Jupiter 0.5°	**3** HAC Meeting Room A102 7PM	**4**
5	**6**	**7** 5:40 AM	**8**	**9**	**10**	**11** Solar Saturday 9-11AM Patterson
12 Daylight Savings Time Begins	**13**	**14** 7:08 PM	**15**	**16**	**17** 	**18**
19	**20** Vernal Equinox 2:24 PM	**21** 10:23 AM Ceres opposition	**22** Jupiter/Moon 0.5°	**23** Patterson Public Night 7:30 PM	**24** Venus/moon 0.1° Uranus/moon 1.5°	**25**
26	**27**	**28** 8:32 PM Mercury - Jupiter 1.5°	**29**	**30**	**31** Venus-Uranus 1.3°	**1 Apr**
2	**3**	**4**	**5** 10:35PM	**6**	**7** HAC Meeting Room A102 7PM	**8** Solar Saturday 9-11AM Patterson
9	**10**	**11**	**12**	**13** 3:11AM AZ Art Academy Hereford	**14**	**15**
16	**17**	**18**	**19** 10:13PM	**20** Earth Day Vet Park 10a-2p	**21** Cochise College Expo 5:30-7:30p	**22** Kartchner Star Party noon-9p Lyrid meteors
23 Lyrid meteors	**24**	**25** Faras Elementary Pirtleville 7PM	**26**	**27** 3:20PM Patterson Public Night 7:30 PM	**28**	Huachuca Astronomy Club of Southeastern Arizona

All times local MST
Join HacAstro to keep up to date with all of the Huachuca Astronomy Club events
Send an email to: HACAstro+subscribe@groups.io