NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

AUGUST 2023

MARK ORVEK – SPEAKER AT THE AUGUST HAC MEETING

Topic: ChatGPT, Python and Astronomy: Why, What and How Or Using ChatGPT and Python to create Astronomy applications.

Mark Orvek's Brief Auto Biography: HAC Board member-at-large since 2021. I retired in April of 2021. My previous occupation was the VP of Engineering for an international software development company. I have bachelor degrees in Electrical Engineering and Computer Science. I enjoy all aspects of astronomy although my main focus is astrophotography. I have an automated backyard observatory dedicated to astrophotography and I also have portable telescopes I use for visual astronomy, astrophotography and community outreach.

WELCOME OUR NEW MEMBERS

Janet and Ian Macdonald of Hereford, are our newest family membership. Also joining the club in July is Dennis Bauer and Susan Harty both of Sierra Vista and John Mills of Benson. Welcome, we are glad you joined.

HAC'S OUTREACH STATISTICS

Over the past 11 years (Jun 2012-Jun 2023) HAC members have conducted 526 outreach events and presentations that reached an estimated 27,699 people. 131 individual HAC members participated in one or more events contributing approximately 8,269 man-hours of effort. Included are 82 public nights, 65 school field trips and 40 youth group events at the Patterson Observatory. In addition to events at Patterson, HAC members have made 64 school visits and 5 visits to the Boys and Girls Club of Sierra Vista. We've held 14 Astronomy Day events, 9 Earth Day events, 18 Kartchner Star Parties, 4 Cave Fest celebrations, 2 Montezuma Pass Star Parties, I City Star Party, and 4 Rune Winery Star Parties.

Well done HAC! These are impressive numbers that represent a culture of sharing the sky on a grand scale. As members come and go, we are always in need of new outreach stars to continue this fine tradition. Doing outreach is fun, rewarding and important. It's also easy – all you have to do is show up and bring your enthusiasm for astronomy. We hope to see you at an outreach event soon.

DINE UNDER THE STARS

Dine Under the Stars is an annual scholarship fundraiser hosted by the University South Foundation (USF). It is held adjacent to the Patterson Observatory. USF is the owner of the observatory and has a long-standing relationship with HAC, which provides the volunteer operators for the observatory and hosts observing events there. HAC benefits from the relationship by gaining unfettered access to the observatory.

Each year, we call upon HAC members to support the Dine Under the Stars event by volunteering at the observatory and by purchasing tickets to the event. Your purchase of a ticket, not only helps to provide scholarships for local students, but also supports HAC's representatives on the foundation's board of directors.

This year's Dine Under the Stars will be held on Saturday, September 23. Emceed by Sheriff Mark Dannels and radio personality Jeff Davenport, the event includes dinner by Pizzeria Mimosa, music by Desert Fever, live and silent auctions, a 50/50 raffle, and more. Of course, the more includes stargazing at the Patterson.

The University South Foundation has awarded over $850,000 in scholarships to resident scholars since 2011. This year's scholarship cycle will see another $90,000 awarded and it is hoped that the 2024 scholarship award will be even greater. This year's $90K will include a $2,000 scholarship awarded in the name of the Huachuca Astronomy Club! HAC will be represented at scholarship award ceremonies here in Sierra Vista on August 15 and in Douglas on August 17.

Adult tickets for Dine Under the Stars are $65 and are available here: https://www.usfaz.org/dineunderthestars

Speakers Needed for Pie & Sky Astronomy Nights

From Ted Forte

The Bisbee Science Center is looking to incorporate a speaker series into their Pie & Sky astronomy nights, and are looking for speakers who would be interested in visiting Bisbee to give a 1 hr. lecture and join them for some stargazing.

The lectures run 6:00-7:00 pm. PowerPoint would be appropriate. They have both a screen and projector, as well as televisions that can be hooked up to a computer. The talks can take place indoors or outdoors.

They typically get 75-100 people to these events and expect maybe 40-50 would be attending the lectures. Attendees are all ages. The information should be presented in a relatively simple way, so that anyone from middle school to senior citizens can understand. Below are the dates and requested subjects:

Thursday, September 21st, 2023: Constellations, the Milky Way, and Telescope Basics
Tuesday, October 17th: Astronomy Basics
Thursday, October 19th: Dark Skies & Night Ecology
Thursday, November 16th: Archeoastronomy
Thursday, December 14th: Our Solar System
Thursday, January 18th 2024: Star Formation & The Evolution of Stars
Thursday, February 15th: Gravity
Thursday, March 21st: Space Design
Thursday, April 18th: James Webb Telescope & Spectroscopy
Thursday, May 16th: Exoplanets
Thursday, June 20th: Black Holes & Dark Matter

Contact Amie Esteves amie@bisbeesciencelab.org if you are interested.

IDA Southern Arizona chapter meeting (July 12, 2023) summary:

From Emilio Falco, Chair, DarkSky Southern Arizona

After our open-house event in June, we asked participants to indicate their level of interest in being part of chapter activities. Several people indicated their willingness to serve on a board of directors or steering committee, and we invited those people to meet on Wednesday, July 12, at the DarkSky headquarters or online by Zoom. The main outcome of the meeting was that all those attending agreed to participate in some capacity as members of a chapter board. I agreed to chair the new board, and others volunteered to serve in other officer roles.

The group decided to meet again on August 17 to consider bylaws to govern our activities and to begin drafting a strategic plan for the chapter. Having such a plan in place will help us focus our efforts as a chapter on achieving concrete goals toward the protection of dark night skies across southern Arizona. We welcome your input to this process, so please contact me if you have any issues or priorities that you would like us to consider.

Once we have a strategic plan in hand, it will naturally suggest smaller committees, task forces and/or working groups that we might assemble to begin working toward our goals. There will be opportunities for individuals to participate in these ad hoc groups as either chairs or members. As plans begin to take shape, we will keep you informed about these opportunities to serve. And we pledge to keep you informed about our activities from time to time. That will be particularly true when we have 'calls to action' in which we need help amplifying the chapter's voice in regional matters.

It just came to our attention that there is an opportunity to participate in the Firefly Fiesta at Tumacácori National Historical Park on July 25-28. Park Rangers will be available each night to help direct visitors to the firefly viewing areas between 7:30 p.m. and 11:00 p.m. We were asked to participate in the Fiesta to describe the need to preserve dark skies, which are crucial for the survival of fireflies. Three members of the chapter are participating but we could use more. Please contact us for more information at southernarizona@darksky.org.

I invite you to keep in touch with us as we set off on this new course for the chapter. Feel free to contact me any time with questions or concerns.

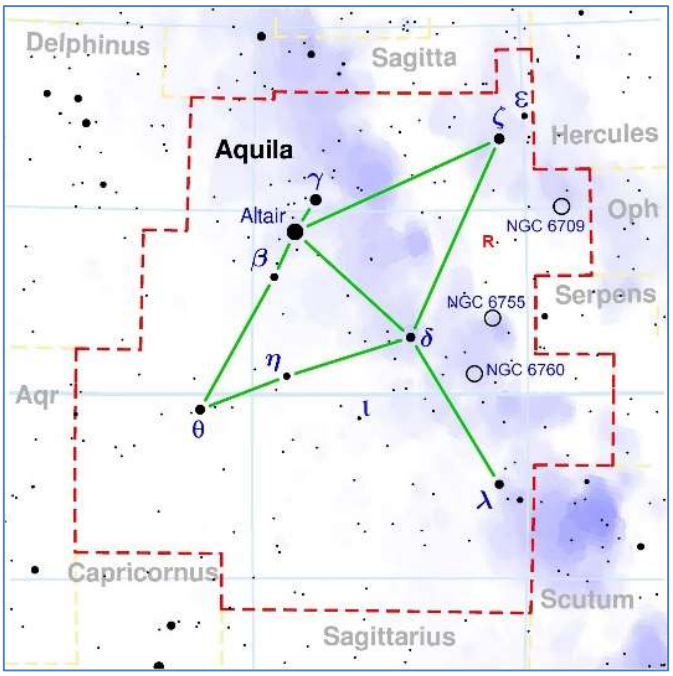
President's Constellation Exploration August 2023

The summer monsoons have arrived at last but in between the clouds I hope you will get out and explore the sky.

This month's exploration is the Aquila constellation, which is located in the northern sky, on the celestial equator. The constellation's name means "the eagle" in Latin. The Aquila constellation represents the eagle of the god Jupiter in Roman mythology. It was first catalogued by the Greek astronomer Ptolemy in the 2nd century.

Aquila is one of the 15 equatorial constellations. Equatorial constellations are the 15 constellations that intersect the celestial equator. These constellations are visible from most

places on Earth but are not circumpolar (visible throughout the year) from any location. The 15 equatorial constellations are: Aquarius, Aquila, Canis Minor, Cetus, Eridanus, Hydra, Leo, Monoceros, Ophiuchus, Orion, Pisces, Serpens, Sextans, Taurus, and Virgo.



The Eagle constellation is easy to spot, flying opposite the celestial Swan (Cygnus). Altair, the constellation's brightest star, forms a prominent asterism known as the Summer Triangle with the luminaries of Cygnus (Deneb) and Lyra (Vega). Aquila is the 22nd biggest star constellation in the sky, occupying an area of 652 square degrees in the fourth quadrant of the northern hemisphere (NQ4).

In Greek mythology, Aquila is identified as the eagle that carried Zeus' thunderbolts. The eagle was dispatched by the god to carry Ganymede, the young Trojan boy Zeus desired, to Olympus so he could be the cupbearer of the gods. Ganymede is represented by the neighboring constellation Aquarius.

In another story, the eagle is found guarding the arrow of Eros (represented by the constellation Sagitta), which hit Zeus and made him love-struck.

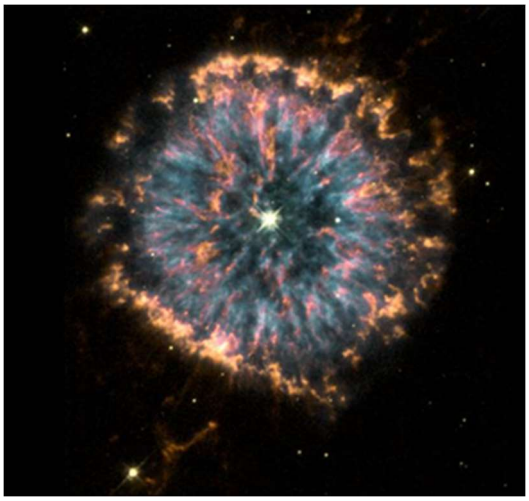
In yet another myth, Aquila represents Aphrodite disguised as an eagle pretending to pursue Zeus (in the form of a swan), so that Zeus' love interest, the goddess Nemesis, would give him shelter. In the story, Zeus later placed the images of the eagle and the swan among the stars to commemorate the event.

Aquila has nine stars with known planets, eight are named stars: Alshain, Altair, Chechia, Libertas, Okab, Petra, Phoenicia, and Tarazed. The brightest star in the constellation is Altair (Alpha Aquilae). Altair is the 12th brightest star in the sky, with an apparent magnitude of 0.77. Lying only 16.8 light-years away, Altair is one of the closest stars to Earth that is visible to the unaided eye. Altair has 1.8 times the mass of the Sun. Because it rotates very rapidly (286 km/s at the equator), Altair's shape is not spherical, but flattened at the poles. The star's proper motion is relatively quick, it shifts by about a degree in 5000 years.

Altair, is derived from the Arabic al-nasr al-ta'ir, which means "flying eagle" or "vulture." Ptolemy called the star Aetus, which is Latin for "eagle." Similarly, both Babylonians and Sumerians called Altair "the eagle star." It is an A-type main sequence star (hydrogen fusing dwarf) that has three visual companions.

Altair is one of the three stars that form the Summer Triangle, an asterism that can be seen directly overhead at mid-northern latitudes in the summer. Altair is the southernmost star in the triangle. The other two stars that form the asterism are Deneb (Alpha Cygni) in the constellation Cygnus and Vega (Alpha Lyrae) in Lyra.

Aquila does not contain any Messier objects. However, the constellation does contain several interesting deep sky objects: the planetary nebulae NGC 6803, NGC 6804, NGC 6781 and the Phantom Streak Nebula (NGC 6741), the open clusters NGC 6709 and NGC 6755, and the dark nebula B143-4. There are two meteor showers associated with the constellation: the June Aquilids and the Epsilon Aquilids.



Of special note in Aquila is the Glowing Eye Nebula or Dandelion puffball (NGC 6751) a planetary nebula about 0.8 light years in diameter, which is about 600 times the size of the solar system. The Glowing Eye lies at an approximate distance of 6,500 light years from Earth and has a visual magnitude of 11.9. In April 2000, an image of the nebula was selected to commemorate the 10th anniversary of the Hubble Space Telescope in orbit.

I hope in between storms there will be time for some night/early morning viewing in August and that you will take the chance to look at Aquila and explore these objects. I look forward to seeing images HAC's Astro photographers can capture of these deep sky objects in Constellation Aquila. Stay cool, stay hydrated and happy viewing!'

The Bucket List –August 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 observe. I'll cover one-off events that are special, rare, or uncommon.

ASTRONOMY TERM OF THE MONTH

This month's term is "barycenter". No, it is not the center of a "berry", nor the center of a person named "Barry". The term "bary" comes from the Ancient Greek word meaning "heavy". The term refers to the center of mass of two or more bodies that orbit each other. If you want to impress your audience, remember to correct those who say, for example, the "The Moon orbits Earth". The correct way to describe it is to say, "The Earth and Moon orbit a common center of mass called the barycenter". Ok, if dealing with 6-year-olds, the Moon orbits the Earth will suffice. The center of mass can lead to some very unintuitive outcomes. For example, the barycenter of the Earth/Moon system is not at the center of the earth (as some will claim), rather it is 1,700km (~1,000 miles) inside the surface of the Earth. This is not a fixed point, it is very dynamic, always in motion as the Moon moves and it is also affected by the Sun, and, ready for your mind to be blown? Every object in the universe affects the position of the barycenter! Gravity is everywhere, and it is why it is so difficult to predict where an object in orbit will be. This is known as the N-body problem. Kepler and Newton gave us the basic orbital laws, but the math needed for solving modern orbital problems is indeed mind blowing!

A SERIES OF LUNAR OCCULTATIONS OF THE SAME OBJECT.

As the moon orbits the Earth, it slowly shifts where it crosses the ecliptic each month. This causes the moon to pass in front of the same object several times over a period of months. This is referred to as a series, and starting this month, the object in question is the bright star Antares. Not all these events are visible in AZ, though. The first in this series of Antares occultations by the moon occurs on August 24th with the disappearance occurring near 7:00pm. This happens in daylight just before sunset.

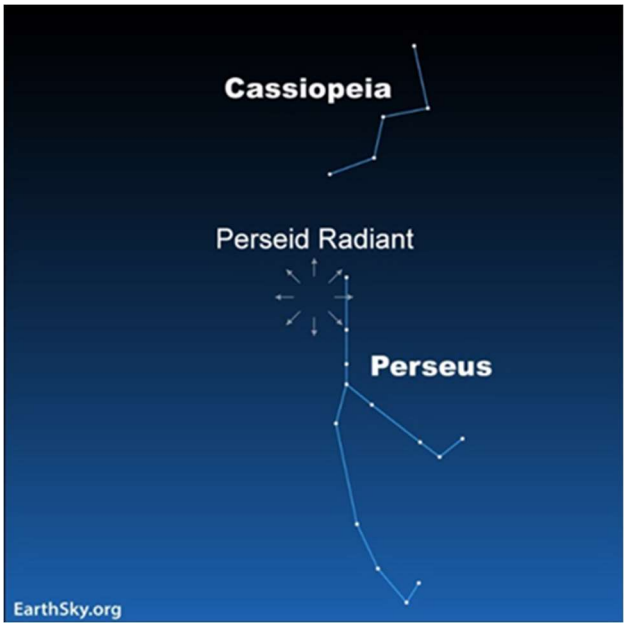
The bright dot near the lower left side of the image is Antares 10 minutes before it disappears behind the moon. The moon, a waxing gibbous, will be near the meridian and will be easily visible in the daytime sky. Antares should be visible in a modest sized scope. As a bonus, Antares, at magnitude +1.0 is a close double star whose companion is magnitude +5.4 and is separated by 2.6". The position angle is 276 degrees which means the companion is directly west of Antares. The companion will disappear first, followed by Antares. But the reverse happens when Antares emerges on the west side of the moon. The companion will appear first, followed by Antares itself. This effect is easily seen in the 16-year-old video by Dave Gault of Australia, a very active occultation observer.

https://www.youtube.com/watch?v=W09GACXhoY4

Unfortunately, the reappearance of Antares will be against the bright limb of the moon, making it difficult to see the companion. As you can see, the sky will be darker around 8:00pm when Antares emerges.

This series of occultations will be around till 2028 so there should be more opportunities in upcoming years.

THE BEST METEORS OF THE YEAR…. probably.



This year's Perseid meteor shower has one outstanding thing going for it. The moon will be a thin waning crescent only 10% illuminated. This means that the shower can be observed well into the wee hours of the morning under a moonless sky. The radiant as shown in the diagram is easy to find. At midnight, the night of August 12th, the radiant is 25°above the northeast horizon. Jupiter will also be visible, 45° to the right, slightly lower in altitude. As the night progresses, the radiant will rise higher and higher and addition meteors should be visible, spreading out in all directions. For those with binoculars, don't forget to look for the Double Cluster in Perseus, only 7° away from the radiant to the upper right. The source of the Perseid meteors is the comet 109P/Swift-Tuttle.

The comet orbits the sun every 133 years. It was discovered in 1862 using a 4.3" refracting telescope. Check out the Wiki page for more detailed information.

https://en.wikipedia.org/wiki/Comet_Swift%E2%80%93Tuttle

For those in dark skies, meteor showers offer a chance for some interesting photographs. The simplest way is to mount a DSLR camera on a tripod, position the radiant in the bottom left or right corner of the frame, and take a 1–2-minute exposure. If the focal length of your lens is short, then you won't see any trailing. You might need to adjust the f-stop and ASA value to keep the image from fogging over from skylight. The next level of meteor photography is to mount the camera on a polar aligned motorized mount and take the same type of photo, but now you can use longer exposure times. Click on the link to read an article from the NASA site for more information.

https://solarsystem.nasa.gov/news/510/how-to-photograph-a-meteor-shower/

While you are out looking for meteors, turn your telescope to Jupiter around 2am on the 13th. Jupiter's moon Ganymede will be very close to the west edge of Jupiter and over the next 45 minutes, it will slip behind Jupiter. The event occurs very near the northern edge of Jupiter, so the disappearance will be slow, and Ganymede will gradually dim until it disappears. Jupiter's apparent diameter is 42" while Ganymede is only 0.5". It will appear as a dot in most scopes.

TRIVIA QUESTION OF THE MONTH

From the clues below, name the astronomer who is the topic of this month's trivia question.

- She was born on August 1st, 1818, on the island of Nantucket, MA. No limericks, please!
- She discovered comet C/1847 T1, which was later named after her.
- She was the first American woman professional astronomer.
- She was appointed professor of astronomy at Vassar College becoming the first female professor of astronomy.
- She has a crater on the moon named after her.
- She was active in the women's suffrage and anti-slavery movements.
- The telescope she and her students used at Vassar College is on display in the Smithsonian's Museum of American History.

For the answer, search the name of the comet!

Viewing this morning (July 25)

By Karen Madtes

I had such a refreshing time this morning - the weather and timing finally cooperated and I was able to do some viewing :) Since the forecast for last night was late night showers, I thought it a good idea to set up in the morning. I set my alarm for 3am, was up and dressed by 3:08, then on to uncover, move and set up my cart, add the base and tube by 3:30. I was so excited that I thought I would just sneak a peek at Alberio even though the scope hadn't had a chance to acclimate, when I realized there was no eyepiece in the scope.

My first target was Alberio as it has been some time since I've seen it. I used a 21mm 68degree, then added a 2x Barlow. I located it in the Telrad, then in the finder scope. When I looked in the eyepiece, it was almost out of view. Evidently the finder scope had gotten bumped so had a fun time trying to switch between them fast enough to realign the finder scope better. Alberio was SO nice - nice separation and vivid colors, very memorable!

Since I was in that area of the sky, I wanted to try for the Coat Hanger (Collinder 399). I remembered from our last public night that it was about halfway between Altair and Vega going away from Cygnus. I found a group of stars that looked like a likely candidate and was trying to impress them on my memory to record on my log. I noted it in the log and when I came back to the scope and looked in the finder, it was very prominently displayed! I didn't have a wider field eyepiece in the rack so just enjoyed the vivid image in the finder.

Next on the agenda was my old buddy, the Owl Cluster (NGC 457). It was very rewarding to find that the stars have stayed in the right place so I can find them where they were before. Checked out the stars in his wings & chest to be better able to tell guests what to look for at public nights. I saw a small star below his right eye that I hadn't noticed before - almost looked like he was winking :) He's such a fun one!

Of course, after that, the logical destination was the Double Cluster (NGC 869 and NGC 884) which was as outstandingly magnificent as always. Thinking about which one I like best but getting distracted by beauty of both. Tomorrow I want to take another look then move over to the Trumpler 2 & Northern area of Perseus.

Looking for the next target, the Pleiades (M45) sparkled at me so I had to check them out. The dipper just fits in the eyepiece of the 21mm and I most enjoy Merope with her little accompanying triangle. I resolved to do some further research and learn the names and locations of the seven

main stars in this constellation. There was a bit of nebulosity which added to their attraction.

I was racing the clock/light as it was 4:25am so I focused on Jupiter and easily saw the belts. Little Io is usually so close but today had acceptable separation. Europa, Ganymede and Callisto (I Eat Grandma's Cookies) were also lined up. I'm not sure which is always the furthest away, but as soon as I get that down, I'll be batting 50%.

Since I looked at Jupiter and remembering David's story of how he got hooked on astronomy by viewing Saturn, I turned the scope to Saturn. The tilt of the rings reminded me how Galileo thought they were little "ears" and it wasn't hard to imagine how he came to that conclusion. I also saw Titan and was trying to remember if it is quite often the same distance/location from it's planet. The clouds started moving up on the Southern horizon from the dome and Saturn would go in and out of focus. Since it was on the far side of 4:30am, the light was coming and my dog needed walking, so reluctantly but refreshed and satisfied, I ended the viewing session with the hopes of additional sights tomorrow.

It was so light at 4:45am when I walked my dog, that all I could see was Jupiter, Capella, Deneb, Vega, Saturn and Spica. I'm thinking 2:30am sounds like a good time to set the alarm for tomorrow.

Credits: Unless otherwise credited, all graphics were generated by the author using Stellarium.

NASA Night Sky Notes August 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!

Super Blue Sturgeon Moon

Vivian White

On August 1st, catch a full Moon rising in the east just 30 minutes after sunset. We are seeing the entire sunlit side of the Moon as it is nearly (but not quite) in line with the Sun and Earth. The Farmers' Almanac calls this month's Moon the "Sturgeon Moon", for the time of year when this giant fish was once abundant in the Great Lakes. Cultures around the world give full Moons special names, often related to growing seasons or celebrations.

As the Moon rises later and later each night, the bright sunlit part appears to get smaller or "wane" - we call this a waning gibbous Moon. About a week later, on August 8th, we see only one half of the Moon alight. At this phase, the Moon rises around midnight and sets around noon. Have you ever seen the Moon in the daytime? You may notice this phase towards the southwest in the morning sky. Hold up a ball or egg beside it and see how the Sun lights up the same part.

By August 16th, the Moon has gone through its crescent phase and is now only showing its dark side towards the Earth. Did you know the dark side and the far side of the Moon are different? The Moon always shows the same face towards Earth due to the gravitational pull of Earth, so the far side of the Moon was only viewed by humans for the first time in 1968 with the Apollo 8 mission. However, the dark side is pointed at us almost all the time. As the Moon orbits the Earth, the sunlit side changes slowly until the full dark side is facing us during a new Moon. When the Moon is just a small crescent, you can sometimes even see the light of an Earthshine reflecting off Earth and lighting up the dark side of the Moon faintly.

Then as the Moon reappears, making a waxing (or growing) crescent Moon, best seen in the afternoons. By the time it reaches the first quarter on August 24th, we see the other half of the Moon lit up. At this point, the Moon passes through Earth's orbit and marks the spot where the Earth was just 3 hours prior. It takes the Earth about 3 hours to move the distance between the Moon and Earth.

The Moon on August 30th is referred to as a blue moon. Blue moons are not actually blue in color of course; it refers to the second full Moon in any month. Since it takes 29.5 days to complete the cycle from full to new and back to full, most months will see only one. But occasionally, you'll fit two into one month, hence the phrase "once in a blue moon." We see a blue moon about once every 3 years on average - next in May 2026. In addition, this full Moon appears larger in the sky than any other full Moon this year - an unofficial supermoon. A supermoon appears larger than average because it is closer in its slightly elliptical orbit. The difference in apparent size between the smallest and largest full Moon is about the size difference between a quarter and a nickel. Even at its largest, you can always cover the whole Moon with your pinky extended at arm's length.

Follow the Moon with us this month and keep a Moon journal if you like - you may be surprised what you discover! moon.nasa.gov/moon-observation

Image of waning crescent Moon shown next to a ball on a stick that is lit by the Sun on the same side as the Moon, with trees and a blue sky in the background. Try this with an egg or any round object when you see the Moon during the day! Credit: Vivian White

Earthshine as seen from the International Space Station with the sun just set - Astronaut Photograph ISS028-E-20073 was taken on July 31, 2011, and is provided by the ISS Crew Earth Observations Facility and the Earth Science and Remote Sensing Unit, Johnson Space Center

For Sale

Dob for Sale

Lola Watts (elle19612010@hotmail.com)

I have a barely used {new in Dec 2022} Dobsonian Synscan telescope that is too complicated for me to use and too heavy for one person to lift. It was a wonderful gift for Christmas but I'm just not into it and it is a shame to have it sit in the garage gathering dust.

It is assembled and comes with manuals. It cost $1600 new, but I'm willing to hear reasonable offers. Please text me at 520 409 4397. As a rule, I don't answer unrecognized phone numbers, so do text me. Thanks!

Mount for Sale

Mark Orvek

For sale is my Celestron CGEMII mount. It was purchased in 2021 and is in excellent condition. It recently had the RA motor replaced by Starizona in Tucson, AZ. The mount is able to handle a 40 lbs payload and features a dual saddle plate. The mount includes the Celestron tripod, NexStar+ hand contoller, polar aignment scope (installed in the mount), 17 lbs counterweight, car / battery adapter power cable and printed manual. I have the original shipping boxes.

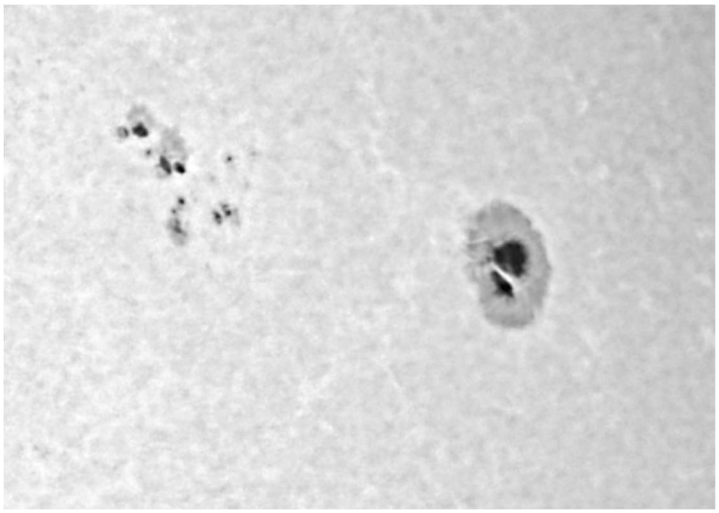
Additional info for specs as well as the manual can be found on the Celestron website (https://www.celestron.com/products/cgem-ii-eq-mount-and-tripod).

I'm selling it because it's a bit heavy for portable use. Having said that, it is well built very stable mount and the goto functionality (star alignment and all-star polar alignment routines in particular) are excellent.

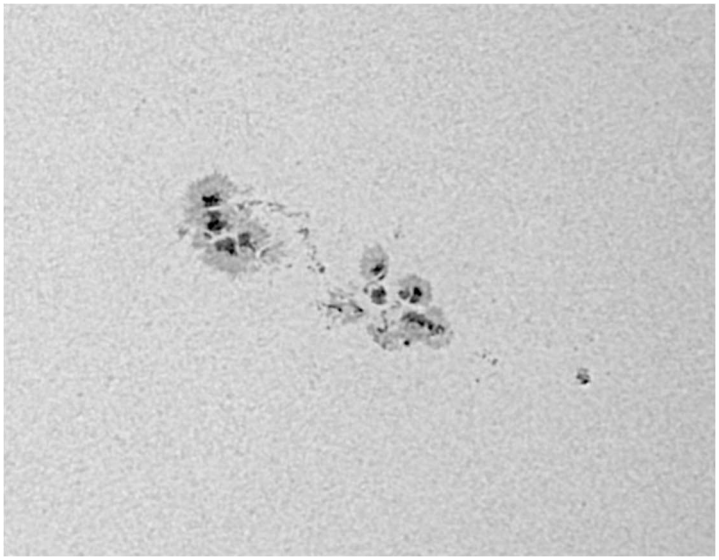
Asking price is $1000.00. Local pickup only please (Southern Arizona). I am willing to drive and meet as well.

I am happy to answer any questions you may have.

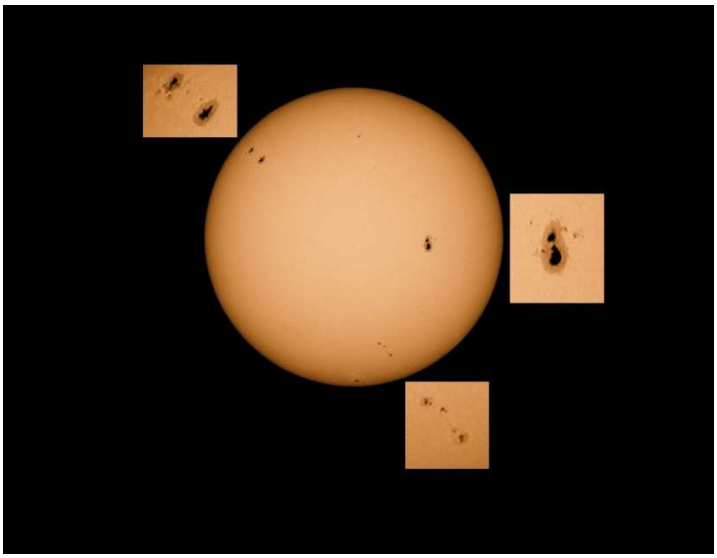
Pictures from HAC Astro



Sunspot group by Richard Lighthill



Sunspot group with possible flair by Richard Lighthill



Sun Spots by JD Maddy

Club Officers and Contacts

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Secretary: *Katherine Zellerbach* ***Treasurer:*** *Ted Forte*

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Facebook: *http://www.facebook.com/HuachucaAstronomyClub*

Email: *info@hacastronomy.org*

HAC Aug-Sep 2023 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
30 Delta Aquariid meteors	**31** Delta Aquariid meteors	**1 Aug** 11:32AM	**2** Moon at Perigee	**3**	**4** HAC Meeting Room A102 7PM	**5**
6	**7**	**8** 3:28 AM	**9**	**10**	**11**	**12** Beginning Astronomy Class Patterson Perseid Meteors
13 Perseid Meteors	**14**	**15**	**16** 2:38AM	**17**	**18**	**19** Beginning Astronomy Class Patterson
20	**21**	**22**	**23**	**24** 2:57AM	**25**	**26** Beginning Astronomy Class Patterson
27 Saturn at Opposition	**28**	**29**	**30** 6:36PM Saturn/Moon 2d	**31**	**Sept 1** HAC Meeting Room A102 7PM	**2**
3	**4** HAPPY LABOR DAY	**5**	**6** 3:21 PM	**7**	**8**	**9** Solar Saturday at Patterson 9AM
10	**11**	**12**	**13**	**14** 6:40PM	**15** Ft Huachuca Home School Group at Patterson 9AM	**16**
17	**18**	**19** Neptune at Opposition Venus greatest brillancy	**20**	**21** Patterson Public Night 7PM	**22** 12:32PM Astronomy Day Autumnal Equinox 11:50PM	**23** Dine Under the Stars 6-9PM Patterson
24 O-Rex Sample Return lands at Utah Test Range	**25** Saturn 3d N of Moon	**26**	**27**	**28**	**29** 2:58 AM	Huachuca Astronomy Club of Southeastern Arizona

All times local MST
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