



NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

SEPTEMBER 2023

JEFF PREGLER – SPEAKER AT THE SEPTEMBER HAC MEETING

Topic: Lighting policies of the City of Sierra Vista

Jeff Pregler, AICP, is a Senior Planner with the City of Sierra Vista. He has been with the City for 23 years. Prior to the City, he was a Planner for Pima County. He graduated from the California State University, Stanislaus in 1998 with Master's Degree in Public Administration.

His presentation will be about the city of Sierra Vista lighting policies in regard to recent additions, existing and future lights at City facilities and rights-of-way, and how the public can provide input in shaping future lighting codes.



WELCOME OUR NEW MEMBERS

Rachelle and her dad Arthur Bartlett of Benson, AZ joined as a family in July and Sally Carpenter of Sierra Vista joined in August. Welcome we are glad you joined!

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 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.

New this year: be sure to visit

<https://www.usfaz.org/dineunderthestars> and check out the amazing vacation packages being offered at the auction. There will also be a local artist, Dara Preciado, who will be doing a painting, live, on site, that will be offered at auction as well.

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

EVENTS AT THE PATTERSON OBSERVATORY

September sees the return of events at the Patterson Observatory. Saturday, September 9 will be our next *Solar Saturday*. We'll set up to observe the sun from 9 to 11 a.m. Then on September 21, we will have our first *Public Night* of the fall. Public night is free but guests must register on line. HAC members are always welcome and do not have to register. Doors open to the public at 7 p.m.

We have only one school field trip scheduled so far but that is likely to change. We'll host students and family members from the Ft. Huachuca Home School Group on Friday Sep 15 from 9 to 11 a.m. Watch the HACAstro group on groups.io for new events as they get scheduled.

KARTCHNER STAR PARTY

The Kartchner Star will be held on Saturday, October 14, 2023 at Kartchner Caverns State Park. We will set up at 8 a.m. to view the partial solar eclipse. First contact is 8:12 a.m., last contact 11:05 a.m.

The guest speaker is Dr. Tyler Robinson and his talk is entitled "*Finding Other Earths*"

(Talk synopsis) Astronomical observations have made it clear that worlds around other stars -- so-called "exoplanets" -- are extremely common. However, we do not yet know if ocean-covered worlds like our own Earth are common or uncommon. Excitingly, NASA's James Webb Space Telescope, and the under-development Habitable Worlds Observatory, will answer the age-old question of whether or not there are Other Earths.

Tyler Robinson is an Associate Professor of Planetary Science and Astronomy at the University of Arizona. Tyler studies planetary atmospheres and specializes in understanding how we can learn about planetary and exoplanetary atmospheres from telescope observations. Recently, Tyler collaborated on the study of two mission concepts that led to the astronomy-wide recommendation that NASA embark on building a space telescope capable of spotting small, rocky worlds around nearby stars.

The talk will be held at 5 p.m. in the Tenen-Tufts theater in the Discovery Center. There will be stargazing after dark.

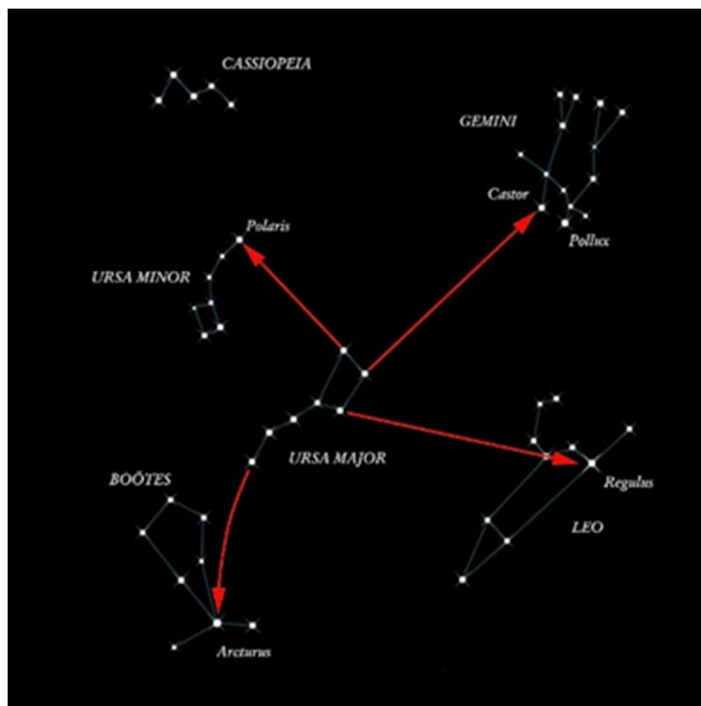
HAC members bringing telescopes to the event are entitled to free park admission.

PRESIDENT'S CONSTELLATION EXPLORATION SEPTEMBER 2023

I thought I would finish off 2023 with an exploration of constellations based on this graphic which shows how to use stars in the big dipper to find four major constellations in the night sky. I will explore one constellation a month starting with Ursa Minor and going clockwise.

Ursa Minor (Latin: 'Lesser Bear') also known as the Little Bear, is a constellation located in the far northern sky. As with the Great Bear, the tail of the Little Bear may also be seen as the handle of a ladle, hence the North American name, Little Dipper: seven stars with four in its bowl like its partner the Big Dipper.

Ursa Minor was one of the 48 constellations listed by the 2nd-century astronomer Ptolemy. Ursa Minor has traditionally been important for navigation, particularly by mariners, because of Polaris being the north pole star. Ursa Minor covers 256 square degrees, it ranks 56th of the 88 constellations in size. Its position in the far northern celestial hemisphere means that the whole constellation is visible only to observers in the northern hemisphere. Within the constellation's borders, there are 39 stars brighter than or equal to apparent magnitude 6.5.



In the Babylonian star catalogues, Ursa Minor was known as the "Wagon of Heaven" associated with the goddess Damkina. It is listed in the MUL.APIN catalogue, compiled around 1000 BC, among the "Stars of Enlil"—that is, the northern sky. The Phoenicians are reported to use for navigation at sea the constellation named Phoinikē. (the Wagon).

The tradition of naming the northern constellations "bears" primarily comes from the Greek, although Homer refers to just a single "bear". The original "bear" is thus Ursa Major, and Ursa Minor was admitted as the second or "Phoenician Bear" only later, due to a suggestion by Thales, to the Greeks, who had been navigating by Ursa Major.

In classical antiquity, the celestial pole was somewhat closer to Beta Ursae Minoris than to Alpha Ursae Minoris, and the entire constellation was taken to indicate the northern direction. Since the medieval period, it has become convenient to use Alpha Ursae Minoris (or "Polaris") as the North Star. (Even though, in the medieval period, Polaris was still several degrees away from the celestial pole.) Now, Polaris is within 1° of the north celestial pole and remains the current Pole star. Its Neo-Latin name of stella polaris was coined only in the early modern period.

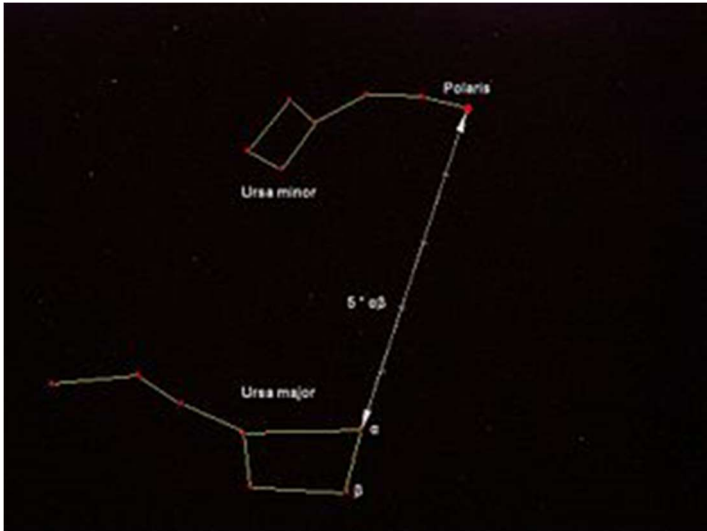
The ancient name of the constellation is Cynosura (Greek Κυνσοῦρα "dog's tail"). The origin of this name is unclear (Ursa Minor being a "dog's tail" would imply that another constellation nearby is "the dog", but no such constellation is known). A suggested reason is that an archaic interpretation of Ursa Major was that of a cow, forming a group with Boötes as herdsman, and Ursa Minor as a dog.

Because Ursa Minor consists of seven stars, the Latin word for "north" is septentrio, from septem (seven) and triones (oxen), from seven oxen driving a plough, which the seven

stars also resemble. This name has also been attached to the main stars of Ursa Major.

In Inuit astronomy, the three brightest stars—Polaris, Kochab and Pherkad—were known as Nuutuittut "never moving", though the term is more frequently used in the singular to refer to Polaris alone. The Pole Star is too high in the sky at far northern latitudes to be of use in navigation. In Chinese astronomy, the main stars of Ursa Minor are divided between two asterisms: Gòuchén (Curved Array) and Běijí (Northern Pole).

The constellation Ursa Minor can be seen by the naked eye. To find it using the Ursa Major, make a line from the outermost Big Dipper stars (sometimes called the "pointers") to Polaris.



Polaris, the brightest star in the constellation Ursa Minor, is a yellow-white supergiant and the brightest Cepheid variable star in the night sky, ranging in apparent magnitude from 1.97 to 2.00. It is located around 432 light-years away from Earth, it has around 6 times the Sun's mass, 2,500 times its luminosity, and 45 times its radius. Polaris is the brightest Cepheid variable star visible from Earth. It is a triple star system, the supergiant primary star having two yellow-white main-sequence star companions that are 17 and 2,400 astronomical units (AU) distant and take 29.6 and 42,000 years respectively to complete one orbit. The other stars in the little dipper have been called the "guardians of the pole star" or "Guardians of The Pole". Planets have been detected orbiting four of the stars in the Little Dipper.

Ursa Minor is rather devoid of deep-sky objects. It contains the Ursa Minor Dwarf, a dwarf spheroidal galaxy, which had a single burst of star formation that took place almost 14 billion years ago and lasted around 2 billion years. NGC 3172 (also known as Polarissima Borealis) is a faint, magnitude-14.9 galaxy that happens to be the closest NGC object to the north celestial pole. NGC 6217 is a barred spiral galaxy located some 67 million light-years away. It has been characterized as a starburst galaxy, which means it is undergoing a high rate of star formation compared with a typical galaxy. And NGC 6251 is an active supergiant

elliptical radio galaxy more than 340 million light-years away from Earth. This galaxy is associated with a gamma-ray source, which has high-energy gamma-ray emission. It is also noted for its one-sided radio jet—one of the brightest known—discovered in 1977.

The Ursids, a prominent meteor shower that occurs in Ursa Minor, peak between December 18 and 25. Its parent body is the comet 8P/Tuttle.

Being able to locate Ursa Minor or the Little Dipper is critical for establishing "North" when setting up yourself and your telescope for night viewing. I hope understanding a little more about the constellation will not only enhance your orientation but pleasure in finding other night sky objects.

THE BUCKET LIST –SEPTEMBER 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.

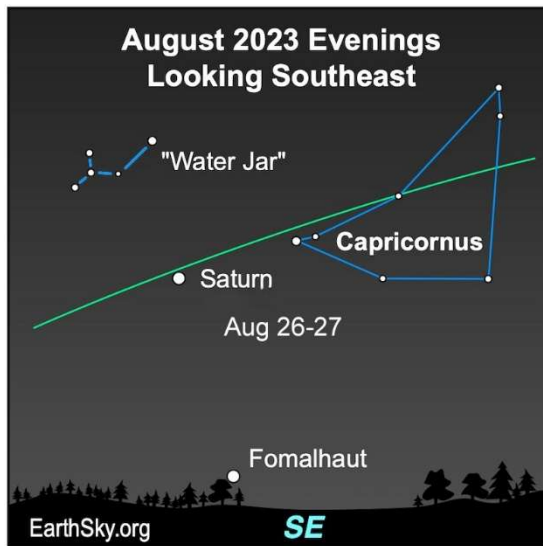
ASTRONOMY TERM OF THE MONTH

This month's term is "Asteroid Populations". No, this does not refer to the total number of asteroids, but rather, populations are groups of asteroids that have the same orbital characteristics. The "Main Belt" asteroids are the most common population of asteroids. These are characterized by having orbits that remain between the orbits of Mars and Jupiter. Trojan asteroids are populations that share an orbit with a larger planet or moon, but the parent body is safe because the location of these asteroids is at the L4 and L5 Lagrangian points of the parent body. The two points are located 60° ahead and 60° behind the parent in its orbit. Forming an equilateral triangle involving the parent body, the asteroid, and the grandparent, which in the case of the Earth is the Sun. The Earth has objects located at these two points, but most are very small and difficult to observe. Jupiter, on the other hand, has a million objects located at its L4 and L5 points. Some of these objects are the targets of the space mission LUCY. Launched in 2021, it will visit 6 of Jupiter's Trojan asteroids in a few years. Near Earth Asteroids, or NEAs are asteroids whose orbits pass close to Earth's orbit. If the asteroid's orbit crosses Earth's, then it is referred to as an Earth Crosser. A few of the NEAs are the remains of extinct comets, but most are regular asteroids that were dislodged by gravitational interactions with Jupiter. Thanks a lot, Jupiter. Because scientists are not satisfied with just one category of NEAs there are four sub-categories. These are named Atiras, Atens, Apollos, and Amors. Their differences have to do with the differences in their orbital parameters. These are just a few examples of Asteroid Populations. There are many more.

IN THE SKY

Saturn reached opposition and brightest on August 27th.

Located in Aquarius, it rises low in the southeast skies and on the 1st of September at 10 pm (MST) it can be seen due south, 20° above the slightly dimmer star Fomalhaut. Light from Saturn takes



73 minutes to reach us at opposition. The “apparent” tilt of Saturn’s rings is lessening, and a year from now they will be barely visible. Contrary to popular belief, the tilt of Saturn’s rings does not change, rather we here on Earth are just seeing them from a different orientation. How the rings appear changes as Saturn rotates around the Sun. It takes Saturn almost 30 years to orbit the sun, so every 15 years or so, the rings appear edge on because we are seeing them at the time of Saturn’s equinoxes. When Saturn is near its solstices, we see the rings face-on in all their glory. This effect is no different than how the seasons change here on Earth. The Earth’s tilt is 23.5°, whereas Saturn’s is around 26.7°. If Saturn had no axial tilt, we would see the rings edge-on almost all the time, except for the effects of orbital tilt.

and shines around magnitude 6 in the northeast. Venus is further east as a reference point.

On the morning of September 9th at 5am, the waning crescent Moon will be near Castor and Pollux in Gemini.

It just seemed like we were enjoying Venus in the evening sky, but now it is it back to the eastern morning sky. It will be at maximum brightness on the morning of the 18th as it speeds ahead of us towards the far side of the Sun

On the 26th of September, look for the fat gibbous Moon just below Saturn in the southeast sky around 8:30 pm.

TRIVIA QUESTION OF THE MONTH

This is an easy one. Name the three stars that make up both the Summer and Winter Triangles.

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

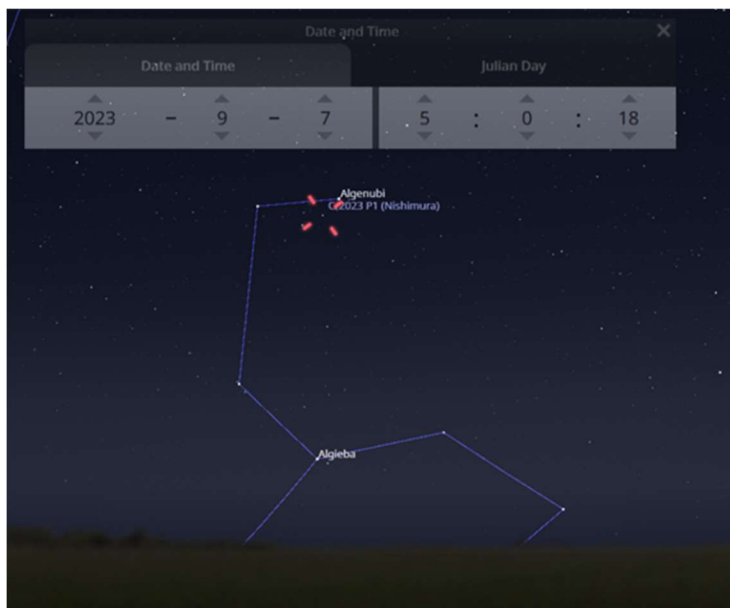
WONDERFUL ASTRONOMY EXPERIENCES – THE ANTARES OCCULTATION

BY KAREN MADTES

Thanks so much to Vince for the reminder about the Antares occultation! It seems like so many times when there's a special astronomy event, SOMETHING prevents you from being able to enjoy it :(It may be an early work schedule the next morning, a previous commitment, clouds, rain, a blocked view, an unexpected obligation, etc. I set my alarm to take my scope out at 6:30pm in time to acclimate for the anticipated 6:54pm event. There were a lot of clouds at that time. There were several clear areas, too, but I couldn't find the MOON! I went to several different areas of my yard peeking between trees, over houses - I knew it was big and it was up there in the South so I went out front to see if maybe it could be seen from there, but no luck. When I turned around to go back into the backyard, there it was!!

However, by this time it was about 7pm so the moon had been cloud covered from where I was viewing at the time of occultation. That was pretty discouraging to have missed it but I still hoped to see Antares re-emerge in "about 50 minutes". I enjoyed looking at the moon, did some sketching, trying to keep a close eye on the bright edge of the limb so I wouldn't miss it. Went in the house and put on a long sleeve shirt to try for some mosquito protection. I don't think it was really that hot, but with a long sleeve shirt, jeans and a hoodie on, it was uncomfortable. I felt like a heated mosquito magnet for sure!

Around 6:45pm I started to be extra vigilant about patrolling the limb. The "50 minutes" came and went and I wondered if somehow I had missed it and wondered if it was really worth it sweating it out. I even looked naked eye and saw a star to the West of the moon so scoped it out and decided it wasn't red enough to be Antares. I decided to give it until 8pm and



Comet C/2023 P1 (Nishimura). Probably the easiest way to see this new comet is to use a phone or PC app to provide the current RA/Dec of the comet and then use a “goto” telescope to seek it. This makes it easy to find on any date. The best date to see it with star hopping is at 5am on September 7th when the comet will be 45’ away from the star Algenubi, epsilon Leo. The comet is 23° above the horizon

then go in. Sure enough, at VERY close to 8pm I SAW it - I saw Antares come out from behind the moon!!! It was VERY impressive!! I could hardly believe it at first but I continued to see this "diamond" separating from the moon and even got a few photos with my camera phone. They're not the best but they are definitive :) I was convinced as soon as I was sure that I was seeing what I had hoped to see, that it WAS worth it! Even though my left eye was half blind from staring at the bright moon for so long, I was still quite thrilled to have been able to see this wonderful sight.

I think astronomy is so much fun!!!

MORNING VIEWING REPORT FOR 08/25/2023

BY KAREN MADTES

3:25am It was 67degrees when I started viewing at 3:25am. I had been researching the target of NGC 2169 which is the "37"/"LE" open cluster around Orion's elbow. Orion was easy to find but the first stop HAD to be M42! I was using a 21mm 68 degree eyepiece in my 8" Orion Skyquest Dobsonian telescope. Once you've been there a couple times, it's not hard to access this target. I focused in on the Trapezium and it looked nice but smaller than I remembered so I inserted the 2X Barlow for a closer look, which helped a little. I think the difference is where I'm looking at Orion in the sky. He is fairly low in the Eastern sky the month of August in the morning. I am remembering looking at him much higher in the Southern sky toward the end of the year when he's visible in the night sky and probably closer? I also tried the SVBony 15mm 68 degree eyepiece with the Barlow. It was somewhat more clear in the 15mm but seemed to move significantly faster! I was wanting to get a good look and it kept moving across the field of view too fast :) Made a little sketch noting where the fish mouth was and denoting the various brightness of the different stars in the Trapezium.

Wanted to look for M41 in Canis Major but it was behind a tree at this time.

3:45am Back to the 21mm, which is my standard eyepiece, I next moved on to M45, the Pleiades. It was (they were) BEAUTIFUL! I can JUST get them all to fit into the 68 degree field of this eyepiece. I had been working on remembering the names of the 7 stars and I remembered them all, but was unsure of which stars were the ones with names on the right side of the "dipper". I don't understand why they picked certain stars to be named and others to remain nameless that seem just as bright.

4:00am Having recently written a poem about the Hyades and Pleiades, I skipped down to the Hyades. This is the first time that I have really seen them. I try to see them naked eye but they hide from me:) I collected them all in the field of view and realized that although it's hard not to compare them to the Pleiades, it's not really a fair comparison. I made a sketch and to me, they look kind of like a bird in flight.

4:15 Remembered I was after NGC 2169 before I got "diverted" and tried to find it. I thought I could see it in the finder so looked into the eyepiece. By the time I wrapped my brain around the upside down or reverse image thing, I still wasn't sure if I was in the right place or not. I sketched a distinctive star pattern nearby and plan to refer to the atlas to validate if that was the right spot.

4:30 - noticed a beginning brightness on the Eastern horizon so moved to Northern sky.

4:30 Swung around to Cassiopeia and NGC 457, which I call the Owl Cluster (also known as ET Cluster, Dragonfly Cluster, etc.) This is one of my favorites that I credit Thomas Brondum introducing to me. It is a nice size, has a distinctive shape, and is another easy find. I started out with the 21mm then added the Barlow. The Owl will just fit in the field of view with the Barlow. I had heard that you could see the outline of the owl's body and when I looked for that feature, decided it depended on your point of view. I attribute the brighter stars as chest feathers and see the owl from the front. There are fainter stars that COULD be made out as an outline of the body. If the brighter stars are an outline then the owl is sideways, but since owls can swivel their heads quite easily, this is entirely possible.

4:40 I usually follow the Owl with the Double Cluster since it is so close and SO nice! It was MARVELOUS! SO FULL! The stars were very clear and rich. Both clusters fit nicely in the 21mm. I just couldn't decide if I liked NGC 884 or NGC 869 best as they both have so much to offer.

4:45 M41 I think I found it but between the sky beginning to brighten, the street light to the Southeast of my yard and some tall cypress trees plus being close to the horizon, it was really too light to tell. I guess I have to wait another month or so before I can get a good look at it. It has a very unique pattern that is hard to sketch but easy to recognize. I am looking forward to that because when I can see the Dog's Heart (my name for it) I will also be able to view NGC 2362, the Jumping Bean - LOL!

5:00 Jupiter Looked good so inserted Barlow. Sketched rings and moon locations

5:15 Ended with Venus and what a spectacular finish - looked like a solar eclipse!! The lighted area looked like it was on fire - amazing!

COSMIC CAMPGROUND

Did you know that on Hwy 180 in New Mexico, just North of Silver City is the first International Dark-Sky Association designated campground.

In 2016 this Dark Sky Sanctuary, located on 3-1/2 acres is designated as the darkest skies in North America. It features a 360° unobstructed view of the night sky (nearest lights 40 miles away).

This campground features four concrete telescope observation pads, open 24 hours a day, no reservations needed, open 7 days a week, no fees! They have restrooms too. This area is called "Cosmic Campground" an International Dark Sky Sanctuary and it is located in the Gila National Forest.

Phone number for more information is (575) 539-2481 in the Glenwood New Mexico District.

THE HYADES

BY KAREN MADTES

I have a confession to make about the Hyades
that I can hide no longer,
It is a weak area
where I wish I were stronger.
The Hyades are high - this is true,
however, the Hyades hide from me - they DO!!

The books say "naked eye" is all it takes
to see these Pleiades relations.
But looking in the area around Aldebaran,
I only see consternation!!
These "twin" stories might raise doubts
about the Greek's imagination

Their history is like the other,
same father, different mother.
They were thrown into the heavens
for crying about their brother.
Are there five or seven stars to behold?
Where does that number come from - is it polled?

What can I do to improve my view?
Eye exercises? Eat carrots? I haven't a clue...
There are so many other beautiful things to see,
I think for now I'll just let it be.

BOOK REVIEW - "THE ELEPHANT IN THE UNIVERSE"¹- OVER A HUNDRED YEAR SEARCH FOR DARK MATTER BY GOVERT SCHILLING

REVIEWED BY KAREN PEITSMAYER

I really enjoyed reading this book, which covers a wealth of astronomical observations, theories and computer simulations. Dark Matter can be reconciled with all these various methods of measurement. Also, many physicists that have been searching for Dark Matter, revealed their ideas that have been brought to the table.

In this easily understandable book, it gives a picture of the history and current status of the ongoing research. This book was released and published in 2022 and I thoroughly enjoyed and learned a lot from this well written publication.



NASA NIGHT SKY NOTES SEPTEMBER 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!

LOOKING BEYOND THE STARS

BRIAN KRUSE

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way Galaxy. And while the amount of stars visible from a dark sky location seems immense, the actual number is measurable only in the thousands. But what lies between the stars and why can't we see it? Both the Hubble telescope and the James Webb Space Telescope (Webb) have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way.

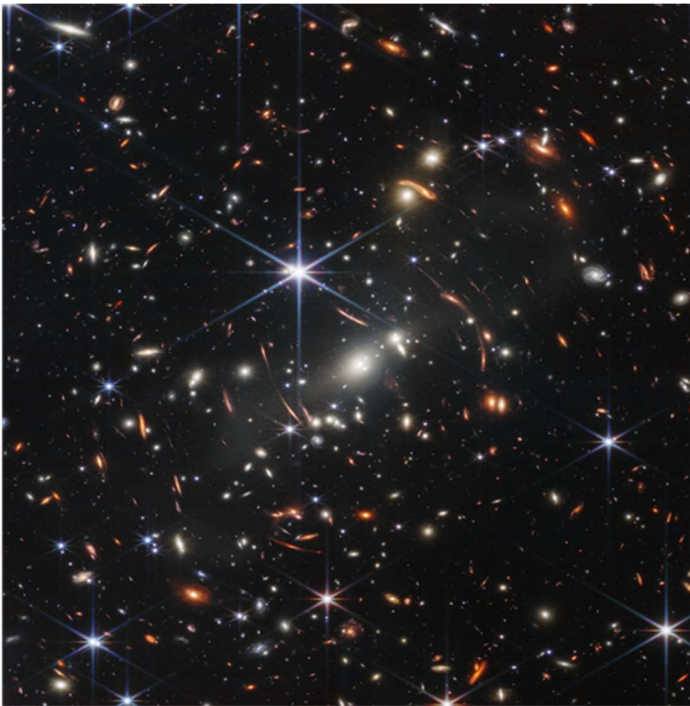
So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots. Many philosophers and astronomers have considered this paradox. However, it has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

It was not until the 1960s with the discovery of the Cosmic Microwave Background that the debate was finally settled, though various lines of evidence for an evolving universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic universe, not eternal and unchanging as previously thought. Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this led to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with

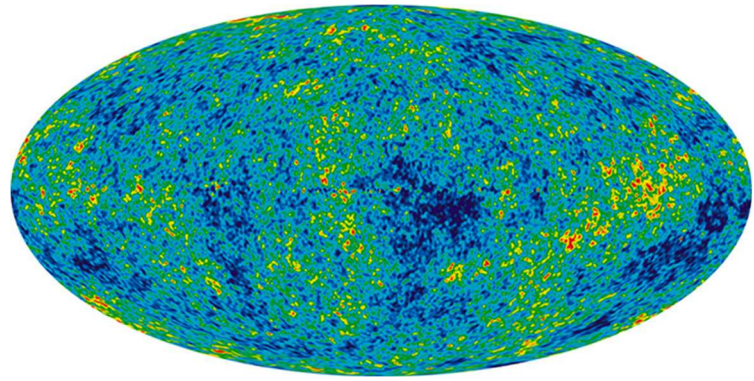
the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the longer wavelengths of the electromagnetic spectrum. So the farther an object is from us, the redder it appears. The Webb telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wavelengths, where it is stretched into the radio and microwave portions of the spectrum. The farther back we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.

The next time you look up at the stars at night, turn your attention to the darkness between the stars, and ponder how you are seeing the result of a dynamic, evolving Universe.



NASA's James Webb Space Telescope has produced the deepest and sharpest infrared image of the distant universe to date. Known as Webb's First Deep Field, this image of galaxy cluster SMACS 0723 is overflowing with detail. This slice of the vast universe is approximately the size of a grain of sand held at arm's length by someone on the ground. (Image Credit: NASA, ESA, CSA, STScI)

<https://bit.ly/webbdeep>



The oldest light in the universe, called the cosmic microwave background, as observed by the Planck space telescope is shown in the oval sky map. An artist's concept of Planck is next to the map. The cosmic microwave background was imprinted on the sky when the universe was just 380,000 years old. It shows tiny temperature fluctuations that correspond to regions of slightly different densities, representing the seeds of all future structure: the stars and galaxies of today. (Image credit: ESA and the Planck Collaboration - D. Ducros)

<https://go.nasa.gov/3qC4G5q>

PETAVIUS

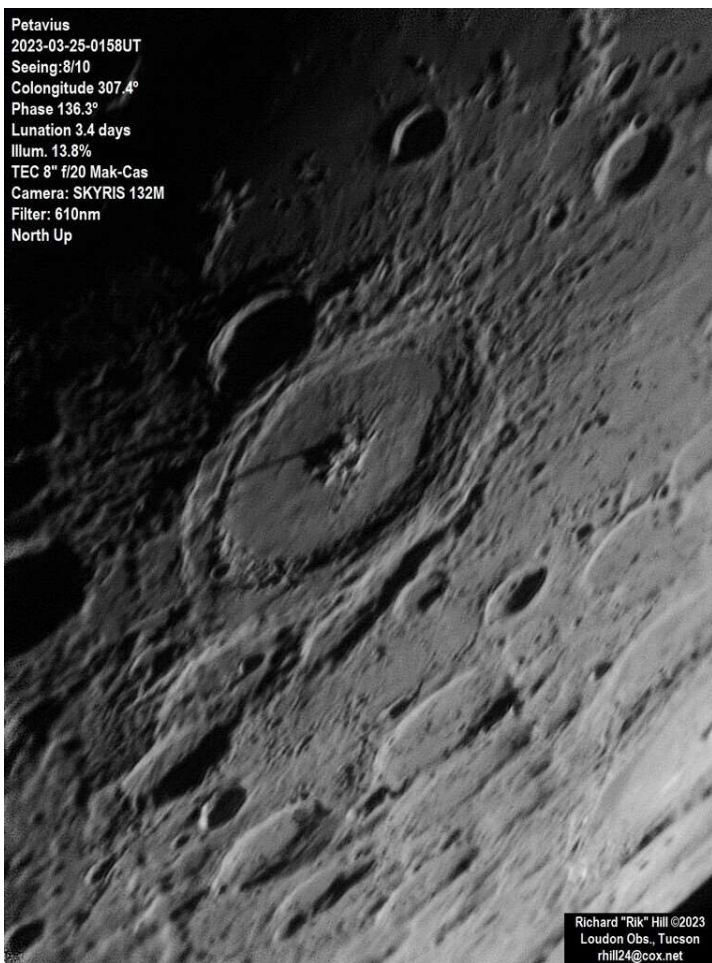
BY RIK HILL

Located just east of the southern lobe of Mare Fecunditatis, is this beautiful 182km diameter crater Petavius a favorite for all us amateurs as the crescent Moon climbs into our twilight skies at the beginning of each lunation. The beautiful terraced walls and the grand rille (or rima) going from the central peak to the southern wall catches the eye right away. The walls of this crater are rather wide for the diameter and beautifully terraced. Another rima, part of the Rimae Petavius system, is on north side of the central peaks to the upper right in this image. Ejecta splash can be seen to the north and south of this crater indicating the violence of the impact. I always enjoyed seeing all these features in my 2.4" Tasco refractor in the early 1960s. I first read about this crater in Patrick Moore's book Survey of The Moon the second printing of which came out in 1963 (this was well before he was "Sir Patrick") A few years later this was the first identifiable lunar formation I ever photographed, holding a camera to the eyepiece of my RV-6 reflector telescope (6" f/9).

Notice on the east wall of Petavius (below in this image) the elongated walled plain, Palitzsch an often overlooked "extraordinary formation" as stated by Elger. He described it as "a great trough or a deep elongated gorge" visible in smaller telescopes. It's width is 20km at the widest and length over 100km as measured on LROC QuickMap and is likely the merger of two or more craters modified by the later impacts.

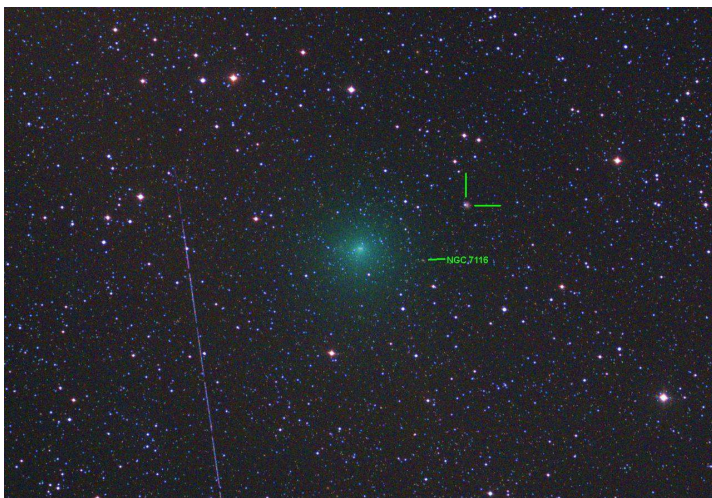
Three days after full moon you can get another spectacular view of this crater and several more near it when the

colongitude is near 117°. No matter when, Petavius never disappoints.

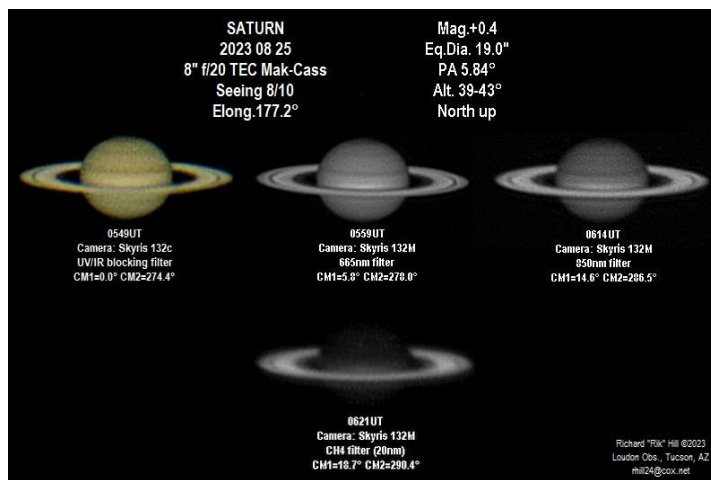


This image was a stack of an 1800 frame AVI using AVIStack2 (IDL) and finish processed with GIMP and IrfanView.

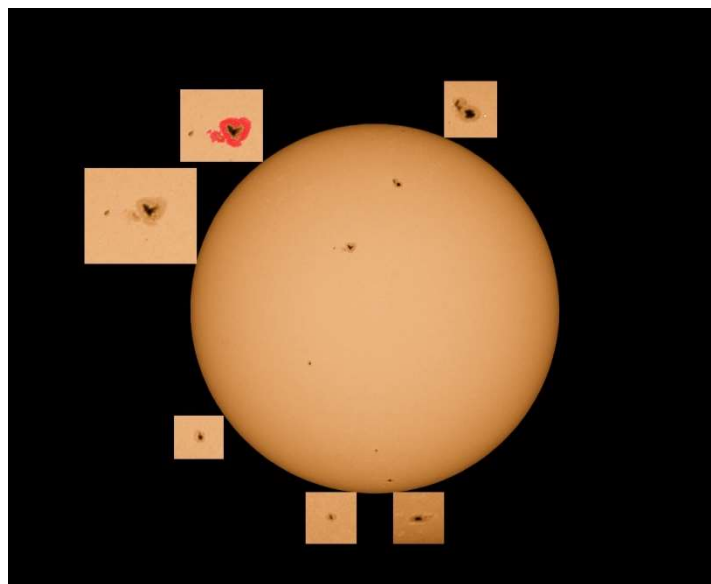
PICTURES FROM HAC ASTRO



Comet Nishimuri by JD Maddy



Saturn by Rik Hill



Sun Spots by JD Maddy

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HAC Sep Oct 2023 Calendar of Events

SU	MO	TU	WE	TH	FR	SA
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 brilliancy	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	30
1 OCT	2	3	4	5	6  6:48 AM HAC Meeting Room A102 7PM	7
8	9  Columbus Day	10	11	12	13	14  10:55AM Kartchner Star Party. 8:00 AM Annular Eclipse
15	16	17	18	19 Patterson Public Night 6:30PM	20	21  8:29 PM Orionid Meteors
22 Orionid Meteors	23 Venus western elongation	24	25	26	27	

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