NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

OCTOBER 2024

OCTOBER'S HAC MEETING SPEAKER

The speaker at this month's meeting is Dr. Aaron Meisner, who will speak on the topic "Crowdsourcing the Hunt for Nearby Worlds". In 2010, he graduated from Standford University with a degree in Physics and received his PhD in Physics from Harvard University in 2015. He is currently an Associate Astronomer at NSF's NOIRLab (formally named the National Optical-Infrared Astronomy Research Laboratory). Please join our speaker for dinner at the Applebee's in Sierra Vista at 5pm, October 18th.

WELCOME OUR NEW MEMBERS

Larry Stein of Benson, the Bowling family (Angie, Jason, Seth and Grace), and the Kemp family (Lora and Robert) both of Sierra Vista, and Caroline Whitehill of Patagonia joined HAC in September. Welcome, we are glad you joined.

HAC DUES REMINDER

Most HAC memberships expire in December. The treasurer will gladly accept your 2025 dues payment at any of the remaining meetings this year for anyone that wants to take care of things early. Dues are $35 Family and $25 Regular ($25 and $20 for active-duty military). Full time students pay $10. There are five options to pay your dues:

1. You can pay your dues in person by cash or check made out to Huachuca Astronomy Club. See the treasurer, Ted Forte, at a meeting or event.
2. You can mail your dues check to the Huachuca Astronomy Club PO Box 922, Sierra Vista AZ 85636
3. You can pay online by visiting www.hacastronomy.org and pulling down the membership menu. You'll be directed to Pay Pal where you can use your Pay Pal account OR your credit card.
4. If you have a Pay Pal account, you can use PayPal Direct to send your payment to paypal@hacastronomy.org
5. If you have a Zelle account with your bank, you can make a dues payment by transferring funds to twforte@powerc.net

2025 BOARD CANDIDATES AND GENERAL ELECTION

BY JAMES REESE

The election for our 2024 Board of Directors is coming soon. The election process is spelled out in the HAC Constitution and By-Laws. In this article, I refer to key sections regarding the election process.

The Nominating Committee (consisting of Mark Orvek and myself) for the 2025 HAC Board is in the process of soliciting candidates for the 2025 Board of Directors.

These are the Board of Director positions to be filled (8 members in total):

- Officers Candidates and Nominees
  - President: Penny Brondum (nominee)
  - Vice President: open for nominations
  - Secretary: open for nominations
  - Treasurer: Ted Forte (nominee)
- Members-at-Large: (4 total)
  - Vince Sempronio (nominee)
  - Mike Morrison (nominee)
  - Gary Grue (nominee)
  - Richard Lighthill (nominee)
- Past President: David Roemer

Nominations for write-in candidates from the floor will be accepted at the November 15th general meeting. If there are additional nominees for any of the Officer positions or more than 4 nominees for Member-at-Large positions, we will follow the procedure stated in the Constitution (as noted

above). The official vote for the 2025 Board of Directors will take place at the November 15th general member meeting.

Patterson Observatory 20th Anniversary Celebration

by Penny Brondum & Ted Forte

Penny Brondum writes...

On September 5th we celebrated the 20th Anniversary of the Patterson Observatory. For those who could not make it, here are a few highlights regarding the Huachuca Astronomy Club (HAC) and the Patterson Observatory owned by the University South Foundation (USF).

David Patterson, for whom the observatory was named, was a HAC founding member and its first president. The 20" Ritchey–Chrétien telescope in the observatory was from the generosity of HAC member Dave Healy. HAC members Doug Snyder and Tim Doyle were foundation board members at the time and strong advocates for the observatory's construction and currently 4 HAC members serve on the USF board.

Over the last 20 years, HAC volunteers have donated almost 9,200 hours toward outreach at the Patterson to well over 22,000 people at more than 500 events. This includes about 180 public nights, at least 25 different public elementary to High schools (nearly all of them multiple times) as well as many home school groups and a few of the private academies in Cochise County. In addition to schools, HAC has hosted: 4H Club, Boys & Girls Club, Boy Scouts, Girl Scouts, Cub Scouts, CAP Cadets, Italian Exchange Students, Sister City Students, church groups, the Car Club, a hiker's club and the Italian Club. We have also conducted multiple astronomy classes for adults.

HAC has also supported 21 Dine Under the Stars events as well as many of the "Cocoa with Santa" holiday galas, participated in a half dozen Cochise College Math and Science expos at the Patterson.

HAC and the Patterson have hosted community events like Business at Twilight and the University of Arizona Family Day, private tours and viewings; for travel writers and other journalists for the Tourism Commissions for both Cochise County and Sierra Vista, student teachers, local dignitaries and university of Arizona staff.

HAC has conducted NASA events with multiple launch parties, support to the University of Arizona's OSIRIS REx Asteroid Sample Return Mission for more than a decade. In addition, we have conducted several events associated with that mission plus eclipse watches, transit watches, observe the moon nights, and National Astronomy Days.

HAC has hosted a half dozen telescope clinics and about as many astronomy equipment swap meets at Patterson.

HAC members have used the Patterson telescope for asteroid search sky surveys, variable star photometry. WE also participated in Project Asteroid for the Lunar and Planetary Laboratory, participated in the 4P Comet Observing Program for the Planetary Science Institute, participated in the international comet ISON observing campaign, participated in an international pro-am collaboration working on TESS objects of interest, and imaged asteroid occultations for the International Occultation Timing Association (IOTA).

HAC members have also invested over 1,800 hours in telescope maintenance and repair plus upgrades to the computer and related systems.

It is exciting that HAC members continue to learn from each other, share their skills and knowledge thru observing events, work together to promote astronomy and dark sky education. HAC is an association of likeminded enthusiasts who enjoy sharing astronomy and our passion for the night sky.

Ted Forte writes...

About 50 people, including more than a dozen HAC members, attended a reception celebrating the 20th anniversary of the Patterson Observatory on September 5th. The University of Arizona's College of Applied Science and Technology (CAST) set up the Judy A. Gignac center for the event and provided the AV support.

The University South Foundation (USF), owner of the Patterson Observatory conducted the event and provided light refreshments for the crowd who enjoyed fresh panini and salad from Pizzeria Mimosa.

USF president Callie Groth made introductory remarks that described how the observatory came to be. The idea for the Patterson Observatory was originally proposed by Dr. Frank Zizza, a mathematician from UC Berkeley, who was one of the first professors to join the University of Arizona South in Sierra Vista and teach mathematics in the community. His idea for the observatory stemmed from the fact that a variety of east coast Ivy League schools had observatories for research purposes but were often hampered by frequent cloud cover and poor environmental conditions. Dr. Zizza recognized that there was not a more ideal location for a research-focused observatory than southeastern Arizona.

Dr. Zizza proposed the concept to Dr. Randy Groth, founding Dean at the University of Arizona South. David Patterson, founding member of the Huachuca Astronomy Club (HAC), along with his wife June, were major supporters of the University of Arizona and University South Foundation and generously funded most of the observatory's construction costs. HAC Member Dave Healy, owner of the Junk Bond Observatory (HBO), was instrumental in the acquisition of the 20-inch Ritchey Chretien telescope.

HAC President Penny Brondum addressed the assembly and related the club's long association with, and support of, the observatory and the University South Foundation. She described the numerous events the club conducts at the observatory, the large number of guests hosted each year, and the many, many volunteer hours that HAC members donate to the operation and maintenance of the observatory.

The guest speaker for the event was the famous amateur astronomer, author and comet discoverer, David Levy. David's talk was entitled "Remembering" and it was revealing, amusing, and moving. He quoted poetry and 'remembered' the discovery of Shoemaker Levy 9 and the excitement around the later realization that it was going to impact Jupiter. He talked about the months-long media frenzy, how the NYT reported that he was married to Carollyn Shoemaker, how they met President Clinton at the White

House, and how he spoke to Al Gore about comets and Gore's visits upstairs at the Naval Observatory. He also noted how, the hurricane of media attention evaporated in an instant after the last impact.

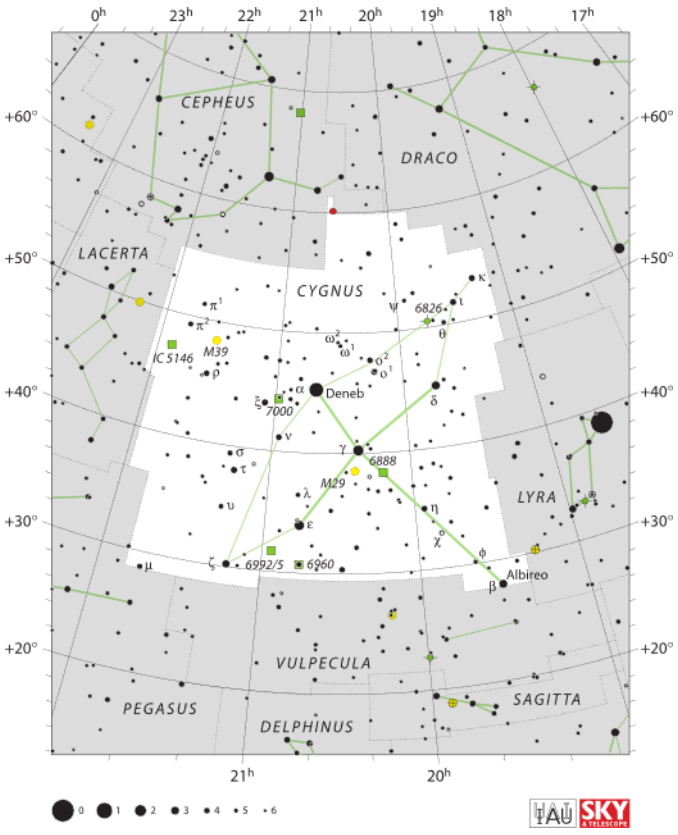
He also spoke a lot about his wife Wendee who passed away in 2022 and he played a very poignant video remembrance of her. David nearly came to tears and so did many in the audience.

Patterson's future is somewhat in doubt as is the future of the foundation itself and the current Sierra Vista campus, but HAC will continue to support the observatory going forward. It has become the centerpiece of astronomy outreach in our community and is pretty much the "home" of the Huachuca Astronomy Club. It has been my honor to coordinate events there for more than a decade. I look forward to continuing that role and hope to see many more HAC members participate in this remarkable resource.

President's Constellation Exploration – Cygnus

by Penny Brondum

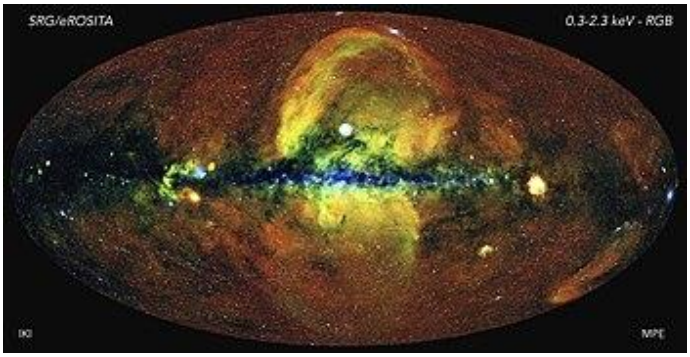
I know that in February of this year I covered the Constellation Cygnus, but the end of September with the equinox shifting our seasons from summer to fall it is a good time to revisit one of the most recognizable Constellations, Cygnus, and some of its more prominent features Hercules-Corona Borealis Great Wall, the Veil Nebula (which contains the "Witches broom") and the DR 6 cluster nicknamed the "Galactic Ghoul".



Cygnus is a northern constellation on the plane of the Milky Way, deriving its name from the Latinized Greek word for swan. Cygnus ranks 16th of the 88 constellations in size covering 804 square degrees and around 1.9% of the night sky.

Most of the eastern part of Cygnus is part of the Hercules–Corona Borealis Great Wall, a giant galaxy filament that is the largest known structure in the observable universe, covering most of the northern sky. The Hercules–Corona Borealis Great Wall (HCB) or simply the Great Wall is a galaxy filament, measuring approximately 10 billion light-years in length (the observable universe is about 93 billion light-years in diameter). This massive superstructure is a region of the sky seen in the data set mapping of gamma-ray bursts (GRBs). It was found to have a higher concentration of similarly distanced GRBs than the expected average distribution. It was discovered in early November 2013 by a team of American and Hungarian astronomers led by István Horváth, Jon Hakkila and Zsolt Bagoly while analyzing data from the Swift Gamma-Ray Burst Mission, together with other data from ground-based telescopes.

The Great Wall lies in the Northern Hemisphere, centered on the border of the constellations Draco and Hercules. The "over density" was discovered using data from different space telescopes operating at gamma-ray and X-ray wavelengths, plus some data from ground-based telescopes. By the end of 2012 they successfully recorded 283 GRBs and measured their redshifts spectroscopically.



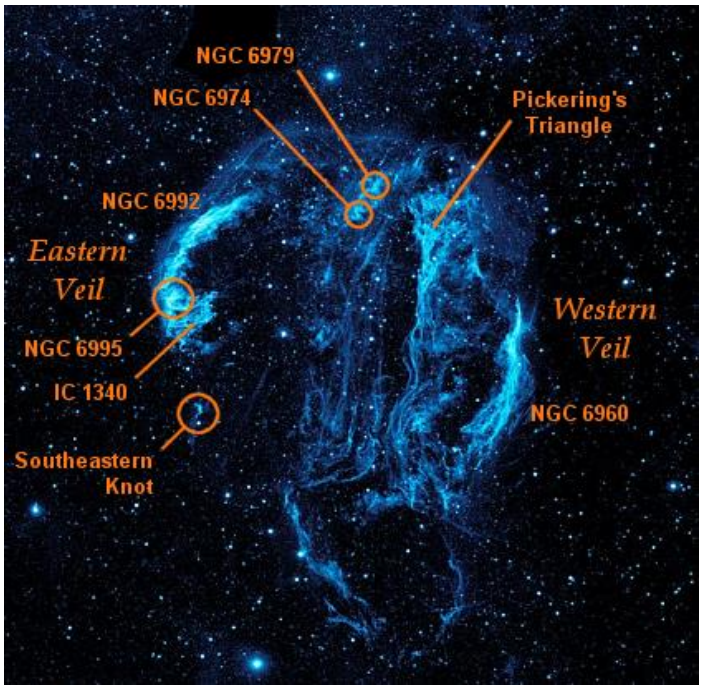
In this x-ray image Cygnus's molecular clouds forms the Cygnus Rift dark nebula constellation, comprising one end of the Great Rift along the Milky Way's galactic plane. The rift begins around the Northern Coalsack, and partially obscures the larger Cygnus molecular cloud complex behind it, which the North America Nebula is part of. On the left image side are the bright North America Nebula (left bright part) with Sadr region (right bright part) in the Cygnus X region, visually interrupted by the Cygnus rift, of the Cygnus constellation.

The term "Hercules–Corona Borealis Great Wall" was coined by Johndric Valdez, a Filipino teenager from Marikina on Wikipedia, after reading a Discovery News report three weeks after the structure's discovery in 2013. The nomenclature was used by Jacqueline Howard, on her "Talk Nerdy to Me" video series, and Hakkila would later use the name. The term is misleading, since the clustering occupies a region much larger than the constellations Hercules and Corona Borealis. In fact, it covers the region from Boötes to as far as the Zodiac constellation Gemini. In addition, the clustering is somewhat roundish in shape,

which is more likely a supercluster, in contrast to an elongated shape of a galaxy wall.

The Cygnus Loop is only visible in long-exposure astrophotography and is over 50 light-years long.

The Cygnus Loop is a strong emitter of radio waves and x-rays. The Hubble Space Telescope (HST) captured several images of the nebula. The analysis of the emissions from the nebula indicates the presence of oxygen, sulfur, and hydrogen Because of its appearance, it is also called the Cygnus Loop.



Cygnus Loop Nebula: NASA photograph of the Cygnus Loop in ultraviolet light, with labels for well-known features By Elphion

Many portions of the Cygnus Loop have acquired their own individual names and catalogue identifiers. The visible portions of the Cygnus Loop is called the Veil Nebula, a supernova remnant. The source supernova was a star 20 times more massive than the Sun which exploded between 10,000 and 20,000 years ago. At the time of the explosion, the supernova would have appeared brighter than Venus in the sky, and visible in the daytime. The remnants have since expanded to cover an area of the sky roughly 3 degrees in diameter (about 6 times the diameter, and 36 times the area, of the full Moon). While previous distance estimates have ranged from 1200 to 5800 light-years, a recent determination of 2400 light-years is based on direct astrometric measurements. (The distance estimates affect also the estimates of size and age.)

In modern usage, the names Veil Nebula, Cirrus Nebula, and Filamentary Nebula generally refer to all the visible structure of the remnant, or even to the entire loop itself. The structure is so large that several NGC numbers were assigned to various arcs of the nebula. There are three main visual components:

• The Western Veil (also known as Caldwell 34), consisting of NGC 6960 (the "Witch's Broom", “Lacework Nebula”, “Filamentary Nebula”) near the foreground star 52 Cygni.

• The Eastern Veil (also known as Caldwell 33), whose brightest area is NGC 6992, trailing off farther south into NGC 6995 (together with NGC 6992 also known as "Network Nebula") and IC 1340.

• Pickering's Triangle (or Pickering's Triangular Wisp), brightest at the north central edge of the loop, but visible in photographs continuing toward the central area of the loop.

NGC 6974 and NGC 6979 are luminous knots in a fainter patch of nebulosity on the northern rim between NGC 6992 and Pickering's Triangle.

The Veil nebula was discovered on 5 September 1784 by William Herschel. He described the western end of the nebula as "Extended; passes thro' 52 Cygni... near 2 degrees in length", and described the eastern end as "Branching nebulosity ... The following part divides into several streams uniting again towards the south.

The Veil Nebula is expanding at a velocity of about 1.5 million kilometers per hour. Using images taken by the Hubble Space Telescope between 1997 and 2015, the expansion of the Veil Nebula has been directly observed.

NASA Inferred image: “Galactic Ghoul”

The DR 6 nebula is located about 3,900 light-years away in the constellation Cygnus. DR 6 is a cluster of stars composed of dust, gas, and about 10 large newborn stars, each roughly ten to twenty times the size of the Sun. It was discovered by astronomers at NASA with the Spitzer Space Telescope, viewing the nebula using infrared light. The center of the nebula, where the ten stars are located, is roughly 3.5 light-years long, roughly equivalent to the distance between the Sun and Alpha Centauri, the closest star to the Sun. The areas of the cluster that appear green are mainly composed of gas, while the parts that seem to be red are made of dust.

The DR 6 cluster is nicknamed the "Galactic Ghoul" because of the nebula's resemblance to a human face; astronomers have described it as "some sort of freakish

space face," emphasizing the cavity-like regions that look like eyes and a mouth. These large cavities are the result of "energetic light" and strong stellar wind that come from the ten stars in the center of the nebula (the part also known as the "nose").
Because of the nebula's spooky appearance, it was featured on the NASA website as the Astronomy Picture of the Day on All Hallows Eve, November 1, 2004.

Cygnus is a constellation that has an abundance of objects to explore naked eye, with binoculars, through small and large telescopes and with astrophotography. I challenge you to get out, look up and enjoy the multitude of discoveries available in Cygnus to awe-stronomers now that our summer monsoons have stopped.

The Bucket List
by Vince Sempronio

All times MST unless otherwise noted.

TERMS OF THE MONTH

Retrograde and Stationary. These terms describe the odd motion of a solar system object in the sky where the apparent motion of the object slows down and reverses direction, only to do it again after a length of time. The important phrase here is “apparent motion” since the planets can’t actually stop in their orbits and decide to go backwards. There is a saying that states, “Objects in orbit can’t make U-turns”. This apparent reversal in direction of an object from the point of view of another, as viewed against the distant stars is called retrograde motion. The points in time where the object appears not to be moving is referred to as the object being stationary. This effect, when mapped against the background stars looks like a loop or in some cases, S-shaped. The images below are examples of the retrograde motion of planets centered around the times of their opposition. I’ve used planets as examples, but retrograde also applies to any object, such as asteroids. The first image is that of Mars over time showing the loop shape. Note that there is a dim asteroid just above the loop. It is experiencing its own retrograde motion.

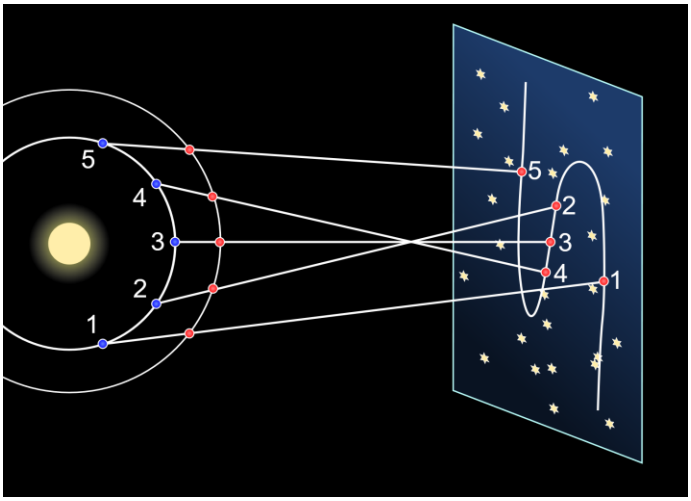
Credit: University of Edinburgh Royal Observatory: Mars Composite

The following image is also a representation of retrograde motion, but the geometry does not create an overlapping loop.

Credit: EarthSky.org

This motion also occurs to the inferior planets, which are those that are closer to the Sun. The effect is caused by one object overtaking another. The further the two objects are separated in distance from the body they orbit, the longer in time the retrograde loop is.

When early astronomers started mapping the position of the planets, the retrograde loop confuses them, since, at the time, the planets were still thought to orbit the Earth. Why on Earth (pun intended) would the point in the sky reverse course? This behavior led to describing these dots in the sky as planets, as the word planet comes from the Greek word for wanderer.



Credit: Brian Brondel - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=1652425

IN THE SKY

Mars

On the morning of the 7th, at 4:16am, Mars will occult a 10th magnitude star in Gemini. This is not an easy event to observer because of the large difference in magnitudes between Mars (mag 0.3) and the star. From the Sierra Vista area, the event will be high in the eastern sky.

Occultation of star TYC 1909-00533-1 by Mars on October 7th, 2024. Shown in horizon orientation, the zenith is up. Credit: Stellarium

The star will pass near the northern pole of Mars (shown with an ice cap) and will pass very close to Deimos at 4:18 am.

Jupiter

Just past midnight on, Oct 1st. Jupiter's 4 moons will be in distant order on the west side of Jupiter. Remember I-E-G-C (I Eat Grandma's Cookies). Io will have just come off the front edge of Jupiter, so it might take a few minutes to notice it. Over the next 40 minutes, Europa will approach Io, but Io is in the foreground and Europa is on the far side of Jupiter. At 00:44 am, Europa will disappear into the shadow of Jupiter and finally behind Jupiter. It won't reappear till 7 am later the same morning.


Jupiter and the Galilean moons, October 1st, 00:15 AM. The moons, from closest to furthest from Jupiter are Io, Europa, Ganymede, and Callisto. Credit: Stellarium

Oct 10th. Jupiter goes backwards. Starting around the first of the month, use a wide-angle eyepiece to see both Jupiter and the 5th magnitude star 109 Tauri to the west (along Jupiter's path). They will be separated by a little more than the width of the moon. Each night, they will appear more separated as Jupiter moves to the east. But around the 10th, Jupiter's motion will be stationary, and from then on, Jupiter will start to move towards the west again. If you keep watching each night, on the 24th, Jupiter will once again pass 109 Tauri, this time going west! Jupiter has entered its retrograde motion and will continue to do so until February of 2025. See "Term of the Month" for additional information.

Moon

On the evening of Oct 5th at 6:30pm, our Moon is 4.5° away from Venus.

Conjunctions of the Moon and Venus are always striking with the crescent phase of the moon paired with the bright white intensity of Venus. Think of it as the visual version of enjoying green cheese with a nice crisp white wine. How appetizing!

On the evening of the 7th at 6:30pm the moon is 3° away from Antares in the western sky.

Saturn

Saturn is well placed after sunset in the eastern sky. At the beginning of the month, it is 23° above the eastern horizon at 7 pm. By month's end, it will be 43° above the horizon at the same time. Saturn is already in its retrograde cycle and will continue to move west till mid-November.

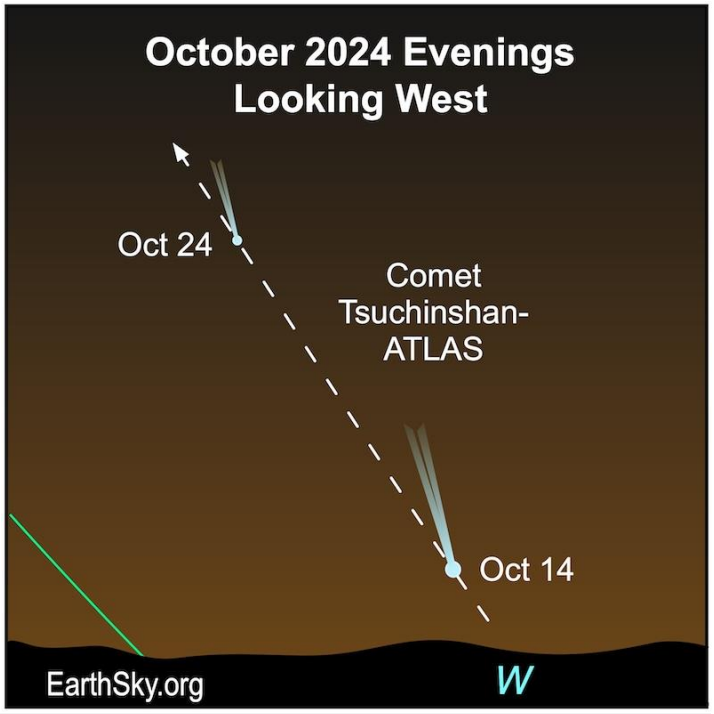
On the evening of the 20th, Saturn passes within 9' of the magnitude 6.8 star HIP 113583 - HD 217376 - SAO 146438. The star is brighter than any of Saturn's moons. Stars have many designations. In an upcoming column, I'll discuss the various star catalogs mentioned in publications.

C/2023 A3 (Tsuchinshan-ATLAS)

A lot of information is available online regarding this comet and starting around October 12 it will be at its closest and brightest in the western sky. Each night, it will appear dimmer, but higher in the sky. Having a good horizon free of mountains will make it easier to locate.

You can watch the comet motion in the sky through a telescope if you have a dark sky and clear horizon before it sets. Find a nearby star in the field of view as a reference and keep tracking on the star. The comet should move relative to the star.

Will this comet be spectacular, or will we get Kohoutek-ed. Seasoned observers will understand that reference!



Courtesy of EarthSky.org

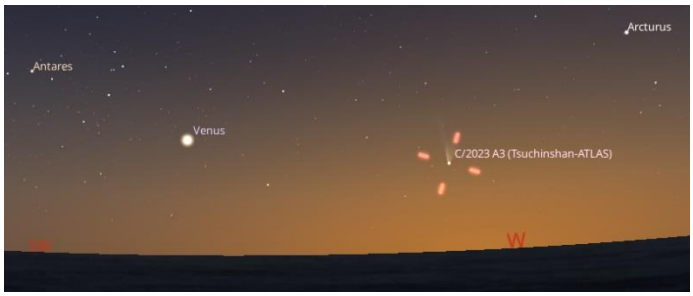
If the comet has a large tail, grab your camera and a tripod and capture it. Comets are great targets for cameras mounted on tripods, star trackers, or even imaging telescopes. Something for everyone!

But even without a camera, a “lifer” comet will be spectacular. Here is link to a beginner’s guide to photographing comets.

https://www.youtube.com/watch?v=8yt4cqHqyoE

Bright comets are generational; they don’t appear very often. The good ones are so spectacular that we can’t forget them.

Will C/2023 A3 become “your” lifer comet? Mine “first” comet is still my favorite. It was Comet Bennett, appearing in the morning skies in April of 1970.



Evening of Oct 13th. Comet C/2023 A3 is closest to earth on the 12th and 113th around 0.47 AU away.
Credit: Stellarium

What is “your” comet, meaning, which comet was the most unforgettable? I am calling for a writing challenge for all the readers. Please submit a paragraph to the editor of your experience observing your favorite comet. I’ll post the results in an upcoming edition.

TRIVIA QUESTION OF THE MONTH

Of the top ten largest confirmed impact craters on Earth, only one is located in the United States. And before you say the Meteor Crater here in Arizona, that is not the correct answer. The crater in question is 85 km across and was formed during the Eocene epoch, 35.5 MYA. Hint: Over 200,000 people live within the walls of the crater. This crater is now a major waterway on the east coast of the United States.

NASA Night Sky Notes

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!

Catch Andromeda Rising!

By: Dave Prosper
Updated By: Kat Troche

If you’re thinking of a galaxy, the image in your head is probably the Andromeda Galaxy! Studies of this massive neighboring galaxy, also called M31, have played an incredibly important role in shaping modern astronomy. As a bonus for stargazers, the Andromeda Galaxy is also a beautiful sight.

Spot the Andromeda Galaxy! M31’s more common name comes from its parent constellation, which becomes prominent as autumn arrives in the Northern Hemisphere. Surprising amounts of detail can be observed with unaided eyes when seen from dark sky sites. Hints of it can even be made out from light polluted areas. Use the Great Square of Pegasus or the Cassiopeia constellation as guides to find it. Credit: Stellarium Web

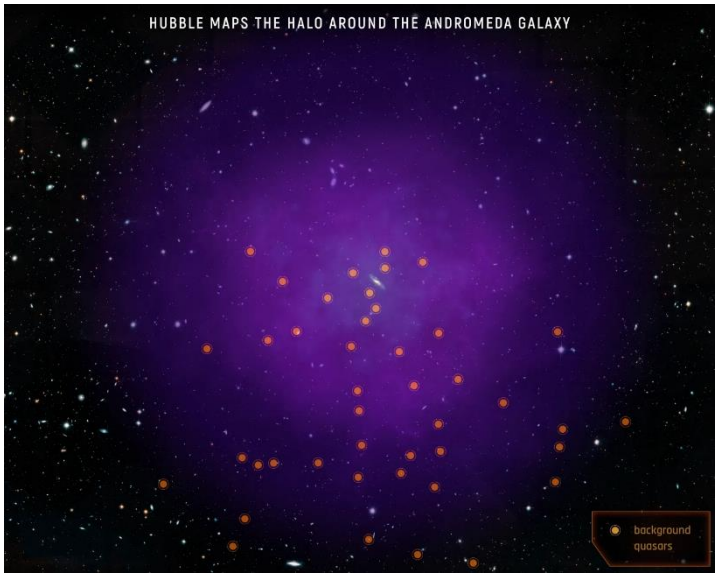
Have you heard that all the stars you see at night are part of our Milky Way galaxy? While that is mostly true, one star-like object located near the border between the constellations of Andromeda and Cassiopeia appears fuzzy to unaided eyes. That’s because it’s not a star, but the Andromeda Galaxy, its trillion stars appearing to our eyes as a 3.4 magnitude patch of haze. Why so dim?

Generated version of the Andromeda Galaxy and its companion galaxies M32 and M110. Credit: Stellarium Web

Distance! It’s outside our galaxy, around 2.5 million light years distant - so far away that the light you see left M31’s stars when our earliest ancestors figured out stone tools. Binoculars show more detail: M31’s bright core stands out, along with a bit of its wispy, saucer-shaped disc. Telescopes bring out greater detail but often can’t view the entire galaxy at once.

Depending on the quality of your skies and your magnification, you may be able to make out individual globular clusters, structure, and at least two of its orbiting dwarf galaxies: M110 and M32. Light pollution and thin clouds, smoke, or haze will severely hamper observing fainter detail, as they will for any "faint fuzzy." Surprisingly, persistent stargazers can still spot M31's core from areas of moderate light pollution as long as skies are otherwise clear.

Modern astronomy was greatly shaped by studies of the Andromeda Galaxy. A hundred years ago, the idea that there were other galaxies beside our own was not widely accepted, and so M31 was called the "Andromeda Nebula." Increasingly detailed observations of M31 caused astronomers to question its place in our universe – was M31 its own "island universe," and not part of our Milky Way? Harlow Shapley and Heber Curtis engaged in the "Great Debate" of 1920 over its nature. Curtis argued forcefully from his observations of dimmer than expected nova, dust lanes, and other oddities that the "nebula" was in fact an entirely different galaxy from our own. A few years later, Edwin Hubble, building on Henrietta Leavitt's work on Cepheid variable stars as a "standard candle" for distance measurement, concluded that M31 was indeed another galaxy after he observed Cepheids in photos of Andromeda, and estimated M31's distance as far outside our galaxy's boundaries. And so, the Andromeda Nebula became known as the Andromeda Galaxy.



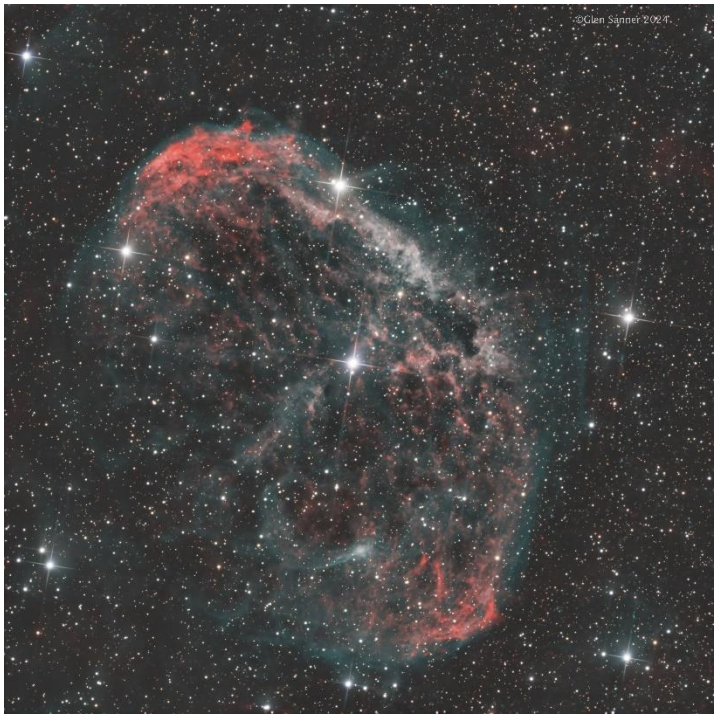
While M31's disc appears larger than you might expect (about 3 Moon widths wide), its "galactic halo" of scattered stars and gas is much, much larger – as you can see here. In fact, it is suspected that its halo is so huge that it may already mingle with our Milky Way's own halo, which makes sense since our galaxies are expected to merge sometime in the next few billion years! The dots are quasars, objects located behind the halo, which are the very energetic cores of distant galaxies powered by black holes at their center. The Hubble team studied the composition of M31's halo by measuring how the quasars' light was absorbed by the halo's material. Credits: NASA, ESA, and E. Wheatley (STScI)

These discoveries inspire astronomers to this day, who continue to observe M31 and many other galaxies for hints about the nature of our universe.

One of the Hubble Space Telescope's longest-running observing campaigns was a study of M31: the Panchromatic Hubble Andromeda Treasury (PHAT). Dig into NASA's latest discoveries about the Andromeda Galaxy, on their Messier 31 page.

Originally posted by Dave Prosper: September 2021
Last Updated by Kat Troche: September 2024

Images
by HAC Members & Friends



The Crescent Nebula, NGC-6888 is an emission nebula in the constellation Cygnus. It is 5,000 Lys away and shines at magnitude 7.4. It appears 18' x 12' in size. William Herschel discovered it in 1792.
Image by Glen Sanner

C/2023 A3 (Tsuchinshan-ATLAS) before sunrise on September 30th.
Imaged by Jay LaBlanc using a 300mm lens.

Trifid Nebula - NGC-6514, M20 by Mark Orvek. M20 is a star forming region in northwest Sagittarius.

Sky Safari Description: M20 is estimated to lie about 5,200 light years away, on the far side of the same complex of nebulosity that includes the Lagoon Nebula, M8. The Trifid's exact distance is rather uncertain, with estimates ranging from 2,200 to 9,000 light years. At the value of 5,200 light years adopted here, the Trifid spans a diameter of about 10 light years across.

M 20 is only about 300,000 years old, making it among the youngest emission nebulae known. All of its bright central stars are extremely hot, of spectral type O5 to O7. They illuminate a dense pillar of gas and dust, producing a bright rim on the side facing them. Star formation is no longer occurring in the immediate vicinity of the central star cluster, because its intense radiation has blown away the gas and dust from which new stars are made.

The image took 3 hours and 55 minutes of integration time (47 by 5-minute subframes).

Telescope: Sky-Watcher 100ED Esprit APO Triplet Refractor
Camera: ZWO ASI2600MC (One Shot Color)
Mount: ZWO AM5

Famous Dates in October

Oct 1st, 1962 - US National Radio Astronomy Observatory installs a 300' (91m) radio telescope in Green Bank, West Virginia

Oct 4th, 1957 – the USSR launches the first artificial space satellite, Sputnik 1
Oct 4th, 1959 – Luna 3 (USSR) takes photos of the far side of the moon.

Born Oct 5th, 1958 - Neil deGrasse Tyson, astrophysicist and science communicator

Born: Oct 15th, 1949 – Thomas Bopp, astronomer

Born Oct 19th, 1910 - Subrahmanyan Chandrasekhar, astrophysicist

Oct 20th, 1975 – Venera 9 (USSR) is first spacecraft to orbit Venus

Oct 21st, 1991 – Galileo spacecraft is the first spacecraft to flyby an asteroid (951 Gaspra) at 1600 km.

Born Oct 22nd, 1905 - Karl Guthe Jansky, astronomer

LBN 437. The reflection nebula LBN 437 near the emission nebula SH2-126. Also known as the Gecko Nebula due to its bizarre shape, it is curiously located within the constellation Lacerta, The Lizard.
Gear: Svbony sv503-70ed, flattener, asi533mc pro, Svbony sv165 guide scope with asi120mm camera, asiAir plus controller and HEQ5 tracking mount. using manual focus for now. 7 hrs integrated time from 3 min subs captured just west of Bisbee, AZ. edits in Siril Affinity

Club Officers and Contacts

President: *Penny Brondum* ***Vice President:*** *Jim Reese*
Secretary: *Katherine Zellerbach* ***Treasurer:*** *Ted Forte*
Past President: *David Roemer*

Board Members-at-Large
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Website: *http://www.hacastronomy.org*
Facebook: *http://www.facebook.com/HuachucaAstronomyClub*
Email: *info@hacastronomy.org*

Club Meetings: Monthly at 7pm at the Cochise College Downtown Center at 2600 E Wilcox Drive, Sierra Vista, AZ in Room A102. Refer to the calendar for specific dates.

HAC Calendar of Events (October - November)

SU	MO	TU	WE	TH	FR	SA
Sep 29	**30**	**Oct 1** **11:49 AM**	**2**	**3**	**4**	5 Kartchner Star Party Noon - 9 pm
6	**7**	**8** Adult Adaptive Rec at Patterson 7:00 - 8:30 PM	**9**	**10** **11:55 AM** Patterson Public Night 6:30 – 8:30 PM	**11**	12 Solar Saturday at the S.V. library 10:00 AM - Noon
13	**14** **COLUMBUS DAY**	**15**	**16**	**17** **4:26 AM**	**18** HAC Meeting Room A102 Downtown 7:00 PM	19 Master Nautualists at Patterson 6:00 - 7:30 PM
20 Orionid Meteors	**21** Orionid Meteors	**22** Orionid Meteors	**23**	**24** **1:03 AM**	**25**	26 Rune Star Party Dusk-?
27	**28**	**29**	**30**	**31**	**Nov 1** **5:47 AM** Conscious Child Preschool at Patterson 6:00 PM	2 Kartchner Star Party 6:00 - 9:00 PM
3 Daylight Savings Time Ends Antares/Moon 0.08º	**4**	**5** Election Day	**6**	**7** Patterson Public Night 6:30 PM	**8** **10:55 PM**	9 Kartchner 50th Annivesrsary Solar Observing Noon to 4:00 PM
10 Saturn/Moon 0.09º	**11**	**12**	**13**	**14**	**15** **2:29 PM** HAC Meeting Room A102 Downtown 7:00PM	16 Uranus at Opposition Leonid Meteors
17 Leonid meteors	**18** Leonid meteors	**19**	**20**	**21**	**22** **6:28 PM**	

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

Answer to trivia question: Chesapeake Bay Crater