NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

SEPTEMBER 2024

SEPTEMBER HAC MEETING SPEAKER

The speaker at the September HAC meeting is K. Azalee Bostroem of Steward Observatory. She will discuss supernova and the explosive way in which massive stars end their lives and what this can tell us about the stars themselves. She is currently an LSSTC Catalyst Fellow at the University of Arizona. She is currently working on projects to characterize the massive stars that explode as (Type II) supernova.

The location of the speaker's dinner has not yet been chosen.

WELCOME OUR NEW MEMBERS

Buford Pippin of Patagonia, Caroline Whitehill also of Patagonia, and Terry O'Neill of Sierra Vista joined the club in August. Welcome to HAC, we're glad you joined!

PATTERSON OBSERVATORY 20TH ANNIVERSARY CELEBRATION

The Patterson's 20th Anniversary will be celebrated at a reception in the Judy A. Gignac Education Center on the campus of the University of Arizona, Sierra Vista on Thursday, September 5 at 5 p.m. Light refreshments will be served. The event will be followed by a Public Night observing session at the observatory beginning at 7 p.m. (weather permitting). The address of the event is 1140 Colombo Ave, Sierra Vista, AZ, and the building is adjacent to the north side of the Patterson Observatory.

Admission to the reception is free but space is limited. Please RSVP by email to foundation@usfaz.org

The special guest speaker at the September 5 celebration of the Patterson Observatory's 20th anniversary is the famed comet hunter and author David Levy.

David's talk, entitled "Remembering", will be in two parts. Part one will remember a comet he discovered thirty years ago that did a few neat things. The other part is a love story.

Dr. David H. Levy describes himself as "Wendee's Husband" and provided us with, what he termed: "A short bio for a tall man."

Levy is arguably one of the most enthusiastic and famous amateur astronomers of our time. Although he has never taken a class in astronomy, he has written over three dozen books, has written for three astronomy magazines and has appeared on television programs featured on the Discovery and the Science Channels. Among David's accomplishments are 23 comet discoveries, the most famous being Shoemaker-Levy 9 that collided with Jupiter in 1994, a few hundred shared asteroid discoveries, an Emmy for the documentary Three Minutes to Impact, five honorary doctorates in Science and a PhD which combines astronomy and English Literature. Currently, he is the editor of the web magazine *Sky's Up!*, and has a monthly column, *Skyward*, in the Vail Voice newspaper. David continues to hunt for comets and asteroids, and lectures worldwide.

DINE UNDER THE STARS

On Saturday, September 28, the University South Foundation will conduct the 22nd annual Dine Under the Stars scholarship fundraiser on the University of Arizona Sierra Vista campus. The event is held outside, under a large tent adjacent to the Patterson Observatory. The observatory is open during the event for stargazing.

This year's event features an elegant dinner provided through the generosity of Pizzeria Mimosa. New this year, guests will be served at table rather than going through a buffet line. Adults are entitled to two servings of beer or wine. Live music is provided by Desert Fever. Emcees Sherrif Mark

Dannels and local radio personality, Jeff Davenport, conduct a lively evening of fun and good fellowship.

This year's silent auction will be bigger and better than ever and there are a lot of exciting items on the list for the live auction, including a Sherrif Dannels ride-along, a side of prime beef, and some exciting vacation packages, just to mention a few. There is also a 50/50 raffle to try your luck with.

Tickets are available on-line at:
https://www.usfaz.org/dineunderthestars.
Adult tickets are $80

HAC Dues Reminder

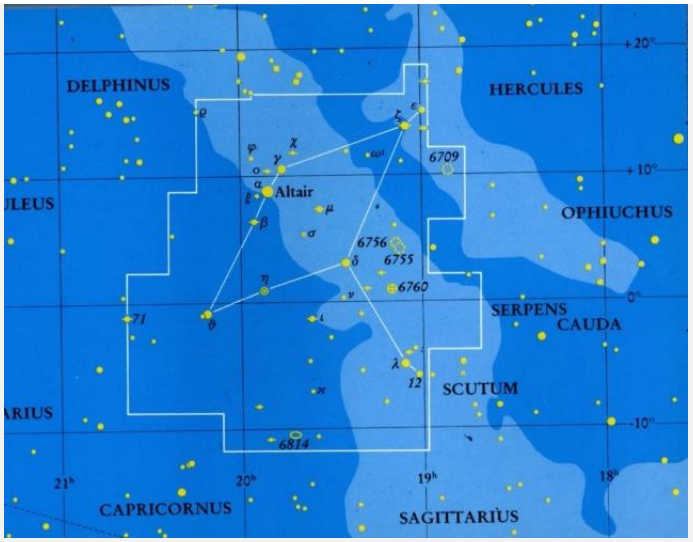
Most HAC memberships expire in December. The treasurer will gladly accept your 2025 dues payment at any of the remaining meetings this year for anyone that wants to take care of things early. Dues are $35 Family and $25 Regular ($25 and $20 for active-duty military). Full time students pay $10. There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

President's Constellation Exploration – Aquila

by Penny Brondum

Aquila is a constellation on the celestial equator. We can trace the history of the constellation back to the earliest times. Its name is Latin for 'eagle'. The Sumerian-Akkadian Eagle was "Alula", the great spirit, the symbol of the noontide sun. On an Euphratean uranographic stone of about 1200 b.c. there is a bird figure, which is supposed to represent the constellation of Aquilla. To the Romans, the constellation was also known as *Vultur Volans* (the flying vulture) not to be confused with *Vultur cadens* which was their name for Lyra.



National Audubon Society Pocket Guide

Aquila is often held to represent the eagle which held Zeus's/Jupiter's thunderbolts in Greco-Roman mythology. Aquila is also associated with the eagle that kidnapped Ganymede, a son of one of the kings of Troy (associated with Aquarius), to Mount Olympus to serve as cup-bearer to the gods. and it represents the bird that carried Zeus/Jupiter's thunderbolts in Greek-Roman mythology. The Greek Aquila is probably based on the Babylonian constellation of the Eagle but is sometimes mistakenly thought of as a seagull which is located in the same area as the Greek constellation.

In illustrations of Aquila that represent it as an eagle, a nearly straight line of three stars symbolizes part of the wings. The center and brightest of these three stars is Altair. Aquila, with the now-obsolete figure of Antinous, as depicted by Sidney Hall in *Urania's Mirror*, a set of constellation cards published in London around 1825, at left is Delphinus.

In the Chinese love story of Qi Xi, Niu Lang (Altair) and his two children (β and γ Aquilae) are separated forever from their wife and mother Zhi Nu (Vega), who is on the far side of the river, the Milky Way.

In Hinduism, the constellation Aquila is identified with the half-eagle half-human deity Garuda.

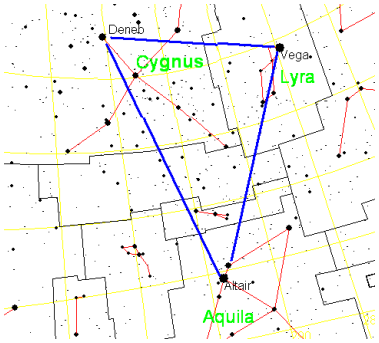
Among the Australians Aquila is "Totyarguil" and represent a man who, when bathing, was killed by a fabulous animal. The Hebrews know this constellation as "Neshr" and eagle, falcon or vulture. The Turks called Aquila the "Hunting

Eagle" as contrasted with nearby Vega which was the "swooping or falling Eagle".

Aquila was one of the 48 constellations described by the second-century astronomer Ptolemy. Ptolemy catalogued 19 stars jointly in this constellation and in the now obsolete constellation of Antinous, which was named in the reign of the emperor Hadrian (AD 117–138), but sometimes erroneously attributed to Tycho Brahe, who catalogued 12 stars in Aquila and seven in Antinous. Hevelius determined 23 stars in the first and 19 in the second. It had been earlier mentioned by Eudoxus in the fourth century BC and Aratus in the third century BC. It is now one of the 88 constellations defined by the International Astronomical Union.

The Aquila constellation is best seen in the northern summer, as it is located along the Milky Way. Because of this location it contains many rich starfields with many novae, clusters, nebulae and a few galaxies to be found within its borders, but they are dim.

Altair (α Aql) is the brightest star in this constellation and one of the closest naked-eye stars to Earth at a distance of 17 light-years. Its name comes from the Arabic phrase *al-nasr al-tair*, meaning "the flying eagle".



Cosmos PNW.com

Altair is one of the three stars of the Summer Triangle asterism, along with Vega and Deneb. It is an A-type main-sequence star with 1.8 times the mass of the Sun and 11 times its luminosity. The star rotates quickly, and this gives the star an oblate shape where it is flattened towards the poles. Altair was commonly named among Polynesian peoples, as well. The people of Hawaii called it *Humu*, the people of the Tuamotus called it *Tukituki* ("Pound with a hammer"). The Māori people named Altair *Poutu-te-rangi*, "Pillar of the Sky", because of its important position in their cosmology. It was used differently in different Māori calendars, being the star of February and March in one version and March and April in the other. Altair was also the star that ruled the annual sweet potato harvest. In astrology, Altair is ill omened and supposed to portend danger from reptiles. However Altair was an important star for mariners as the moon's distance was taken from it to compute longitude at sea.

The radiant point of the Aquilids meteors which are visible from early June to mid-August, is located about 5 degrees east of Altair. In 389 AD a famous temporary star or comet appeared in this vicinity. A bright nova was observed in Aquila in 1918 (Nova Aquilae 1918) and briefly shone brighter than Altair, the brightest star in Aquila. It was first seen by Zygmunt Laskowski and was confirmed on the night of 8 June 1918. Nova Aquilae reached a peak apparent magnitude of −0.5 and was the brightest nova recorded since the invention of the telescope.

There are three planetary nebulae in Aquila: NGC 6804 shows a small but bright ring, NGC 6781 bears some resemblance with the Owl Nebula in Ursa Major. It was discovered by William Herschel in 1788, and NGC 6751, also known as the Glowing Eye

Aquila contains both loose open clusters and globular clusters among them are NGC 6709 is a loose open cluster containing roughly 40 stars, NGC 6755 an open cluster is made up of about a dozen stars NGC 6760 a globular cluster where at least two pulsars have been discovered; NGC 6749 is another open cluster in Aquila.

Aquila also holds some extragalactic objects. One of them is what may be the largest single mass concentration of galaxies in the Universe known, the Hercules–Corona Borealis Great Wall. It was discovered in November 2013 and has the size of 10 billion light years. It is the biggest and the most massive structure in the known Universe.

NASA's Pioneer 11 space probe, which flew by Jupiter and Saturn in the 1970s, is expected to pass near the star Lambda (λ) Aquilae in about 4 million years.

I know the current nights, with all the clouds, that seeing Aquila can be difficult, but if you get a clear night, step out and look up. Aquila is a rich area to explore with a wide field telescope. And the Summer triangle is a fun asterism for everyone to find.

The Bucket List
by Vince Sempronio

All times MST unless otherwise noted.

IN THE SKY

There are a couple interesting lunar occultations this month involving Saturn and the Pleiades.

Hide and seek with Saturn

Saturn is at opposition this month providing a great target for the multitude of upcoming public events the club is hosting. Saturn will be in our evening skies till the end of January 2025, when it will be lost in evening twilight. But that is not all that is lost. In March of 2025, Saturn's ring system will appear edge-on to us here on Earth. The rings are appearing rather thin, so see them while you can. Unfortunately, when the rings are totally edge on, Saturn will be behind the Sun and won't be visible. Don't worry though, in November of 2025 the rings will once again appear edge on.

The Moon will occult Saturn on the morning of September 17th starting around 4:16am for viewers in SE Arizona. Saturn's moon Dione will be the first to disappear. The Moon, nearly full, will present a very thin zone of darkness on the leading edge that overtakes Saturn. The entire event takes only 4 minutes. The objects are low in the western sky at 12

Saturn and the Moon on the morning of September 17th at 4:16am MST. Credit: Stellarium

degrees above the horizon. To reproduce the view as seen in the image, high magnification and a tracking mount will be required. Shown are the brightest four moons of Saturn.

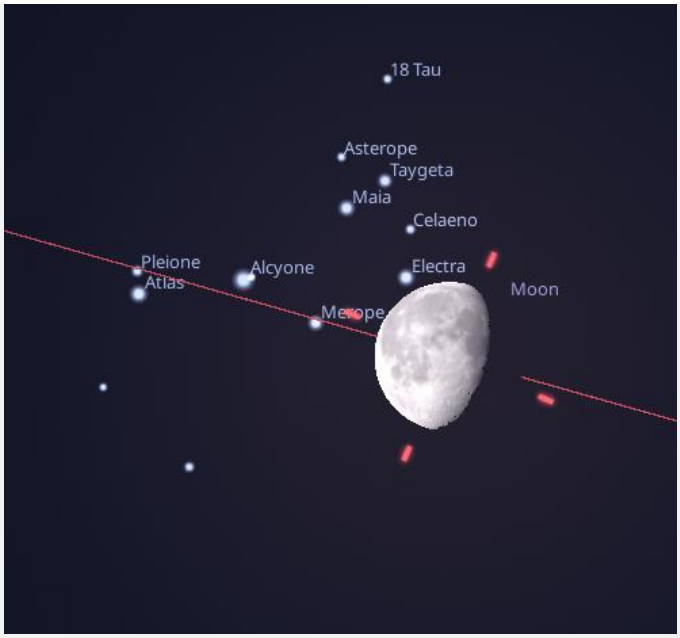
A Bite of the Moon

On the evening of the 17th, the Full Moon will pass through Earth's shadow. This is only a partial lunar eclipse with just a thin piece of the Moon passing through the umbra portion of the shadow. Maximum eclipse occurs at 7:34pm MST. Look for a slight dimming of the north-east edge of the Moon.

The Full Moon in Pisces on the evening of September 17th at 7:34pm. Credit: Stellarium

Pleiades and the Moon

Starting around 2am on the morning of the 22nd, the waning gibbous moon will pass through the Pleiades cluster (M45). The disappearances of the stars will be against the bright edge of the Moon and will be difficult to observe, but the sudden reappearance of each star from behind the dark edge



The Moon through Pleiades is shown at 2am on the morning of September 22nd. Credit: Stellarium

are sudden and exciting. The Moon can never occult all the bright stars of the Pleiades in a single pass since the angular diameter of Pleiades is much larger than the Moon. The Pleiades has many dimmer stars that aren't shown in the diagram. Leading bright limb occultations are not as spectacular as when the dark edge of the Moon hides each star.

On the early evening of April 1st, 2006, I recorded the thin crescent Moon passing through the Pleiades. Clouds rolled in before the event ended, but I was able to successfully record 12 disappearances. The event this month will last over 4 hours around which time pre-dawn twilight interferes. The brightness of the Moon will require optical aid to see any of the individual events.

TRIVIA OF THE MONTH

Here are some clues to this month's trivia question offered in first person. As an astronomer, I discovered two DSOs that would eventually become the closest NGC objects to the North and South celestial poles. I proposed the names of seven of the moons of Saturn and four of the moons of Uranus. I was a three-time president of the Royal Astronomical Society. I discovered sodium thiosulfate, a chemical used in photography as a "fixer" which makes exposed film images permanent. I also invented the blueprinting process. I was born into astronomy royalty, raised by parents and an aunt all of whom were astronomers. Along with my wife, we both were accomplished botany illustrators. I fathered 12 children, lived to the age of 79, and am buried in Westminster Abbey. Who am I? The answer is at the bottom of the newsletter.

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!

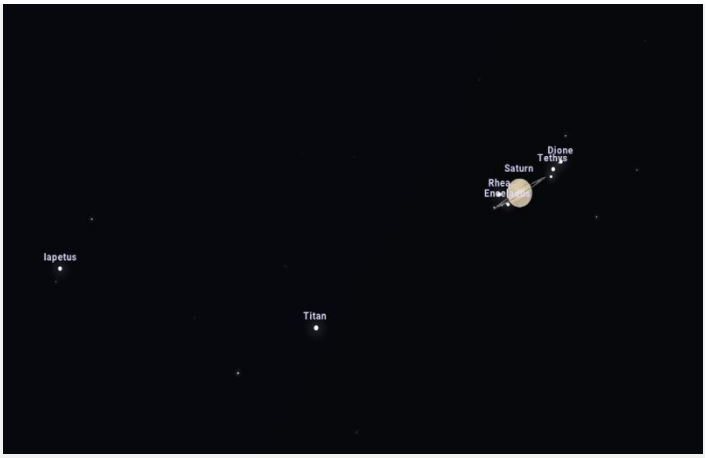
Marvelous Moons

By Kat Troche

September brings the gas giants Jupiter and Saturn back into view, along with their satellites. And while we organize celebrations to observe our own Moon this month, be sure to grab a telescope or binoculars to see other moons within our Solar System! We recommend observing these moons (and planets!) when they are at their highest in the night sky, to get the best possible unobstructed views.

The More the Merrier

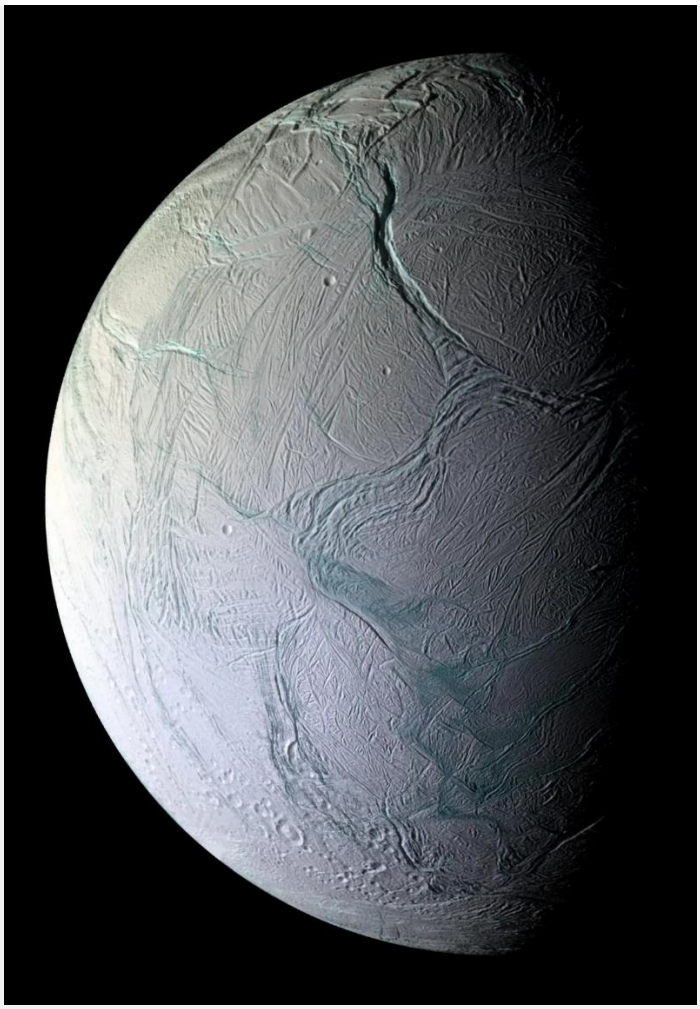
As of September 2024, the ringed planet Saturn has 146 identified moons in its orbit. These celestial bodies range in size; the smallest being a few hundred feet across, to Titan, the second largest moon in our solar system.



The Saturnian system along with various moons around the planet Saturn: Iapetus, Titan, Enceladus, Rhea, Tethys, and Dione. Credit: Stellarium Web

Even at nearly 900 million miles away, Titan can be easily spotted next to Saturn with a 4-inch telescope, under urban and suburban skies, due to its sheer size. With an atmosphere of mostly nitrogen with traces of hydrogen and methane, Titan was briefly explored in 2005 with the Huygens probe as part of the Cassini-Huygens mission, providing more information about the surface of Titan. NASA's mission Dragonfly is set to explore the surface of Titan in the 2030s.

Saturn's moon Enceladus was also explored by the Cassini mission, revealing plumes of ice that erupt from below the surface, adding to the brilliance of Saturn's rings. Much like our own Moon, Enceladus remains tidally locked with Saturn, presenting the same side towards its host planet at all times.



This mosaic of Saturn's moon Enceladus was created with images captured by NASA's Cassini spacecraft on Oct. 9, 2008, after the spacecraft came within about 16 miles (25 kilometers) of the surface of Enceladus. Credit: NASA/JPL/Space Science Institute

The Galilean Gang

The King of the Planets might not have the most moons, but four of Jupiter's 95 moons are definitely the easiest to see with a small pair of binoculars or a small telescope because they form a clear line. The Galilean Moons – Ganymede, Callisto, Io, and Europa – were first discovered in 1610 and they continue to amaze stargazers across the globe.

The Jovian system: Europa, Io, Ganymede, and Callisto.
Credit: Stellarium Web

- Ganymede: largest moon in our solar system, and larger than the planet Mercury, Ganymede has its own magnetic field and a possible saltwater ocean beneath the surface.
- Callisto: this heavily cratered moon is the third largest in our solar system. Although Callisto is the furthest away of the Galilean moons, it only takes 17 days to complete an orbit around Jupiter.
- Io: the closest moon and third largest in this system, Io is an extremely active world, due to the push and pull of Jupiter's gravity. The volcanic activity of this rocky world is so intense that it can be seen from some of the largest telescopes here on Earth.
- Europa: Jupiter's smallest moon also happens to be the strongest candidate for a liquid ocean beneath the surface. NASA's Europa Clipper is set to launch October 2024 and will determine if this moon has conditions suitable to support life. Want to learn more? Rewatch the July 2023 Night Sky Network webinar about Europa Clipper here.

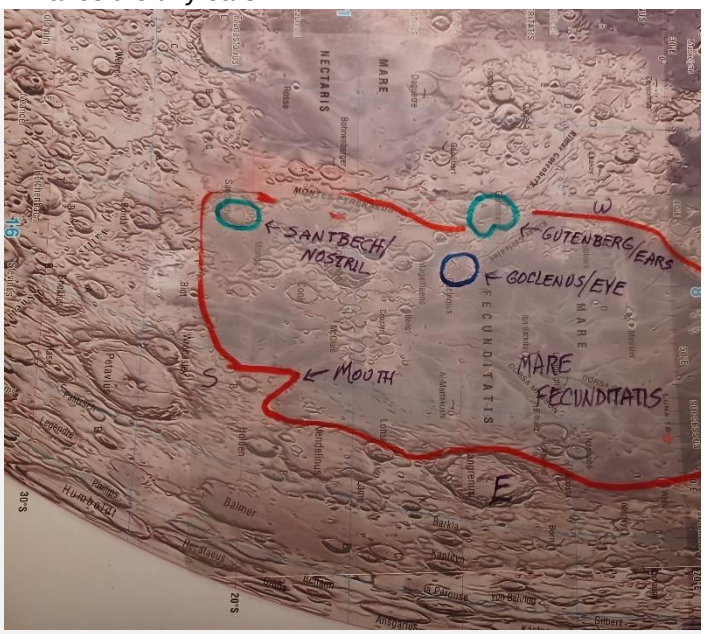
Be sure to celebrate International Observe the Moon Night here on Earth September 14, 2024, leading up to the super full moon on September 17th! You can learn more about supermoons in our mid-month article on the Night Sky Network page!

10 Reasons Why You Should Try Lunar Viewing

By Karen Madtes

1. It's bright and easy to find
2. All your acquaintances will know what you are talking about
3. It's frequently available for observation
4. At times, it can also be viewed during daylight hours
5. Easy to watch eclipses, no special equipment needed
6. It's a good, safe topic for conversation
7. Why fight the moon light? Use it to enjoy lunar details!
8. The moon has lots of variety in features, textures and lighting
9. No worries about dark adaptation!!
10. Abundant pareidolia challenges.

Try this pareidolia. Look at Mare Fecunditatus. Find the crater Goclenus (West side middle) With Goclenus as the "eye", Imagine the South end of the sea as a muzzle and find a HIPPOPOTAMUS! The crater, Gutenberg, makes the tiny ears.



North is to the right. Markup courtesy of Karen Madtes

DSOs in Vulpecula

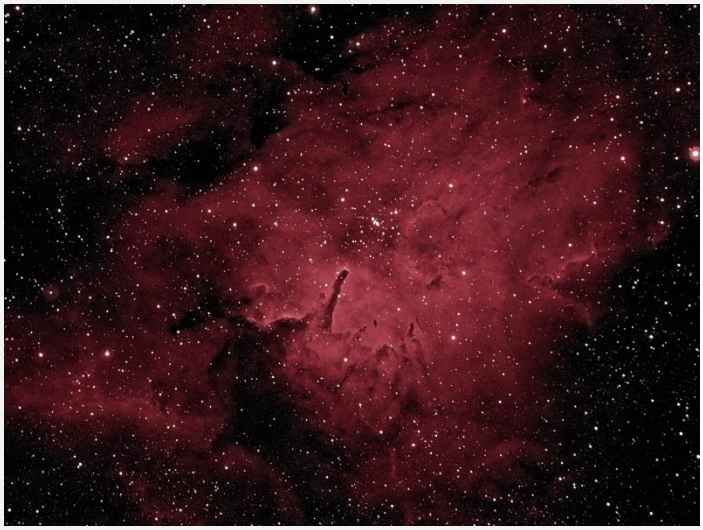
By Richard Pattie

Open cluster NGC 6823, near the center of this image, is a star forming area that is slowly converting gas clouds into stars. The center of the open cluster formed only about two million years ago and is dominated in brightness by a host of bright young blue stars. Some outer parts of the cluster contain even younger stars. The huge pillars of gas and dust in nebula NGC 6820 likely get their elongated shape by erosion from hot radiation emitted from the brightest cluster stars. Dark globules of gas and dust are also near the pillars. Cluster NGC 6823 and nebula NGC 6820 span about 50 light-years and lie about 6000 light-years away toward the constellation Vulpecula.

The first time I saw a photo of this nebula I was using a DSLR camera for capture. I was so impressed by that photo that one night I pointed my scope up at the nebula's coordinates to try to create my own capture. When I looked at what I had acquired, however, there was no nebula, just stars! I inquired on cloudynights.com about why I wasn't getting the nebula. This marked the beginning of my learning about emission and reflection nebulae, as well as mono CCD cameras and narrowband filters. I also learned

that this 'hobby' (read 'obsession') of mine just got significantly more complex, and a whole lot more expensive.

ES102 refractor on an Orion G3 mount.
Image courtesy of: Richard Pattie



A 5.5 hour exposure of open cluster NGC 6823 (center of image) and the nebula NGC 6820 through a 6nm Hydrogen-alpha filter. Processing using PixInsight and Photoshop CC.
Image courtesy of: Richard Pattie

A year later I was able to (at last) capture and process my own image of NGC 6820, which was very satisfying. Finally acquired in July of 2015 using a 102mm refractor telescope coupled to an entry-level Orion cooled mono CCD astrophotography camera, through a 6nm Hydrogen-alpha filter (see accompanying photo). 5.5 hours total exposure, processed with PixInsight and Photoshop CC.

HAC Members & Friends Images

Image courtesy of Richard “Rik” Hill

Upcoming Observing Highlight

COMET C/2023 A3 IN THE MORNING SKY

Perhaps the most anticipated comet in years will make an appearance in late September. It won’t get very high above the horizon before sunrise but look for it in the eastern sky the last few mornings of the month. It might get as bright as magnitude one. The altitude of the comet will be less than 8 degrees above the horizon, so having a low, mountain free view is required. The comet will swing back towards the sun until the middle of October when the best time to observe occurs after sunset. More coverage in next month’s newsletter.

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
Vince Sempronio Mike Morrison Gary Grue Richard Lighthill

Nightfall Editor: *Vince Sempronio* *nightfall@hacastronomy.org*
Webmaster: *Ken Kirchner*
Facebook Editor: *Richard Lighthill*

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 (September - October)

SUN	MON	TUE	WED	THU	FRI	SAT
SEP 1	**2** **6:56 PM** **LABOR DAY**	**3**	**4**	**5** 5:00 PM Patterson 20th Anniversary 7:00 PM Patterson Public Night	**6** Spica & Moon 0.5°	**7** Kartchner Star Party 6:00 – 9:00 PM
8 Saturn opposition	**9**	**10** **11:06 PM** Antares & Moon 0.1°	**11** **PATRIOT DAY**	**12**	**13**	**14** Solar Saturday at the S.V. library 10:00 AM – 12:00 PM
15	**16**	**17** **7:34 PM** Saturn Occultation 4:19 AM Partial Lunar Eclipse 7:13 PM	**18**	**19**	**20** HAC Meeting Room A102 Downtown 7:00 pm Neptune Opposition	**21**
22 Autumnal Equinox 5:44 PM	**23**	**24** **11:50 AM**	**25**	**26**	**27**	**28** Dine Under the Stars 5:00 – 9:00 PM
29	**30**	**OCT 1** **11:49 AM**	**2**	**3**	**4**	5 Kartchner Star Party Noon – 9:00 PM
6	**7**	**8** Adult Adaptive Rec at Patterson 7:00 - 8:30 PM	**9**	**10** **11:55 AM** Patterson Public Night 6:30 PM	**11**	12 Solar Saturday at the S.V. library 10:00 AM – 12:00 PM
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**	

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: I am Sir John Herschel (1792–1871), son of Sir William Herschel.