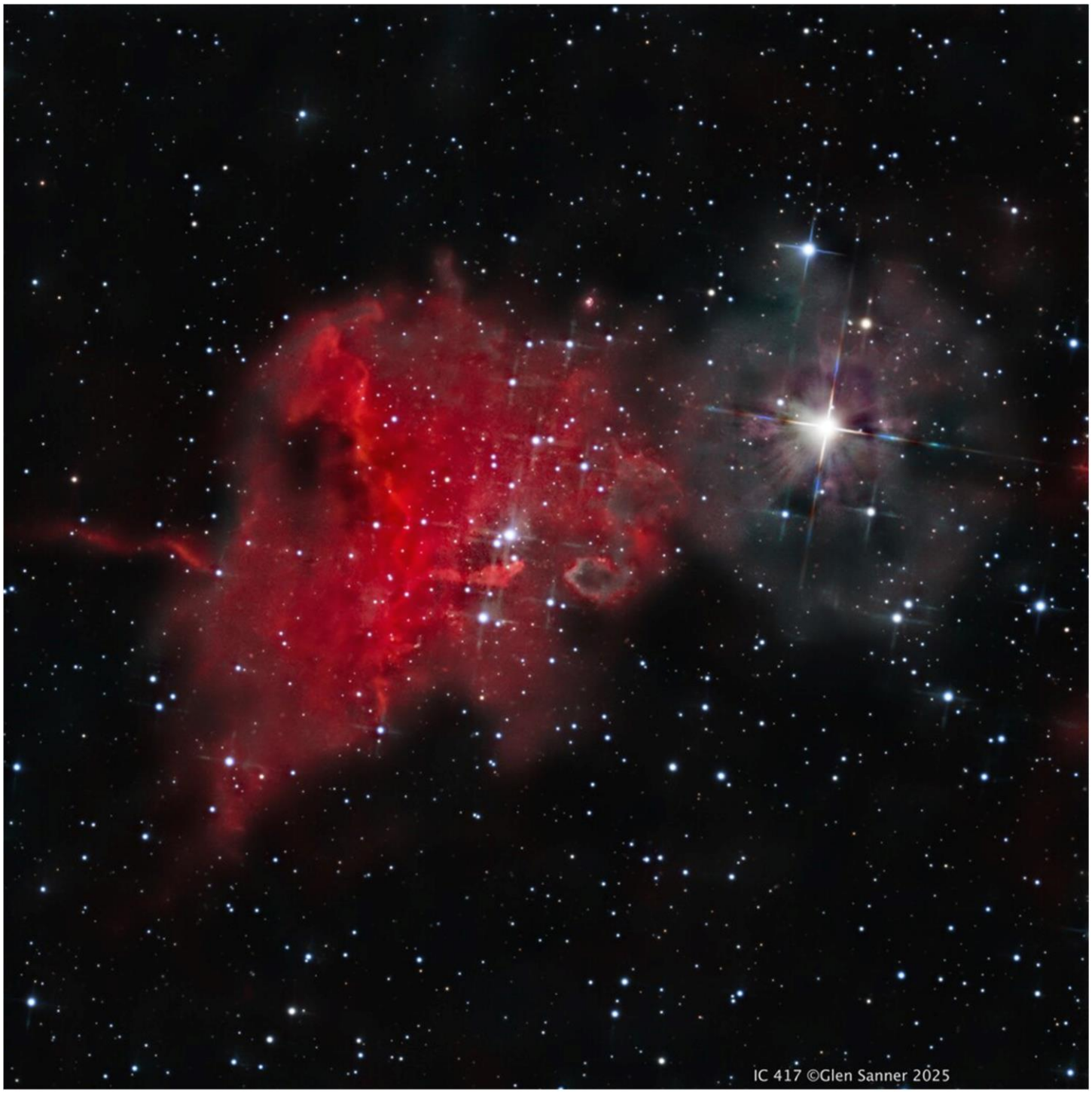
Nightfall

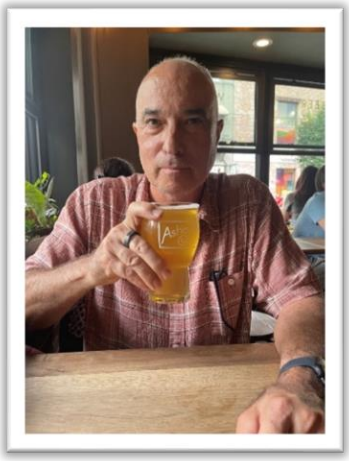
A Publication of the Huachuca Astronomy Club

April, 2025



Club Meeting Speaker

The speaker at the April 2025 club meeting is HAC club member Jim Reese. The title of his talk is "*History of Kitt Peak National Observatory, relationship with the Tohono O'odom Nation, and the evolution of the McMath-Pearce Solar Telescope."*



Jim is a retired U.S. Army Civilian Supervisor (GS13) and U.S. Army Human Intelligence and Counterintelligence Chief Warrant Officer Three. Jim served as a Team Leader at the Defense Strategic Debriefing Course, Deputy Director of the Defense HUMINT Officer course and Course Manager / Developer of the Joint Analyst-Interrogator Collaboration Course. Jim deployed to Panama, Albania, Kosovo and Iraq, overseeing interrogation operations, counterintelligence investigations, HUMINT Analysis and source operations for the 82d Airborne Division and 1st Armor Division. He has been a docent at Kitt Peak National Observatory. Jim has had a lifelong interest in astronomy but only been able to devote considerable time to it since his final retirement. He is a graduate of Miami University, Oxford, Ohio.

Welcome our new members

Rebecca Winters of Sierra Vista joined the club in March. Welcome, we are glad you joined.

HAC Dues Reminder

Thank you to everyone who has paid their 2025 dues. There are still several memberships that expired in December. If you're unclear about your due's status, please contact the treasurer, Ted Forte at tedforte511@gmail.com Dues are $35 Family and $25 Regular ($25 and $20 for active-duty military). Full time students pay $10. Here are the 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

Earth Day at Vet Park April 17, 2025

This fun annual solar viewing event is held in conjunction with the Sierra Vista Farmer's Market. We will set up in the eastern corner of the field used for the market at Veterans Memorial Park. Members are requested to set up solar telescopes from 10 a.m. to 2 p.m. There are food vendors at the event.

Donor Appreciation Night at Patterson, April 19, 2025

Let's hope the third time is a charm. We will host University South Foundation donors and their families at the Patterson Observatory on Saturday, April 19 starting at 7:30 p.m. HAC volunteers are requested to come and set up telescopes. Refreshments will be served.

Astronomy Day, May 3, 2025

HAC will be collaborating with the Sierra Vista Library to conduct an Astronomy Day gala at Thomkins Park on Saturday May 3. The event runs from 3 p.m. until 9 p.m. with set up starting at 2 p.m.

Sierra Vista Mayor McCaa will proclaim May 3 as "Astronomy Day" in Sierra Vista at the April 24 city council meeting at 5 p.m. HAC President Penny Brondum will receive the proclamation on behalf of the club. HAC members are encouraged to attend that meeting to support Penny.

Besides volunteers to attend, we need ideas and activities to enrich the event. We are calling on all HAC members to participate, but we also need you to give the event some thought and propose activities. Time is short, so please don't delay and don't be shy about suggestions.

Editors Corner

There are a few new changes to the overall look of the newsletter, some are obvious, some are subtle. The biggest change is the cover. HAC has many fine astro photographers, and one way to showcase their work is to present their efforts on the cover of our newsletter. For consideration, please submit your best efforts from past or present to the editor. A description of the cover image will appear elsewhere in the newsletter.

President's Constellation Exploration – Canis Major and Canis Minor

by Penny Brondum

Last evening as we were aligning our telescopes for another outreach event and everyone seemed to be using Sirius as an alignment star for their telescopes, I realized I had not explored the Canis Major or Canis Minor Constellations. So, let's rectify that.

The constellation Canis Minor can be seen alongside Monoceros and the obsolete constellation Atelier Typographique in this 1825 star chart from Urania's Mirror.

Canis Major, the Great Dog, lies in the sky just southeast of Orion. Like Orion, many of the stars that make up Canis Major are bright. Canis Major represents the bigger dog following Orion, the hunter in Greek mythology. The Great Dog is often depicted pursuing a hare, represented by the constellation Lepus. The smaller dog is represented by the nearby constellation Canis Minor. Both dog constellations are among the 48 Greek constellations, first catalogued by Claudius Ptolemy of Alexandria in his *Almagest* in the 2nd century CE The Milky Way passes through both Canis Major and Canis Minor.

Although Canis Major is a mid-sized constellation and contains a wide variety of excellent telescopic targets. Canis Major and Canis Minor belong to the Orion family of constellations, along with Lepus, Monoceros, and Orion. Canis Minor is a small constellation. In the second century, it was included as an asterism, or pattern, of two stars in the sky. Its name is Latin for "lesser dog", in contrast to Canis Major, the "greater dog"; both figures are commonly represented as following the constellation of Orion the hunter. There are three dog constellations in the sky Canis Major, Canis Minor(the Little Dog) and Canes Venatici (the Hunting Dogs).

Canis Minor lies directly south of Gemini's bright stars Castor and Pollux. It does not border Canis Major; Monoceros is in between the two. Canis Minor is most prominent at 10 p.m. during mid-February but it is seen early in the evening until July, when it is only visible after sunset before setting itself.

Canis Major as depicted in Urania's Mirror, a set of constellation cards published in London c.1825. Next to it are Lepus and Columba (partly cut off).

Canis Major was described by Manilius as "the dog with the blazing face" because the dog appears to hold Sirius, the brightest star in the sky, in its jaws. In mythology, the constellation Canis Major is associated with Laelaps, the fastest dog in the world, one destined to catch anything it pursued. In Greek lore, Zeus gave Laelaps to Europa as a present, along with a javelin that could not miss. The gift proved to be an unfortunate one, as Europa herself met her end at the hands of her husband Cephalus, who was out hunting with the javelin.

In ancient Mesopotamia, Sirius, named KAK.SI.SA$_2$ by the Babylonians, was seen as an arrow aiming towards Orion, while the southern stars of Canis Major and a part of Puppis were viewed as a bow. The arrow, Sirius, was also linked with the warrior Ninurta, and the bow with Ishtar, daughter of Enlil. Ninurta was linked to the later deity Marduk, who was said to have slain the ocean goddess Tiamat with a great bow, and worshipped as the principal deity in Babylon.

The Ancient Greeks replaced the bow and arrow depiction with that of a dog. The ancient Greeks refer only to one dog, but by Roman times, Canis Minor appears as Orion's second dog. In Chinese astronomy, the modern constellation of Canis Major is located in the Vermilion Bird where the stars were classified in several separate asterisms of stars. Both the Māori people and the people of the Tuamotus recognized the figure of Canis Major as a distinct entity, though it was sometimes absorbed into other constellations. The Māori constellation included both Canis Minor and Canis Major, along with some surrounding stars.

Among the Merazig of Tunisia, shepherds note six constellations that mark the passage of the dry, hot season. One of them, called *Merzem*, includes the stars of Canis Major and Canis Minor and is the herald of two weeks of hot weather.

Canis Minor originates from ancient Mesopotamia. Procyon and Gomeisa were called *MASH.TAB.BA* or "twins" in the *Three Stars Each* tablets, dating to around 1100 BC. Canis Minor was also given the name *DAR.LUGAL*, its position defined as "the star which stands behind it [Orion]", in the *MUL.APIN*; the constellation represents a rooster.

The Ancient Greeks called the constellation *Procyon*, "coming before the dog", transliterated into Latin *minor Canis*. In Greek mythology, Canis Minor was sometimes connected with the Teumessian Fox, a beast turned into stone with its hunter, Laelaps, by Zeus, who placed them in heaven as Canis Major (Laelaps) and Canis Minor (Teumessian Fox). The medieval Arabic astronomers maintained the depiction of Canis Minor (*al-Kalb al-Asghar* in Arabic) as a dog. The ancient Egyptians thought of this constellation as Anubis, the jackal god. Occasionally, Canis Minor is confused with Canis Major and given the name *Canis Orionis* ("Orion's Dog"). Korea recognized four stars in Canis Minor as part of a different constellation, "the position of the water". This constellation was located in the Red Bird, the southern portion of the sky. Polynesian peoples often did not recognize Canis Minor as a constellation, but they saw Procyon as significant, in the Tuamotu Archipelago it was known as *Hiro*, meaning "twist as a thread of coconut fiber". The Aztec calendar was related to their cosmology. The stars of Canis Minor were incorporated along with some stars of Orion and Gemini into an asterism associated with the day called "Water".

Procyon, the brightest star of Canis Minor (the Little Dog) is likely the closest stellar neighbor to Sirius, the brightest star in Canis Major (the Great Dog) . These two bright stars are separated by about 5.2 light-years.

Procyon, or Alpha Canis Minoris, is the eighth-brightest star in the night sky, as well as one of the closest. Its name means "before the dog" or "preceding the dog" in Greek, as it rises an hour before the "Dog Star", Sirius, of Canis Major. It is a binary star system, consisting of a yellow-white main-sequence star, and a faint white dwarf companion. Procyon A is 1.4 times the Sun's mass, while its smaller companion is 0.6 times as massive as the Sun. The system is 11.4 light-years from Earth, the shortest distance to a northern-hemisphere star of the first magnitude.

Canis Major's brightest star Sirius is one of the constellation's most interesting and challenging telescopic targets. Sirius is a double star with a separation that varies in distance from each other over a period of 50 years. Sirius A and B are currently around their maximum separation. Splitting the pair would be a breeze except for one thing—Sirius B is an Earth-sized white dwarf star that is 10 magnitudes fainter than Sirius A. As a result, picking Sirius B out of the glare of Sirius A can be extremely difficult. However, it can be done with all but the smallest good-quality telescopes. Sirius is found by extending a line through the three bright stars of Orion's Belt.

Credit: arabianightsrum.com

The name Sirius comes from the Greek *Σείριος* (*Seirios*), meaning "scorching," "glowing" or "searing." In ancient times, the star rose just before sunrise during the hottest summer period, the "dog days" of summer. Ancient Greeks and Romans believed that Sirius was somehow responsible for the summer heat. In ancient Egypt, Sirius marked the flooding of the Nile. The star's heliacal rising, just before the annual flooding and the summer solstice, played a crucial role in the Egyptian calendar during the Middle Kingdom era. Some suggest that ancient Egyptians associated Sirius with the god Osiris.

Sirius, in Canis Major that is not expected to end its life as a supernova. Even though it has twice the Sun's mass and is 25.4 times more luminous, the star appears so bright in Earth's sky mainly because it is one of our nearest neighbors. Canis Major stars Adhara, Wezen, Mirzam, Aludra, and many other visible stars in Canis Major are supernova candidates. These massive stars have already evolved away from the main sequence, while Sirius is still fusing hydrogen into helium in its core. Due to its lower mass, Sirius will still be here long after these luminous giants and super giants are gone. The Great Dog hosts at least 10 stars with known planets and 10 formally named stars.

Canis Major is home to several notable deep sky objects. These include the bright open clusters Messier 41(NGC2287), Caroline's Cluster (NGC 2360), the Canis Major Dwarf Galaxy, and the emission nebulae NGC 2359

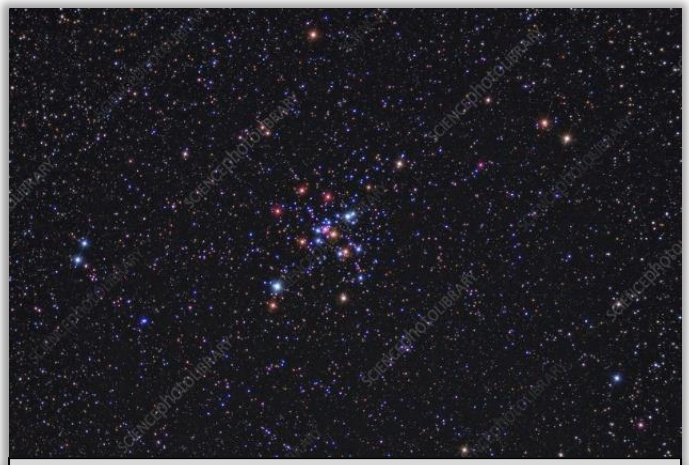
(Thor's Helmet Nebula). There are no meteor showers associated with the constellation.

60-minute exposures (320mm aperture FL 2600mm) a Focal Ratio 8.1 (10 sub of 360seconds) processed as RGB with color balance by photometric data from the stars present. I applied deconvolution via 'Blur' exterminator process. Then the Narrow Band normalization applied. Thor's helmet SHO PROCESS. Credit: Len Amburgey

M41 and NGC 2360, two noteworthy open clusters, occupy the northern part of Canis Major. M41 is the brighter of these two and contains about 100 stars. Several members are red giants. M41 is bright enough to be visible to the unaided eye under dark skies. It lies 2,300 light-years away. Binoculars will resolve a few of the cluster's stars, and telescopes at low magnification will give the best views of the cluster. The cluster was discovered by the Italian astronomer Giovanni Battista Hodierna before 1654. It may have been recorded by ancient Greek philosopher Aristotle around 325 BCE. It has been nicknamed the Little Beehive Cluster because of its resemblance to the brighter and larger Beehive Cluster (Messier 44) in the zodiac constellation Cancer.

NGC 2360 (Caroline's Cluster or Caldwell 58) is dimmer and smaller than M41, but it is still bright enough to be visible with binoculars as a fuzzy spot of light. It was named Caroline's Cluster after its discoverer, the German-born British astronomer Caroline Herschel, who spotted it on February 26, 1783. Her brother William Herschel added the cluster to his 1786 catalogue, crediting her for the discovery. The cluster lies approximately 3,700 light-years away. It should not be mistaken for the brighter and larger Caroline's Rose Cluster (the White Rose Cluster, NGC 7789), an open cluster located in the northern constellation Cassiopeia. Astronomers used Hubble to study white dwarfs in Caldwell 58 to better understand the age of our galaxy.

Canis Major's most impressive nebula is NGC 2359, also known as the Duck Nebula or Thor's Helmet is an emission nebula located approximately 11,960 light-years away. NGC 2359 is not very bright, but it is relatively easy to observe under dark, clear skies. The Duck Nebula consists of a round "bubble" of nebulosity, with streamers of nebulosity extending in several directions from the bubble. The easiest parts of the nebula to observe are the central bubble and the brightest extension. With larger telescopes and dark skies, you may be able to see wispy detail within the central bubble, as well as three long extensions leaving the bubble.



Open Cluster M41. Credit: Sciencephoto. com

William Herschel recorded four objects in his 1786 work *Catalogue of Nebulae and Clusters of Stars*, in Canis Minor including two he mistakenly believed were star clusters. NGC 2459 is a group of five thirteenth- and fourteenth-magnitude stars that appear to lie close together in the sky but are not related. A similar situation has occurred with NGC 2394, also in Canis Minor, a collection of fifteen unrelated stars of ninth magnitude and fainter. Herschel also observed three faint galaxies, two of which are interacting with each other.

The 11 Canis-Minorids, also called the Beta Canis Minorids, are a meteor shower associated with Canis Minor discovered in 1964 by Keith Hindley. They last from 4 to 15 December, peaking over 10 and 11 December.

There so much more to explore in both of Canis Major and Canis Minor constellations. I challenge you to get out, look up and enjoy the awesome night skies of April and May before we get to the monsoon rains of June, July and August. Look for Sirius and Procyon as star guides to great viewing before they disappear following Orion.

"The church says the earth is flat; but I have seen its shadow on the moon, and I have more confidence even in a shadow than in the church."

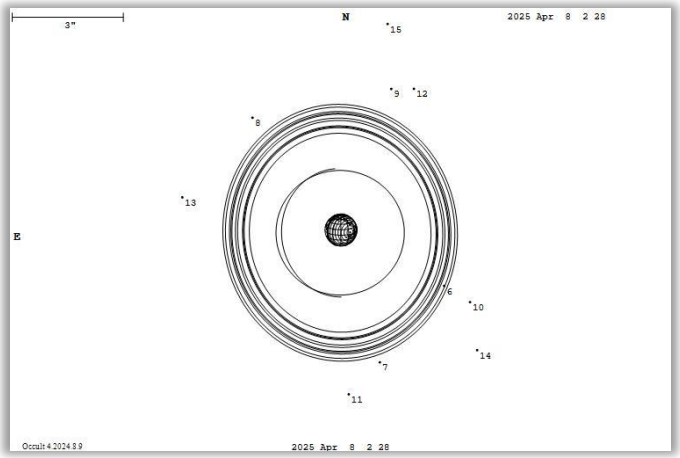
---Ferdinand Magellan.

The Bucket List
by Vince Sempronio

On the evening of April 7th, the planet Uranus occults the magnitude 9.2-star, HIP16271 in Taurus. This event is not easy to observe visually because of the difference in magnitudes. Uranus is much brighter at magnitude 5.8. Technically, the recommended technique is to limit the light from Uranus by using a CH4 (Methane) filter. Uranus absorbs the Methane band of light which makes it appear darker. Using the filter requires more light gathering power, so the bigger the scope, the better. As an example, I did some testing with an 8" SCT on the target star, with and without a CH4 filter. The camera I used required a 1 second exposure to see the star with the filter and a fraction of a second without the filter. A 1-second exposure is much too long to obtain useful scientific data, especially considering events involving the Uranian rings.

What to expect

The point of observing occultations of asteroids is to record the instantaneous (usually) disappearance and reappearance of the occulted star by the usually much darker asteroid. These observations help pinpoint the size and location of the asteroid to a high degree of accuracy. In the case of Uranus, which has an atmosphere, occultations will show a star slowly dimming as the planet moves in front of it. This doesn't help in nailing down the size and location, but the dimming of the atmosphere is useful to planetary scientists. Uranus also has rings, and they too are worth the effort to record their individual events. The rings are tenuous, so each ring may or may not completely cover the star as they pass in front of it, adding to the difficulty of recording their passage. Some of the rings were discovered by occultation back in March of 1977. The Uranus event this month offers another chance to reproduce that initial discovery.

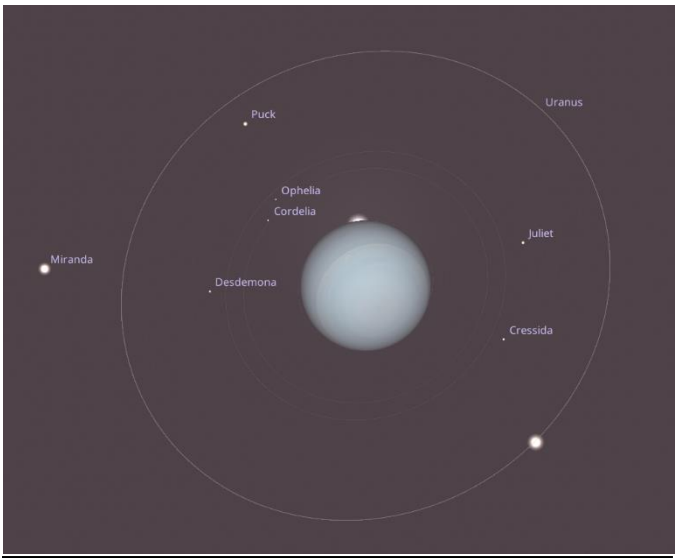


Uranian System. Credit: David Dunham, IOTA

The diagram above shows the relative positions of the rings and moons in relationship to Uranus. Uranus moves very slowly and from Tucson, it will take the star 50 minutes to traverse the entire system from ingress to egress. Notice the angular size ruler in the upper left corner. The rings are only a few arc seconds away from Uranus. The numbered dots represent the location of the some of the moons of Uranus.

There are 13 known rings in the Uranian system. They are, from outer to inner named Mu, Nu, Epsilon, Lambda, Delta, Gamma, Eta, Beta, Alpha, 4, 5, 6, and Zeta. Zeta is located only 1.5 arc seconds away from the edge of Uranus.

The star will engage the leading edge of the ring system in the Sierra Vista area around 7:05pm. The end of the leading rings event ends at 7:11pm. Six minutes later, the star encounters the disc of Uranus at 7:17pm. It will take 28 minutes for Uranus to move far enough east to uncover the star at 7:45pm. The trailing rings are encountered between 7:51pm till 7:57pm.



Uranian system at the moment HIP 16721 starts to disappear behind Uranus.The other white dot near the Epsilon ring to the lower right is the companion star. Image credit: Stellarium

Bonus observation

The star HIP16721 star system is located 335 light years away. The star is binary, with a 13th magnitude companion separated 7.4" from the primary. The companion won't contribute to the rings or planetary occultation effort (as it is too dim), but it will occult Cressida (IX), a moon of Uranus. Unfortunately, this event is only visible in parts of Alaska and northern Canada.

What a coincidence that both components of the star system are involved in these events!

NASA Night Sky Notes

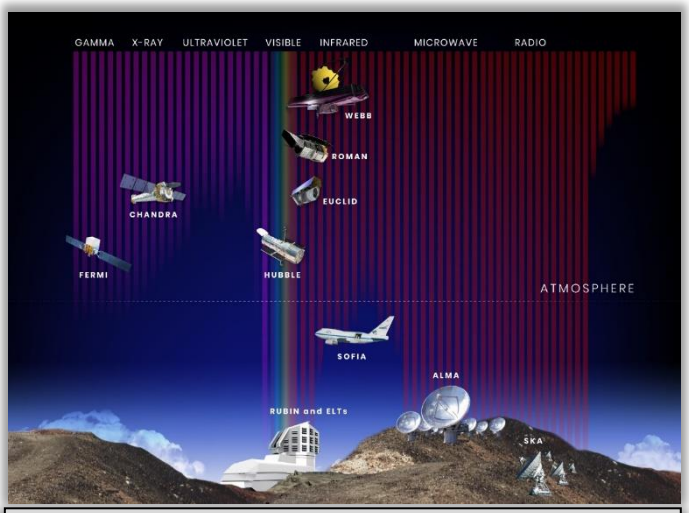
This article is distributed by NASA's Night Sky Network (NSN)

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 the Waves
By Kat Troche

The Electromagnetic Spectrum

If you've ever heard the term "radio waves," used a microwave or a television remote, or had an X-ray, you have experienced a broad range of the electromagnetic spectrum! But what is the electromagnetic spectrum? According to Merriam-Webster, this spectrum is *"the entire range of wavelengths or frequencies of electromagnetic radiation extending from gamma rays to the longest radio waves and including visible light."* But what does **that** mean? Scientists think of the entire electromagnetic spectrum as many types of light, only some that we can see with our eyes. We can detect others with our bodies, like infrared light, which we feel as heat, and ultraviolet light, which can give us sunburns. Astronomers have created many detectors that can "see" in the full spectrum of wavelengths.



This illustration shows the wavelength sensitivity of a number of current and future space and ground-based observatories, along with their position relative to the ground and to Earth's atmosphere. The wavelength bands are arranged from shortest (gamma rays) to longest (radio waves). The vertical color bars show the relative penetration of each band of light through Earth's atmosphere. Credit: NASA, STScI

Telescope Types

While multiple types of telescopes operate across the electromagnetic spectrum, here are some of the largest, based on the wavelength they primarily work in:

NASA's Hubble Telescope captured the Pillars of Creation in 1995 and revisited them in 2014 with a sharper view. Webb's infrared image reveals more stars by penetrating dust. Hubble highlights thick dust layers, while Webb shows hydrogen atoms and emerging stars. You can find this and other parts of the Eagle Nebula in the Serpens constellation. Credit: NASA, ESA, CSA, STScI, Hubble Heritage Project (STScI, AURA)

- **Radio:** probably the most famous radio telescope observatory would be the Very Large Array (VLA) in Socorro County, New Mexico. This set of 25-meter radio telescopes was featured in the 1997 movie Contact. Astronomers use these telescopes to observe protoplanetary disks and black holes. Another famous set of radio telescopes would be the Atacama Large Millimeter Array (ALMA) located in the Atacama Desert in Chile. ALMA was one of eight radio observatories that helped produce the first image of supermassive black holes at the center of M87 and Sagittarius A* at the center of our galaxy. Radio telescopes have also been used to study the microwave portion of the electromagnetic spectrum.

- **Infrared:** The James Webb Space Telescope (JWST) operates in the infrared, allowing astronomers to see some of the earliest galaxies formed nearly 300 million years after the Big Bang. Infrared light allows astronomers to study galaxies and nebulae, which dense dust clouds would otherwise obscure. An excellent example is the Pillars of Creation located in the Eagle Nebula. With the side-by-side image comparison below, you can see the differences between what JWST and the Hubble Space Telescope (HST) were able to capture with their respective instruments.

- **Visible:** While it does have some near-infrared and ultraviolet capabilities, the Hubble Space Telescope (HST) has primarily operated in the

visible light spectrum for the last 35 years. With over 1.6 million observations made, HST has played an integral role in how we view the universe. Review Hubble's Highlights here.

- **X-ray:** Chandra X-ray Observatory was designed to detect emissions from the hottest parts of our universe, like exploding stars. X-rays help us better understand the composition of deep space objects, highlighting areas unseen by visible light and infrared telescopes. This image of the Crab Nebula combines data from five different telescopes: The VLA (radio) in red; Spitzer Space Telescope (infrared) in yellow; Hubble Space Telescope (visible) in green; XMM-Newton (ultraviolet) in blue; and Chandra X-ray Observatory (X-ray) in purple. You can view the breakdown of this multiwavelength image here.

Try This at Home

Even though we can't see these other wavelengths with our eyes, learn how to create multiwavelength images with the Cosmic Coloring Compositor activity and explore how astronomers use representational color to show light that our eyes cannot see with our Clues to the Cosmos activity.

"Astronomical Navigation"
By Karen Madtes

Astronomical navigation
has built-in aggravation...
Just star hop from here to there,
but I can't see the guide star no matter how long I stare!
In that case, you can use triangulation
which brings a whole new realization.
You're bombarded with consternation
and ready for an altercation.
Oh, for the elimination of the frustration
involved in location identification.
The possible irritation in this recreation
whose fallback is averted imagination
Is to contemplate strangulation,
but that's too permanent of a termination.
It really does get easier with compilation
of experience and maybe some automation?
How about the hand controller creation?
in order to entice, a new user to the device
Just push a button and go - oh, how easy it sounds
no mention of kicked tripods, low batteries or cord wrap-arounds
Not to add condemnation to a complication and to avoid stagnation
the revelation of a little contemplation to avoid incrimination and perhaps decimation
Could be to take a short vacation?

About the Cover

Glen Sanner describes his image. This is a composite image of IC 417, an emission and reflection nebula in the constellation Auriga, the Charioteer. It is a stack of 62 x 12 min. sub exposures (12hr. 24min.) Open cluster Stock 8 is near the center of the photo. This cluster is very young, approximately 3Myr old and contains many O/B stars and a mixture of variable stars. Many YSO's (Young stellar objects) are to be found here. IC 417 is sometimes referred to as "the Spider Nebula" and with a wide field view you can see the spider's prey "the Fly nebula." The Fly Nebula (NGS 1931) does not appear in this image and is off to the left out of the field of view. These nebulae are 7800 to 10.000 light years distant. The emission nebula IC 417 glows due to the intense radiation from young stars that ionize the abundant H alpha here. IC 417 is also known as Sharpless 2-234. The bright naked eye star to the right in the image is Phi Aurigae and is at visual magnitude 5.0. It is approximately 480 light years distant. As you can see from the image it caused many reflections in my telescope, and I see the square sensor reflection as well.

Trivia Question

On April 11th, 1970, Apollo 13 launched from Launch Complex 39A in Florida. The crew consisted of James Lovell, Jack Swigert, and Fred Haise. The command module was named *Odyssey* and the lunar module, *Aquarius*. We all know what happened, but for all the marbles, what was the name of the location on the Moon where they were to land?

Club Officers & Contacts

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Past President: *David Roemer*

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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

(March - April '25)

SU	MO	TU	WE	TH	FR	SA
30	**31**	**April 1**	**2**	**3** Public Night @Patterson Obs 7:30 PM	**4** **7:15 PM**	**5**
6	**7** Uranus occults a mag 9 star	**8**	**9**	**10**	**11** HAC Meeting Room A102 7 PM	**12** **5:22 PM** Solar Saturday 10A-12P Passover begins at sunset
13	**14**	**15**	**16**	**17** Earth Day @ Veteran's Park 10 AM – 2 PM	**18**	**19** Donor Appreciation Night @ Patterson Obs 7:30 PM
20 **6:36 PM** Easter	**21** Lyrid Meteors	**22** School Field Trip @ Patterson Obs 9 AM -11 AM Lyrid Meteors	**23** Lyrid Meteors	**24** SV City Council Meeting Astronomy Day Proclamation 5 PM	**25**	**26** Star Party @ Kartchner Noon to 9 PM
27 **12:31PM**	**28**	**29**	**30**	**May 1** Public Night @ Patterson Obs 7:30 PM	**2** Vesta Opposition	**3** Astronomy Day at Thompkins Park 2PM-9PM
4 **6:52AM**	**5** Eta Aquariid meteor shower	**6** Eta Aquariid meteor shower	**7** Eta Aquariid meteor shower	**8**	**9** HAC Meeting Room A102 7PM	**10** Solar Saturday @SV Library 10 AM-12 PM
11	**12** **9:56AM**	**13**	**14** Juno at opposition	**15**	**16**	**17**
18	**19**	**20** **4:59AM**	**21**	**22**	**23**	

All dates and times are local MST
Astronomy events listed are those visible in the Southwestern, USA

Join the HAC Astro forum to keep up to date with all the Huachuca Astronomy Club events.
To join, send an email to: HACAstro+subscribe@groups.io

Answer to the trivia question: Fra Mauro.