



JULY, 2025

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB



CLUB MEETING SPEAKER

The speaker for July's HAC meeting is [Lucas Smith](#) (UoA - PhD Candidate).



Abstract of his Talk

In September of 2023, samples of the carbonaceous near-earth asteroid Bennu were returned to Earth by NASA's Origins, Spectral Interpretation, Resource Identification, Security, Regolith Explorer (OSIRIS-REx) sample return mission. OSIRIS-REx succeeded in returning more than 120 grams of pristine asteroidal material, far surpassing the mission requirement of 60 grams. These samples are currently being investigated by a dedicated interdisciplinary team of scientists from across the globe and have revealed critical information about materials and processes in the early system, with more discoveries to come. These discoveries include the revelation that Bennu is rich in carbon, nitrogen, and complex organic molecules, all of which are key components of life as we know it on Earth and supports the hypothesis that prebiotic molecules may have been delivered to the young Earth by impacts. Samples returned by OSIRIS REx have been found to contain dust from previous generations of stars and have even helped unravel the nature of water in the early solar system through the first confirmed extraterrestrial evaporite mineral sequence. These discoveries would not be possible without the pristine material provided by the OSIRIS-REx mission and underscore the scientific value and necessity of sample return missions.

Bio

Lucas received a B.S. in Physics with an emphasis on astrophysics and astronomy from Appalachian State University in Boone, NC. Currently, he is a 5th-year PhD student at the University of Arizona's Lunar and Planetary Laboratory where he received an M.S. in Planetary Science in 2023. Lucas's research focuses on identifying and investigating presolar stardust and studying rare phosphorus bearing in aqueously-altered meteorites. As an extension of this work, he is a part of the OSIRIS-REx Sample Analysis Team, where he is a member of the

Sample Element and Isotopes (SEIWG), Sample Organic Analysis (SOAWG), and mineralogy and petrology (MAPWG) working groups.

Lucas has presented to HAC before.

Join Lucas at our pre-meeting dinner at the [Angry German](#) restaurant.

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

JULY OUTREACH

Because of the monsoon season, the club rarely has any planned observing events in July and August. Check for exceptions on the [HAC forum](#).

EDITOR'S CORNER

Mark Twain is credited with saying "Write about what you know." I'm willing to bet that some of our readers have experiences that could be typed up and shared with the readership. As an example, a short paragraph about the first time you observed a comet or DSO, or a brush with astronomy royalty. We don't need a novel, so share what you know!

PRESIDENT'S CONSTELLATION

EXPLORATION – LYRA

BY PENNY BRONDUM

[Lyra](#) (Latin for 'lyre') is a small constellation (52nd in size) occupying an area of 286 square degrees. It is one of the 48 listed by the 2nd century astronomer [Ptolemy](#) and is one of the 88 modern constellations recognized by the International Astronomical Union ([IAU](#)). Lyra was often represented on star maps as a vulture or an eagle carrying a lyre and hence is sometimes referred to as Vultur Cadens or Aquila Cadens ("Falling Vulture" or "Falling Eagle"), respectively. Lyra is nearly overhead in temperate northern latitudes shortly after midnight at the start of summer. From the equator to about the 40th parallel south Lyra is visible low in the northern sky during the same (thus winter) months. The neighboring constellations are [Cygnus](#), [Draco](#), [Hercules](#) and [Vulpecula](#).



Lyra can be seen on the right of this c. 1825 star map from *Urania's Mirror*.

Lyra belongs to the Hercules family of constellations, along with Aquila, Ara, Centaurus, Corona Australis, Corvus, Crater, Crux, Cygnus, Hercules, Hydra, Lupus, Ophiuchus, Sagitta, Scutum, Sextans, Serpens, Triangulum Australe and Vulpecula.

Lyra represents the lyre of [Orpheus](#), the musician and poet in Greek mythology. The lyre of Orpheus was made by [Hermes](#) from a tortoise shell and is said to be the first lyre ever produced. Orpheus was known for his ability to charm even stones with his music, for his attempts to save his wife [Eurydice](#) from the underworld, and for being the harpist and companion of [Jason](#) and the [Argonauts](#).

The most famous story involving Orpheus is that of the passing of his wife Eurydice. Eurydice was trying to escape a satyr at her wedding and fell into a nest of vipers. Orpheus traveled to the world of the dead to gain her release. Orpheus' song deeply moved Hades and his wife [Persephone](#) and they agreed to return Eurydice to the world of the living on one condition: Orpheus should walk in front of her and not look back until they both had

reached the upper world. However, Orpheus forgot that they both had to arrive to the upper world before he could turn. Orpheus turned around, but Eurydice was not quite there yet disappeared from his sight, for good this time. Orpheus spent the rest of his life strumming his lyre while wandering aimlessly through the land, rejecting all marriage offers from women.

Without Orpheus and his music, the Argonauts would not have been able to make it past the Sirens, whose song enticed sailors to come to them, which usually resulted in sailors crashing their ships into the islands on which the Sirens lived. When the Argonauts approached the islands, Orpheus drew his lyre and played music that drowned out the Sirens' calls.

Orpheus met his end at the hands of Thracian Maenads, who ripped him to shreds for not honoring Dionysus. One version says Orpheus's lyre was carried to heaven by the Muses, who also collected the fragments of his body and buried them below Mount Olympus. Another version says that when Orpheus died, his lyre was thrown into a river. Zeus sent an eagle to get the lyre and placed both of them in the sky.

In Wales, the constellation Lyra is known as King Arthur's Harp (Talyn Arthur) or King David's Harp. The constellation was seen by the Arabs as a vulture or an eagle carrying a lyre, either enclosed in its wings, or in its beak. In Australian Aboriginal astronomy, Lyra is known by the Boorong people in Victoria as the Malleefowl constellation. Lyra was known as Urcuchillay by the Incas and was worshipped as an animal deity. The Persian Hafiz called it the Lyre of Zurah

The Lyra constellation contains six formally named stars and nine stars with known planets. Lyra contains two Messier objects – Messier 56 ([M56](#), NGC 6779) and Messier 57 ([M57](#), NGC 6720, Ring Nebula). There are three meteor showers associated with the constellation: the Lyrids, which peak around April 21-22 every year, the June Lyrids and the Alpha Lyrids.

The brightest star in the Lyra constellation is [Vega](#) (Alpha Lyrae), a main-sequence star only 7.7 parsecs distant or 25.04 light years distant from Earth. Vega is a Delta Scuti variable, varying between magnitudes -0.02 and 0.07 over 0.2 days. On average, it is the second-brightest star of the northern hemisphere (after Arcturus) and the fifth-brightest star in all. Vega was the Northern pole star in the year 12,000 BCE and will again become the pole star around 13,727 CE.

Vega was the first star, other than the Sun, to be photographed as well as the first to have a clear spectrum recorded, thus showing absorption lines for the first time. It was first imaged by William Bond and John Adams Whipple at the Harvard College Observatory on July 17, 1850, and it was the American amateur astronomer Henry Draper who took the first photograph of Vega's spectrum in August 1872. Vega is 2.1 times as massive as the Sun,

and only about a tenth of the Sun's age. The star was the first single main-sequence star other than the Sun to be known to emit X-rays, and is surrounded by a circumstellar debris disk, similar to the Kuiper Belt. Vega forms one corner of the famous Summer Triangle asterism; along with Altair and Deneb, these three stars form a prominent triangle during the northern hemisphere summer.

Another notable star in Lyra is [Epsilon Lyrae](#), popularly known as the Double Double, a multiple star system about 162 light years away. It has an apparent magnitude of 4.7. In binoculars, the system appears as two stars, each of which can be resolved into a binary when observed through a telescope. The two main components, the binary stars, orbit each other making a four star system. (Note: a fifth star has been found in this formation.) It is located around 162 light years away.

A few key Deep Sky objects in Lyra are the objects M56, M57 and NGC6791. M56 is a rather loose globular cluster at a distance of approximately 32,900 light-years, with a diameter of about 85 light-years. Its apparent brightness is 8.3. It was discovered by Charles Messier on January 19, 1779. It is thought to be about 13.7 billion years old. M56 lies halfway between the stars Albireo (Beta Cygni) in the Cygnus constellation and Sulafat (Gamma Lyrae). It appears as a fuzzy star in larger binoculars, but can be resolved with an 8-inch telescope. It contains stars that are 13th magnitude and about a dozen variables.

M57, also known as the "Ring Nebula", is a distance of 2,550 light-years from Earth and one of the best known planetary nebulae and the second to be discovered, located south of the star Vega, about 40% of the distance from Beta to Gamma Lyrae. It is relatively easy to find and is a popular target among amateur astronomers. It was discovered in 1779 by Antoine Darquier, 15 years after Charles Messier discovered the Dumbbell Nebula. Astronomers have determined that it is between 6,000 and 8,000 years old and is approximately one light-year in diameter. The Ring Nebula belongs to the class of planetary nebulae known as bipolar nebulae. It has a thick equatorial ring that noticeably extends the structure through its main axis of symmetry. The nebula was formed when a shell of ionized gas was expelled by a red giant star that was in the process of becoming a white dwarf. It is expanding at the rate of about 1 arc second per century. The central planetary nebula nucleus (PNN) was discovered by the Hungarian astronomer Jenő Gothard on September 1, 1886.

[NGC 6791](#) is an open cluster of stars in Lyra. The cluster was discovered by the German astronomer Friedrich August Theodor Winnecke in 1853 and contains three age groups of stars: 4-billion-year-old white dwarfs, 6-billion-year-old white dwarfs and 8-billion-year-old normal stars. It has an apparent magnitude of 9.5 and is approximately 13,300 light years distant from the solar system. NGC 6791 has an iron to hydrogen abundance

ratio that is more than twice that of the Sun, making it one of the oldest and most metal-rich clusters in the Milky Way. This is contrary to the typical rule-of-thumb where older means more metal-poor. Compounded with the fact that it has an unusually high population of stars, NGC 6791 is among the most studied clusters in the sky.

There are many other deep sky objects and stars to discover in Lyra. It is placed high in the sky during the summer months, so it could be a good target when we have clear night skies or in between Monsoon clouds. Whether naked eye, via binoculars, a telescope or via your camera get out, look up and enjoy the wonders of Lyra.

THE BUCKET LIST

BY VINCE SEMPRONIO

The Moon Eats a Pi

On the evening of Sunday, July 6th, the waxing gibbous Moon occults [Fang](#), the southernmost star in the right claw of the constellation [Scorpio](#). Fang, also known as Pi (π) or 6 Scorii shines at magnitude 2.9. It is part of a multiple star system which is about 590 light years distant. The main star is an eclipsing binary composed of two massive hot B-type main sequence stars orbiting each other every 1.57 days. Both stars are much more massive than the sun with masses of 12.5 and 9 times that of the sun with luminosities of 22,000 and 3000 times more than



the Sun. They are separated by 15 solar radii.

The Moon occults the star around 8:36pm and is easily visible in a small scope in the southeast sky.

On the morning of Sunday the 20th of July, the Moon passes through the [Pleiades](#) (M45) star cluster. A few of the brighter members will be occulted, but only the reappearances on the dark limb are easily seen. At 3am, the pair will be seen low in the Eastern sky only 20 degrees above the horizon. Look for [Venus](#) rising soon after below the pair.



The Moon, passing through the Pleiades cluster on the morning of July 20th, 2025, at 3am (MST) as seen from Sierra Vista, AZ. Credit: Stellarium



The star map of the Scorpius constellation highlights the star Antares and several notable deep-sky objects like the Rho Ophiuchi Complex, Messier 4, the Cat's Paw Nebula,

- [Messier 4](#): one of the easiest globular clusters to find, M4 is the closest of these star clusters to Earth at 5,500 light years. With a magnitude of about 5.6, you can spot this with a small or medium-sized telescope in average skies. Darker skies will reveal the bright core. Use Antares as a guide star for this short trip across the sky.
- [Caldwell 76](#): If you prefer open star clusters, locate C76, also known as the Baby Scorpion Cluster, right where the 'stinger' of Scorpius starts to curve. At a magnitude of 2.6, it is slightly brighter than M4, albeit smaller, and can be spotted with binoculars and the naked eye under good sky conditions.

Lastly, if you have an astrophotography set up, capture the Cat's Paw Nebula near the stinger of Scorpius. You can also capture the Rho Ophiuchi cloud complex in the nearby constellation Ophiuchus. Brilliant Antares can be found at the center of this wondrous structure.

Manaiakalani

While many cultures tell tales of a 'scorpion' in the sky, several Polynesian cultures see the same stars as the demigod Māui's fishhook, [Manaiakalani](#). It is said that Māui didn't just use his hook for giant fish in the sea, but to pull new islands from the bottom of the ocean. There are many references to the Milky Way representing a fish. As Manaiakalani rises from the southeast, it appears to pull the great celestial fish across a glittering sea of stars.

Measure Your Darkness

While you can use smartphone apps or dedicated devices like a Sky Quality Meter, Scorpius is a great constellation to measure your sky darkness with! On a clear night, can you trail the curve of the tail? Can you see the scorpion's

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!

SPY THE SCORPION BY KAT TROCHE

As summer deepens in the Northern Hemisphere, a familiar constellation rises with the galactic core of the Milky Way each evening: Scorpius the Scorpion. One of the twelve zodiacal constellations, Scorpius contains many notable objects, making it an observer's delight during the warmer months. Here are some items to spy in July:

- **Antares**: referred to as "the heart of the scorpion," this supergiant has a distinct reddish hue and is visible to the naked eye. If you have good skies, try to split this binary star with a medium-sized telescope. Antares is a double star with a white main-sequence companion that comes in at a 5.4 magnitude.

heart? Use our free printable [Dark Sky Wheel](#), featuring the stars of Scorpius on one side and Orion on the other for measurements during cooler months. You can find this resource and more in the [Big Astronomy Toolkit](#).



A digital map of the Rho Ophiuchi Complex.
Credit: Stellarium Web

FOR SALE

Zane Landers has a number of scopes and equipment for sale. If you are interested in any of the items, please contact him via email (zdlanders@gmail.com).

- Criterion Dynamax 6" f/10 SCT - EQ fork mount and on a Celestron triangle tripod from a C8. It has very good optics and holds collimation well. 6x30 finder and 1.25" star diagonal. It is very fast to thermally acclimate thanks to Bakelite tube. Clock drive works but ideally needs a drive corrector to keep proper speed. Asking \$400. Includes 25mm SMA, 18mm Orthoscopic, 10mm Konig eyepieces (if you already have eyepieces, I would like to keep these to include with a future scope, they are best for beginners anyway).
- Sarblue Mak70 - altaz mounted 70mm Mak with very sharp optics. upgraded with a proper prism star diagonal, includes a small carrying case and a pair of Orion Sirius Plossl eyepieces. \$120
- Hadley 114mm f/8 Dobsonian - Printed out of durable high temp resistant ASA. Wooden base. I have one ready to go, can print up to 5 more, 25mm & 10mm eyepieces included. \$360 each
- Meade 90mm/800mm achromat refractor optical tube - 2" focuser, decent performance, includes a very low quality 1.25" star diagonal and red dot sight. I have the mount too but it's missing the Autostar controller. \$50

- Orion 9x50 straight through finder - 5-degree true field (50 deg AFOV). Includes base and caps. Brownish color, from Orion XTi Dobsonian. \$40
- Tele-Vue 7.4mm Plossl eyepiece (1.25") - original smooth top Japan version with no eye guard, great shape, \$60

ABOUT THE COVER

This month's cover is provided by Mark Orvek

Object: M20 (Trifid Nebula) – It is an [H II region](#) located in [Sagittarius](#). It was discovered by [Charles Messier](#) on June 5, 1764. The nebula has three lobes, which is the "Tri" in its name. This area of the sky has it all, an [open cluster](#), an [emission nebula](#) (the pink part), a [reflection nebula](#) (blue), and [dark nebula](#) scattered throughout.

Telescope: Stellarvue SVX152T

Camera: ATIK 16200 (CCD, mono)

Mount: Paramount MX+

FOV: 1.3x1.0 degrees

Image scale: 1.03 arcsec / pixel

Integration: 1 hour and 40 minutes (20x5 minute subframe, LRGB)

Automation software: Voyager

Processing software: PixInsight

CLUB OFFICERS & CONTACTS

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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 (July – August 2025)

SU	MO	TU	WE	TH	FR	SA
29	30	July 1	2  12:30 PM	3 Earth at aphelion	4 Independence Day	5
6	7 Antares/moon 0.4°	8	9	10  1:37 PM	11 HAC Meeting Room A102 7 PM	12
13	14	15	16	17  5:38 PM	18	19
20	21	22	23 Italian Student Event at Patterson 7 PM	24  12:11 PM	25 Pluto Opposition	26
27	28	29	30	31	Aug 1  5:41 AM	2
3	4	5	6	7	8 HAC Meeting Room A102 7 PM	9  12:55 AM
10	11 Perseid Meteors	12 Jupiter/Venus 1° Perseid Meteors	13 Perseid Meteors	14 Perseid Meteors	15  10:12 PM	16
17	18	19 Mercury greatest western elongation	20	21	22  11:07 PM	23
24	25	26	27	28	29	

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