



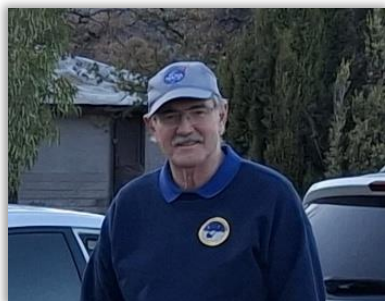
JUNE, 2025

NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB



CLUB MEETING SPEAKER



HAC member and [NASA Solar System Ambassador](#), Ted Forte will give an update on the Artemis Program. Ted is a Contributing Editor for [Sky & Telescope](#) magazine, director of the [Patterson Observatory](#), and the coordinator of the Astronomical League's [Planetary Nebula Observing Program](#). He serves as HAC's treasurer and has been a Solar System Ambassador since 2013.

WELCOME OUR NEW MEMBERS

Bruce Gary of Hereford rejoined the club in May. Welcome back, Bruce.

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

JUNE OUTREACH

Besides our usual Patterson Public Night on June 5th and Solar Saturday on June 14th, we have three unusual events.

On Saturday, June 21st, we will set up for solar in [Lewffingwell Park](#), adjacent to the Huachuca City Library from 9 to 11 AM.

On Tuesday, June 24th we'll be at the Seifert School Age Center on Ft Huachuca, from 9 to 11 AM.

On Thursday, June 26th, we'll participate at the Urbano Star Party from 8 to 10 PM. Watch the [HAC Astro group](#) for details and directions.

EDITORS CORNER

What's the Bortle is a common question asked to and by astronomers when inquiring about how dark the sky is at a given location. [Bortle](#) refers to a dark sky scale created by the American amateur astronomer [John E. Bortle](#). He developed the scale to help observers ascertain the darkness of a site and to compare one observing site to another. He published his scale in the February 2001 issue of Sky & Telescope. More detailed information about the scale can be found [here](#). The scale measures the darkness of the sky from 1 (best) to 9 (worst)

The Bortle scale is available from this [light pollution map](#) and is searchable, zoomable, and clickable. Clicking on the map at the Patterson Observatory, the following information is displayed.

Zenith sky brightness info (2015)	
Coordinates	31.56732, -110.24486
SQM	20.39 mag/arc sec ²
Brightness	0.756 mcd/m ²
Artif. bright.	585 μ cd/m ²
Ratio	3.42
Bortle	class 5
Elevation	1347 meters

Interesting to say the least, but two items stand out as problematic. The first is the year in which the data represents (2015). This is 10-year-old data. I'm

pretty sure that the skies today are not as dark as they were then. The second item is the Bortle class of the location. Class 5 isn't very accurate. Is it at the low or high end of class 5?

SQM to the Rescue

The Bortle scale is sufficient in a broader sense, but not very accurate for specific locations and doesn't consider changes in local or seasonal conditions. A more accurate way to measure the sky is to use a system that measures the Night Sky Brightness of the sky at the zenith in real-

time. To accomplish this, a device, not unlike a photographic light meter we used. This device is called a Sky Quality Meter (SQM), and measures units of "magnitudes per square arcsecond". This scale is complicated to describe, but to keep things simple, the scale runs between 16 (urban skies) and 22 for the darkest skies on earth.

There are several efforts worldwide that collect SQM readings to help monitor light pollution. [Globe at Night](#) is one of those efforts. The nice thing is that you don't need a SQM meter to participate. Just follow their instructions and report what you see in the sky.

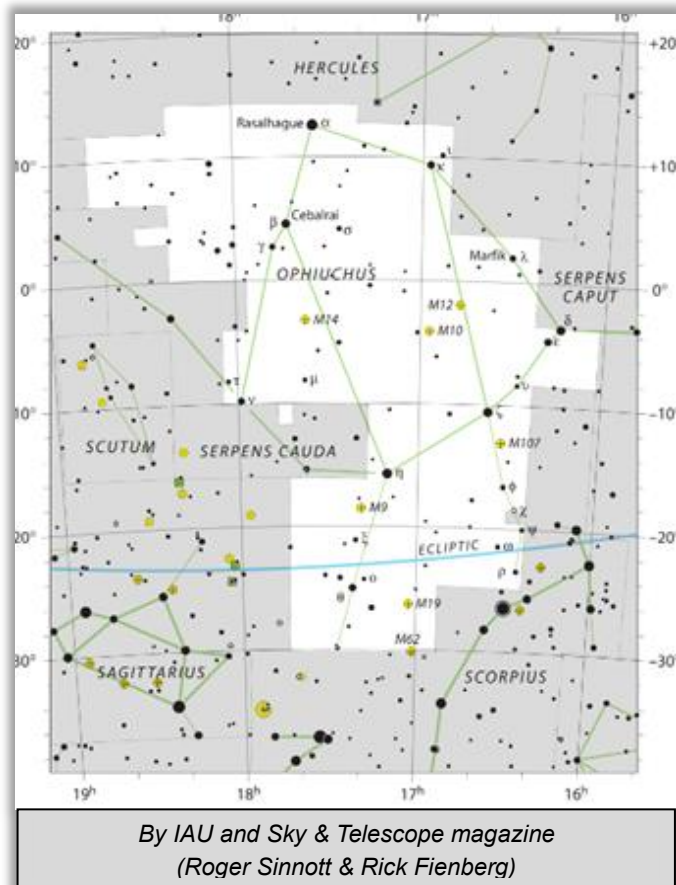
I frequently make SQM measurements as part of my citizen science occultation observations. These readings, along with weather info, become part of the meta data that accompanies my scientific data.

When I was younger, I observed under the very dark skies of northern California. I didn't have any meters or Bortle scales to tell me how dark the sky was. All I can recall now is that I could see objects with my naked eye then that I can't see now. Light pollution maps indicate that the skies there are Bortle class 2 with an estimated SQM reading of 21.9. I'm skeptical, but there is one way to be sure, I'm going to have to remember to bring my SQM meter the next time I visit there!

PRESIDENT'S CONSTELLATION EXPLORATION — OPHIUCHUS BY PENNY BRONDUM

Ophiuchus is a large [constellation](#) straddling the [celestial equator](#). Its name comes from the [Ancient Greek](#) and means "serpent-bearer", and it is commonly represented as a man grasping a snake. The interposition of his body divides the snake constellation Serpens into two parts. The serpent is often associated with doctors, so Ophiuchus is also associated with healing images. Ophiuchus straddles the equator with the majority of its [area](#) lying in the southern hemisphere. It was one of the 48 constellations listed by the 2nd-century astronomer [Ptolemy](#), and it remains one of the [88 modern constellations](#). An old alternative name for the constellation was Serpentarius. In the [northern hemisphere](#), it is best visible in summer. It is opposite of the constellation [Orion](#).

To the [ancient Greeks](#), the constellation represented the god [Apollo](#) struggling with a huge snake that guarded the [Oracle of Delphi](#). Later myths identified Ophiuchus with [Laocoön](#), the [Trojan](#) priest of [Poseidon](#), who warned his fellow Trojans about the [Trojan Horse](#) and was later slain



by a pair of sea serpents sent by the gods to punish him. According to [Roman era](#) mythography, the figure represents the healer [Asclepius](#), son of the god Apollo, who learned the secrets of keeping death at bay after observing one serpent bringing another serpent healing herbs. To prevent the entire human race from becoming [immortal](#) under Asclepius' care, [Jupiter](#) killed him with a bolt of [lightning](#). In medieval [Islamic astronomy](#), the constellation was known as *Al-Hawwa'*, "the snake-charmer".

Ophiuchus is the 11th largest constellation in the sky, occupying an area of 948 square degrees. It is one of the 15 [equatorial constellations](#). There have been attempts to include Ophiuchus among the signs of the zodiac, it does not belong to the [Zodiac family](#) (It crossed the Ecliptic when the modern 88 official boundaries were made.), but to the Hercules family of constellations.

Ophiuchus contains 13 named stars and seven stars in the constellation have known planets. Notable stars in Ophiuchus including [Rasalhague](#) (head of the serpent charmer) which is a recurrent novae star and is thought to be on the brink of becoming a supernova and [Barnard's Star](#), one of the [nearest stars](#) to the [Solar System](#) (the only stars closer are the [Alpha Centauri binary star](#)

system and [Proxima Centauri](#)). In 1998, an intense flare was observed emanating from Bernard's Star and it has also been a target of plans for interstellar travel such as [Project Daedalus](#).

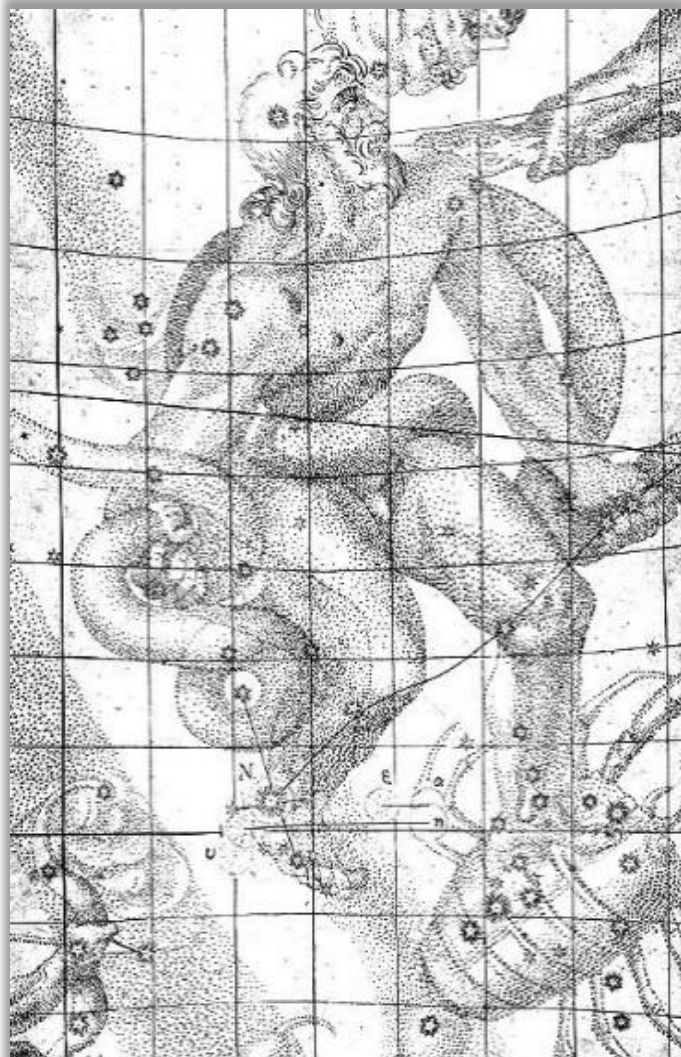
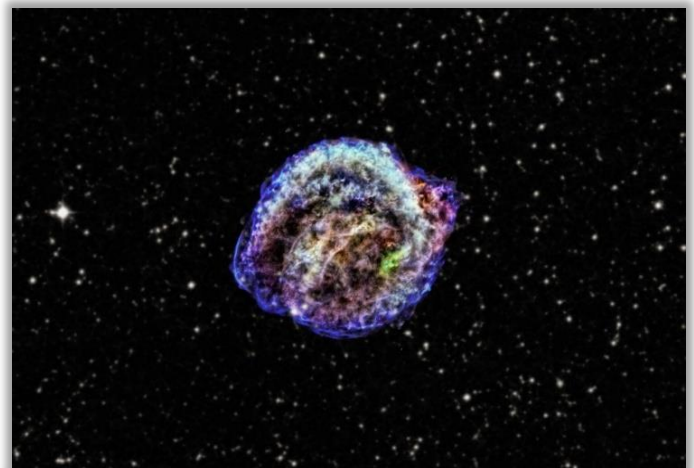


Illustration from Johannes Kepler's book De Stella Nova in Pedo Serpentarii (On the New Star in Ophiuchus's Foot) indicating the location of the 1604 supernova. The supernova, also known as Kepler's Supernova, is the star marked with a 'N' on the right foot of the Ophiuchus (Serpent Bearer) constellation. It is the latest supernova in the Milky Way observed with certainty by mankind

There are four meteor showers associated with the Ophiuchus constellation: the Ophiuchids (May 19-July 2), the Northern May Ophiuchids, the Southern May Ophiuchids and the Theta Ophiuchids

There are also many famous deep sky objects within Ophiuchus including [Kepler's 1604 Supernova](#), the [Twin Jet Nebula](#), the Little Ghost Nebula, the dark nebulae Barnard 68, the Pipe Nebula, the Snake Nebula, and the

Dark Horse Nebula In addition, Ophiuchus contains several super clusters, such as IC4665, NGC 6633, and globular clusters [M9](#), [M10](#), M12, [M14](#), M19 M62 and M107 as well as the nebula IC 4603-4604.



This is the remnant of Kepler's supernova, the famous explosion that was discovered by Johannes Kepler in 1604. The red, green and blue colors show low, intermediate and high energy X-rays observed with NASA's Chandra X-ray Observatory, and the star field is from the Digitized Sky Survey. X-ray image by NASA/CXC/NCSU/M.Burkey et al; Optical: DSS)

Ophiuchus is a rich area for astronomy research. In 2005, astronomers using data from the [Green Bank Telescope](#) discovered a [superbubble](#) so large that it extends beyond the plane of the galaxy. The [Ophiuchus Superbubble](#) is located 23 thousand light-years from the Earth, and the object itself is "raised" 10 thousand light-years above the plane of the galaxy. The [superbubble](#) is hypothesized to the remanent of a massive cluster of young stars that exploded essentially at the same time. The matter from the stars was "pushed" out of the galactic plane, resulting in the inflation of the bubble. Such structures are capable of influencing the distribution of chemical elements in the galaxy: heavy nuclei that are born inside stars are ejected during an explosion, together with gas, over considerable distances.

In April 2007, [astronomers](#) announced that the [Swedish-built Odin satellite](#) had made the first detection of clouds of [molecular oxygen](#) in space, following observations in the constellation Ophiuchus.

NASA's Stardust mission captured possible samples of interstellar dust that came from the direction of Ophiuchus. The craft's collector tray was positioned so it could catch bits of Comet Wild-2, while the opposite side of the tray pointed toward Ophiuchus. Stardust returned

to Earth in 2006 and preliminary analysis of the tray uncovered [evidence of interstellar dust](#) in 2014.

In 2017, scientists found methyl isocyanate — a key building block for life — near the young [triple star system IRAS 16293-2422](#) in Ophiuchus. Five years before, scientists found "space sugar" in the same system — [glycolaldehyde](#), which is associated with the formation of RNA — another building block of life.

Though Ophiuchus is low on the horizon for us in June it might be one constellation visible under the clouds of monsoon, so get out and look up while you can

THE BUCKET LIST

BY VINCE SEMPRONIO

Close, But No Cigar



The Moon near Regulus (Alpha Leonis) on the evening of June 1st at 8:45 PM (MST). Mars, slightly brighter than Regulus is visible to the lower right of the pair.

June 1st, 9:45 PM – The Moon passes just north of the bright star Regulus (Alpha Leo). Mars will be visible to the lower right of the pair.

The moon will occult Regulus this night, but the event is best observed in Canada though the moon will graze Regulus in northwest Washington state. Currently, there are 5 stars brighter than magnitude 2 which the moon can occult. For more information about the complexity of lunar occultations, read [this](#) interesting article.

Pre-Sunset Encounter



On the evening of June 29th, the waxing crescent Moon occults the planet Mars.

Unfortunately, this event is mostly visible over the Pacific Ocean with a part of the path touching land in the northwest area of South

America. In the southwest USA, the Moon will pass close to Mars, missing it by 6' here in the Sierra Vista area. The closest approach occurs around 6:45 PM, 45 minutes before sunset. You'll need a telescope to see Mars, but the Moon should be visible to the unaided eye. Mars will be just above the lunar northern cusp.

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!

SEASONS OF THE SOLAR SYSTEM

BY: KAT TROCHE

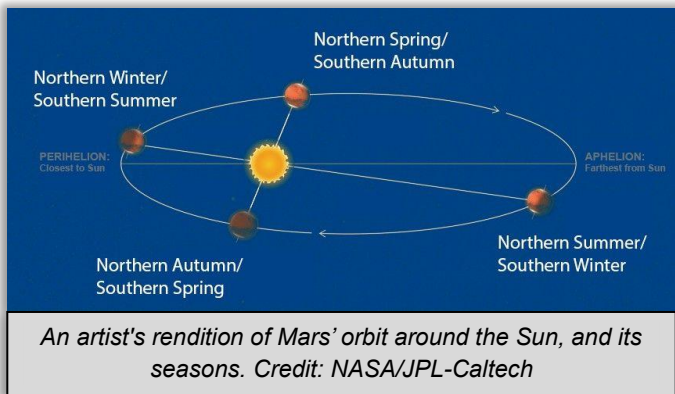
Here on Earth, we undergo a changing of seasons every three months. But what about the rest of the Solar System? What does a sunny day on Mars look like? How long would a winter on Neptune be? Let's take a tour of some other planets and ask ourselves what seasons might look like there.

Martian Autumn

Although Mars and Earth have nearly identical axial tilts, a year on Mars lasts 687 Earth days (nearly 2 Earth years) due to its average distance of 142 million miles from the Sun, making it late autumn on the red planet. This distance and a thin atmosphere make it less than perfect sweater weather. A recent weather report from Gale Crater boasted a high of -18 degrees Fahrenheit [for the week of May 20, 2025](#).

Seven Years of Summer

Saturn has a 27-degree tilt, very similar to the 25-degree tilt of Mars and the 23-degree tilt of Earth. But that is

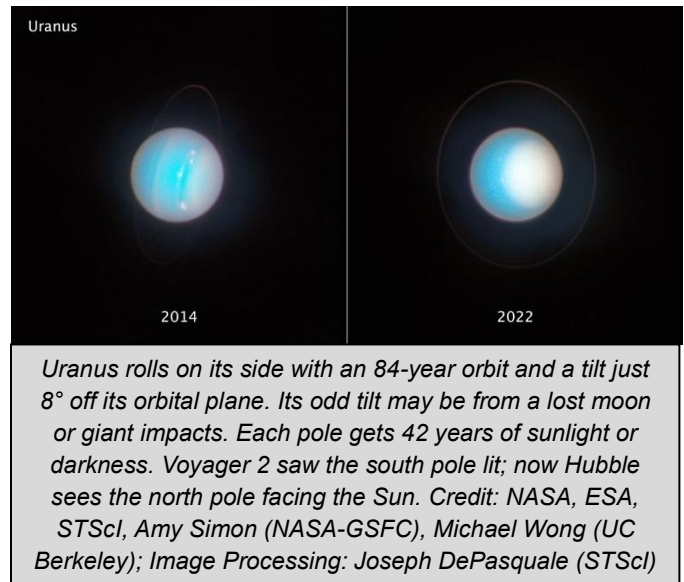
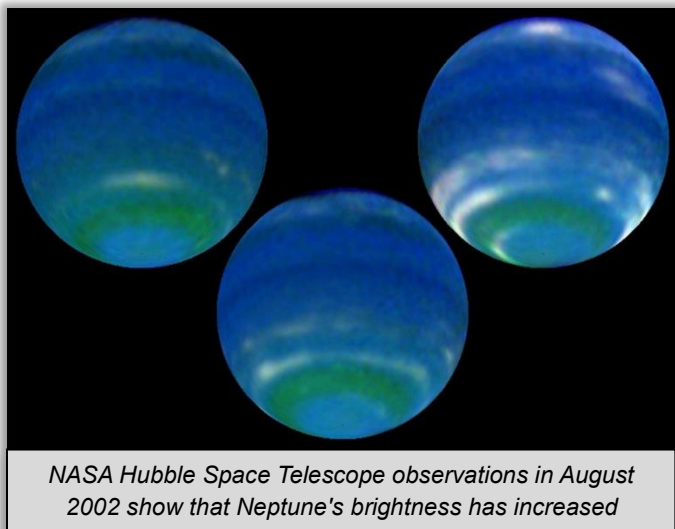


where the similarities end. With a 29-year orbit, a single season on the ringed planet lasts seven years. While we can't experience [a Saturnian season](#), we can observe a [ring plane crossing](#) here on Earth instead. The most recent plane crossing took place in March 2025, allowing us to see Saturn's rings 'disappear' from view.

A Lifetime of Spring

Even further away from the Sun, each season on Neptune lasts over 40 years. Although changes are slower and less dramatic than on Earth, scientists have observed seasonal activity in Neptune's atmosphere. [These images](#) were taken between 1996 and 2002 with the Hubble Space Telescope, with brightness in the southern hemisphere indicating seasonal change.

As we welcome summer here on Earth, you can build a [Suntrack](#) model that helps demonstrate the path the Sun takes through the sky during the seasons. You can find even more fun activities and resources like this model on NASA's [Wavelength and Energy](#) activity.



SPECIAL EVENT AT PATTERSON RUBIN IMAGE REVEAL PARTY



Mark Your Calendars! NSF-DOE Vera C. Rubin Observatory Will Unveil First Look Images on the 23rd of June 2025. Rubin Observatory's ultimate cosmic movie is about to begin, and we want you to be a part of it

We invite you to attend the live stream of NSF-DOE Vera C. Rubin Observatory's First Look event, taking place on June 23rd, 2025, at 8:00 AM (MST). At this international celebration the Rubin Observatory team will unveil the observatory's first spectacular images. The event will be live streamed via YouTube in English and Spanish. Links to the live streams will be made available on [rubinobservatory.org](#). **We will open the Patterson Observatory Classroom to enjoy the event together. Doors open at 7:30 a.m.**

NSF-DOE Vera C. Rubin Observatory is jointly funded by the U.S. National Science Foundation and the U.S. Department of Energy's Office of Science.

The First Look event will feature the unveiling of a set of large, ultra-high-definition images and videos that showcase Rubin's extraordinary capabilities to the world for the first time. This will mark the beginning of a new era in astronomy and astrophysics.

These images and videos will be the first of many that Rubin will release over the course of the next decade as it conducts the Legacy Survey of Space and Time (LSST). Equipped with the world's largest digital camera, Rubin will sweep the entire visible southern sky every three to four nights. In doing so, Rubin will produce the most detailed time-lapse view of the cosmos that has ever existed.

This unique movie will bring the cosmos to life, yielding a treasure trove of discoveries: asteroids and comets, pulsating stars, and supernova explosions. With Rubin data, we will better understand the Universe, chronicle its evolution, delve into the mysteries of dark energy and dark matter, and reveal answers to questions we have yet to imagine.

Rubin Observatory is a joint Program of NSF NOIRLab and SLAC National Accelerator Laboratory (SLAC), who will cooperatively operate Rubin.

More Information

NSF-DOE Vera C. Rubin Observatory, funded by the U.S. National Science Foundation and the U.S. Department of Energy's Office of Science, is a groundbreaking new astronomy and astrophysics observatory under construction on Cerro Pachón in Chile, with first light expected in 2025. It is named after astronomer Vera Rubin, who provided the first convincing evidence for the existence of dark matter. Using the largest camera ever built, Rubin will repeatedly scan the sky for 10 years and create an ultra-wide, ultra-high-definition, time-lapse record of our Universe.

ABOUT THE COVER

The Whirlpool Galaxy, also known as NGC-5194 or Messier 51 (M51). It is a [interacting grand-design spiral galaxy](#). It is in the constellation [Canes Venatici](#), 31 million light years distance, and was the first galaxy to be classified as a spiral galaxy. It is close to the star Alkaid, which is the star at the end of the handle of the [Big Dipper](#). M51's northerly location makes it a favorite target for astro-imagers. Its magnitude is 8.4 making it one of the top 10 brightest galaxies.

Imaged by Richard Pattie in 2016, he had to contend with Southern California light pollution.

Richard used an AT8RC Ritchie Chretien 8" scope on an Orion Atlas EQ-G mount. He used an Atik One mono camera with off-axis guiding. LRGB imaging was used for a total of 5.8 hours integration. The image was processed with PixInsight.

TRIVIA QUESTION

In the Bucket List column this month, it was stated that there are 5 stars brighter than magnitude 2 which the Moon can occult. The four brightest stars are Regulus, Antares, Aldebaran, and Spica. What is the 5th star? Hint: It is in the same constellation as one of the other 4.

RESHARING ASTRONOMY RESOURCES

Each month, at our club meeting we raffle off items that were donated to the club, mostly by members. Some of the items included are astronomy related books and other reference materials. I was asked in confidence if it is permissible to offer an item for the raffle that previously was raffled off. Of course it is allowed. It is pretty much understood that most items are not brand new, so, the person donating items may have received them second hand from someone else. So, think of our raffles as a little astronomy library...with a twist!

CLUB OFFICERS & CONTACTS

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Past President: David Roemer	

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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.

"Our feeblest contemplations of the Cosmos stir us—there is a tingling in the spine, a catch in the voice, a faint sensation, as if a distant memory, or falling from a height. We know we are approaching the greatest of mysteries."

- Carl Sagan.

HAC Calendar of Events (June – July 2025)

SU	MO	TU	WE	TH	FR	SA
June 1	2  8:41 PM	3	4	5 Public Night Patterson Obs 7:30 PM	6	7
8	9	10	11  12:44 AM	12	13 HAC Meeting Room A102 7 PM	14 Solar Saturday SV Library 10 AM-12 PM Flag Day
15	16	17	18  12:19PM	19	20	21 Solar Observing Huachuca Library 9 AM – 11 AM
22	23 Image Reveal Watch Party at Patterson Obs 7:30 AM	24 Seifert School Age Center Ft Huachuca 9 to 11AM	25  3:32 AM	26 Urbano Star Party 8 - 10 PM	27	28
29 Moon/Mars 6'	30	July 1	2  12:30 PM	3	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	24  12:11 PM	25 Pluto Opposition	

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: El Nath (Beta Tauri).