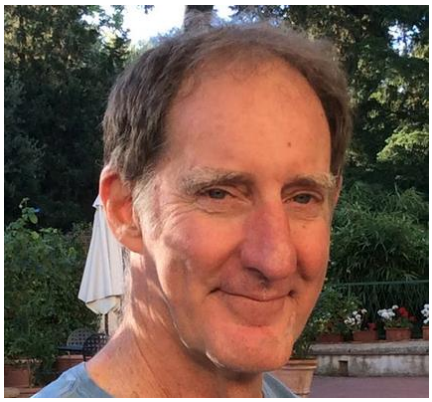
NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

FEBRUARY 2025

FEBRUARY CLUB MEETING

Our speaker this month is Dr. Al Conrad and his presentation is “Observation of Io with SHARK-VIS at LBT”. This month’s talk will be given remotely via Zoom at the downtown meeting location.



"Al received his PhD in Computer Science from the University of California at Santa Cruz in 1994. Before joining LBT in 2014, he worked as software engineer and support astronomer at both Lick and Keck Observatories before moving to the Max Planck Institute for Astronomy to lead the development of the ground layer AO system for LINC-NIRVANA (LN). At LBT, Al has served as point of contact for LN, LBTI, and LUCI/AO commissioning. His current duties include the science archive, SHARK-NIR, SHARK-VIS, LN, and OSCO. His research interests include asteroid systems and developing novel techniques to study comets, planets, and the moons of planets, particularly Jupiter’s moon Io. He enjoys cycling, sailing, and outrigger canoe paddling.”

WELCOME OUR NEW MEMBERS

Adrienne Hickey of Sierra Vista, and Bruce and Maria Strniste of Hereford joined the club in January. 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

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 setup 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.

TRIVIA QUESTION OF THE MONTH

Who said, “We are just an advanced breed of monkeys on a minor planet of a very average star. But we can understand the Universe. That makes us something very special.”
Answer

President's Constellation Exploration – Monoceros

by Penny Brondum

Monoceros is a faint constellation that lies on the celestial equator. Its name means "unicorn" in Latin. The origins of the mythical creature Monoceros - a one-horned animal with the head and forequarters of a horse and the hindquarters of a stag and the tail of a lion can be traced back to the Assyrians (2700 BCE - 600 BCE) Modern scholars think the idea of the unicorn originated from a mistaken description of the Indian rhinoceros.

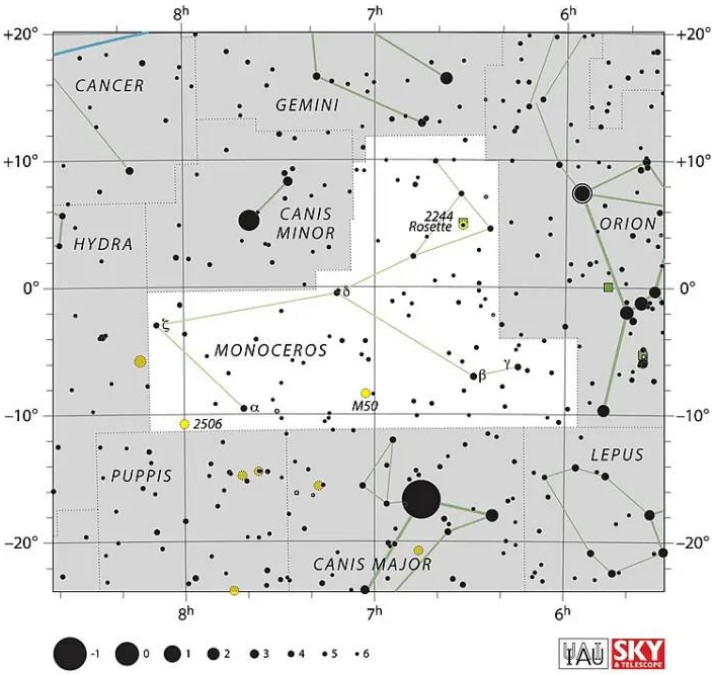
The constellation Monoceros, from *Urania's Mirror*, a set of star charts from 1825. Includes Canis Minor and the obsolete constellation Printer's Workshop

The constellation Monoceros was introduced in our sky maps by the Dutch astronomer and cartographer Petrus Plancius from the observations of Dutch navigators in the 17th century. It is bordered by Orion to the west, Gemini to the north, Canis Major to the south, and Hydra to the east.

According to traditional Chinese uranography, the modern constellation Monoceros is located within the southern quadrant of the sky, which is symbolized as the Vermillion Bird of the South and contain Chinese asterisms Sze Fūh, the Four Great Canals; Kwan Kew; and Wae Choo, the Outer Kitchen.

Monoceros contains only a few fourth magnitude stars, making it difficult to see with the naked eye. Beta Monocerotis is a triple star system; the three stars form a fixed triangle. The visual magnitudes of the stars are 4.7, 5.2, and 6.1. William Herschel discovered it in 1781 and called it "one of the most beautiful sights in the heavens".

V838 Monocerotis, is a variable red supergiant star, which had an outburst starting on January 6, 2002; in February of that year, its brightness increased by a factor of 10,000 in one day. After the outburst was over, the Hubble Space Telescope was able to observe a light echo, which illuminated the dust surrounding the star. Monoceros also contains Plaskett's Star, a massive binary system whose combined mass is estimated, per 2008 calculations, to be almost 100 solar masses.



Monoceros is the location of the binary system Scholz's Star, host to a red dwarf primary and brown dwarf secondary; the system performed a close fly-past of the Solar System approximately 70,000 years ago, travelling within 120,000 astronomical units of the Sun within the Oort cloud.

One of the nearest known black holes to the Solar System is in the binary star system A0620-00 in the constellation of Monoceros at a distance of roughly 3,300 light-years (1,000 parsecs) away. The black hole is estimated to be 6.6 solar masses.

Rosetta Nebula
Image by Richard Pattie: Astrophotography book

Monoceros also contains several interesting deep sky objects: the open cluster Messier 50 (NGC 2323), the Rosette Nebula, the Christmas Tree Cluster, and the Cone Nebula, among others.

The Rosette Nebula (NGC 2237, 2238, 2239, and 2246) is a diffuse nebula in Monoceros. It has an overall magnitude of 6.0 and is 4900 light-years from Earth. The Rosette Nebula, over 100 light-years in diameter, has an associated star cluster and possesses many Bok globules in its dark areas. It was independently discovered in the 1880s by Lewis Swift (early 1880s) and Edward Emerson Barnard (1883) as they hunted for comets and is visible with binoculars in very dark skies.

An infrared Spitzer Space Telescope image of NGC 2264 Christmas Tree and Cone Nebulas By IAU

The Christmas Tree Cluster (NGC 2264) is another open cluster in Monoceros. Named for its resemblance to a Christmas tree, it is fairly bright at an overall magnitude of 3.9; it is 2400 light-years from Earth. The variable star S Monocerotis represents the tree's trunk, while the variable star V429 Monocerotis represents its top.

The Cone Nebula (NGC 2264), associated with the Christmas Tree Cluster, is a very dim nebula that contains a dark conic structure. It appears clearly in photographs, but is very elusive in a telescope. The nebula contains several Herbig–Haro objects, which are small irregularly variable nebulae. They are associated with protostars.

With Monoceros being a faint constellation, its clusters and nebulae are wonderful targets for astrophotography. For those who want to learn more about astrophotography contact Richard Lighthill for his Beginners Astrophotography workshop happening soon. I look forward to seeing the images you capture in the coming months.

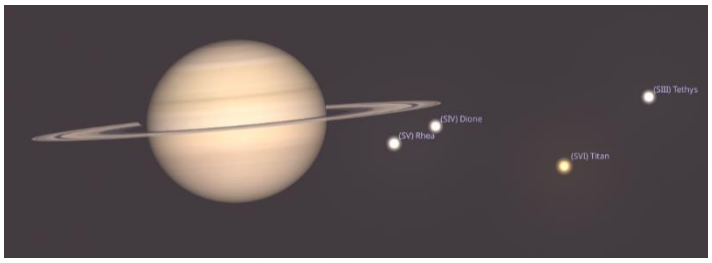
The Bucket List

by Vince Sempronio

This month we will lose an old friend, watch a planet behave like the Moon, and once again enjoy the Moon eating stars.

Saturn

Each night, Saturn angles closer to the Sun as Earth's orbit outpaces Saturn's slower easterly motion. By the end of the month, it will be lost in the evening twilight.



Saturn and it's four brightest moons as they will appear on the 8th of February, 6:45pm. Credit: Stellarium

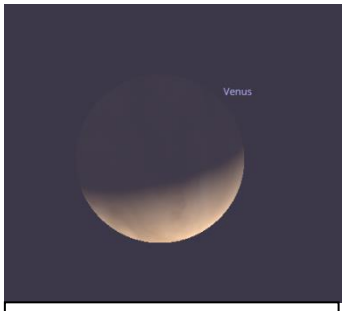
On the evening of the 8th around 6:45pm, the four brightest moons of Saturn will all appear close together on the west side of the planet. You will need a telescope to appreciate the alignment.

On the 24th at 6:45pm, there is one last chance to catch the ringed-planet next to something brighter, in this case, the planet Mercury. The pair will appear very low in the west barley 6° above the horizon. Mercury shines a full 2 magnitudes brighter than Saturn, so first find Mercury, and look for Saturn 1.5° to the upper left of Mercury.

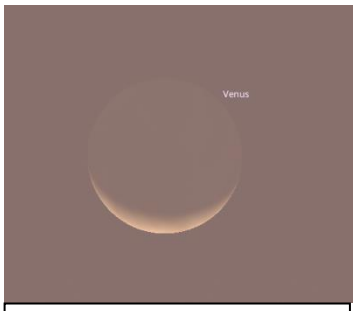
But it isn't just Saturn we will lose; Saturn is also losing its rings! Well, not literally, but visually. A couple of days after the March equinox, Saturn's rings will be edge on, as seen from earth. We won't be able to witness this event since Saturn will be behind the Sun. When Saturn reemerges in the morning sky near the end of March, the rings will barely be visible.

Venus

Venus recently reached its greatest eastern elongation, which means that the angle between the Sun and the Earth from Venus is 90°. When viewed from Earth, half of the surface of Venus is illuminated while the other half is dark. This also occurs each month with our Moon when it reaches its first quarter phase. This point in the Venusian orbit is also when the planet will appear to start moving closer to the Sun from our perspective. Venus is coming towards us and at the same time is moving toward its inferior conjunction; the point when Venus is directly between the Earth and the Sun. Each day, the phase of Venus becomes more and more like the crescent phase of the Moon. Venus will reach its inferior conjunction on March 23rd.



Venus on the 1st at 6:30pm



Venus on the 28th at 6:30pm

Moon

Once again, this month, the Moon will occult stars in the Pleiades (M45) cluster. We were unfortunate to be clouded out for January's encounter, but here in Arizona, we won't be able to see this month's event in its entirety because both the Pleiades and the Moon will set before the event is over. The event begins just before midnight on the evening of the 5th when the Moon is only 24° above the horizon to the west. Before moonset, a few of the brighter stars will be occulted behind the dark limb. Times are approximate depending on your location. Additional dimmer stars are also occulted, but they are not listed here.

Time	Star Name	Magnitude	Altitude
00:27	Celaeno	5.4	19°
00:31	Electra	3.7	18°
00:50	Taygeta	4.3	14°
00:55	Maia	3.9	13°
01:40	Alcyone	2.9	05°

A good, low western horizon is needed to catch the Alcyone event.

So why is the Moon occulting the Pleiades so often lately? It isn't just the Pleiades; the Moon occults many DSOs as it orbits the Earth each month. Another example is the Beehive Cluster (M44) in Cancer. The Moons orbit is tilted ~5° with respect to the plane of the Earth's orbit around the Sun and this means that the Moon's position will vary between +/- 5° north and south of the ecliptic. Any object in this zone is fair game for a lunar occultation. But there is a catch. The orientation of the Moon's orbit is not fixed but rotates over time. This 8.85-year precession, combined with the Earth's motion around the Sun causes the Moon's orbit to favor certain areas of the sky over several months. These are called seasons, and right now, we are in a season of Pleiades occultations. But just because there is an occultation of the Pleiades or a bright star, it doesn't mean we will see it. The times of events are not synchronized to the Earth's rotation, so if we can see an event at midnight, halfway around the world it will be noon. So, let's enjoy the events while they last!

Midnight, evening of the 5th. The Moon is at altitude 24° towards the west. The red line is the path of the Moon along its orbit. Credit: Stellarium.

NASA Night Sky Notes

This article is distributed by NASA Night Sky Network

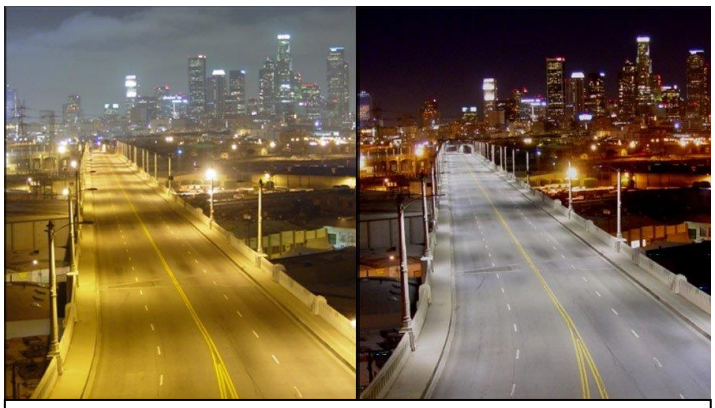
The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.org to find local clubs, events, and more!

How Can You Help Curb Light Pollution?

By Dave Prosper, Updated by Kat Troche

Light pollution has long troubled astronomers, who generally shy away from deep sky observing under full Moon skies. The natural light from a bright Moon floods the sky and hides views of the Milky Way, dim galaxies and nebula, and shooting stars. In recent years, human-made light pollution has dramatically surpassed the interference of even a bright full Moon, and its effects are now noticeable to a great many

people outside of the astronomical community. Harsh, bright white LED streetlights, while often more efficient and long-lasting, often create unexpected problems for communities replacing their older streetlamps. Some notable concerns are increased glare and light trespass, less restful sleep, and disturbed nocturnal wildlife patterns. There is increasing awareness of just how much light is too much light at night. You don't need to give in to despair over encroaching light pollution; you can join efforts to measure it, educate others, and even help stop or reduce the effects of light pollution in your community.



Before and after pictures of replacement lighting at the 6th Street Bridge over the Los Angeles River. The second picture shows improvements in some aspects of light pollution, as light is not directed to the sides and upwards from the upgraded fixtures, reducing skyglow. However, it also shows the use of brighter, whiter LEDs, which is not generally ideal, along with increased light bounce back from the road. Image Credit: The City of Los Angeles

Amateur astronomers and potential citizen scientists around the globe are invited to participate in the Globe at Night (GaN) program to measure light pollution. Measurements are taken by volunteers on a few scheduled days every month and submitted to their database to help create a comprehensive map of light pollution and its change over time. GaN volunteers can take and submit measurements using multiple methods ranging from low-tech naked-eye observations to high-tech sensors and smartphone apps.

Globe at Night citizen-scientists can use the following methods to measure light pollution and submit their results:

- Their own smartphone camera and dedicated app
- Manually measure light pollution using their own eyes and detailed charts of the constellations
- A dedicated light pollution measurement device called a Sky Quality Meter (SQM).
- The free GaN web app from any internet-connected device (which can also be used to submit their measurements from an SQM or printed-out star charts)

Night Sky Network members joined a telecon with Connie Walker of Globe at Night in 2014 and had a lively discussion about the program's history and how they can participate. The audio of the telecon, transcript, and links to additional resources can be found on their dedicated resource page.

The International Dark-Sky Association (IDA) has long been a champion in the fight against light pollution and a proponent of smart lighting design and policy. Their website provides many resources for amateur astronomers and other like-minded people to help communities understand the negative impacts of light pollution and how smart lighting policies can not only help bring the stars back to their night skies but also make their streets safer by using smarter lighting with less glare. Communities and individuals find that their nighttime lighting choices can help save considerable sums of money when they decide to light their streets and homes "smarter, not brighter" with shielded, directional lighting, motion detectors, timers, and even choosing the proper "temperature" of new LED light replacements to avoid the harsh "pure white" glare that many new streetlamps possess. Their pages on community advocacy and on how to choose dark-sky-friendly lighting are extremely helpful and full of great information. There are even local chapters of the IDA in many communities made up of passionate advocates of dark skies.

Light pollution has been visible from space for a long time, but new LED lights are bright enough that they stand out from older streetlights, even from orbit. Astronaut Samantha Cristoforetti took the above photo from the ISS cupola in 2015. The newly installed white LED lights in the center of the city of Milan are noticeably brighter than the lights in the surrounding neighborhoods. Image Credit: NASA/ESA

The IDA has notably helped usher in "Dark Sky Places", areas around the world that are protected from light pollution. "Dark Sky Parks", in particular, provide visitors with incredible views of the Milky Way and are perfect places to spot the wonders of a meteor shower. These parks also perform a very important function, showing the public the wonders of a truly dark sky to many people who may have never before even seen a handful of stars in the sky, let alone the full glorious spread of the Milky Way.

More research into the negative effects of light pollution on the health of humans and the environment is being conducted than ever before. Watching the nighttime light slowly increase in your neighborhood, combined with reading

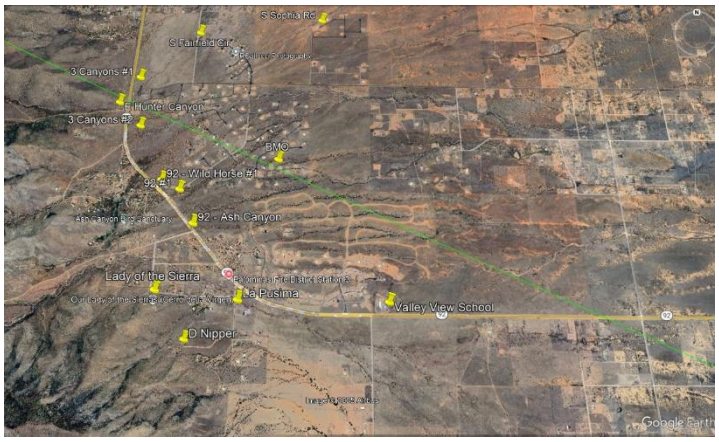
so much bad news, can indeed be disheartening! However, as awareness of light pollution and its negative effects increases, more people are becoming aware of the problem and want to be part of the solution. There is even an episode of PBS Kid's SciGirls where the main characters help mitigate light pollution in their neighborhood!

Astronomy clubs are uniquely situated to help spread awareness of good lighting practices in their local communities to help mitigate light pollution. Take inspiration from Tucson, Arizona, and other dark sky-friendly communities that have adopted good lighting practices. Tucson even reduced its skyglow by 7% (as of 2018) after its own citywide lighting conversion, proof that communities can bring the stars back with smart lighting choices.

Originally posted by Dave Prosper: November 2018
Last Updated by Kat Troche: January 2025

Heads up: Upcoming Observation Highlight

Mark your calendars. On the evening of March 6th, the moon occults the star Elnath (βTauri). This event is interesting because the event is a grazing event, involves a bright 1.7 magnitude star, and is visible from the southern limits of our region. The map shows the northern limit of the event with no occultations occurring above the green line. Within a 2 km zone below the green line, the star may be occulted multiple times as the mountains and valleys at the edge of the Moon cover and expose the star multiple times. A detailed description of the event will appear in the March edition of this Newsletter.



For Sale

Deb Browy is selling a 22" Dobsonian that once belonged to HAC member Bob Kepple. It had a new mirror installed (not sure when or why). Deb is open to all offers. She can be contacted at dbrowy @ yahoo.com, or by phone at 928 – 920 3815.

The Nightfall Editor's Corner

Our newsletter (Nightfall) can only exist if we have monthly contributions, and I'm not referring to the financial variety. Currently, we have the following recurring topics of content.

1) Information regarding the speaker provided by our Vice President, Mark Orvek.
2) Club news provided by our Treasurer, Ted Forte.
3) A monthly article highlighting the constellations from our President, Penny Brondum.
4) Your editor writes an article diving deeper into some upcoming events.
5) N.A.S.A. provides an article from their "Night Sky Notes" which we republish as our club's participation in the Night Sky Network.
6) Astro Images showcases efforts by our club members who image various objects in the sky.

There is usually space left over which is filled by various short entries, mostly provided by your editor.

Cutting to the chase, I would like to see more input from our club members in the way of articles. These don't need to be recurring monthly columns, which would be great, but it would be nice to have an excess of content to draw from for filling future newsletter issues. Examples such as equipment reviews, anecdotal stories about a historic or recent observation, even descriptions of your home observatory setup. I'm sure we have some hidden writers out there, let's hear from you!

Club Officers and Contacts

President: *Penny Brondum* ***Vice President:*** *Mark Orvek*
Secretary: *Del Gordon* ***Treasurer:*** *Ted Forte*
Past President: *David Roemer*

Board Members-at-Large
Gary Grue Richard Lighthill Mike Morrison Vince Sempronio

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.

Astro Images
by HAC Members & Friends

3 hours of imaging of NGC 2359 with 3-minute subs
Scope: Daystar 80mm f/6
Camera: ZW0 ASI585MC pro (cooled)
Stacked post processed with SIRIL
Post-processed with GIMP.

Image by Mark Orvek.

The Horsehead Nebula is one of my seasonal favorite celestial objects. It's on my list to image every year. The attached image was taken on Saturday night, Jan 18th, at the Chiricahua Sky Village in Pearce, AZ.

Object: IC434 (Horsehead Nebula)
Telescope: Sky-Watcher Esprit 100ED APO Triplet
Mount: ZWO AM5
Camera: ZWO ASI2600MC Pro
Field of View: 2.4x1.6 degrees
Image scale: 1.4 arc seconds / pixel
Integration: 2 hours, 55 minutes (35x5 minute subframes)
Image processing: PixInsight

From the Editor: Embedded links are provided to give the reader an opportunity to delve deeper into a topic or phrase. To save research time, Wikipedia (love it or hate it) is the source for most additional information. If you wish to opine, use the email address found above in the Club Officers and Contacts Information section.

Seestar S50 image by Harold Baillie

Grandpa Astronomy Puns

What did Earth say to the other planets in the solar system?
You guys have no life.

What happens if you cross Dwayne Johnson with the moon?
You get a moon rock.

What did the moon say to its therapist?
I'm going through a difficult phase.

How do planets buy their coffee?
With star bucks.

Why didn't the Dog Star laugh at the joke?
It was too Sirius.

What do aliens say to the meter ruler?
Take me to your liter.

HAC Calendar of Events

(February - March '25)

SU	MO	TU	WE	TH	FR	SA
Feb 1/2 Moon near Venus and Neptune 7 pm	**3**	**4**	**5** **1:02 AM** Moon Occults Pleiades 11:45 pm	**6** Patterson Public Night 6:30 PM Moon near Jupiter 7 pm	**7** HAC Meeting Room A102 7:00 PM	**8** Solar Saturday S.V. Library 10:00 AM
9 Moon near Mars and Pollux 7 pm	**10**	**11**	**12** **6:53 AM** Moon near Regulus 9 pm	**13**	**14** Valentine's Day	**15**
16	**17** President's Day Spica/Moon 1° 5 am	**18**	**19** Veritas Christian at Patterson 18:30 PM	**20** **10:33 AM**	**21** First Baptist Christian at Patterson 6:45 PM Moon/Antares 4am	**22**
23	**24**	**25**	**26**	**27** **5:45 PM**	**28**	**March 1** Donor Appreciation Night at Patterson 7:00 PM
2	**3**	**4** Moon near Uranus 7 pm	**5** Moon near Jupiter 7 pm	**6** **9:32 AM** Public Night at Patterson 7:00 PM Moon occults Elnath 8 pm	**7**	**8** Solar Saturday S.V. Library 10:00 AM Moon near Mars Mercury: Eastern Elongation
9	**10**	**11**	**12** Moon/Regulus 1° 3 am	**13** Lunar Eclipse 9 pm – 3 am	**14** **12:55 AM** HAC Meeting Room A102 7:00 PM	**15**
16 Spica near Moon 6 am	**17** St. Patrick's Day	**18**	**19**	**20** March Equinox 3:01 AM Antares near Moon 6 am	**21**	**22** **5:29 AM**
23	**24**	**25**	**26**	**27**	**28**	

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
Send an email to: HACAstro+subscribe@groups.io