NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB

MARCH, 2025

FEBRUARY CLUB MEETING SPEAKER

Our March speaker is Dr. Vinicius Placco, an Associate Astronomer at the NSF National Optical-Infrared Astronomy Research Laboratory (NSF NOIRLab). He works in the US National Gemini Office (US NGO|@usngo), which is a group within the Community Science and Data Center (CSDC) at the NOIRLab. He received his Doctorate in Astronomy from the Instituto de Astronomia, Geofísica e Ciências Atmosféricas Universidade de São Paulo. The talk this month will be through Zoom and the title of Dr. Placco's talk is "A Tale of Two Stars: Revealing the Age and Chemical Evolution of the Universe."

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

DONOR APPRECIATION NIGHT AT PATTERSON

We will host University South Foundation donors and their families at the Patterson Observatory on Saturday, March 1st starting at 7 p.m. HAC volunteers are requested to attend 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 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.

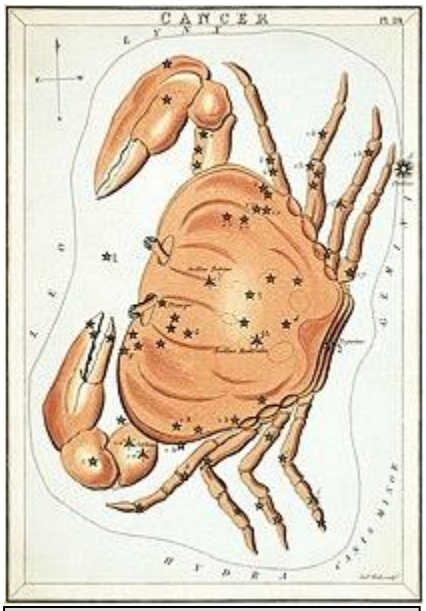
EDITOR'S CORNER

Bring out the inner writer in yourself by submitting an article for our Nightfall newsletter. Product reviews and anecdotal accounts of astronomical events are just a couple of ideas.

"The most remarkable discovery in all of astronomy is that the stars are made of atoms of the same kind as those on the earth." -- Richard P. Feynman.

President's Constellation Exploration – Cancer

by Penny Brondum

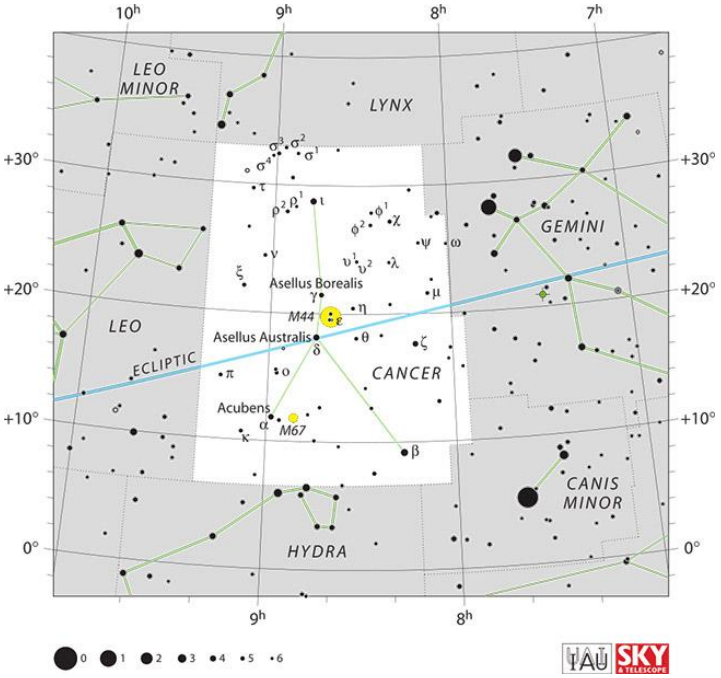


Cancer as depicted in Urania's Mirror, a set of constellation cards published in London c.1825.

The exploration this month is the Cancer constellation located in the northern sky. Its name means "the crab" in Latin. Cancer is the faintest of the 12 zodiac constellations and was first catalogued by the Greek astronomer Ptolemy in his *Almagest* in the 2nd century CE.

Cancer is a medium-size constellation (31st largest constellation of the 88 in the sky) with an area of 506 square degrees.

The neighboring constellations are Gemini to the west, Lynx to the north, Leo Minor to the northeast, Leo to the east, Hydra to the south, and Canis Minor to the southwest. Under city skies, Cancer is invisible to the naked eye. Cancer was often considered the "Dark Sign", quaintly described as "black and without eyes". Dante, alluded to its faintness in *Paradiso*, and mentioned it being visible for the whole night when it culminated at midnight in a Northern Hemisphere winter month.



By IAU and Sky & Telescope magazine (Roger Sinnott &Rick Fienberg

The modern symbol for Cancer represents the pincers of a crab, but Cancer has been represented as many types of creatures, usually those living in the water, and always those with an exoskeleton. In the Egyptian records of about 2000 BC it was described as Scarabaeus (Scarab), the sacred emblem of immortality. In Babylonia the constellation was known as MUL.AL.LUL, a name which can refer to both a crab and a snapping turtle. There also appears to be a strong connection between the Babylonian constellation and ideas of death and a passage to the underworld, which may be the origin of these ideas in later Greek myths associated with Hercules and the Hydra. Cancer was the crab sent by Hera to defeat Heracles. In different versions of the myth, the crab is either kicked into the sky by Heracles or placed among the stars by Hera after getting crushed by the Greek hero. In the 12th century, an illustrated astronomical manuscript shows it as a water beetle.

Cancer's stars are rather faint, its brightest star Beta Cancri having an apparent magnitude of 3.5. Cancer contains ten stars with known planets, including 55 Cancri, which has five: one super-earth and four gas giants, one of which is in the habitable zone and as such has expected temperatures similar to Earth.

Cancer was the backdrop to the Sun's most northerly position in the sky (the summer solstice) in ancient times, in the Gregorian calendar it was within a few days of June21.

Equivalently, this is the date when the Sun is directly overhead as far north as 23.437°N. The northern-most parallel where the sun is directly overhead is still called the *Tropic of Cancer*, even though the corresponding position on the sky now occurs in Taurus, due to the precession of the equinoxes.

The close conjunction of Jupiter and Saturn in Cancer, mid 1563, which was observed by Tycho Brahe and led him to note the inaccuracy of existing ephemerides (Tables showing the position of celestial objects.) lead to his own program of astronomical measurements.

Praesepe (M44)

Praesepe (Messier 44) is at the heart of Cancer and one of the closest open clusters, also called the *Beehive Cluster*. Located about 590 light-years from Earth and a popular target for amateur astronomers. It has an area of 1.5 square degrees, or three times the size of the full Moon. It is most

easily observed when Cancer is high in the sky, north of the Equator (February to May).

Ptolemy described the Beehive Cluster as "the nebulous mass in the breast of Cancer." It was one of the first objects Galileo observed with his telescope in 1609, spotting 40 stars in the cluster and Charles Messier added the cluster to his catalogue in 1769. Today, there are about 1010 high-probability stars in the cluster, most of them (68 percent) red dwarfs. The Greeks and Romans identified the nebulous object as a manger from which two donkeys, represented by the neighboring stars Asellus Borealis and Asellus Australis, were eating. The stars represent the donkeys that the god Dionysus and his tutor Silenus rode in the war against the Titans. The ancient Chinese interpreted the object as a ghost or demon riding in a carriage, calling it a "cloud of pollen blown from under willow catkins.

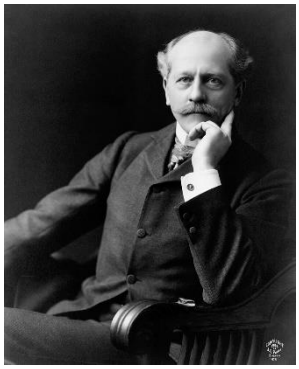
The smaller, denser, open cluster Messier 67, can also be found in Cancer, 2600 light-years from Earth. It has an area of approximately 0.5 square degrees, the size of the full Moon. It contains approximately 200 stars (100 stars similar to the Sun and a number of red giants) the brightest of which are of the tenth magnitude. The cluster was discovered by the German astronomer Johann Gottfried Koehler in 1779. It has an apparent magnitude of 6.1. Almost all the stars in the cluster are roughly at the same distance and of the same age (with the exception of 30 or so blue stragglers), which makes M67 one of the most observed and studied objects by those studying stellar evolution.

Cancer also has several spiral galaxies NGC 2775 (Caldwell 48), NGC 2535, NGC 2536 and NGC 2608. NGC 2608 is considered a grand design spiral galaxy. It is approximately 93 million light years distant. Two supernovae were observed in the area in recent history.

Even though Cancer is a faint constellation it has had an impact on astronomy thru the ages from the Egyptians thru the modern day. Take time this month to view the “bees” of the Beehive thru binoculars, or telescope. Remember to look up and enjoy the “Awe” in Awe-stronomy.

Editor’s Note: The brightest object in Cancer is not a star. It is M44, the Praesepe cluster. Cancer might be the only constellation where a star is not the brightest object.

Visual Trivia



Born in March of 1855.

Who am I and what am I famous for?

The answer is at the end of the newsletter.

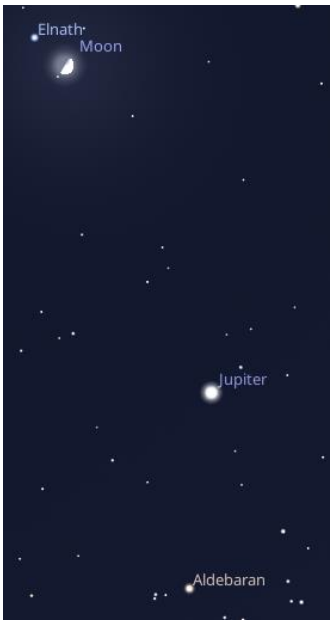
The Bucket List

by Vince Sempronio

Here we highlight the events in March.

March 1st, 6:30pm – A good opportunity to find the planet Mercury after sunset. Start with Venus and then find the thin crescent Moon, then move down towards the horizon to Mercury.

March 6th, 7pm – While attending our monthly HAC Public Night event this month, look high in the southern sky to locate Jupiter and further south, Aldebaran, the brightest star in Taurus. Higher and slightly east is the first quarter Moon. Just east of he Moon is the second brightest star in Taurus, El Nath. A few hours later, near 10pm, depending on where you live, The Moon will occult El Nath. Along a thin line near Hereford, AZ, a grazing occultation can be seen. The occultation will occur south of the white line on the map and the graze zone is within a couple of kilometers of the line.



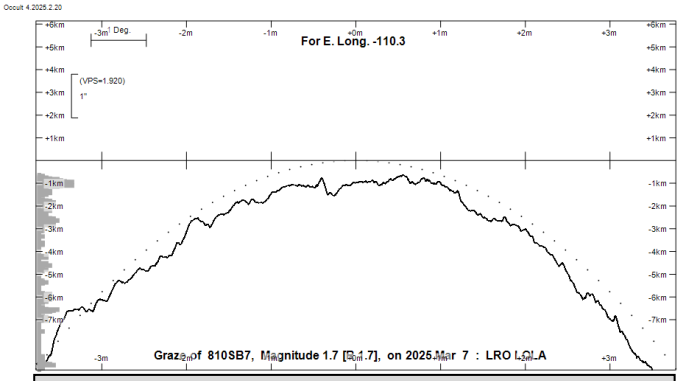
A grazing lunar occultation occurs when the northernmost or southernmost edge of the Moon passes very close to an object, in this case a bright star.

The best location to observe this event is between 0.9-1.1km south of the white line. Each blue/gray line is separated by 500m.

From our perspective, the Moon’s profile is not uniformly smooth, it has hills and valleys. A good analogy is when we

Map of the El Nath grazing occultation on the evening of March 6, 2025. Generated using GRAZPREP and rendered in Google Earth

observe the horizon after a sunset; the horizon has high and low points. This zone will have the most disappearances and reappearances. Shown on the map is Gary Grue's observatory (BMO), which is right at the graze limit. Unfortunately, the event will be a miss from his location.

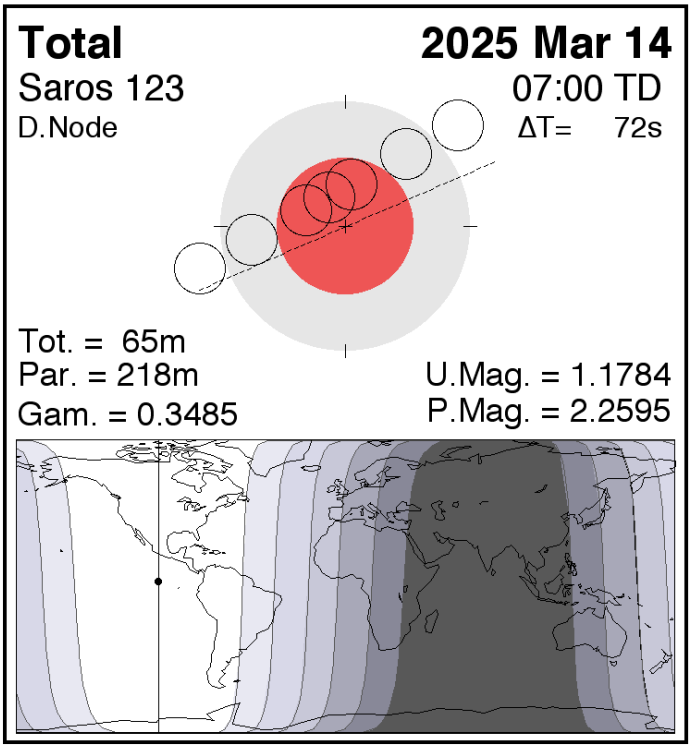


Lunar edge profile for graze of El Nath on March 6, 2025. Generated using OCCULT occultation software.

March 13th-14th – A Lunar Eclipse for North America where observers can witness the event from start to finish.

On the chart, the moon moves from right to left. For those who want to photograph the entire eclipse, be prepared to observe nearly 6 hours starting when the leading edge of the moon enters the penumbra shadow at 8:57pm local time on the 13th and ends when the trailing edge leaves the penumbra at 3:00am on the 14th.

www.EclipseWise.com/eclipse.html



Thousand Year Canon of Lunar Eclipses

©2014 by Fred Espenak

Credit: Fred Espenak

The umbra portion of the eclipse, when the entirety of the Moon is within the boundaries of the dark shadow begins at 11:26pm and ends at 12:31pm. Maximum eclipse is at 11:59pm. The Moon will be 60° up and slightly east of south.

We won't delve into all the techniques of how to photograph a lunar eclipse, but if you are interested in doing some photography, please use your favorite search engine as there are a plethora of sites devoted to this topic. Here is but one.

The author plans to set up an AVX EQ mount with an 80mm short tube refractor and record using the Celestron 5MP solar system camera. Exposing every 2 or 3 seconds between images will reduce the 6 hours of the eclipse down to a 4-minute video.

What color will the totally eclipsed moon appear to you?

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!

Messier Madness

by Kat Troche

March is the start of spring in the Northern Hemisphere; with that, the hunt for Messier objects can begin!

What Are Messier Objects?

During the 18th century, astronomer and comet hunter Charles Messier wanted to distinguish the 'faint fuzzies' he observed from any potential new comets. As a result, Messier cataloged 110 objects in the night sky, ranging from star clusters to galaxies to nebulae. These items are designated by the letter **'M'** and a number. For example, the Orion Nebula is **Messier 42** or **M42**, and the Pleiades are **Messier 45** or **M45**. These are among the brightest 'faint fuzzies' we can see with modest backyard telescopes and some even with our eyes.

Stargazers can catalog these items on evenings closest to the new moon. Some even go as far as having "Messier Marathons," setting up their telescopes and binoculars in the darkest skies available to them, from sundown to sunrise, to catch as many as possible. Here are some items to look for this season:

Messier 44 in Cancer: The Beehive Cluster, also known as Praesepe, is an open star cluster in the heart of the Cancer constellation. Use Pollux in Gemini and Regulus in Leo as guide stars. A pair of binoculars is enough to view this and other open star clusters. If you have a telescope handy, pay a visit two of the three galaxies that form the Leo Triplet - **M65** and **M66**. These items can be seen one hour after sunset in dark skies.

Messier 3 Canes Venatici: M3 is a globular cluster of 500,000 stars. Through a telescope, this object looks like a fuzzy sparkly ball. You can resolve this cluster in an 8-inch telescope in moderate dark skies. You can find this star

cluster by using the star Arcturus in the Boötes constellation as a guide.

Messier 87 in Virgo: Located just outside of Markarian's Chain, M87 is an elliptical galaxy that can be spotted during the late evening hours. While it is not possible to view the supermassive black hole at the core of this galaxy, you can see M87 and several other Messier-labeled galaxies in the Virgo Cluster using a medium-sized telescope.

Messier 76 in Perseus: For a challenge, spot the Little Dumbbell Nebula, a planetary nebula between the Perseus and Cassiopeia constellations. With an apparent magnitude of 12.0, you will need a large telescope and dark skies. You can find both M76 and the famous Andromeda Galaxy (M31) one hour after sunset, but only for a limited time, as these objects disappear after April. They will reappear in the late-night sky by September.

Plan Ahead

When gearing up for a long stargazing session, there are several things to remember, such as equipment, location, and provisions:

- **Do you have enough layers to be outdoors for several hours?** You would be surprised how cold it can get when sitting or standing still behind a telescope!
- **Are your batteries fully charged?** If your telescope runs on power, be sure to charge everything before you leave home and pack any additional batteries for your cell phone. Most people use their mobile devices for astronomy apps, so their batteries may deplete faster. Cold weather can also impact battery life.
- Determine the **apparent magnitude** of what you are trying to see and the **limiting magnitude** of your night sky. You can learn more about apparent and limiting magnitudes with our Check Your Sky Quality with Orion article.
- When choosing a location to observe from, select an area you are familiar with and bring some friends! You can also **connect with your local astronomy club** to see if they are hosting any Messier Marathons. It's always great to share the stars!

You can see all 110 items and their locations with NASA's Explore the Night Sky interactive map and the Hubble Messier Catalog, objects that have been imaged by the Hubble Space Telescope.

In Praise of Visual Observing
by Ted Forte

In 1850, John Adams Whipple and William Cranch Bond ruined astronomy. Their daguerreotype of Vega started a devastating revolution, unmatched in its diabolical evil until 1879, when Thomas Edison invented the light bulb. After 240 years, the epoch of classical astronomy was about to be hurled to an ignominious end.

OK, removing tongue from cheek, I'll grant that photography is a powerful tool that has advanced the science of astronomy immeasurably. Without it, I doubt there would even *be* professional astronomy.

But photography has caused a schism in amateur astronomy that gets wider with each new technological advance. At this point, we must recognize that there have evolved two distinct species: the observer and the imager. While hybrids still exist, like mules, they are an evolutionary dead end. The two species have differentiated so significantly that they can hardly recognize each other any longer. They have different jargon making it difficult to communicate, and the imager's "telescope" has become so mutated as to be unrecognizable. At first, it was just that the underlying telescope was so besmirched with cables, cameras and guide scopes, that it was hard to find. The newest manifestations, however, must stretch credulity to be considered telescopes at all. Just try and find a place to fit an eyepiece!

The majority of novice amateurs that I meet these days are overwhelmingly interested in doing photography. I foresee the eventual extinction of the visual astronomer, and I mourn its loss.

Before I continue, I want to express admiration for imagers and their creations. Their images are beautiful, instructive, and illuminating. I admire the enormous dedication, time, and effort that goes into producing the best of those images. I would argue, however, that it's not amateur astronomy they are doing, it's photography.

There's nothing wrong with doing photography, of course, but it's not what attracted me to the hobby, and it misses the mark for what I think is the most important aspect of amateur astronomy: experiencing the universe with one's own eyes.

Leslie Peltier said it well: *"No photograph has yet been made which is not cold and flat and dead when compared with the scenes that meet one's eyes when the moon is viewed through even a small telescope."*

I would paraphrase him: No photograph has ever, or ever will, match the visceral impact of seeing a celestial object with one's own eyes. When we look through the eyepiece, we don't just see an object, we connect with it. Actual photons, produced eons ago, have a somewhat direct line from that distant object to your retina. The light we receive is ours alone, we absorb it, its personal, it's unique, and it can be, if you let it, an incredibly moving experience.

Perhaps you'll accuse me of hyperbole. All too often, frequent observers become jaded, complacent. They allow that childlike awe we once experienced to weaken with repetition. I beg you not to let that happen.

I find it rather profound that when we peer into the eyepiece of a telescope, we become, for that instant, the last in a line of observers to view that object stretching back from the discoverer to the present day. We see these objects just as the first person to stumble upon them did. We can, in essence, share the view with the great observers of the past and even sense the same thrill of discovery they may have felt. For some of the fainter, more obscure objects, the list of

observers is quite short. We become part of a very select community. With the right point of view, your telescope becomes a gateway to an exclusive world that very few have ever witnessed. What a privilege that is.

Viewing the sky and contemplating our place in the universe is a uniquely human activity. It doesn't seem like our primate cousins, or any of the other "intelligent" species on earth, like elephants, dolphins or octopi, can wonder about the stars. As our pastime becomes more defined by the techno-gadgets of the modern astronomy marketplace, and more of us exchange computer screens for starlight, that uniquely human capacity is being squandered.

For those with a growing image portfolio, I say farewell. We've already lost you to the dark side. My plea to the novice amateur, however, is to forego attaching that camera, and just look! Experience the *real* universe. No processing required.

Astro Images
by HAC Members & Friends

This is a composite image of NGC 7538, an emission and reflection nebula in the constellation Cepheus. It is a stack of 56 x 12min. exposures totaling 11+ hrs. I used the ZWO dual band filter and the ZWO 533MCpro camera to capture the images with the 8" Visac. The Hydrogen alpha (Red) shows up very well, the dust within the nebula glows in the far-infrared. This nebula is sometimes referred to as "the Northern Lagoon Nebula," or Sharpless 2-158. It is located 9000 light years distant. North is toward the bottom of the image. I think the nebula has a distinctive 3-dimensional look to it-let me know what you think. Also, the reddish glow in the right bottom quadrant is not a gradient, it is an abundance of Hydrogen alpha. Credit: Glen Sanner

What a spectacular terminator on this night, in this place! Dramatic features from the great crater Archimedes (83 km dia.) on the left edge to the middle of Mare Serenitatis on the right. Due east (right) of Archimedes is the crater Autolycus (40 km) and above it is the crater Aristillus (55 km) with it's wonderful hatch-work ejecta blanket that according to some extends as far as 600 km from the center of the crater. Below Autolycus and east of Archimedes is a small flat region that is Paulus Putredinis, the "Marsh of Decay", where you can glimpse the lunar dome Putredinis 1 (above my marker) some 7km in diameter and 90 m high. There are several other domes in this area, but a lower sun angle is needed to bring them out. A little east the "o" marks the landing site of Apollo 15, much easier to see with slightly higher Sun. Note the great rimae all along this northern portion of the Montes Apenninus. Credit: Rik Hill.

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.

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.

HAC Calendar of Events

(February - March '25)

SU	MO	TU	WE	TH	FR	SA
March 2	**3**	**4**	**5**	**6** **9:32 AM** Patterson Public Night 7:00 PM Jupiter/Moon 6º	**7**	**8** Solar Saturday S.V. Library 10AM Mercury Eastern Elongation
9 Daylight Savings Time Begins (except in AZ)	**10**	**11**	**12**	**13** Total Lunar Eclipse	**14** **12:55 AM** HAC Meeting 7PM Room A102 Total Lunar Eclipse	**15**
16 Spica/Moon 0.4º	**17** St. Patrick's Day	**18**	**19**	**20** Vernal Equinox 3:01 AM Antares/Moon 0.5º	**21**	**22** **5:29 AM** Miss Sierra Vista Gala at Az Arts Academy 6-8 PM
23	**24**	**25**	**26**	**27**	**28** Venus/Moon 9º	**29** **3:58 AM**
30	**31**	**April 1**	**2**	**3** Patterson Public Night 7:30 PM	**4** **7:15 PM**	**5**
6	**7**	**8**	**9**	**10**	**11** HAC Meeting 7PM Room A102	**12** **5:22 PM** Solar Saturday 10A-12P Passover begins at sunset
13	**14**	**15**	**16**	**17** Earth Day at Veteran's Park 10AM – 2PM	**18**	19
20 **6:36 PM** Easter	**21** Lyrid Meteors	**22** Lyrid Meteors	**23** Lyrid Meteors	**24** SV City Council Meeting (5PM) Astronomy Day Proclamation	**25**	

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

Answer to Visual Trivia: Percival Lowell for the efforts that led to the discovery of the planet Pluto.