



MARCH, 2026

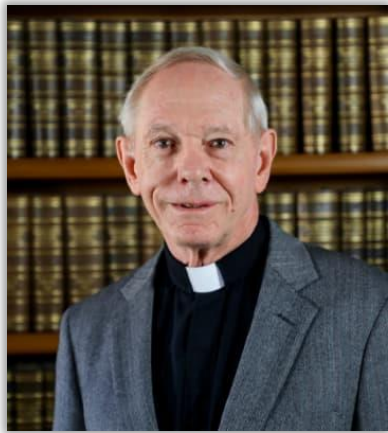
NIGHTFALL

A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB



MARCH MEETING SPEAKER

The speaker at our March meeting is Christopher Corbally from the Vatican Observatory. The topic of his talk is "Weird Binaries Under Close Surveillance: TU Tau and HD 5501"



Abstract

These two binaries are weird, but different.

TU Tau was long thought to be a regular carbon star, but it has a companion which is recently under investigation, thanks

to a Pro-Am group. The companion turns out to be the first example of a "massive" Barium dwarf, caught in the act of becoming a Barium giant. The companion's habit of disappearing irregularly requires close surveillance of the system.

HD 5501 is an unusual eclipsing binary with a light curve that does not repeat exactly from one cycle to the next. The system is under strong suspicion of harboring a hotspot on the secondary's disk that shows dynamic chaos, and it defies the usual change of period with mass loss for a reason that is becoming clear. Again, close surveillance by the Pro-Am group is being repaid.

Bio

Christopher Corbally is a Jesuit priest, emeritus vice director of the Vatican Observatory, and an adjunct astronomer at the University of Arizona. He was a project scientist for building the Vatican Advanced Technology Telescope and pursues his interest in stars primarily through spectroscopy.

Join the speaker, prior to the meeting for dinner at the Olive Garden in Sierra Vista at 5pm.

"It is clear to everyone that astronomy at all events compels the soul to look upwards, and draws it from the things of this world to the other."

--- Plato

2026 HAC DUES

Several HAC memberships expired in December. If you are unsure of the status of your dues, contact the treasurer, Ted Forte [tedforte511@gmail.com]

Annual dues are \$35 family and \$25 regular (\$25 and \$20 for active-duty military). Student memberships are \$10. 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.

You can mail your dues check to the Huachuca Astronomy Club PO Box 922, Sierra Vista AZ 85636

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. IF YOU ARE PAYING A PRORATED AMOUNT TO EXTEND YOUR MEMBERSHIP FOR A PARTIAL YEAR, YOU'LL NEED TO USE THE DONATE BUTTON – The dues "renew" option will not allow a non-standard amount.

If you have a Pay Pal account, you can use PayPal Direct to send your payment to paypal@hacastronomy.org

If you have a Zelle account with your bank, you can make a dues payment by transferring funds to treasurer@hacastronomy.org. (NOTE THE NEW ADDRESS)

PATTERSON OBSERVATORY ACCESS ROAD UPDATE

Temporary Patterson Access

The construction of a fire access road to the back of the Patterson and Discovery Gardens on the USF Campus will begin shortly. The expected completion is April 2026.

The red line represents the guest access that will be used during construction to reach The Patterson. There will be signs to guide guests to the Observatory.

The new fire access roadway will exit the north end of the current parking lot (red X) and pass through the current Rose Garden. (The garden plants will be relocated to be installed in a new Rose Garden closer to the Discovery Gardens after construction is complete.)

Temporary arrangements have been made for the gate to be opened through Cochise College during construction

for HAC volunteers to bring telescopes to the back patio of the Patterson.



More convenient handicapped and volunteer equipment accessibility via the south side of the Patterson Observatory is in discussion.

ARTEMIS II UPDATE

The Artemis II experienced an issue with the flow of helium to its SLS rocket's upper stage. That has forced the space agency to roll the craft away from the launch pad to investigate the issue – and that will, said NASA Administrator Jared Isaacman, "take the March launch window out of consideration."

Quick work to begin preparations for rolling the rocket and spacecraft back to the VAB potentially preserves an April launch window, pending the outcome of data findings, repair efforts, and how the schedule comes to fruition in the coming days and weeks.

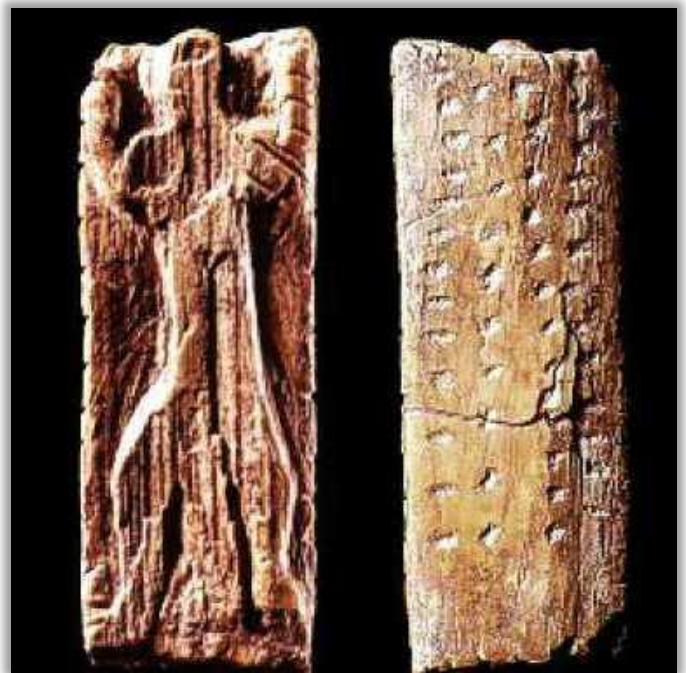
PRESIDENT'S CONSTELLATION EXPLORATION – ORION (PART 2) BY PENNY BRONDUM

Orion has a rich history in almost every ancient civilization, from Greek to Roman, Chinese, and Aztecs. Fascinating prehistoric Aurignacian ivory carvings, dating as far back as 38000 years, show images of the Orion

Constellation. Archaeologists found this carving in a cave in the Ach Valley in West Germany in 1979. The distinctive pattern of Orion is recognized in numerous cultures around the world, and many myths are

associated with it. In ancient mythology, the Hunter symbolized a force that was strong and powerful. He was feared by his enemies and admired by his friends. The Hunter has strength, speed, and agility. He has huge amounts of perseverance, endurance, and stamina, stalking his prey, sometimes for many miles before the kill.

The constellation Orion has its origins in [Sumerian mythology](#), specifically in the myth of [Gilgamesh](#) and the story of their hero fighting the bull of heaven, represented by Taurus. They called Orion URU AN-NA, meaning "the light of heaven." Their name for the constellation Taurus was GUD AN-NA, or "the bull of heaven."



Ach Valley carved mammoth ivory, www.astronomytrek.com.
Public Domain

Babylonian astronomical records dating back to 1200BC in the Late Bronze Age also showed a hunter in the sky. The [Babylonian star catalogues](#) of the Late Bronze Age name Orion MULSIPA.ZI.AN.NA, "The Heavenly Shepherd" or "True Shepherd of Anu" – Anu being the chief god of the heavenly realms.

In ancient Egypt, around 3100BC, astronomers identified the constellation as the God Sah or Sahu. Sahu was

swallowed by the underworld every day at dawn and then reappeared at night. Because Orion rises before Sirius, the star whose heliacal rising was the basis for the Solar Egyptian calendar. Sah is one of many gods whose form the dead pharaoh is said to take in the afterlife. The Egyptians recognized the cosmic power of Orion and built the three pyramids accurately aligned with the main stars on Orion's Belt.

In Greek mythology, the hunter Orion was the most handsome of men. He was the son of the sea god [Poseidon](#) and Euryale, the daughter of King Minos of Crete. All myths of Orion's passing share the same outcome: Orion and the scorpion were placed on opposite sides of the sky, so that when the constellation Scorpius rises in the sky, Orion sets below the horizon in the west, fleeing from the scorpion. This is given as the reason that the constellations of Scorpius and Orion are never in the sky at the same time. However, Ophiuchus, the Serpent Bearer, revived Orion with an antidote. This is said to be the reason that the constellation of Ophiuchus stands midway between the Scorpion and the Hunter in the sky.

The Orion constellation is mentioned in [Horace's Odes'](#) (Ode 3.27.18), [Homer's Odyssey](#) (Book 5, line 283) and [Iliad](#), and [Virgil's Aeneid](#) (Book 1, line 535). And the [Bible](#) mentions Orion three times, Job 9:9 ("He is the maker of the Bear and Orion"), Job 38:31 ("Can you loosen Orion's belt?"), and Amos 5:8 ("He who made the Pleiades and Orion").

The [Aztecs](#) called the stars of Orion's Belt and Sword, the Fire Drill. Their rise in the sky signaled the beginning of the New Fire ceremony, a ritual Aztecs performed to postpone the end of the world. This ancient tradition took place as long ago as 1300AD.

In medieval [Muslim astronomy](#), Orion was known as al-Jabbar, "the giant". Orion's sixth brightest star, Saiph, is named from the Arabic, saif al-Jabbar, meaning "sword of the giant

In old Hungarian tradition, Orion is known as "Archer" or "Reaper". In recently rediscovered myths, he is called Nimrod, the greatest hunter, father of the twins Hunor and Magor. In other Hungarian traditions, Orion's Belt is also known as "Judge's stick".

In Ireland and Scotland, Orion was called An Bodach, a figure from Irish folklore whose name literally means "the one with a penis [bod]" and was the husband of the Cailleach (hag).

In Scandinavian tradition, Orion's Belt was known as "Frigg's Distaff" (friggerock) or "Freyja's distaff". The Finns call Orion's Belt and the stars below it "Väinämöinen's scythe. Another name for the asterism of Alnilam, Alnitak, and Mintaka is "Väinämöinen's Belt" and the stars "hanging" from the Belt as "Kaleva's sword".

The Chinese knew the Orion constellation as Shen and associated it with a great hunter or warrior. The name Shen means "three." for the 3 stars of Orion's Belt.

The Seri people of northwestern Mexico call the three stars in Orion's Belt Hapj (a name denoting a hunter) which consists of three stars: Hap (mule deer), Haamoja (pronghorn), and Mojet (bighorn sheep). Hap is in the middle and has been shot by the hunter; its blood has dripped onto Tiburón Island.

The same three stars are known in Spain and most of Latin America as "Las tres Marías" (Spanish for "The Three Marys"). In Puerto Rico, the three stars are known as the "Los Tres Reyes Magos" (Spanish for The Three Wise Men).

The [Ojibwa](#)/Chippewa Native Americans call this constellation Mesabi for Big Man. To the Lakota Native Americans, Tayamnicankhu (Orion's Belt) is the spine of a bison. The great rectangle of Orion is the bison's ribs; the Pleiades star cluster in nearby Taurus is the bison's head; and Sirius in Canis Major, known as Tayamnisinte, is its tail. Another Lakota myth mentions that the bottom half of Orion, the Constellation of the Hand, represented the arm of a chief that was ripped off by the Thunder People as a punishment from the gods for his selfishness. His daughter offered to marry the person who can retrieve his arm from the sky, so the young warrior Fallen Star (whose father was a star and whose mother was human) returned his arm and married his daughter, symbolizing harmony between the gods and humanity with the help of the younger generation. The index finger is represented by Rigel; the Orion Nebula is the thumb; the Belt of Orion is the wrist; and the star Beta Eridani is the pinky finger.

There are alternative ways to visualize Orion. From the Southern Hemisphere, Orion is oriented south-upward, and the Belt and Sword are sometimes called the saucepan or pot in Australia and New Zealand. Orion's Belt is called Drie Konings (Three Kings) or the Drie Susters (Three Sisters) by Afrikaans speakers in South Africa and are referred to as les Trois Rois (the Three Kings) in Daudet's *Lettres de Mon Moulin* (1866). The appellation Driekoningen (the Three Kings) is also often found in 17th and 18th-century Dutch star charts and seaman's guides.

The imagery of the Belt and Sword has found its way into popular Western culture symbolism, for example in the form of the shoulder insignia of the 27th Infantry Division of the United States Army during both World Wars, probably owing to a pun on the name of the division's first commander, Major General John F. O'Ryan. The film distribution company Orion Pictures used the constellation as its logo.

Orion is currently located on the celestial equator, but that will not always be the case because of [precession](#) of the Earth's axis. Orion lies well south of the ecliptic, and it only happens to lie on the celestial equator because the point on the ecliptic that corresponds to the June solstice is close to the border of Gemini and Taurus, to the north of Orion. Precession will eventually carry Orion further south, and by AD 14000, Orion will be far enough south that it will no longer be visible from the latitude of Great Britain.

Further in the future, Orion's stars will gradually move away from the constellation due to proper motion. However, Orion's brightest stars all lie at a large distance from Earth on an astronomical scale—much farther away than Sirius, for example. Orion will still be recognizable long after most of the other constellations—composed of relatively nearby stars—have distorted into new configurations, except for a few of its stars eventually exploding as supernovae, for example Betelgeuse, which is predicted to explode sometime in the next million years.

Because Orion is so easy to spot naked eye it is a wonderful place to start your winter exploration. Progressing from naked eye to binoculars to telescope to astrophotography lets you delve deeper into the wonders that are contained within the Orion Constellation. So, I challenge you to bundle up and get outside when it clears, to look up and enjoy all that Orion holds for the novice to the expert sky-observer.

SCATTERED REFLECTIONS

BY: THE STEAMPUNK ASTRONOMER

The Cassini Dynasty: Part 1

When one wishes to talk about great scientific families there are more than a few names that come to the fore. There is, of course, the [Herschel](#) family beginning with William, the discoverer of Uranus, and his sister Caroline, followed by his imminently famous and productive son John who was both a friend and collaborator of William Whewell. John would have three scientifically famous sons, Alexander, William and John the Younger, the first

being among the earliest users of fingerprints as unique identifiers and the latter two being elected as Fellows of the Royal Society for their astronomical work.

There were the [Bernoullis](#) of Basel who produced no fewer than eight mathematicians and engineers who would work in areas as diverse as the establishment of probability theory and fluid dynamics.

In Denmark there were the [Bohrs](#), Neils and his son Alge, both of whom would win Nobel Prizes for their work in physics, not to mention Neils' brother Harald who did groundbreaking work in the mathematical field of what is known as almost periodic functions.

Similarly, there were the [Curies](#), husband and wife Pierre and Marie who would share a Nobel Prize and whose daughter, Irene, would share a Prize with her husband Pierre Joliot.

There are the [Darwins](#) whose influence in England is still significant to this day and from India one can marvel at the contributions of the extended family from which C. V. Raman and Subrahyanman Chandrasekhar come.

The most enduring family of them all, however, originated in Italy and while the Herschels would join them in obtaining noble title for their work, none of these families can be said to have had as long an influence as the four generations that served and survived the Kings of France. I am, of course, talking about the [Cassini](#) Dynasty that spanned from 1625 to 1845 and that would explore the heavens and map the globe with a precision that no one had previously. With roots that reach back to [Galileo](#) in northern Italy, the Cassinis would be a scientific force of nature that would redefine how we measure the Earth and who would wrestle with the heirs of Isaac Newton about the true shape of the planet. In this article we will trace their rise from the back country of Nice to the height of noble privilege in Ancient Regime France to a fall brought about by the tides of revolution.

With that overview in mind, come with me back to the year 1625. In that year, [James VII of Scotland](#) who was also James I of the United Kingdom would die passing his throne to his ill-fated son, [Charles I](#). In France, Louis XIII was fighting the Huguenots led by the Duke of Soubise. The Dutch were settling a small outpost on Manhattan Island in the New World and the capital of Madagascar, Antananarivo, was being founded by King Andrianjaka. In that year, several prominent figures would die, including the great German astronomers, Simon Marius and Johann Bayer, while others would be born to high estate and privilege. Unnoticed among these noteworthy

events, was the birth, on June 8th, of a boy in the village of Perinaldo in the county of Nice in what was then the duchy of Savoy. Named Giovanni by his parents, Jacopo Cassini of Tuscany and Guilia Corvesi of Nice, he wasn't raised in their home but rather by his maternal uncle, a man of better means, connections, and access to education.

The young Cassini spent two years in a school at Vallebone before moving to a Jesuit run school in Genoa where he showed great intellectual promise. Excelling in poetry, astronomy and mathematics, he soon matriculated to the abbey at San Fructuoso where he was attracted to astrology until reading Pico della Mirandola's work attacking the subject as nothing more than frivolous pseudoscience. Turning instead to purely astronomical pursuits, he soon attracted the attention of a local nobleman, the [Marquis Cornelio Malvasia](#), who, rather ironically, had read some of Cassini's writing on astrology and was impressed by his insight and intellect. Malvasia was an astrologically inclined senator from Bologna who had the money and ego to build a world class observatory and then staff it with some of the best astronomers in Italy.

While Cassini wasn't originally hired in the role of working astronomer at the [Panzano Observatory](#) by the astrology loving Marquis, he was independent enough to, in 1644 as the age of 19, to spend as much time as he could with those who were. Over the next four years, he learned from the likes of Giovanni Baptiste Riccioli and Francesco Maria Grimaldi. Riccioli was the Jesuit priest who worked to confirm a number of Galileo's observations as well as to quantify his Law of Falling Bodies with a series of incredibly accurate observations. Grimaldi did important work in optics, eventually discovering the phenomenon known as diffraction. As you might expect, with the amount of talent Cassini possessed and the tutelage of Italy's two greatest living astronomers, it wasn't long before the young man began producing his own astronomical work.

In November of 1647, the professor of astronomy at the University of Bologna, [Boneventura Cavaleiri](#), who is a fascinating figure in the history of mathematics, died and with the Marquis as his patron, Cassini was appointed as his successor. At about the same time, in early 1648, Cassini was able to purchase several upgraded instruments for the Observatory where he maintained his appointment. With his newfound status and equipment, he quickly set out to make a number of observations of the motion of a comet in 1652. The publication of these results established him as being among Italy's elite scientific figures. To quote the complete dictionary of

scientific biography, "In 1652–1653 the passage of a comet attracted his attention. In the account of his observations, he accepted that the earth is at the center of the universe, that the moon possesses an atmosphere, and that the comets, which are situated beyond Saturn, are formed because of emanations originating from the earth and the planets."

It is here that we need to note the beginning point of what would be a long and interesting journey for Cassini. Having been trained by Riccioli and Grimaldi, Cassini had inherited both their incredible commitment to accuracy in observation and deep suspicion of new and radical ideas. As such, at this point, it would be fair to say that Cassini was devoutly [Ptolemaic](#) and [Aristotelian](#) in his cosmological views. Even as Riccioli would move towards more advanced ideas, Cassini was still thinking in a pre-Galilean and pre-Keplerian way.

It's at this point that a rather fortunate happenstance interjected itself into Cassini's life. One of the things I should remind you of is that at this point in Europe, good timekeeping devices were hard to come by. So, the question arises, how did folks keep time back then. As had been the case in the medieval Islamic world, the people of Italy relied on the religious institutions, namely the local churches, to keep track of the passing of the hours. One of the ways a church could do this was to create a modified [gnomon](#). Instead of using a stick to cast a shadow in the ground, what a church would do is have a hole made in a south facing wall of the church. This hole would act like a pinhole camera or camera obscura and project an image of the Sun onto the floor of the church. The floor would be marked, beginning with a line running north and south, and then with additional markings that acted as a sort of reverse sundial. In this way, the system could act as a sort of clock during daylight hours but also as a calendar by marking the position of the Sun's image on the north-south line or meridian at noon. The higher the Sun was in the sky at noon, the closer to the wall the image would be. By keeping track of the image's position, the local priest could determine approximate dates for the solstices and equinoxes and thus keep the solar calendar in sync.

So what does this have to do with Giovanni? Well, back in 1575, his predecessor as professor of astronomy in Bologna had built such a gnomon for the local church of San Petronio or St. Peter. The problem was that as Bologna had grown and become a cultural and economic center, the church had grown and expanded as well until structural modifications had blocked the old gnomon system. The church, understandably not wanting to lose

the instrument's functionality, decided to go back to the university to see if the new chair might be able to build them a new one. While the plan that Cassini developed in response to this request was daunting in its execution, he was able to make the very precise calculations necessary and, just as importantly, oversee the engineering and construction challenges so that the instrument worked perfectly. Having been so involved in its creation, Cassini then began training the priests to make precise scientific observations and measurements for him for those times when he couldn't be at the church to make them himself. Most importantly, he was able to measure not only the location of the image on the north-south meridian line but also its size with better precision than had been previously achieved. This allowed him to calculate what is known as the obliquity of the ecliptic as well as precise determinations of the dates and times of the solstices and equinoxes as previously mentioned. He would publish a compilation of this work in 1656 that would be dedicated to Queen Christina of Sweden who was in exile in Tuscany at the time. He would return to these measurements later in his life in a very important way.

Next month we'll continue with the life and discoveries of Cassini.

FOR SALE

Your editor is offering a Celestron focus motor, model 94155-A. I opened the box but never used it. I was going to use it for a project but went with a different solution. New ones are \$240+ online, I'm asking \$190.

ABOUT THE COVER

Glen Sanner offers this month's cover image. This is a composite image of Sharpless 2-162, better known as the "Bubble Nebula," in Cassiopeia. I took the images for the composite this past November and December. 11+ hours using an Askar C1 filter (Ha-Oiii) and 12+ hours using an Askar C2 filter (Sii-Oiii). I used the Vixen Visac with the ZWO ASI 533 pro CMOS camera for the images. The composite is done in the Hubble SHO Palette. Using the Narrowband Normalization module in Pixinsight, you can manipulate the colors to "suit your fancy,"--anything goes. North is at about a 20-degree angle to the upper right in the image. It is difficult to separate the colors to distinguish Ha and Sulfur II, Nitrogen is in the mix as well. The blue is Oiii. The entire bubble is surrounded by a huge molecular cloud.

The following description is from the Science Mission Directorate at NASA.

"The Bubble Nebula is 7 light-years across and resides 7,100 light-years from Earth in the constellation Cassiopeia. The star forming this nebula is 45 times more massive than our sun. Gas on the star gets so hot that it escapes into space as a "stellar wind" moving at over 4 million miles per hour. This outflow sweeps up the cold, interstellar gas in front of it, forming the outer edge of the bubble much like a snowplow piles up snow in front of it as it moves forward. As the surface of the bubble's shell expands outward, it slams into dense regions of cold gas on one side of the bubble. This asymmetry makes the star appear dramatically off-center from the bubble." That star is at the 6 o'clock position in my composite inside "the Bubble."










The Bubble Nebula was discovered in 1787 by William Herschel.

CLEARING UP HISTORY

It is said that Sir Issac Newton was born on the same day that Galileo died, 8 January 1642. This is not true. The popular belief that Newton was born the same year Galileo died is misleading due to the difference between the Julian and Gregorian calendars used in England and Italy at the time. Newton was born nearly a full year after Galileo's death.

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<i>Club Meetings:</i> Monthly at 7pm at the Cochise College Downtown Center at 2600 E Wilcox Drive, Sierra Vista, AZ in Room A102. Refer to the calendar for specific dates.	

HAC Calendar of Events (March - April 2026)

SU	MO	TU	WE	TH	FR	SA
March 1	2	3  4:38 am	4	5	6 HAC Meeting (1)	7
8	9	10	11  3:39 am	12 Church Group at Patterson 7pm	13	14 Solar Saturday 10 am to 12 pm
15	16	17	18  7:23 pm Veritas Christian at Patterson 7 PM	19	20 Vernal equinox 8:46 am	21
22	23 Church group at Patterson 7 pm	24	25  1:18 pm	26 Patterson Public Night 7:00 pm	27	28
29	30	31	April 1  7:12 pm	2	3 HAC Meeting (1) Mercury GWE	4
5 Easter	6	7	8	9	10  9:52 pm	11 Solar Saturday 10 am to 12 pm
12	13	14	15	16 Patterson Public Night 7:00 pm	17  4:52 am	18 Kartchner Star Party Noon – 9 pm
19	20	21 Lyrid Meteors	22 Lyrid Meteors	23  7:32 pm Earth Day at Veteran's Park 10 am - 2 pm Lyrid Meteors	24	

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

(1) HAC meeting location: Cochise College Downtown Center at 2600 E Wilcox Drive, Sierra Vista, AZ in Room A102
(GEE) – Greatest Eastern Elongation, an evening event, (GWE) - Greatest Western Elongation, a morning event

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