



**APRIL, 2026**

# ***NIGHTFALL***

**A PUBLICATION OF THE HUACHUCA ASTRONOMY CLUB**



*The Trifid Nebula (M20) above, and  
the Lagoon Nebula (M8) below as  
imaged by Zane Landers*

## APRIL MEETING SPEAKER

The speaker at our April meeting is Ed Moss from the Huachuca Astronomy Club. The topic of his talk is " The Story of Mingo Creek Park Observatory - Designing and Building a Large Observatory for Astronomy Outreach."



Ed was co-founder of Laurel Highlands Star Cruise Star Party. He served as the project manager for the Mingo Creek Park Observatory project where he also served as director for seven years. He's been a member of the Amateur Astronomers Association of Pittsburgh for twenty-eight years where he served as club president for 7 years and was on the Executive Committee for 12 years. For the past 7 years he has been a member of the Huachuca Astronomy

Join the speaker, prior to the meeting for dinner at the Mande Le Bar and Grill ([3455 Canyon De Flores, Sierra Vista, Arizona 85650](#)) at 5pm

## 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](http://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](mailto: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](mailto:treasurer@hacastronomy.org).  
(NOTE THE NEW ADDRESS)

## EARTH DAY AT VETERANS PARK

Come set up your solar telescope to share the Sun with shoppers and guests at the Farmer's Market at Veterans Memorial Park in Sierra Vista from 10am until 2pm on Saturday April 23.

## KARTCHNER STAR PARTY

The 2026 Spring Kartchner Star Party will be held on Saturday, April 18 at [Kartchner Caverns State Park](#). Solar observing begins at noon. There will be a talk in the Discovery Center theater at 5 pm and stargazing after dark. Astronomers setting up telescopes are entitled to free park admission.

The speaker is Ted Blank

"Light Pollution: Why Should I Care?"

This talk covers the basics of how smart lighting can help protect dark skies, nighttime pollinators (like bats!), nocturnal animals, migrating birds and human health.

Ted Blank has been a NASA Solar System Ambassador since 2010, communicating the science and excitement of space exploration missions and discoveries to people in his community. He is a past President of the New Hampshire Astronomical Society and a current member of the Board of Directors of the International Dark Sky Discovery Center in Fountain Hills, Arizona slated to open in late 2026. Ted bought his first telescope in 2007 and still frequently sets one up on the sidewalk to share the views with the public. He is a retired IT professional, having spent more than 35 years as a performance analyst with IBM and Oracle. He currently lives in Fountain Hills with his wife Peggy.

# PRESIDENT'S CONSTELLATION EXPLORATION – URSA MAJOR BY PENNY BRONDUM

My Constellation explorations have been geared to be an exploration of what is available look at in the night sky. I took the time this month to convert and organize my list of Constellation Explorations for the past few years from handwritten notes on multiple scraps of paper to a spread sheet. As a result, I realized that I had missed a major Constellation that is always visible in our night sky: [Ursa Major](#).

Ursa Major, also known as the Great Bear, is a constellation in the Northern Sky, whose associated mythology likely dates back into prehistory. Its Latin name means "greater (or larger) bear", referring to and contrasting it with nearby Ursa Minor, the lesser bear. In antiquity, it was one of the original 48 constellations listed by [Ptolemy](#) in the 2nd century AD, drawing on earlier works by Greek, Egyptian, Babylonian, and Assyrian astronomers. Today it is the third largest of the 88 modern constellations covering 1279.66 square degrees or 3.10% of the total sky. Ursa Major is visible throughout the year from most of the Northern Hemisphere and appears circumpolar above the mid-northern latitudes.

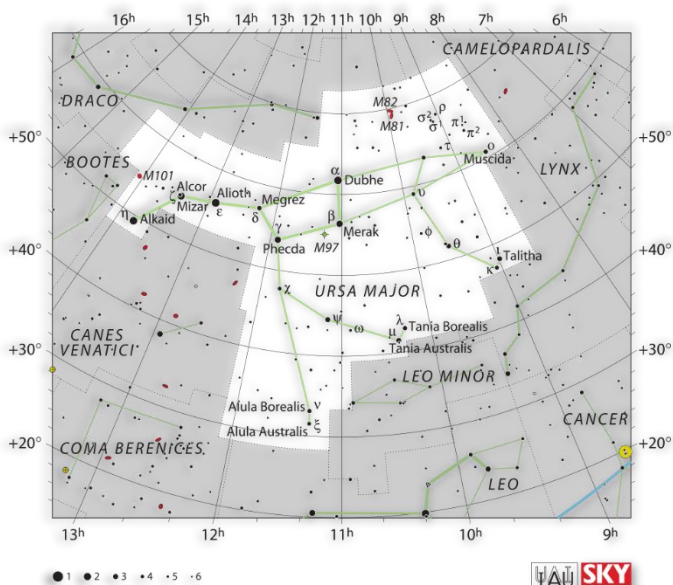


Image from Sky and Telescope  
 3 circles are the 3 leaps of the Gazelle asterism  
 Note I could not get the circles to "group" with the S&T image.  
 Hope you can.

Ursa Major is primarily known for the asterism of its seven main stars, which has been called the "[Big Dipper](#)", "the Wagon", "Charles's Wain", or "the Plough", among other names. In particular, the Big Dipper's stellar configuration mimics the shape of the "[Little Dipper](#)". Starting with the "ladle" portion of the dipper and extending clockwise (eastward in the sky) through the handle, these stars are: Dubhe ("the bear"); Merak ("the loins of the bear"); Phecda ("thigh"); Megrez, ("root of the tail"- referring to its location as the intersection of the body and tail of the bear or the ladle and handle of the dipper); Alioth, a name which refers not to a bear but to a "black horse", the naked-eye binary [Mizar and Alcor](#) (which were termed the "horse and rider" by the Arabs) and Alkaid situated at the end of the tail.

An easy way to locate [Polaris](#), the North Star, is to use the "pointer stars" that form the outer edge of the Dipper's bowl: Merak (the bottom of the bowl farthest from the handle) and Dubhe (the top of the bowl farthest from the handle). Draw a straight line from Merak up through Dubhe and extend it about five times the distance between them. The next bright star you reach is Polaris, at the end of the Little Dipper's handle in Ursa Minor.



Ursa Major and Polaris  
 with names of bright stars in the Big Dipper

By following the curve of the Big Dipper's handle, you can find the bright star Arcturus "the bear keeper". [Arcturus](#) is the brightest star in the northern celestial hemisphere and, therefore, of the constellation [Boötes](#) (the Herdsman). The star's name is derived from the Greek ἄρκτος (arktos), meaning "bear," and οὔρος (ouros), "watcher" or "guardian." Continuing to follow the curved line past Arcturus leads to [Spica](#), the brightest star in the constellation [Virgo](#) and the 16th brightest star in the sky.

[Mizar](#) was the first double star ever to be photographed. The early American photographer and inventor [John A. Whipple](#) with astronomer [George P. Bond](#) took the photo of the binary system in 1857. Mizar A was the first star to be identified as a [spectroscopic binary](#) system. American astronomer [Antonia Maury](#), one of the [Harvard Computers](#), determined the system's orbit based on the periodic doubling of some of its spectral lines in 1890.

[Alcor](#) is a visual companion to the brighter Mizar in the sky. The two stars are sometimes known as the Horse and Rider. The name Alcor comes from the Arabic al-khawāri, meaning "the faint one." Alcor was historically also known as Saidak ("true"), Al Sadak ("the test"), and Suha or Suhā/Sohā ("the forgotten one" or "the neglected one"). In Hindu mythology, it was associated with Arundhati, the wife of the Sage Vashishta (Mizar).

Except for Dubhe and Alkaid, the stars of the Big Dipper all have proper motions heading toward a common point in Sagittarius. A few other such stars have been identified, and together they are called the [Ursa Major Moving Group](#).

Another asterism in Ursa Major is from the Arab culture representing three pairs of footprints of a leaping gazelle. It is a series of three pairs of stars found along the southern border of the constellation. It represents the leaps of a gazelle that dashed across a pond after seeing a lion. The pond is represented by the constellation Coma Berenices. The same asterism has the Chinese name Santai and the Indian name Trivikrama, both meaning "three steps".

The constellation Ursa Major contains 22 formally named stars. The constellation also contains 21 stars with confirmed planets and seven objects listed in the [Messier catalogue](#). One of these, [Messier 40](#), is an optical double star. Of the remaining six objects, one is the planetary nebula Messier 97 – the famous [Owl Nebula](#) – and the others are galaxies. All five Messier galaxies in Ursa Major – [Bode's Galaxy](#) (M81), the [Cigar Galaxy](#) (M82), the [Pinwheel Galaxy](#) (M101), the [Surfboard Galaxy](#) (M108), and M109 – can be found using the bright stars of the Big Dipper.

There are 3 meteor showers associated with Ursa Major: Alpha Ursae Majorids are a minor meteor shower in the constellation. They may be remains of the comet C/1992 W1 (Ohshita). The October Ursae Majorids were discovered in 2006 by Japanese researchers possibly caused by a long period comet. The shower peaks between October 12 and 19. The Kappa Ursae Majorids

are a newly discovered meteor shower, peaking between November 1 and November 10.

The Great Bear constellation is well known in many world cultures and associated with many different myths. Ursa Major is associated with many different forms in the sky in different cultures, including the camel, shark, skunk, sickle, bushel and canoe. The list of stories and myths is so extensive that there is space to cover only one sample.

The constellation of Ursa Major has been seen as a bear, usually female, by multiple connected civilizations. This may stem from a common oral tradition of Cosmic Hunt myths stretching back more than 13,000 years. Using statistical and phylogenetic tools, Julien d'Huy reconstructs the following Paleolithic state of the story: "There is an animal that is a horned herbivore, especially an elk. One human pursues this ungulate. The hunt locates or gets to the sky. The animal is alive when it is transformed into a constellation. It forms the Big Dipper."

The [Pre-Islamic Arabs](#) recognized the larger constellation of Ursa Major and Ursa Minor were imagined as funeral processions with the ladle of either seen as a funerary bier and its handle as a train of mourners. The Big Dipper is known as banāt an-na'sh al-kubrā meaning literally "the greater daughters (mourners) of the bier" thus is translated as "the greater funeral procession", whilst Ursa Minor is known as "the lesser funeral procession".

In Greek mythology, it is associated with the myth of [Callisto](#), a nymph who was turned into a bear by Zeus' jealous wife Hera. The Greek poet Aratus called the constellation Helike, ("turning" or "twisting"), because it turns around the celestial pole. [The Odyssey](#) notes that it is the sole constellation that never sinks below the horizon and "bathes in the Ocean's waves", so it is used as a celestial reference point for navigation. It has also been called the "Wain" or "Plaustrum", a Latin word referring to a horse-drawn cart.

The Romans called the constellation Septentrio, or "seven plough oxen," even though only two of the seven stars represented oxen, while the others formed a wagon. The name was also used for Ursa Minor.

The Chinese know the seven brightest stars, or Tseih Sing, as the Government, or Pih Tow, the Northern Measure and in ancient times, each one of the seven stars had a specific name, often coming themselves from ancient China:

In Shinto, the seven largest stars of Ursa Major belong to Ame-no-Minakanushi, the oldest and most powerful of all

kami. In Hindu legend, the brightest stars of Ursa Major represent the Seven Sages and the constellation is known as Saptarshi. The sages in question are Bhrigu, Atri, Angirasa, Vasishtha, Pulastya, Pulalaha and Kratu.

In South Korea, the constellation is referred to as "the seven stars of the north". In the related myth, a widow with seven sons found comfort with a widower, but to get to his house required crossing a stream. The seven sons, sympathetic to their mother, placed steppingstones in the river. Their mother, not knowing who put the stones in place, blessed them and, when they died, they became the constellation.

The [Iroquois](#) interpreted Alioth, Mizar, and Alkaid as three hunters pursuing the Great Bear. According to one version of their myth, the first hunter (Alioth) is carrying a bow and arrow to strike down the bear. The second hunter (Mizar) carries a large pot – the star Alcor – on his shoulder in which to cook the bear while the third hunter (Alkaid) hauls a pile of firewood to light a fire beneath the pot. Since the constellation is low in the sky in autumn, the legend says that it is the blood of the wounded bear that causes the leaves to turn red.

To Norse pagans, the Big Dipper was known as Óðins vagn, "Woden's wagon". Likewise, Woden is poetically referred to by Kennings such as vagna verr 'guardian of the wagon' or vagna rúni 'confidant of the wagon'

In more recent American history, the Big Dipper played a role in the [Underground Railroad](#), as its position in the sky helped escaped slaves find their way north. There were numerous songs that spread in the south that said to follow the 'Drinking Gourd' to get to a better life.



*Polaris and the Big Dipper  
on the flag of Alaska*

Ursa Major is mentioned by such poets as Homer, Spenser, Shakespeare, Tennyson and by Federico Garcia Lorca, in "Song for the Moon". Ancient Finnish poetry also refers to the constellation, and it features in the painting [Starry Night Over the Rhône](#) by Vincent van Gogh.



*Starry Night Over the Rhône by Vincent van Gogh (1888)*

Ursa Major is pictured as the Starry Plough, the Irish flag of Labour, adopted by James Connolly's Irish Citizen Army in 1916, which shows the constellation on a blue background; on the state flag of Alaska; and on the House of Bernadotte's variation of the coat of arms of Sweden. The seven stars on a red background of the flag of the Community of Madrid, Spain, may be the stars of the Plough asterism (or of Ursa Minor). The same can be said of the seven stars pictured in the bordure azure of the coat of arms of Madrid, capital of that country.

The best time of the year to see Ursa Major is during the month of April, when the constellation appears high above the horizon at 9 pm. The Great Bear is [circumpolar](#) to most northern observers but never rises very high in the sky for observers in the southern hemisphere. But, any month is a great time to view Ursa Major or the big Dipper. It is among the best known and most recognized asterisms. As our weather warms, it is a good place to start your nighttime explorations of our skies. Go get out and look Up.

# SCATTERED REFLECTIONS

## BY: THE STEAMPUNK ASTRONOMER

### The Cassini Dynasty: Part 2

This is the second installment in a series of articles about the [Cassini](#) family of astronomers.

For the next decade, Cassini would be tasked to settling several territorial disputes for the papacy and would



struggle to continue his scientific work. Instead, he published a number of works on engineering, specifically in the areas of hydraulics and hydrology. During this time, however, we see an interesting transition in Cassini's

thinking about [cosmology](#). In 1659, he published a paper that indicated that he had moved from a [Ptolemaic](#) view of the universe to a [Typhonic](#) one. This was likely due to a better understanding of [Galileo's](#) work showing that the observations of the phases of Venus are completely incompatible with Ptolemy's model. By 1664, it seems that he had moved to at least seriously considering a Keplerian model of the solar system based both on additional cometary observations as well as working with the data collected from the gnomon at [San Petronio](#). What seems to be clear was that the traditional Typhonic system could not adequately explain the changes in the image size of the Sun observed on the floor of the church. What is unclear from my research is whether Cassini did move to heliocentrism or decided to adopt a modified Typhonic system that made the orbit of the Sun around the Earth elliptically mirroring the elliptical planetary orbits of the Keplerian system.

While it would have been interesting to see how Cassini's thoughts might have continued to evolve, technology once again changed the course of his research in that same year of 1664. At that time, Cassini, in his role as head astronomer at [Panzano](#), had struck a friendship with two of Italy's best lens makers, [Giuseppe Campani](#) and

[Eustachio Divini](#). Working in conjunction with these two great craftsmen, Cassini was able to install what would be the best telescopes of his age. Over the course of the next four years, he would report a number of startling observations that would amaze the astronomical world. And just to give you a sense of the time frame here, these years bracket the time when [Isaac Newton](#) was a student at Trinity College, Cambridge, [John Flamsteed](#) was first taking the reins at the new [Royal Observatory in Greenwich](#), and the fledgling Royal Society was being granted its charter.

Due to the increased magnification and, more importantly, better resolution of the new telescopes along with better mounts, Cassini was able to, for the first time, see various features on several of the planets. His first target was Jupiter where he used a feature observed earlier in the year by [Robert Hooke](#), to measure the rotation rate of the planet. One of the interesting questions is whether the feature the two men observed was the [Great Red Spot](#) we observe today. While it has long been assumed that these observations were of the same object that Galileo had observed as well as the storm system an observer can see with a modest amateur telescope today, a lack of observational continuity calls such a conclusion into question. Following Cassini's last observations in 1712, just before he died, there seems to be a lack of observations of the system until 1830. Additionally, the dynamics and positioning of the feature Cassini observed as compared to what had been seen from 1830 onward calls into question whether the two are, in fact, the same.

In any case, using this feature, Cassini was able to determine Jupiter's rotation period to be 9 hours, 56 minutes, less than a minute off the presently measured value. Cassini was also able to see surface features on Mars, first observed by his mentors [Riccioli](#) and [Grimaldi](#) and most recently refined by [Christian Huygens](#). Mostly likely using the feature known as [Syrtis Major Planum](#), he was able to refine Huygens' measurement of the Mars' rotation period to 24 hours and 40 minutes, a mere three minutes from the presently known value. Additionally, he seems to have been the first person to have observed the southern polar cap for the first time. In the years between 1644 and 1668, Panzano would have seemed to be a factory of astronomical discovery with Cassini working at the forges.

One of the most intriguing set of observations Cassini made during this time had to do with the moons of Jupiter. They also give us great insight into his character as a scientist, or perhaps it would be better to say, at this date, a natural philosopher. The moons of Jove had, of course,

been first observed by Galileo who had characterized their motions in enough detail to suggest a way in which they could be used to determine a person's longitude on the Earth through the timing of various passages in front and behind the planet. While the Tuscan astronomer had been unable to do this accurately enough to convince anyone of his method, Cassini believed in the fundamental validity of the procedure and so with his better instruments he worked to redo Galileo's observations and calculations. What he found, however, was that there seemed to be an error in his measurements—a delay in when he saw a moon first pass in front of or behind the planet. Moreover, he recognized that this delay was dependent as to whether he was making his Jupiter observations at opposition, i.e. when Jupiter was on the same side of the Earth as the Sun and thus due south in the sky at midnight or if he was making the observation near conjunction, at a point when Jupiter was much nearer the Sun in the sky meaning that it would be on the opposite side of its orbit from the Earth. In the case of the delay in the time of the event, it was significantly smaller than it was near conjunction. Puzzled at first, Cassini seems to have recognized that the results were consistent with a hypothesis that light, if it traveled with a finite speed, would take longer to reach the Earth from the eclipsing moon if Jupiter were further away from the Earth as would be the case in conjunction.

Now, this is a huge result. While some have suggested that light might travel at a finite speed, most notably Galileo, that this would be evidence of such a thing was a first. Unfortunately, Cassini was far too conservative to embrace such an explanation. Whether this was because of some ideological bias or a lingering belief in an Earth centered universe is hard to tease out but Cassini, while noting the explanation in his personal journals, chose not to publish anything more than his data. Ten years later, [Ole Roemer](#) would use Cassini's data, along with some he had gathered to suggest that very same thing and give an estimate for the speed of light—a number that was within 10% of today's accepted value. It was a missed opportunity caused by Cassini's deep-seated intellectual and scientific conservatism. It wouldn't be the last time his instinct would land him on the wrong side of a scientific issue. That being said, however, it shouldn't detract from the absolutely amazing observational work he had done and had the integrity to publish. Without that data, Roemer would likely have missed the phenomenon.

All of this brought Cassini to the attention of the most powerful man in Europe, [Louis XIV](#), the Sun King. Seeing the advances in science in general and astronomy in

particular in both Italy and Britain, Louis resolved that France should not fall behind its rivals in terms of scientific prestige. As such, in addition to founding the [Academie of Sciences](#), he commissioned the founding of a great observatory on the outskirts of Paris. To assist with this, he asked Cassini to come and serve as a sort of outside consultant for the project. At least that was the story. Given the way Cassini was wined and dined, as it were, it seems likely that Louis was using the two-year consulting gig as an extended recruiting effort—one that worked. After a few initial hiccups, Cassini was convinced to leave Bologna in 1670 to take up the de-facto directorship of the [Paris Observatory](#). Within a few years he had changed his name to Jean-Dominique and had taken a French wife, completing his transition to becoming a devout Francophile, embracing all things French including the deep-seated Catholicism of the country and engagement in the work of the Academie of Sciences. During this time, it was the ideas of [Descartes](#) in physics that were dominant even as Newton was working in fits and starts between his alchemical investigations and forays into understanding Biblical prophecy to sort out the details of his grand synthesis of gravitation and the laws of motion that would burst forth in about a decade and a half.

Cassini's years at the Paris Observatory were productive ones. This was the period when he made observations of [Saturn](#) for which he is best known. In the early 1670's, right after taking over in Paris, he announced the discovery of two new moons of the planet, a feat he would repeat in 1684. He would also observe the division in the rings that bears his name. In the paper announcing this observation, he would be the first to posit the hypothesis that the rings were made up of numerous small particles that orbited the planet independently. This would be shown to be true mathematically some 170 years later by [James Clerk Maxwell](#).

What's interesting, however, is as time goes on, one begins to see a new interest beginning to creep into his work. It probably goes back to his research in 1668 on using the moons of Jupiter to determine longitude, but Cassini began to show real interest in a topic known as [geodesy](#) - the determination of the size and shape of the Earth or some portion thereof using a variety of means. Obviously, this has a good deal of overlap with what we now call physical geography but at the time, as we've pointed out in previous episodes, this was all lumped under the broad heading of cosmography—a determining of the order of all things, both terrestrial and celestial, in the universe.

The first important piece of work was Cassini's publication of the much-improved tables of the motions of Jupiter's moons that allowed astronomers to establish the longitude of several ground-based locations with a fair degree of accuracy. For those locations that were a part of French possessions or that hosted scientific teams from the Academie of Sciences, Cassini was often the one who did the required calculations.

In 1672, Cassini also participated in a revolutionary project with two colleagues, [Jean Richer](#) and [Jean Picard](#). Richer traveled with a team to Cayenne in French Guyana while Picard and Cassini remained in Paris. Both groups made very detailed measurements of the position of Mars with respect to the background stars and were able to calculate the parallax effect of observing from the two different positions created over the course of several months. This allowed for a very precise calculation of the distance between the Earth and Mars over the course of the observations thus allowing a good estimate of the distance between the Earth and the Sun, known as the [astronomical unit](#). So precise were the measurements that astronomer would be unable to reproduce them at that precision for many decades and the value for the astronomical unit obtained would stand as the most accurate for almost a hundred years until [Halley's](#) method of observing the [transit of Venus](#) was finally used in 1769.

Another result Richer brought back with him was an observation made with a simple [pendulum](#). A simple pendulum is basically just a light string with a small but somewhat substantial mass attached to its end. If you attach the string to a fixed point and then pull the mass on the other end to the side a small amount, the time it takes for the pendulum to make one swing or oscillation will depend only on length. Well, at least that's what most folks thought when Galileo had first made the observation back in the late 1500's. Since that time, it had been observed that if you took the pendulum further away from the center of the Earth, i.e.-up a mountain, the period would get longer, meaning that to get the same period you had measured near sea level, you'd have to shorten the pendulum. What Richer had observed in [French Guyana](#) was that you had to use a shorter pendulum than you did in Paris to be able to get a swing that took one second. Thus, he reasoned, his location, which was closer to the equator than Paris was, had to be further away from the center of the Earth as like was the case on a mountain.

Now, let's pause and recognize just how cool an experiment and result this was. Richer probably sort of stumbled upon it as he tried to calibrate his equipment to take the Mars measurements and kept finding a

systematic error in his test data. Instead of throwing his hands up or just covering up the slight discrepancy, he tracked down the issue and determined that the pendulum he was using to keep time was running just a bit slow. If his notes are correct, he had to shorten the string by about 1% to get it to swing once per second again. That's impressive dedication to both precision and accuracy.

Now, you'd think Cassini would have been pleased with this information when Richer returned to Paris in 1673 but not so much. Again, for whatever reason, Cassini's scientific conservatism led him to disagree with his colleague. The reason for this is that if Richer was right in saying that points closer to the equator were further away from the center of the Earth, that would mean that the Earth was flattened at the poles. Now, in my research, I've come across two different positions that Cassini might have preferred to this. One is that he believed that the Earth should be a perfect sphere as would have been the dogma of the Catholic church at that time. The other is that Descartes' physics predicted that due to the Earth interactions with the various vortices that filled space it should be squished at the equator and elongated at the poles. Both of these, of course, disagreed with Richer's conclusions and so Cassini wanted to gather additional data-data he was sure would confirm one of the other models.

Before we move on, a word is in order here so that we don't seem to be pillorying Cassini too much. Yes, he had a preferred model, even if I haven't quite been able to ferret out which one it might have been, but it should be noted that he didn't just dismiss Richer's data out of hand. Richer's work on measuring the position of Mars had been top notch and to make it seem as if he had made some error would have invalidated the project. No, Cassini thought that there must be some other explanation for the difference in the period of the pendulum and so he sought to gather data using another method-one that directly measured the Earth itself.

What he recognized was that if the Earth was a perfect sphere, a degree of latitude would be the same physical distance along the surface of the Earth whether nearer the equator or nearer the pole. However, if the Earth were flattened or elongated at the pole, then the distances should be different. Hence, what he proposed to do was measure the longitude line that ran through Paris from the Mediterranean to the North Sea using the surveying techniques first suggested by [Gemma Frisius](#) in 1553 and put into practice with more modern surveying tools by [Willebrod Snellius](#) in 1615. It would be a project that

would progress in fits and starts beginning in 1684 and working into the 1700's across generations.

During this time, Newton would publish the *Principia Mathematica* in 1687 and in it he would derive the result that due to its rotation on its axis, the Earth should be flattened at its poles. In support of this result, Newton referenced Richer's data. However, in 1700, Cassini, now working with his son, who we will introduce more properly in the next installment of this column, would publish data from his meridian survey from Paris to Perpignan to the south that suggested the opposite. Thus, was born a shape of the Earth controversy we shall have ample opportunity to address next time.

Until then, clear skies and full sails.

## 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

This month's cover image, by Zane Landers, shows what can be imaged using the small Electronically Assisted Astronomy (EAA) systems. Zane writes: I drove up one of the peaks in the Chiricahuas to 8500' the other night and stayed up until 4am to get this.

It is a composite image - the majority of what you see is from my ZWO SeeStar S30 Pro but also has data from Vespera II and Dwarf Mini which mostly helped with controlling dynamic range allowing me to push the rest of the data.

Exposures were 10s, 30s, 60s subs respectively for Vespera, SeeStar, Dwarf, 100 minutes integration time each under Bortle 1 skies at 8500' (SeeStar/Dwarf) and 5h 45min integration time, Bortle 1-3 skies, 5500-9500' (Vespera II)

Combined image (9h)

## EDITOR'S CORNER

This month's edition is extended to 10 pages because our writer's columns are exceptionally longer than usual. Please enjoy the additional content.

Your newsletter is maintained using Microsoft Word, and the "powers that be" have determined that the Arial font should no longer be the standard. The new choice is

called Aptos and looks similar to Arial. I may, in the future consider a change since. Let's look at an example of non-bolded 10-point text.

Arial – The quick brown fox jumps over the lazy dog.

Aptos – The quick brown fox jumps over the lazy dog.

Can you notice the difference between them? Aptos is more compact and has thinner lines. Personally, I prefer Arial, but that might be my old eyes talking. Please contact me with your comments.

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<b>Facebook:</b>	<a href="http://www.facebook.com/HuachucaAstronomyClub">http://www.facebook.com/HuachucaAstronomyClub</a>
<b>Email:</b>	<a href="mailto:info@hacastronomy.org">info@hacastronomy.org</a>
<b>Club Meetings:</b> 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.	

## THIS MONTH IN SCIENTIFIC HISTORY

April 15, 1452 – Birth of [Leonardo da Vinci](#).

April 12, 1961 – Soviet cosmonaut [Yuri Gagarin](#) becomes the first human in space orbiting Earth in Vostok 1.

April 30, 1777 – Birth of [Carl Fredrich Gauss](#), German mathematician and physicist.

April 23, 1858 – Birth of [Max Planck](#), German theoretical physicist and initiator of quantum theory.

April 25, 1990 – [Hubble Space Telescope](#) (HST) deployed from the space shuttle [Discovery](#).

# HAC Calendar of Events (April – May 2026)

SU	MO	TU	WE	TH	FR	SA
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 (2) 10am to 12pm
12	13	14	15	16 Public Night at Patterson 7:00 pm	17  4:52 AM	18 Star Party at Kartchner Noon – 9 pm
19	20	21 Lyrid Meteors	22 Youth Group at Patterson 7pm Lyrid Meteors	23  7:32 pm Earth Day at Vet Park 10am- 2pm Lyrid Meteors	24	25
26	27	28	29	30 STEAM Night @Ft. Huachuca 5:30pm – 7:00pm	May 1  11:23 am HAC Meeting (1)	2
3 Antares/Moon 0.5°	4	5 Eta Aquariid meteors	6 Eta Aquariid meteors	7 Eta Aquariid meteors	8	9  3:10 pm Solar Saturday (2) 10am to 12pm
10 Mother's Day	11	12	13	14	15	16  2:01pm
17	18 Venus/Moon 3°	19	20 Jupiter/Moon 3°	21 Public Night at Patterson 7:30 pm	22	

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
- (2) Solar Saturday events are held at the Sierra Vista Library at 2600 E Tacoma St.

(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](mailto:HACAstro+subscribe@groups.io)