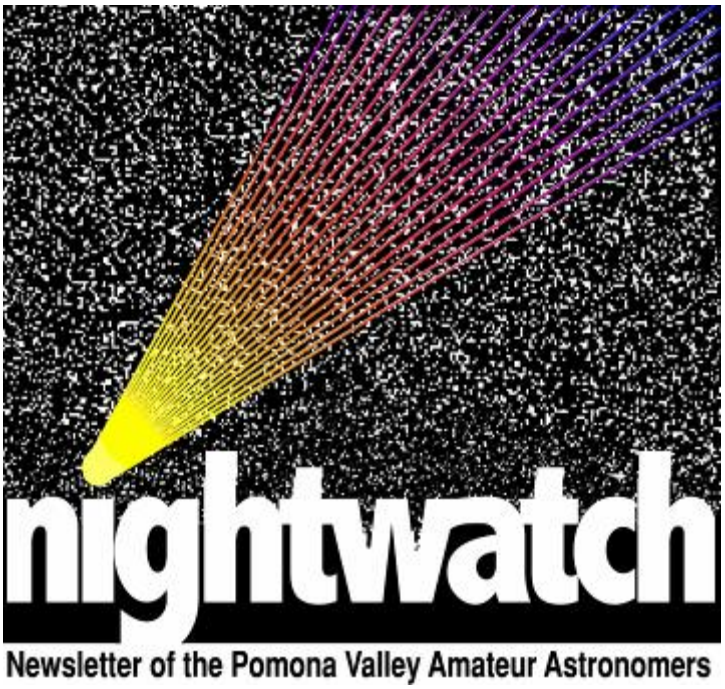


Newsletter of the Pomona Valley Amateur Astronomers

/If we all did the things we are capable of,
we would astound ourselves.
Thomas Edison/

CHECK OUT PVAAs
YOUTUBE CHANNEL

Volume 44 Number 1 ***nightwatch*** **January 2024**

Club Events Calendar

Jan 13	**Star Party – Cahuilla Park**
Jan 17	**Board Meeting 6:15 PM**
Jan 26	**General Meeting 7:30 PM**
Feb 10	**Star Party – Salton Sea**
Feb 14	**Board Meeting 6:15 PM**
Feb 23	**General Meeting 7:30 PM**
Mar 9	**Star Party – Anza-Borrego**
Mar 13	**Board Meeting 6:15 PM**
Mar 22	**General Meeting 7:30 PM**
Apr 6	**Star Party–GMARS**
Apr 17	**Board Meeting 6:15 PM**
Apr 26	**General Meeting 7:30 PM**
May 4	**Star Party – Cow Canyon**
May 8	**Board Meeting 6:15 PM**
May 17	**General Meeting 7:30 PM**
Jun 8	**Star Party – TBD**
Jun 12	**Board Meeting 6:15 PM**
Jun 21	**General Meeting 7:30 PM**
July 10	**Board Meeting 6:15 PM**
July 19	**General Meeting 7:30 PM**
July 27	**Star Party – TBD**
Aug 7	**Board Meeting**
Aug 16	**General Meeting 7:30 PM**
Aug 31	**Star Party – TBD**
Sept 11	**Board Meeting**
Sep 20	**General Meeting 7:30 PM**
Sept 28	**Star Party – TBD**
Oct 9	**Board Meeting 6:15 PM**
Oct 12	**Star Party – Cahuilla Park**
Oct 18	**General Meeting 7:30 PM**
Nov 2	**Star Party – TBD**
Nov 6	**Board Meeting 6:15 PM**
Nov 15	**General Meeting 7:30 PM**
Nov 27	**Board Meeting 6:15 PM**
Dec 7	**Holiday Party**

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

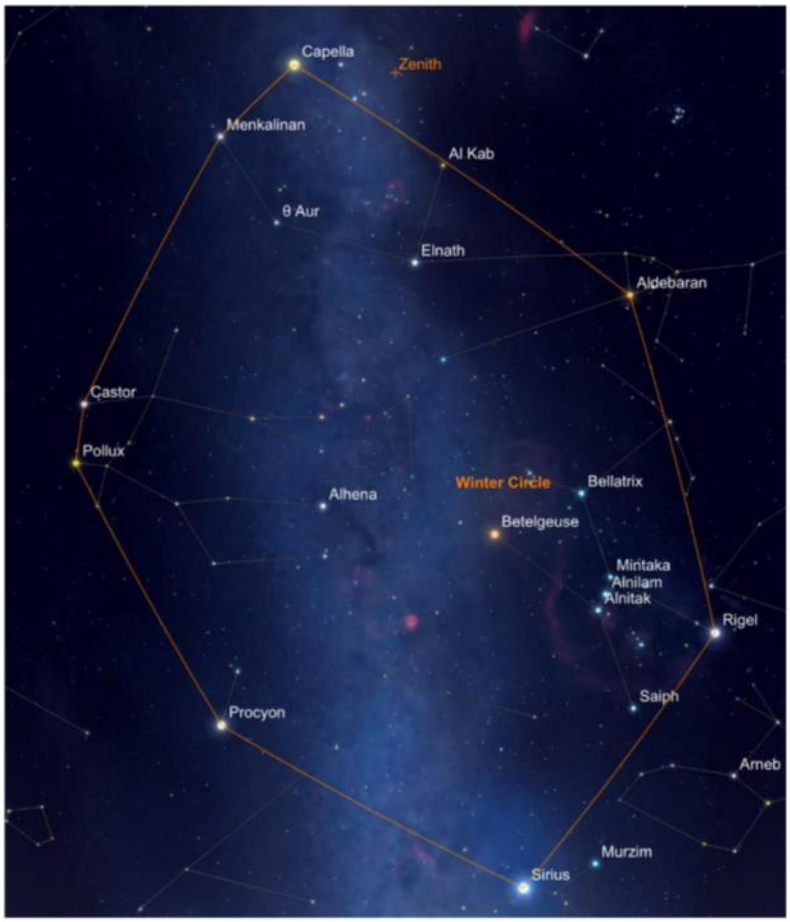
Connecting the 'Dots' with Asterisms

By Kat Troche

In our December Night Sky Notes, we mentioned that the Orion constellation has a distinct hourglass shape that makes it easy to spot in the night sky. But what if we told you that this is not the complete constellation, but rather, an *asterism*?

An asterism is a pattern of stars in the night sky, forming shapes that make picking out constellations easy. Cultures throughout history have created these patterns as part of storytelling, honoring ancestors, and timekeeping. Orion's hourglass is just one of many examples of this, but did you know Orion's brightest knee is part of another asterism that spans six constellations, weaving together the Winter night sky? Many asterisms feature bright stars that are easily visible to the naked eye. Identify these key stars, and then connect the dots to reveal the shape.

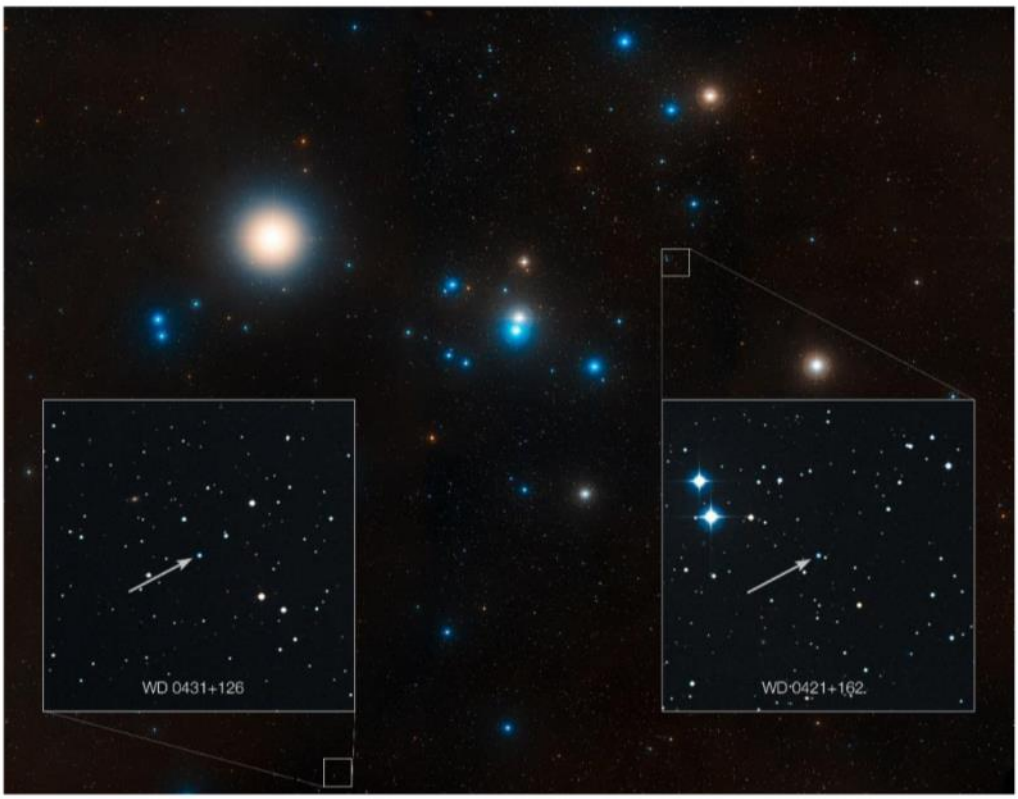
Asterisms Through the Seasons



Stars that make up the Winter Circle, as seen on January 1, 2024
Sky Safari

Try looking for these asterisms this season and beyond:

- **Winter Circle** – this asterism, also known as the Winter Hexagon, makes up a large portion of the Winter sky using stars Rigel, Aldebaran, Capella, Pollux, Procyon, and Sirius as its points. Similarly, the **Winter Triangle** can be found using Procyon, Sirius, and Betelgeuse as points. **Orion's Belt** is also considered an asterism.
- **Diamond of Virgo** – this springtime asterism consists of the following stars: Arcturus, in the constellation Boötes; Cor Caroli, in Canes Venatici; Denebola in Leo, and Spica in Virgo. Sparkling at the center of this diamond is the bright cluster **Coma Berenices**, or Bernice's Hair – an ancient asterism turned constellation!
- **Summer Triangle** – as the nights warm up, the Summer Triangle dominates the heavens. Comprising the bright stars Vega in Lyra, Deneb in Cygnus, and Altair in Aquila, this prominent asterism is the inspiration behind the cultural festival Tanabata. Also found is Cygnus the Swan, which makes up the **Northern Cross** asterism.
- **Great Square of Pegasus** – by Autumn, the Great Square of Pegasus can be seen. This square-shaped asterism takes up a large portion of the sky, and consists of the stars: Scheat, Alpheratz, Markab and Algenib.



This image shows the region around the Hyades star cluster, the nearest open cluster to us. The Hyades cluster is very well-studied due to its location, but previous searches for planets have produced only one. A new study led by Jay Farihi of the University of Cambridge, UK, has now found the atmospheres of two burnt-out stars in this cluster — known as white dwarfs — to be "polluted" by rocky debris circling the star. Inset, the locations of these white dwarf stars are indicated — stars known as WD 0421+162, and WD 0431+126.
NASA, ESA, STScI, and Z. Levay (STScI)

Tracing these outlines can guide you to objects like galaxies and star clusters. The Hyades, for example, is an open star cluster in the Taurus constellation with evidence of rocky planetary debris. In 2013, Hubble Space Telescope's Cosmic Origins Spectrograph was responsible for breaking down light into individual components. This observation detected low levels of carbon and silicon – a major chemical for planetary bodies. The Hyades can be found just outside the Winter Circle and is a favorite of both amateur and professional astronomers alike.

How to Spot Asterisms

- **Use Star Maps and Star Apps** – Using star maps or stargazing apps can help familiarize yourself with the constellations and asterisms of the night sky.
- **Get Familiar with Constellations** – Learning the major constellations and their broader shapes visible each season will make spotting asterisms easier.
- **Use Celestial Landmarks** – Orient yourself by using bright stars, or recognizable constellations. This will help you navigate the night sky and pinpoint specific asterisms. Vega in the Lyra constellation is a great example of this.

Learn more about how to stay warm while observing this Winter with our upcoming mid-month article on the Night Sky Network page through NASA's website!

A rare meeting of current and former PVAA Officers and Board members at Coco's Restaurant in Upland on 11/8/23.
Matt Wedel, Howard Maculsay, Sherry Martinez, Gary Thompson, Richard Wismer, Claire Stover, Ludd Trozpek, and Bob Akers.

Monkey Head Nebula

I hope everyone had a great start to 2024. The new moon weekend, Jan. 13-14 (new moon was the 11th), was reasonably clear but the forecast from earlier in the week kept varying from rainy to clear, so we decided to stay home instead of going to the dark site. I took advantage of the mostly nice weather the week or so before new moon and shot one single target through two different sets of filters and compared it to 10-year-old image I took of the same target. I did have a scare one night over the eight nights the scope was out, though. The weather was forecast to be cloudy for the night of Jan. 6th, so I left the setup out and covered it with my usual cover, a Telegizmos 365 cover. The cover is designed to be used year-round, rain or shine. I woke at 2:00 am to an unforecast downpour!! It was raining too hard to get up and rescue the setup, but the cover performed exactly as expected – the telescope and mount were fully protected from the rain!

There were a couple of potential targets on my list but I settled on NGC 2174/2175, the Monkey Head Nebula, also known as SH2-252. All 4 images this month are of this target but with very different setups. Normally, I frame my image with north up (east to the left), but the profile of the monkey's head is more apparent if north is down (east to the right), so this image is rotated 180°. The Monkey Head is an emission nebula with embedded star cluster located in Orion near his "club", roughly 6,500 light years away spanning about 40 arcminutes of sky. If my math is correct, that would make the nebula about 70 light years across. It's a large bright nebula emitting light mainly from hydrogen at magnitude 6.8, although there are significant amounts of oxygen and sulfur. There is some confusion regarding the NGC designations, but it appears that the nebula itself is NGC 2174 while the embedded cluster is NGC 2175. The cluster is in the bright region near the center of the nebula just to the right of the darker region that corresponds to the monkey's eye.

I first imaged NGC 2174 on January 4, 2014, about 10 years ago. Back then, I had only been imagining for a couple of years, so both my equipment and processing skills were crude. I used a manually focused Celestron CPC800, generally used as a visual telescope, mounted on a wedge for imaging. The camera was an Orion StarShoot Pro v2 color camera, cooled but with no setpoint control. Guiding was done using an off-axis guider and a rather

insensitive Orion autoguide camera. I didn't even know to set my spacing properly between the focal reducer (0.63x) and the imaging camera, so the stars in the corners were really poorly shaped. Nevertheless, I was very happy when I got the picture. The first attached image is my original attempt using 11 10-minute exposures (only 1 hour and 50 minutes) from our dark site processed using Photoshop only. Now that I have better processing tools, I wanted to see if I could get a better image from the original data.

The second image starts with the same stacked image as the first, but this time processed with the tools I have in PixInsight. I am now able to brighten the nebula more without brightening the background, correct the stars in the corner to a better degree, and overall tone down the stars so the nebula is more prominent.

I did not get any current Christmas photos, so I am showing some old ones.

The third image for this month is a narrowband version taken from home in light-polluted skies over the nights of Jan. 4th and 5th. The telescope used was the 8" Ritchey Chretién with a field flattener operating at 1615 mm focal length. The MYT mount that I currently use does not need to be guided at this focal length and the 5-minute exposure duration that was used. The camera was a ZWO ASI294MM Pro monochrome camera equipped with a filter wheel and 5nm bandpass Astrodon filters. The camera was cooled to -10°C. As usual, 21 dark, flat, and dark flat calibration frames were used. Total exposure time was 10 hours, 25 minutes with 32 frames of H-alpha (HA) and S-II data, and 61 frames of O-III data. After normalizing the HA and S-II stacks to the O-III stack, S-II was mapped to red, HA to green, and O-III to blue. Using new tools I recently purchased for PixInsight, noise was reduced and the image sharpened before separating the stars from the nebula. The nebula and stars were stretched separately, before being recombined. The amount of green in the image was reduced significantly to get a good color balance, color saturation was increased, and the image sharpened once again. I like this version for showing how the various elements are distributed. It's clear to see that oxygen is concentrated in the center of the nebula with sulfur being further out.

The fourth and final image for this month is a broadband, LRGB version also taken from home over the nights of January 7, 8, 9, 11, and 12. Using the same unguided mount and camera system, the telescope was switched to a SkyWatcher Esprit 120ED refractor with a focal length of 866mm. Astrodon broadband filters were used, and the camera was again cooled to -10°C. Broadband imaging from light polluted skies requires much more integration time than from a dark site for good results, so this image has total integration time of 39 hours, 47 minutes. The integrated red stack used 87 frames, the integrated green stack used 56 frames, and the integrated blue stack used 84 frames, all of which had 3-minute exposure times. I made a mistake the first night and took 30 2-minute green frames that were scaled and combined with the 3-minute frames. The integrated luminance stack used 823 2-minute frames. Calibration was done with 21 dark, flat, and dark flat frames. The individual R, G, and B frames were combined into a single RGB color frame, then both the luminance and RGB frames had noise reduction applied and were sharpened. After that, the light gradient resulting from the light pollution was removed from both frames and the RGB frame was color calibrated. Stars were removed from both frames, then the star-only and nebula-only frames were stretched separately. Both nebula-only frames were sharpened again, saturation was increased in both color frames before reducing the amount of green in the nebula-only frame, and the star-only frames were recombined with their corresponding nebula-only frames. The frames were combined into an LRGB image, and the black points and mid-points were adjusted. Two regions that I find very interesting are the bluish region at the back of the monkey's neck and what might be thought of as the monkey's breath, especially since it's seen in the cold winter! I also find it very interesting to compare this image to the two I obtained from old data.

As always, I hope you enjoy the images. Until next month, clear skies!

Ron Ugolick

https://www.astrobin.com/users/ruccdu/

Another Look, February 2024 Taurus

"The Ram, the Bull, the Heavenly Twins,
And next the Crab the Lion shines,
The Virgin and the Scales.
The Scorpion, Archer, and He Goat,
The Man that holds the watering-pot,
And Fish with glittering scales."

Saturday the 10th @ 0301 is February's New moon. February's Full moon will be on Saturday the 24th @ 0530. It will be a "Micro" Full moon. Traditionally, February's full moon is called the Full Snow moon. Having lived 20 years in North Carolina on the Blue Ridge Mountains, I can attest to that fact. Native American names for the February moon are Bald Eagle moon, Bear moon, Bony moon, Eagle moon, Hungry moon and Groundhog moon.
In French Pleine Lune de Fevrier, in German, Vollmond im Februar, in Italian, Luna Piena di Febbraio and in Greek, Πανσέληνος Φεβρουαρίου, Panselinos Fevrouariou.

Taurus is old. Known as Le Taureau in France, il Toro in Italy, and is the der Stier of Germany. Seemingly worldwide, via the ancient Zodiacs preserved for us, Taurus **is one** of the earliest and most noted constellations, perhaps the first or one of established, because it marked **the vernal equinox** from about 4000 to 1700 BC. It was called the "Bull of Light" in Babylon. We believe **Taurus was identified with Marduk**, their chief god, and called the "Spring Sun". 15000 years ago the bull, the Pleiades, **the Hyades and the belt** of Orion were painted on a cave wall in Lausaux, France.

Egypt also has Apis, the Bull, In a tomb in Thebes, then **the capital of the lower kingdom**. Twelve constellations have hieroglyphics assigned to them. The **Pleiades represented the bull and was** named Atauria, becoming our Latin Taurus and German Thier. As a zodiacal sign **the bull marked the beginning** of the year, migrating from Akkadia and Babylon through Persia, Chaldea, **India and Egypt, along with their** zodiacs.. Even lingering down the centuries to Mithras, the main deity of the Roman legions.

The Persian and Jewish scholars historically named the **zodiacal constellations** by **giving** them letters, such a A, B, C etc. Taurus was A, the first sign of the zodiac **as it was in the Kabbalah**. Prior to the Roman conquest, the Druids of what we now know as the British Isles **and Ireland worshiped** the Bull during their Tauric festival, when the sun entered the constellation, coming down to **us today as Mayday** and in Scotland the rising of the Bull marking Candlemas.

Among the ancient Chinese Taurus was known as "the White Tiger"; later it was called "the Golden Ox." Strangely enough we find that native South Americans in the Amazon called this star group "the Ox."

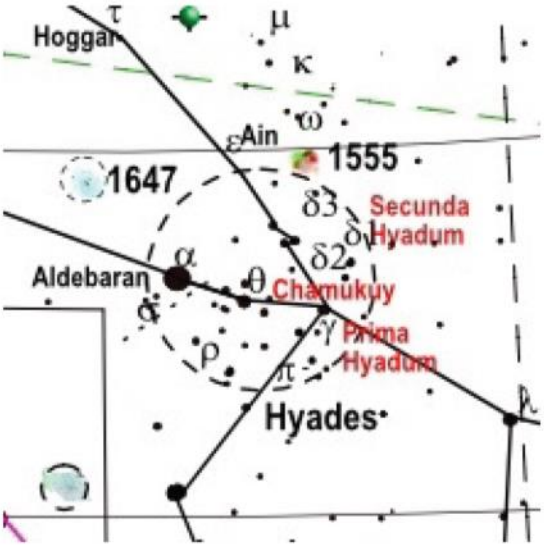
In South Africa they are known as the hoeing stars,

"All of this history shows us a proof that for centuries throughout prehistory, there was a transmigration, or a means of communication between the land masses.

Sweet Europa's mantle blew unclasp'd,
From off her shoulder backward borne,
From one hand droop'd a crocus, one hand grasp'd
The mild Bull's golden horn

Europa was the daughter of Agenor and a Princess of Phoenicia. Jupiter is/was not a nice guy. The Greeks seemed to endow all of their baser instincts into the deities allowing them to be bloodthirsty and ribald, thus excusing themselves of any fault. Jupiter turned himself into a white bull and insinuated himself into Agenor's herd. It seemed Jupiter the bull was so beautiful that Europa could not resist adorning him with garlands of flowers and then climbing onto his back. Jupiter immediately carried her away, swimming to Crete where she bore him three sons: Minos of Crete, Rhadamanthys of the Cyclades and Sarpedon of Lycia. Thought never making it any further west than Crete, somehow she gave her name to an entire continent.

Taurus has 17 stars with proper names. In the Hyades there is Aldebaran, Theta **θ** Tauri is named Chamukuy, In the mythology of the Maya peoples, Chamukuy is a small bird in the Yucatec Maya language. **E ε** tauri marks one of the vertices of the Hyades triangle. It has the name Ain, derived from the Arabic. John Flamsteed named the star Oculus Boreus, Latin for northern eye. Then there is Prima Hyadum and Secunda Hyadum, meaning the first and second of the Hyades. Prima marks the nose and Secunda marks the multiple star system **δ** delta, Two stars surrounded by many smaller ones, halfway between the nose and the ear, **ε** epsilon.



Other stars to point out in the Hyades are the small bi-color group the theta **θ's.** Also look for close doubles kappa **κ** and mu **μ.** Hoggar is **τ** tau, halfway to Elnath, **β** beta. The tip of the other horn is **ζ** zeta, Tianguam.

> In lustrous dignity aloft see Alpha Tauri shine,
> The splendid zone he decorates attests the Power divine:
> For mark around what glitt'ring orbs attract the wandering eye,
> You'll soon confess no other star has such attendants nigh. Serviss

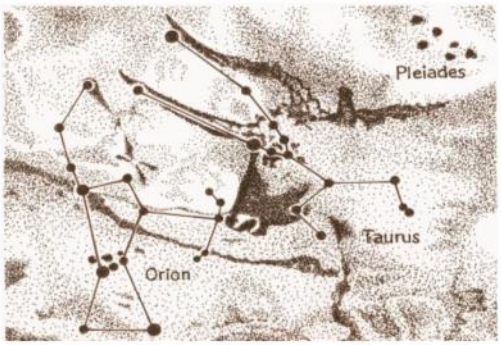
In one of the stories the Hyades and the Pleiades are sisters of Atlas and Pleione. They had a brother named Hyas who died while hunting. This so saddened the sisters that they wept, thus bringing annual storms.

The Pleiades are ancient, much older than the usual Greek myths and older than Homer. There name, however, does come from the Greek word **pleein,** meaning "to sail", clearly referencing that at their setting, stormy winter is passing and spring is nigh.

My most memorable view of the Pleiades was through a pair of 25 x100 binoculars setup on the upper telescope field at RTMC. I remember coming back again and again just to reset the image and look once more. The star field was covered in mist and the stars bright and hard. Each time I looked a had to catch my breath.

The Pleiades are the proof how important the stars are historically. The 15,000 year old image from Lausaux cave in France shows a bull under the 7 or is it 8 stars of the Pleiades. I believe he also painted the Hyades on its head. An imaginative interpretation can find even more figures hidden in the paint.

The name by which the Pleiades are known among the Polynesians is the "Tau". Tau marks a season, and as with the Egyptians, the Pleiades delineates a time of celebration and feasting. Perhaps this is another piece of data that points to cultural mingling going back thousands of years.

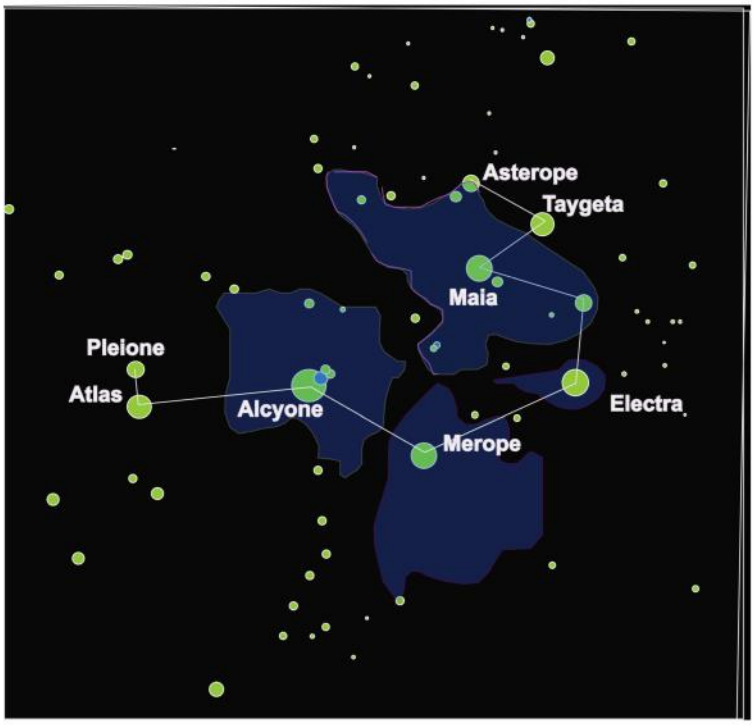


It has always been written the we can see only six Pleiades though tribal memory recalls seven. The seven are the daughters of Atlas, or the Atlantides, whose names were Merope, Alcyone, Celaeno Electra, Taygeta, Asterope, and Mala. Per Hyginus, the seventh star in the group dimmed towards the end of the second millennium BCE.

When the Pleiades were photographed in 1888 by Paul and Prosper Henry, it was found that the seven stars were veiled in nebulous folds clinging to and filling the spaces between with filmy mist and wreaths of stellar gauze. Thus was Tennyson's picturesque description written in the well-known lines —

Many a night from yonder ivied casement, ere I went to rest,
Did I look on great Orion sloping slowly to the West.
Many a night I saw the Pleiads, rising thro' the mellow shade,
Glitter like a swarm of fire-flies tangled in a silver braid.

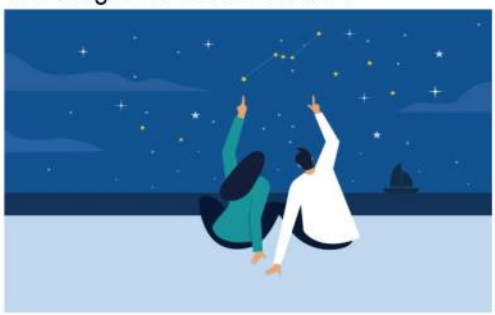
As picturesque as Tennyson writes of Locksley Hall there is a bit of a problem. Charles Messier lived 87 years, passing in 1817. He was a comet hunter and compiled a list of fuzzy objects not to be confused with comets. Messier's telescopes would have had difficulty resolving M45 into stars. Maybe what he saw was a misty ball with specs of stars shining. Tennyson wrote Locksley Hall in 1888, when he was 79 years old, 3 years before he died.
Rather than the "Pleiads" looking through "yonder ivied casement", what he actually saw in a beautiful example of poetic license.



By the way, the Maia nebula bears the NGC number 1432 and vdB 21, the Merope nebula is 1435 and vdB 22. Electra is vdB 20 and Alcyone is surrounded by van der Berge vdB 23. You can find the van der Berge catalog at https://www.emilivanov.com/CCD Images/Catalog_VdB.htm.

So, you tell me. Isn't Taurus the month to take your sweetie out to look through your telescope at "a swarm of fire-flies tangled in a silver braid."?

Dark Skies Dave



Thank you, "The Far Side"

Their names have been thus recorded by Aratus . — These seven names they bear Alcyone and Merope, Celaeno, Taygeta, and Sterope, Electra, And queenly Maia, small alike and faint, But by the will of Jove illustrious all At morn and evening, he makes them mark Summer and winter harvesting and seed time

Hesiod, who wrote about 200 B C., shows how they were observed in his time as signs for the seasons —

When, Atlas-born, the Pleiad stars arise
Before the sun above the dawning skies,
Tis time to reap ,and when they sink below
The moon-illummed west, 'tis time to sow

And, of course, per Mrs. Sigourney,
. . . go forth at night
And talk with Aldebaran, where he flames In the cold forehead of the wintry sky. "The Stars"

What Else Hides Out in Orion?

December had two weekends suitable for imaging from the dark site, but we were away from home on vacation for both. The image this month is shot from home, taken December 5 and 6, just before the first new moon weekend. I began imaging on December 3, but for some reason, the mount didn't want to behave and the frames from December 3 and 4 couldn't be used. It's either because it's the first time I've used this telescope with the new computer system riding atop the setup or it's time to re-grease the mount. Hopefully I'll figure it out before galaxy season in the Spring when the scope is the primary instrument to use.

This month's target is one that isn't photographed very often, probably because of numerous other, well-known targets nearby in Orion. The last time I imaged this region was nearly 8 years ago using a very different setup not nearly as capable as my current setup. The view is primarily three emission nebulae and with several smaller ones, most of which are in the Sharpless catalog. The left-most primary nebula is IC 2162, also known as Sharpless 2-255. Sharpless 2-257 is the middle nebula and the large, diffuse nebula on the right is LBN 858. There is a reddish star along its right side identified as SH2-254 but I suspect the chart meant to identify the larger nebula instead of the star. Sharpless 2-256 is the small nebula below and between the middle and right-most nebulae and Sharpless 2-258 is the very small, faint nebula to the left of IC 2162. I can find no information on the distance to any of these nebulae or even if they are physically close to one another.

Images this month were captured using an 8" Ritchey-Chrétien reflector telescope and field flattener operating at f/8 (a focal length of about 1625mm). The camera was an ZWO ASI294MM Pro using 31mm Astrodon filters. The Paramount MYT mount was unguided. 3-minute exposures binned 2x2 were taken through H-alpha and O-III filters and calibrated with 21 dark, 21 flat, and 21 flat dark frames. As mentioned above, the mount wasn't as stable as the last several months so about a third of the exposures were unusable due to oblong stars. A total of 76 frames taken through the H-alpha filter and 152 frames taken through the O-III filter were used for a total time of 11 hours and 24 minutes. My usual processing workflow in PixInsight was used wherein a color, HOO combination was made and the stars removed for separate processing. Once I was satisfied with the nebula image and the stars-only image, I recombined them and did a little contrast adjustment. I hope you enjoy the result.

Until January, clear skies!

Ron Ugolic

https://www.astrobin.com/users/ruccdu/

This article is distributed by NASA's Night Sky Network (NSN).
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Constant Companions: Circumpolar Constellations, Part I

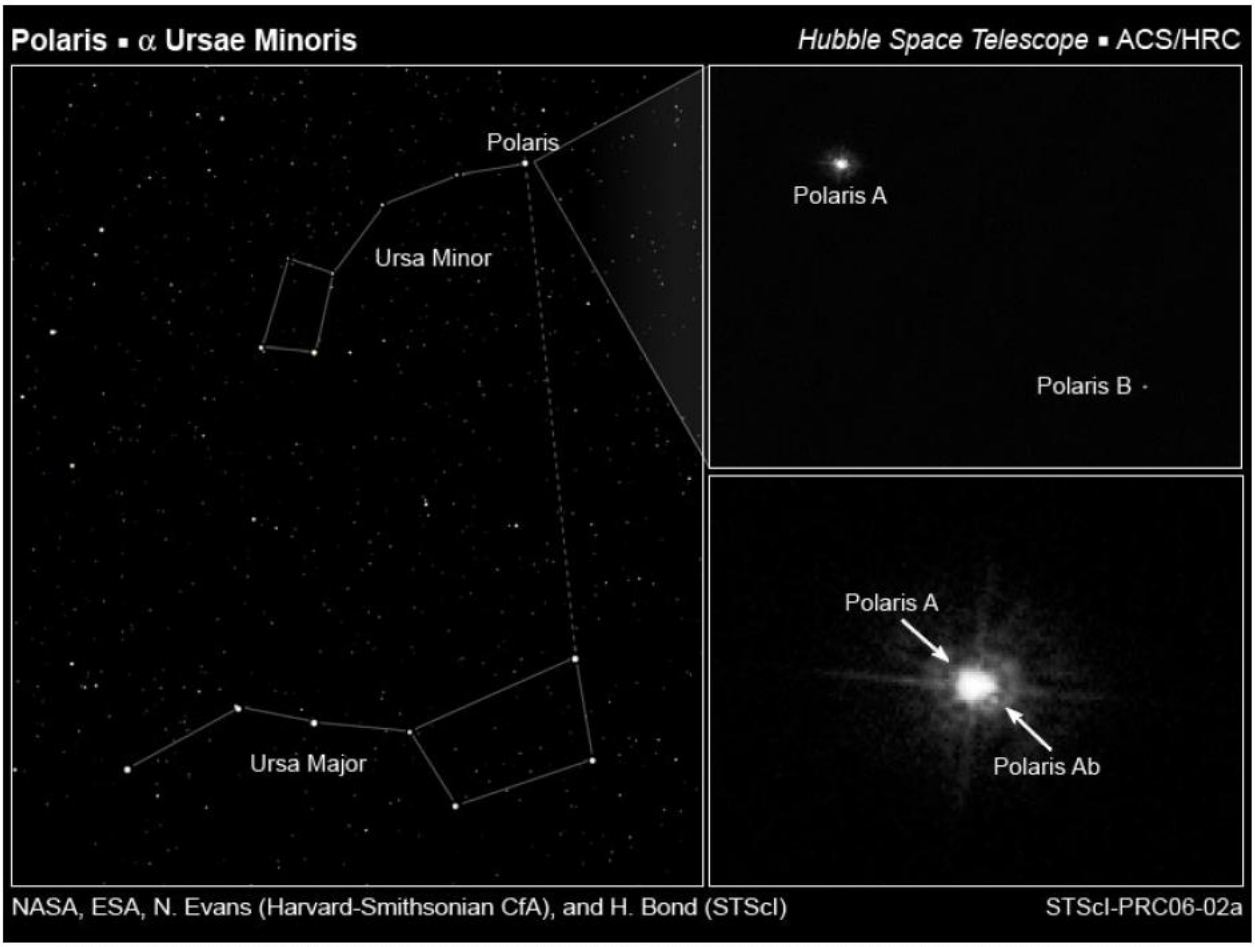
By Kat Troche

Winter in the northern hemisphere offers crisp, clear (and cold!) nights to stargazers, along with better views of several circumpolar constellations. What does circumpolar mean when referring to constellations? This word refers to constellations that surround the north and south celestial poles without ever falling below the horizon. Depending on your latitude, you will be able to see up to nine circumpolar constellations in the northern hemisphere. Today, we'll focus on three that have gems within: **Auriga, Cassiopeia, and Ursa Minor**. These objects can all be spotted with a pair of binoculars or a small to medium-sized telescope.

The counterclockwise circumpolar constellations Auriga, Cassiopeia, and Ursa Minor in the night sky, with four objects circled in yellow labeled: Pinwheel Cluster, Starfish Cluster, Owl Cluster, and Polaris.
Credit: Stellarium Web

- **The Pinwheel Cluster:** Located near the edge of Auriga, this open star cluster is easy to spot with a pair of binoculars or small telescope. At just 25 million years old, it contains no red giant stars and looks similar to the Pleiades. To find this, draw a line between the stars Elnath in Taurus and Menkalinan in Auriga. You will also find the **Starfish Cluster** nearby.

- **The Owl Cluster:** Located in the 'W' or 'M' shaped constellation Cassiopeia, is the open star cluster known as the **Owl Cluster**. Sometimes referred to as the E.T. Cluster or Dragonfly Cluster, this group of stars never sets below the horizon and can be spotted with binoculars or a small telescope.



A black and white image from the Hubble Telescope of the Polaris star system, showing three stars: Polaris A, Ab, and Polaris B.
Credit: NASA, ESA, N. Evans (Harvard-Smithsonian CfA), and H. Bond (STScI)

- **Polaris:** Did you know that Polaris is a triple star system? Look for the North Star on the edge of Ursa Minor, and with a medium-sized telescope, you should be able to separate two of the three stars. This star is also known as a *Cepheid variable star*, meaning that it varies in brightness, temperature and diameter. It's the closest one of its kind to Earth, making it a great target for study and conceptual art.

Up next, catch the King of the Planets before its gone for the season with our upcoming mid-month article on the Night Sky Network page through NASA's website!

See if you can identify these members!