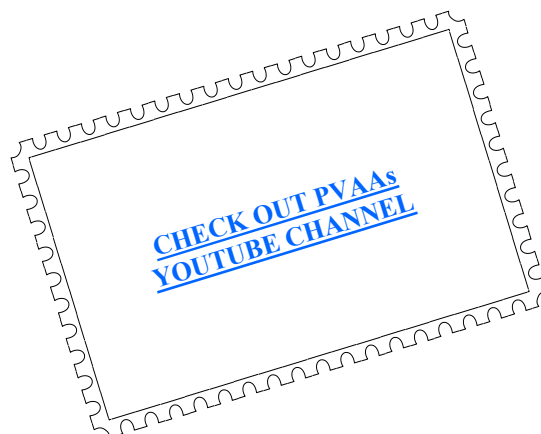




Newsletter of the Pomona Valley Amateur Astronomers

When stupidity is considered patriotism,
it is unsafe to be intelligent.
Isaac Asimov



Volume 44 Number 2

nightwatch

February 2024


Club Events Calendar

Feb 23	General Meeting 7:30 PM Scott Little "EMPs, Aurora, and Plasma"	Aug 7	Board Meeting
Mar 9	Star Party – Anza-Borrego	Aug 16	General Meeting 7:30 PM
Mar 13	Board Meeting 6:15 PM	Aug 31	Star Party – TBD
Mar 22	General Meeting 7:30 PM	Sept 11	Board Meeting
Apr 6	Star Party–GMARS	Sept 20	General Meeting 7:30 PM
Apr 17	Board Meeting 6:15 PM	Sept 28	Star Party – TBD
Apr 26	General Meeting 7:30 PM	Oct 9	Board Meeting 6:15 PM
May 4	Star Party – Cow Canyon	Oct 12	Star Party – Cahuilla Park
May 8	Board Meeting 6:15 PM	Oct 18	General Meeting 7:30 PM
May 17	General Meeting 7:30 PM	Nov 2	Star Party – TBD
Jun 8	Star Party – TBD	Nov 6	Board Meeting 6:15 PM
Jun 12	Board Meeting 6:15 PM	Nov 15	General Meeting 7:30 PM
Jun 21	General Meeting 7:30 PM	Nov 27	Board Meeting 6:15 PM
July 10	Board Meeting 6:15 PM	Dec 7	Holiday Party
July 19	General Meeting 7:30 PM		
July 27	Star Party – TBD		


PVAA General Meeting 01/26/24

Our fellow PVAA member Ken Elchert gave an updated presentation on his book 'Star of Bethlehem.' Ken took the facts and inferences stated in the book of Matthew and came up with nine concerning the "Star" and when it occurred. Ken produced a list of 14 celestial objects as natural candidates to be 'The Star of Bethlehem: Meteor, Sun, Moon, Planets, (Mercury, Venus, Mars, Jupiter, Saturn, Uranus), Asteroids Comets, Stars, Nebula, Nova, or Supernova. Other phenomena were excluded because they would not have been called a star. These include Rainbows, Halos, Lightning, Zodiacal Light, Auroras, Ball Lightning, Red Sprites, Blue Jets and Swamp gas. Ken then created a spreadsheet listing the candidates in one column, with the criteria for the Bethlehem Star in the other columns. When he finished, he was astounded to find that only Jupiter met every criterion.

Babylonia was due East of Jerusalem, and it is believed that the Magi, or 'wise men' came from this area. Ken then went on to talk about the constellation Leo the Lion, the star Regulus (the brightest star in Leo), and clay tablets found in the cities of Nippur, Sippar, and Ur. In 597 B.C. the Babylonian King Nebuchadnezzar II deported 10,000 Judeans to Babylon. In 538/537 B.C. Cyrus II issued a decree allowing the Jews to return home. Many decided to remain. At the time of the Nativity, Babylonia had the largest population of Jews living outside of Herod's kingdom. It is believed that the Magi would have had an interest in Judaism and the Messiah.



Assessment of Astronomical Objects for the Star of Bethlehem



		CRITERIA									
		Single Object?	Visible for Months?	Heliacal Rising in the East?	Visible South of Jerusalem?	Common Object?	Bright?	Star-like?	Motion Stops?	Ken Elchert w/ Kings?	
CANDIDATES	Atmospheric	Meteor	Yes	No	No	Yes	Yes	Yes	No	No	No
	Large Objects	Sun	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
		Moon	Yes	Yes	No	Yes	Yes	Yes	No	Yes	No
	Planets	Mercury	Yes	No	Yes	No	Yes	No	Yes	Yes	No
		Venus	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
		Mars	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
		Jupiter	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		Saturn	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
	Uranus	Yes	Yes	Yes	Yes	No	No	Yes	Yes	No	
	Small Objects	Asteroid	Yes	No	Yes*	Yes	No	No	Yes	Some	No
		Comet	Yes	Yes	Yes*	Yes	No	Some	No	Some	Yes
	Stellar Objects	Star (e.g. Regulus)	Yes	Yes	Some* (Zodiac)	Yes	Yes	Some	Yes	No	Some
		Nebula	Yes	Yes	Some*	Yes	Yes	No	Yes	No	No
		Nova/ Supernova	Yes	Yes	Some*	Yes	No	Yes	Yes	No	No

← The Sole Winner

© Ken Elchert 2013

*only those that are near the ecliptic

Ken then went into determining when Jesus was born. No one knows the precise date. Jupiter and Venus had a conjunction on June 17th, 2 B.C. The disk of Venus overlapped Jupiter by 2.7 arcseconds. But this could not be it, as this was in the evening – to the West, and, according to the Bible, it was visible in the East. Ken then went on to looking into 'Jubilee Years' that happen every 7 years, and found discrepancies in certain events, which did not follow the calendars based on Jubilee Years. Jupiter's rising on August 30th, 2 B.C. matches what the Magi said in Matt. 2:1. This ties Matthew's star of Bethlehem to an astronomical event at the time the Messiah was expected.

Gary Thompson

Sights Between the Raindrops

This month has been one for the weather record books here. We had one of the wettest 2-day periods in history this month. Hopefully, everyone in California survived the big rainstorm earlier this month. We were very wet, but otherwise OK, but it really put a damper on imaging, pun intended. Once again, we didn't make it to the dark site due to the poor weather forecast. Even at home, I only managed one full night and two partial nights of imaging.

The primary target for the month was NGC 2976, a peculiar dwarf galaxy in Ursa Major. While it is classified as an unbarred spiral galaxy with tightly wound arms, there doesn't appear to be any indication of it being a spiral, at least to my eyes. The galaxy itself is not imaged very often but can frequently be seen photo-bombing images of M81 and M82 which are nearby. It is a rather small galaxy from our vantage point, lying at a distance of about 11.5 million light years away. Discovered by William Herschel in 1801, it glows at magnitude 10.8. From our line of sight, we're looking at the galactic disk at an angle of about 65° so that the galaxy appears elliptical. At the ends of the ellipse are H-alpha regions glowing in the characteristic red color and there are blue areas scattered throughout the galaxy, both indicating active star formation. There are other small galaxies in the image as well. Just to the right is PGC 213630 along with at least three other smaller faint galaxies below NGC 2976. Two things to note, this image is upside down relative to my usual presentation and is cropped to better show the galaxy. North is down and east is to the right in this image.



The image of NGC 2976 was taken through the 8" Ritchey-Chretien f/8 telescope with the ZWO ASI294MM monochrome camera and Astrodon LRGB filters over the nights of February 12-14. The telescope is close to being fully collimated, meaning the mirrors are aligned with each other, but some slight tweaking is still needed. This image is a combination of 183 2-minute exposures through the luminance filter; and 61, 60, and 61 3-minute exposures through the red, green, and blue filters, respectively. All the exposures were calibrated with 21 dark, 21 flat, and 21 flat dark frames. Just as a reminder, dark frames are taken with the "lens cap" on to remove bad pixels from the light frames, flat frames are taken of an evenly lit light panel to remove vignetting and

dust motes from the light frames, and flat dark frames are dark frames used to calibrate the flat frames. The image was processed using PixInsight. First, the R, G, and B stacked images were combined to make the color image. Deconvolution (a type of sharpening) was applied, the background flattened, and the stars were separated. The starless image was denoised and stretched using hyperbolic stretching functions before increasing the color saturation. The stars were stretched using arcsinh stretching functions to avoid blowing out the stars and losing color. Color saturation was also increased in the stars. The color frames were then recombined, and the background adjusted with curves. The luminance stack was treated similarly, except no color saturation was applied, since the frames are grayscale. Finally, the processed luminance and color images were combined and cropped to form the LRGB image shown.



The second image is one that should be familiar to everyone, the moon! While hoping for a fourth evening of imaging, the forecast looked very unlikely, but since I was set up already and the moon was out, I decided to make the best of the short window I had. The set up is the same as for NGC 2976. This image of the moon was taken on February 15 at 6:11pm local time, so the moon was 44.34% illuminated and waxing. Imaging the moon, and planets for that matter, is done differently than deep space astrophotography. Usually, a short video is taken instead of individual exposures. One reason is that these targets are much brighter than deep space targets; and another reason is that atmospheric distortion warps parts of the image differently than other parts, so by taking a video, you are hoping that some of the frames are less distorted than others. The image you see is a stack of the best 12% of 3000 video frames (about

360 frames), each being a 10ms exposure. It was taken only through the luminance filter, so the image is only grayscale. The video was stacked and initially processed using Autostakkert!, a program designed for planetary and lunar processing. Final processing was done in PixInsight and was mainly sharpening using a deconvolution algorithm. There are many features of the moon in the image. One of my favorite craters is Theophilus, the large crater near the center of the frame with the prominent rebound feature in its center. It lies between Mare Nectaris to its southwest Sinus Asperitatis to its north. Mare Tranquillitatis is the large sea further north.

Well, it's raining again for the next several days. Hopefully it will clear up and dry out before the next new moon in March. As always, I hope you enjoy the images. Until next month, clear skies!

Ron Ugolick

<https://www.astrobin.com/users/rucddu/>

In addition to using checks and cash, PVAA Members can now pay their dues using Zelle. Send your payment to mathew.wedel@gmail.com using Zelle and it will go into the PVAA bank account. Please. Include your name and membership type in the Zelle comments.

PVAA Membership Renewal for April 30, 2024

- \$30 - Individual Membership
 \$40 - Family Membership
 \$18 Student Under age 18 Membership

Name: _____

Email address for Newsletter delivery: _____

Address: _____

City: _____ State: _____ Zip: _____

Please send check payable to PVAA to:

PVAA
Attention: Treasurer
P.O. Box 162
Upland, CA 91785

Thank you for your continued membership!

Another Look March 2024

The New moon in March is on the 11th at 0358. The Full moon in March is on the 25th at 0983.

Daylight Savings time begins March 10.

A Penumbral lunar eclipse is visible this month from the continental United States, Hawaii and eastern Alaska beginning about 2200 and ending 4 hours later Pacific Daylight Time. Maximum immersion will be at 0013 PDT. The moon will be quite high, it will be interesting to see if we are able to register any appreciable dimming.



March is the Full Worm moon, referring to the larvae emerging from the bark of trees at this time. Native American names include the Crow Comes Back Moon, the Eagle Moon, Goose Moon, Snow Crust Moon, Sore Eyes Moon, Sugar Moon and the Wind Strong Moon.

The Vernal Equinox, i.e. the first day of spring arrives at 2004 PDT on Tuesday March 19. During much of March this year the Christian world celebrates the season of Lent. As a word, lent goes way back to the Old English and the Old German dialects and essentially means spring.

There are a number of lunar/planetary conjunctions this month including an occultation of Antares visible from Florida. Mercury and Neptune are being occulted on the 11th, visible from Antarctica, the So. Pacific and Central/So. America. On the 14th, the Pleiades will be less than 1/2° from the moon and on the 21st Venus will be a 1/4° from Saturn.

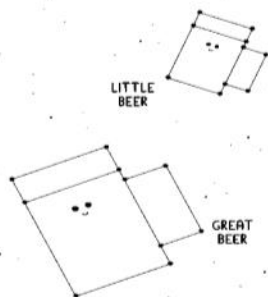
In Spanish its Luna Llena de Marzo, in German Vollmond im März, in French Pleine Lune de Mars, in Italian Marzo Luna Plena, and in Greek Μαρτίου πανσέληνος (Μαρτίου pansélinos)
In Gaelige – Leo Mór agus Leo Mion.



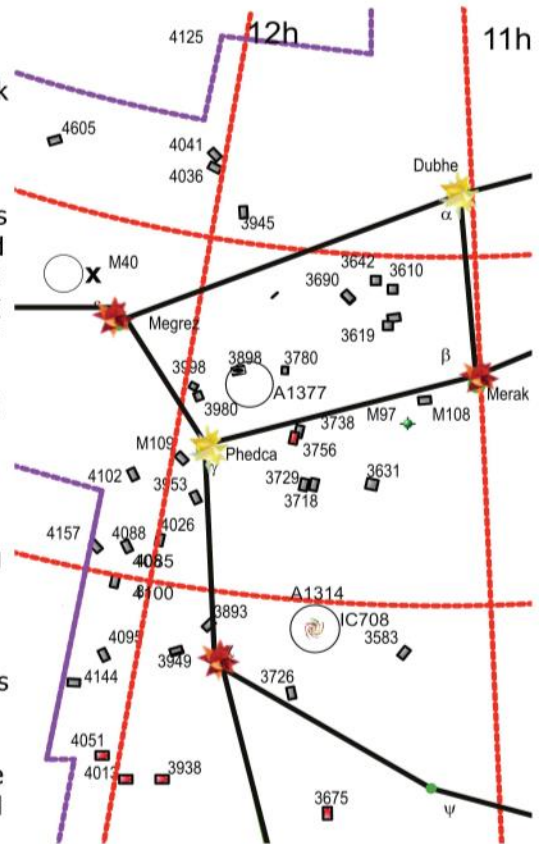
I really wanted to talk this month about the bowl of the Dipper. Years ago I had the opportunity to spend an evening with Rev. Robert Evans of Hazelbrook, New South Wales. I believe he still holds the record for visual discovery of supernovas, over 40. He came to visit Southern California and I had the chance to spend an evening with him at the eyepiece of the 18" reflector at

Ford Observatory near Wrightwood, CA. Robert was consummate at his profession and wanted to spend as much time as he could looking for supernova in the northern skies he couldn't see at home. He passed a year ago. So, I figured another evening galaxy hopping in Ursa Major was a good idea.

Londyn Brown



I was hoping to remember Robert this month by concentrating on the bowl of Ursa and to add to the fun the tail of Leo. It didn't work out. Most of the bowl's galaxies are too dim, you need some mirror and you need decent skies. Still, its hard to resist. So this month and next month in April we will look at several historically famous galaxy clusters, many of them bright galaxies, Messier's and even a Caldwell. We will search for a few of the over 500 NGC and IC objects in Ursa Maj and the over 135 in Leo. To add a dollop of whipped cream to our galaxy pie we will also find two Abell galaxy clusters, one in Ursa and another in Leo.

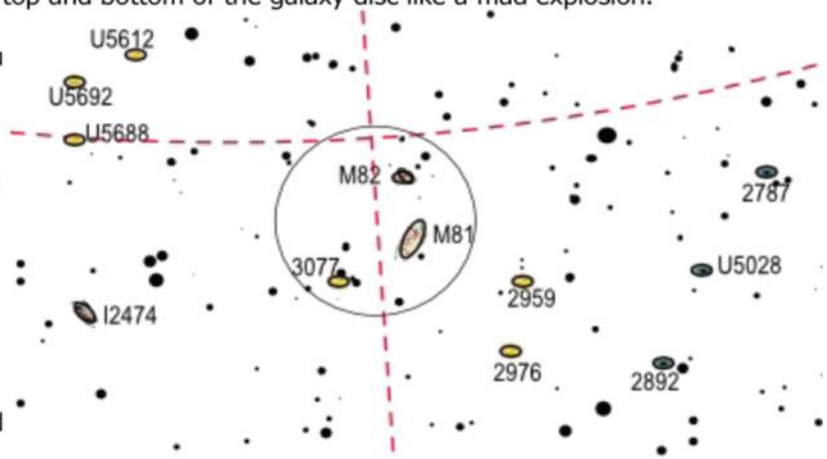




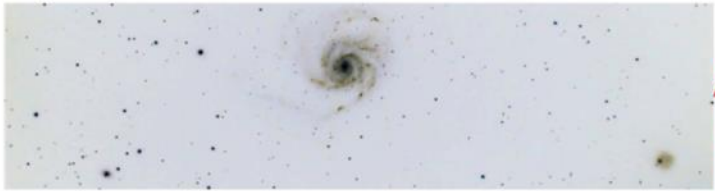
Dan Schechter <https://ocastronomers.org/wp-content/uploads/2019/01/m081-02.jpg>

Ursa Maj. Has two well know galaxy groups and two Abell clusters. The M81 & M82 group is well placed for viewing this month and the M101 group is rising steadily. Abell 1377 and Abell 1314 are also well placed at 2100 this evening. M81, also know as Bode's galaxy, it a big, bright centerpiece of a family of over 70 galaxies. It is 7th magnitude, so easy to see and can be viewed in the same field as M82 and NGC 3077. M82 is 8th magnitude and 3077 is 10th. We have all seen those <https://apod.nasa.gov/apod/ap230120.html> beautiful images of M82 with red filaments boiling out from the top and bottom of the galaxy disc like a mad explosion.

<https://apod.nasa.gov/apod/ap230802.html> Sadly you won't see anything like that. In your eyepiece you can tell its oddly shaped and you may see a little bit of structure in M81, but count yourself successful if you can identify all three galaxies in your field. Just outside the field is 10th magnitude 2787. 10th magnitude 2976 is also easily seen. 2892 is dim at 13th magnitude and small. 2959 is nearly 13th magniude, a tight spiral. Almost touching it is a nearly 15th magnitude lenticular (rod shaped) galaxy, 2961. The circle represents one degree.



The M101 galaxy, called the Pinwheel, is the center for a number of group members. 5474 and 5477 are the closest members to 101. They are both dwarfs. 5474 has a big halo gravitationally bound to 101. You will find it at 11th magnitude. 5477 is near invisible at 14th magnitude. 5473 is 11.5 magnitude. 5475 is quite dim at 13th magnitude. 5485 and 5486 are close, but 14th magnitude. 5422 will be easier. It is a 12 magnitude lenticular galaxy with a quite bright nucleus and rather long arms. 5368 and 5443 are both near 14th magnitude, another tough find. The last galaxy on the chart is UGC 8837, a 13th magnitude dwarf that along with 5474 and 5477 are a family of



(Jeff Malmrose from 2008 includes N5473 and 5474) <https://ocastronomers.org/wp-content/uploads/2018/12/M101.jpg>

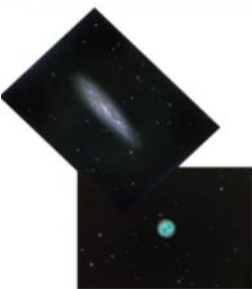
interacting galaxies with M101. U8837 is a small active galaxy, in fact all three galaxies are pretty messed up by the huge gravity of M101.

Donald Lynn 2010 m95-96-105 https://ocastronomers.org/wp-content/upload/2018/12/10.77112.16_06442_RGB_150secV2POvlysm.jpg

Other objects to look for in Ursa Major are M40, M97, M108, M109, Abell 1377 and Abell 1314.

August Winnecke is a German astronomer who published one of the shortest catalogs in our literature. The Winnecke Catalogue of Double Stars has seven items listed, Messier 40 is number 4 on the list. The two stars are magnitude 9 and 10. M108 and M97 are less than a degree apart and can be seen in the same field of view.

<https://www.raysuniverse.space/>



M97 is the famous Owl planetary and M108 is much larger but about the same brightness, around 9th magnitude. M108 is a flat spiral showing us about a 30° face. The more mirror you have the more blue M97 will appear.

M109 is a spiral with about a 60° tilt. It is the same apparent size as M108 and about the same brightness. With a little bit of glass you should be able to see the rather apparent bar and stringy spiral arms. This rather over processed image I cropped from jgscience.org (a good one, check it out), shows M 109 and Phecda, γ Ursae Majoris.



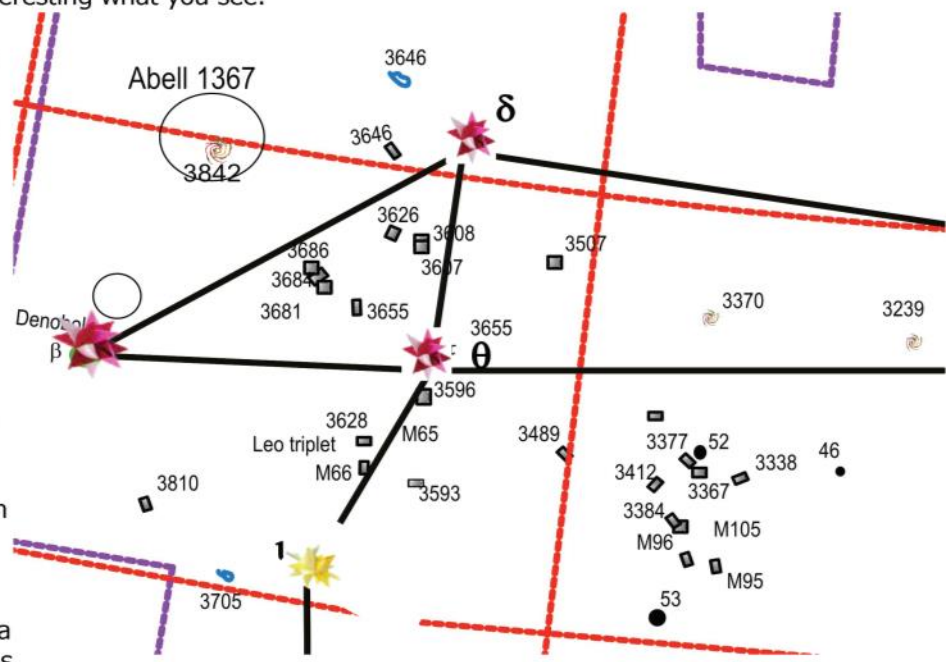
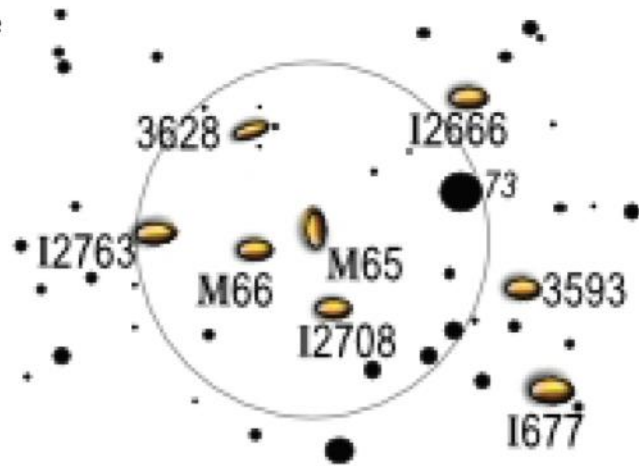
Abell'1314 and 1377 are not among the popular Abells. A1377 is 13th and A1314 is 15th magnitudes. A1377 does have a 3rd magnitude star near the brighter galaxies that can be used as a finder. In A1314 is the famous 14th magnitude "Papillon" galaxy, IC708.

Between Theta and Iota Leonis lie the Leo Triplet. The principle components are M65, M66 and NGC 3628. The three are all about 9th magnitude and will be visible as a group in your wide angle eyepiece. They are an interesting study in galaxy formation. In the one field of view you have a 30° galaxy, M66, a 60° galaxy, M65 and an edge-on galaxy, 3628. Only a degree away from M66 is a smallish, 12th magnitude, nearly lenticular galaxy, N3593. Close by are four 14th magnitude galaxies that will reward careful search: IC's 677, 2666, 2708 and 2763. 2666 is brighter by half a magnitude. 2763, 2666 and 2708 are awarded only a couple of lines and no images in the NGC catalog.

IC 677, however, is interesting since it has an even smaller, close companion galaxy, IC688. 677 is lenticular and active, it will be interesting what you see.

Perhaps a little more satisfying is the Leo II group, located in the triangle of the tail made by Beta, Delta and Theta. The main four galaxies are NGC's 3655, 3681, 3684 and 3686, all 11th and a fraction magnitude and all spiral of one form or another. Leo II could have two dozen or more members, but probably only a dozen or so visible in our larger amateur telescopes. One of the Patrick Stewart Caldwell objects, number 40, NGC 3626 is also right there. 3626 and 3632 are the same galaxy confused back in the day until reconciled by Caroline Herschel. 3626 is between 11 and 12 mag..

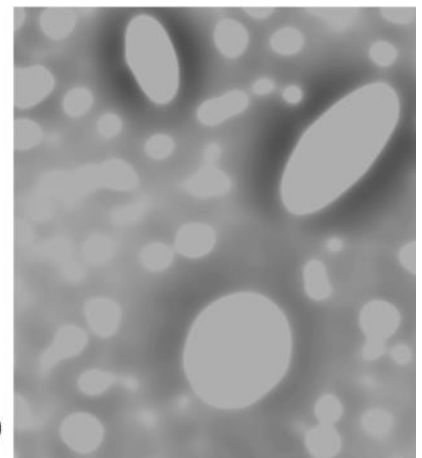
Perhaps Sir Pat was stretching it a little when he chose this galaxy as number 40. Gary Imm [https://www.astrobin.com/337342/?q=ngc 3626](https://www.astrobin.com/337342/?q=ngc%203626)



In the immediate vicinity of NGC 3842, and part of the Abell 1367 cluster are seven galaxies, all 14th or so, and all looking like what we think a galaxy cluster should look like. It will be great fun when you point your cannon to the tail of Leo.



It can be argued that the most popular galaxy group in Leo is near his midsection. There are over half a dozen galaxies 10th magnitude and brighter anchored by M95, M96 and M105. All the galaxies I have plotted are 10th and 11th magnitude or brighter, so galaxy hopping in your big Dob is right up your alley. Leo I is surrounded by a gigantic cloud of Hydrogen and Helium called the Leo ring. It was only discovered in the last 50 years or so and is not observable in our visual wavelengths. Messier 105 and its companion NGC 3384 are surrounded by a vast ring of neutral hydrogen gas. I took a Wikisky image and reduced it to the point where we can see the bridge of hydrogen gas between the two. You have to figure that that whole region of space is lying in a vast cloud of hydrogen and helium. We see the Leo ring as a ring but it is actually a sphere, the greater density of the gas on the sides being more visible and the center of the sphere blown out by the activity of M105, N3384 and N3389.



The Lion flames. There the sun's course runs hottest
Empty of grain the arid fields appear
When first the sun into the Lion enters. Aratos.

From late Bronze and Early Iron Periods, to roughly the 1600's, at least in parts of the world, Regulus, the diminutive of Rex, was considered the "Ruler" of the heavens. This was true in Persia, Babylonia, India, and Arkkadia-ancient Greece. He was king because for much of this time the summer solstice was in Leo which coincided with rivers rising, and the summer sun heating the earth and ripening the crops.

Thank You <http://www.rhysy.net/>

<http://www.quickmeme.com/>

The image of a lion up at the top can be found in early Egypt, inscribed on fountains and gates, on Paleolithic cave walls in Chauvet to Druid, Scots, Central American and Asian civilizations. Leo has been identified world wide for thousands of years.

Dark Skys, Dave Phelps



Chauvet





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!

Constant Companions: Circumpolar Constellations, Part II

By Kat Troche

As the seasons shift from Winter to Spring, heralding in the promise of warmer weather here in the northern hemisphere, our circumpolar constellations remain the same. Depending on your latitude, you will be able to see up to nine circumpolar constellations. This month, we'll focus on: **Lynx**, **Camelopardalis**, and **Perseus**. The objects within these constellations can all be spotted with a pair of binoculars or a small to medium-sized telescope, depending on your [Bortle scale](#) – the darkness of your night skies.

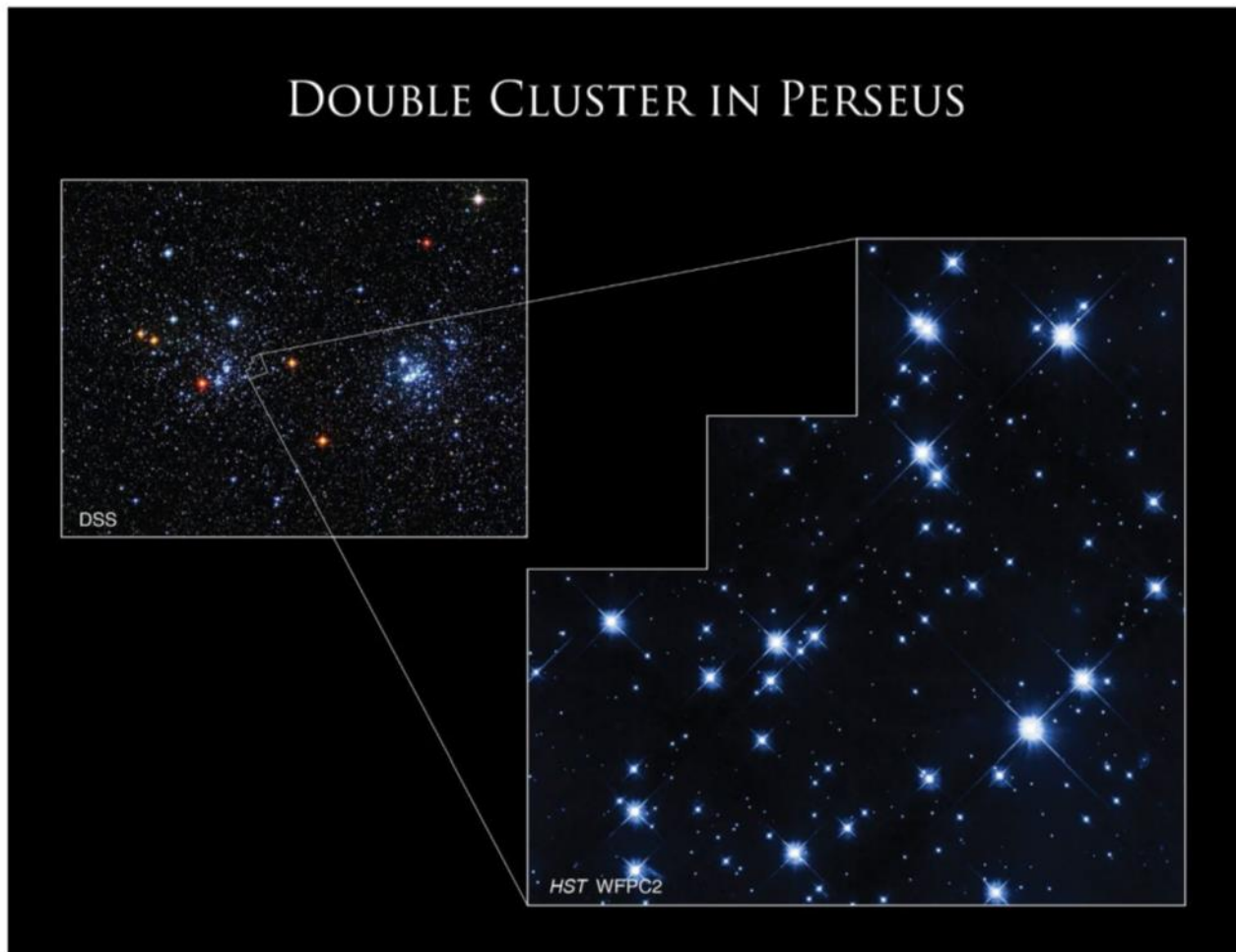


In the appearance of left to right: constellations Perseus, Camelopardalis, and Lynx in the night sky. Also featured: Cassiopeia as a guide constellation, and various guide stars.

Credit: Stellarium Web

- **Double Stars:** The area that comprises the constellation Lynx is famous for its multiple star systems, all of which can be separated with a telescope under dark skies. Some of the notable stars in Lynx are the following:
 - **12 Lyncis** – a triple star that can be resolved with a medium-sized telescope.
 - **10 Ursae Majoris** – a double star that was once a part of Ursa Major.
 - **38 Lyncis** – a double star that is described as blue-white and lilac.

- **Kemble's Cascade:** This [asterism](#) located in Camelopardalis, has over 20 stars, ranging in visible magnitude (brightness) and temperature. The stars give the appearance of flowing in a straight line leading to the Jolly Roger Cluster (NGC 1502). On the opposite side of this constellation, you find the asterism **Kemble's Kite**. All three objects can be spotted with a pair of binoculars or a telescope and require moderate dark skies.



A ground-based image from the Digitized Sky Survey (DSS) in the upper left shows Caldwell 14, the Double Cluster in Perseus, with an outline of the region imaged by Hubble's Wide Field and Planetary Camera 2 (WFPC2).

Ground-based image: Digitized Sky Survey (DSS); Hubble image: NASA, ESA, and S. Casertano (Space Telescope Science Institute); Processing: Gladys Kober (NASA/Catholic University of America)

- **Double Cluster:** The constellation Perseus contains the beautiful Double Cluster, two open star clusters (NGC 869 and 884) approximately 7,500 light-years from Earth. This object can be spotted with a small telescope or binoculars and is photographed by amateur and professional photographers alike. It can even be seen with the naked eye in very dark skies. Also in Perseus lies **Algol, the Demon Star**. Algol is a triple-star system that contains an eclipsing binary, meaning two of its three stars constantly orbit each other. Because of this orbit, you can watch the brightness dim every two days, 20 hours, 49 minutes – for 10-hour periods at a time. For a visual representation of this, revisit [NASA's What's Up: November 2019](#).

From constellations you can see all year to a once in a lifetime event! Up next, find out how you can partner with NASA volunteers for the April 8, 2024, total solar eclipse with our upcoming mid-month article on the [Night Sky Network](#) page through NASA's website!
