



This is the Rosette nebula (NGC2238), imaged by Mike Hayes using narrow band filters. The capture was done with an ASI1600MM Pro camera and Orion 80ED refractor at the OCA Anza site in February 2023.

### Upcoming Events - free and open to the public

|                         |   |
|-------------------------|---|
| <b>Beginner's class</b> | Friday, 7 April at 7:30 to 9:30 PM <b>ONLINE</b><br>This is session 2 of the class discussing the different types of equipment used to observe the night sky, including telescopes, mounts, eyepieces, filters, and advantages and disadvantages of different options. Check OCA website to see if this class is also meeting onsite. |
| <b>Club Meeting</b>     | Friday, 10 March at 7:30 to 9:30 PM <b>In person</b> at Chapman University and <b>ONLINE</b><br>"What's Up?": Alex McConahay from Riverside Astronomy Society<br>Main speaker: Dr. Rachel Street from Las Cumbres Observatory whose topics will be "Hunting Isolated Black Holes"   |
| <b>Open Spiral Bar</b>  | Saturday, 11 March at 10:00 to 11:30 PM <b>ONLINE</b><br>Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.   |
| <b>Star Parties</b>     | Saturday, 18 March at the OCA Anza site.<br>??? Irvine site dates are yet to be determined  |

The monthly club meeting is viewable in progress on Zoom and our social media platforms. The recording is available on these platforms after the meeting is over.

<https://twitter.com/OCAstronomers>  
<https://www.facebook.com/OrangeCountyAstronomers>  
<https://www.youtube.com/@ocastronomers>

**Please consult the calendar on the OCA website to RSVP online meetings (required)**

# President's Message

By Barbara Toy

## March and the Messier Marathon

March 20 is the Spring Equinox, when night and day are of equal length – which also means that we're heading into the season of shortening nights even as night temperatures are rising so viewing can be more comfortable. It's sad that the longest nights for viewing also tend to be the coldest and the most comfortable nights the shortest.

The equinox also marks the period when all of the Messier objects can be seen in one night, at least theoretically (the first and last objects are generally hard to find in evening and morning twilight). There are various controversies about the Messier Catalog, including just how many Messier objects there are, but 110 is the generally accepted number.

These are objects that Messier determined were not comets, which is why he cataloged them. It seems he didn't have much interest in what they actually were compared to what they were not (he was primarily a comet hunter), but they include some really nice nebulae, galaxies and open and globular star clusters. They tend to be brighter specimens of these types of objects, and some can even be seen naked-eye under dark enough skies. The Beehive Cluster (M44) is one that has caught me by surprise more than once, as I haven't been sure if I was actually seeing something there or not (though once you get binoculars on it, it's clear that the half-glimpsed object is a big cluster of stars). M42, the Orion Nebula, is easier to see even with light pollution, as it's quite bright and distinctly fuzzy, though you need binoculars or a telescope to see any detail. M31, the Andromeda Galaxy, is another object bright enough to see as a distinct bright patch under dark skies.

About 50 years ago, several amateur astronomers noticed this seasonal peculiarity and developed the Messier Marathon, in which intrepid viewers determine how many of the Messier objects they can see in one night. Generally, the closer this is to the equinox the better chance of success, and this year the equinox itself is the day before New Moon, so it should be nice and dark, which also helps. The Saturday before the equinox (March 18) is when our Anza Star Party is scheduled, and that should be a good night to try the Marathon if the weather is decent. The Saturday after that (March 25) is the fourth day after New Moon, so it should also be good for the Marathon – any of the nights in that period should be good, if you can sleep the next day.

Although I've heard that there were times in the past when things got quite competitive on club Messier Marathon nights, the Marathons since I joined the club have been pretty low-key. Most people seem to regard them as individual challenges, or as a chance to improve on their own past scores rather than a competition with others. Some come up with their own handicaps, such as deciding to find all of the objects just by star-hopping (this is a particular challenge with the galaxies in the Virgo cluster), and some have decided to do the Marathon by imaging each one. The most important thing, though, if you decide to do a Messier Marathon this year, is to have fun with it, and maybe use it to spend some time on objects in the Messier catalog that you generally don't look at much.

We should have a Messier Marathon form posted on the website – if not, please notify Reza. There are others available on the Internet, and even books (with suggested forms) on the subject. The forms generally try to list objects from earliest to latest to help organize the Marathon. Forms are generally pretty similar but may differ in their order for specific objects.

One challenge they can't help with much is the period when you've seen all of the Messier objects that are up and it's going to be a couple hours before the next batch starts coming into view; when this hits depends on how fast you get through the first half, but you often reach it around 1:00 to 2:00 in the morning. It's very tempting to take a nap when you reach this point, to be refreshed when the next objects rise, but most often this nap marks the end of the Marathon for the night – it can be very difficult to wake up and get back into Marathon mode to finish it. Some people don't even try – they do a "half Marathon" instead, and sometimes will do the second half another night, though that requires getting up early.

If you decide to do the Marathon this year (it really can be a lot of fun), please be sure to put the date you did the Marathon on your form (it doesn't have to be done at or on the night of the star party or even at Anza as long as it's done by a member), put your name on it and send a scan of your form to our Secretary, Alan Smallbone (Alan@ocaastronomers.org), or mail it to the club's PO Box. I'm not sure yet what recognition we'll be giving, but we do want to recognize the efforts of our very own Marathoners!

## General Meetings

After the many frustrations of the in-person portion of the January General Meeting, I'm happy to report that John Hoot put an improved system together that worked very well through the February meeting. It makes us self-sufficient for sound (we have our own quite powerful speaker), and the video connected to Chapman's system without problems. That was quite a relief and bodes well for the future – and we hope more of you will choose to join us in person at Chapman!

Our next General Meeting returns to our usual second Friday of the month and will be on March 10, 2023. As always, details on the speaker are on the website – and Reza continues to find us excellent speakers for our meetings!

## Anza

We frequently mention "harsh conditions" at our Anza site, and this winter has shown how harsh they can be. We're high enough and cold enough that we can get snow on our site, though generally not deep drifts. We did get snow in February, and, as I am writing this, a new arctic storm is moving in that may give us some more. What has been more problematic is the temperatures, which have gotten down into the 20s.

The pipe coming out of the main pump by our well froze on what was the coldest night so far, and broke, so we had quite a fountain going for a while as the pump continued pumping. Fortunately, Gary Schones was out there soon after the break became apparent, and was able to turn off the power to the pump. That gave time for Alan Smallbone to make arrangements for Heritage Well to make the necessary repairs and check the system for more leaks before they turned it back on. Everything was working when they left the site and we hope it stays that way. Heritage Well, by the way, is the company that replaced the pump in the well when it failed a few years ago, and they replaced the storage tank at the top of the property and have done other repairs. They've been great to work with, and if you happen to see one of their trucks on site, it's most likely because they're taking care of a problem for us.

The heavy rains we had this winter did what they generally do to dirt roads, particularly the road going past the entrance to our Anza site. Usually, though water may have carved deep cuts into the road there, because of its slope, our driveway has remained undamaged. It has a storm drain built into it so water coming down the channel on that side of the road can go under the driveway without damaging it. Unfortunately, that drain got blocked in the storms this winter, and there was a deep gully cut across our driveway for about a week as a result. Some club members did some emergency repairs, making it passable with care. There were no tractors in the Anza area available at the time, but Gary Schones was able to rent one a few days later and did more complete repairs. We do thank everyone who pitched in to help make our site accessible!

If you're planning to go out to Anza, particularly if there has been significant rain, it's a good idea to do some checking on conditions there before you go. At this point, the AstroImagers email group (Astroimagers@groups.io) is probably the easiest source of current information on conditions at the site, as many of the imagers who post regularly go out to Anza at different times during the month, not just around the time of the star parties.

Happy star gazing as we head toward Spring and warmer days and nights, and best wishes for all of your astronomical activities!

© Barbara Toy, February 2023

## Response to COVID-19 Crisis

Any use of the club's Anza site by members is at their own risk. Visitors should bring supplies to clean and sanitize surfaces they contact. When you leave, take any trash that you generate or find on site out with you. Please maintain social distancing if anyone else is out there.

|                                 |  |
|---------------------------------|--|
| Meeting in person:              | Astrophysics SIG, Anza star parties, and <b>monthly club meeting</b> |
| Meeting via Zoom:               | <b>Monthly club meeting</b> , Beginner's Astronomy class             |
| Coming soon:                    | Orange County Star Parties   |
| Cancelled until further notice: | AstroImaging SIG   |
| Check with Coordinator:         | Outreach events  |

## From the Editor

### Sirius wants photograph submissions from club members

Sirius is doing okay for pictures but still wants more! Please send pictures to me along with a brief description of the subject, where the image was taken, and the equipment used.

### Ideas for Future articles

The newsletter includes articles from members or about subjects suggested by our members. We seek ideas and writers to cover them. To contribute an article or work with the editor to produce one, please contact me at [newsletter@ocastronomers.org](mailto:newsletter@ocastronomers.org).

### Due dates for submission of articles, pictures and advertisements

| <u>Issue</u> | <u>Due date</u> |
|--------------|-----------------|
| April        | 25 March        |
| May          | 22 April        |
| June         | 20 May          |

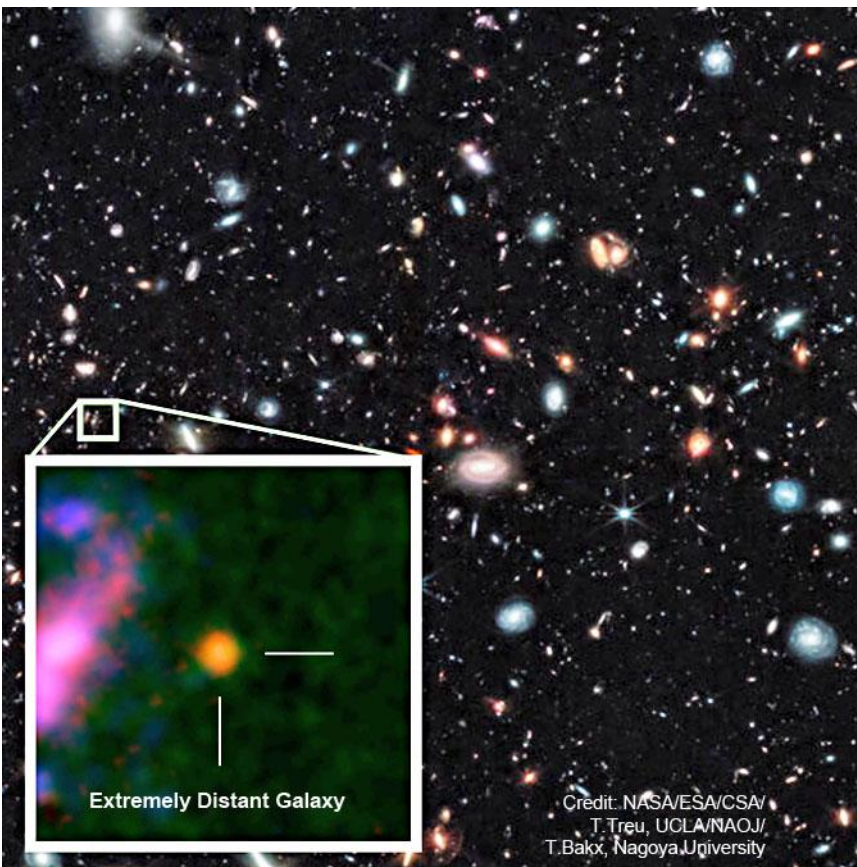
# AstroSpace Update

March 2023

Astronomy and space news summarized by Don Lynn from NASA and other sources

**Extremely Distant Galaxy** – The ALMA radiotelescope array in Chile took a spectrum of one of the suspected extremely distant galaxies found in a James Webb Space Telescope (JWST) image. This allowed to be determined an accurate redshift and therefore the time at which the light left the galaxy. Earlier work had relied on filter-derived redshifts, which are not as accurate. The result is that light left the galaxy known as GHZ2/GLASS-z12 just 367 million years after the Big Bang, when the Universe was less than 3% of its current age. The redshift was measured of an oxygen spectral line. This shows that stars in that galaxy had already produced in substantial quantities elements heavier than hydrogen and helium, such as oxygen.

**Rogue Black Hole** – The usual way for astronomers to find a supermassive black hole is to see the X-rays and other emission that occur when material falls into it. But when a black hole runs out of material to fall in, it is difficult to detect it. Theorists believe that occasionally gravitational interactions will throw a supermassive black hole out of its galaxy, but these rogue black holes have been hard to find because there is no material to fall in after leaving its galaxy. But astronomers have just spotted a streak in circumgalactic medium in images taken by the Hubble Space Telescope (HST) that they believe is a sort of wake left by a rogue supermassive black hole. After considering other events that could cause such a streak, the astronomers concluded that a rogue black hole is the most likely cause. It best fits the metallicity, dust, and star-forming knots associated with the streak. The galaxy that the black hole apparently left shows signs of gravitational interactions about 39 million years ago. The astronomers hope to make JWST observations to learn more.



**Andromeda Star Migration** – Astronomers have studied the motions of more than 7000 stars about the Andromeda Galaxy, also known as M31, and found that there is a mass migration of stars into the galaxy. This migration consists of stars that were born in another galaxy that merged into the more massive M31 about 2 billion years ago. The inner halo of M31 was found to be dominated by stars from this one event. The observations were made with DESI, a spectrograph that can take thousands of spectra simultaneously, using robotic control of light fibers to align them onto the requested targets. DESI is installed on the 4-meter Mayall telescope in Arizona.



**Largest Star Catalog** – Using the Dark Energy Camera on the Victor M. Blanco telescope in Chile, and the Pan-STARRS 1 telescope in Hawaii, astronomers have produced a mosaic image covering the entire Milky Way. It contains 3.3 billion objects, mostly stars. The data was processed to separate close individual objects. It is the largest catalog of stars yet produced.

**White Dwarf Mass** – In most cases, the only way to get an accurate mass of a star is when it happens to have a closely orbiting companion star, since the mass can be calculated from the orbit. A new technique used the HST to measure the relativistic deflection of light from a distant star due to the gravity as the light passed a foreground white dwarf star. The star, known as LAWD 37, has a fast proper motion, and was predicted to pass in front of a more distant star in 2019, and so was monitored by HST. Its mass was found to be 56% the mass of the Sun. It is located 15 light-years away in the constellation Musca. The technique has actually been used once before, but to bolster data on a white dwarf with a companion star.



**Andromeda Cloud** – A group of amateur astronomers took extremely long exposures (more than 100 hours) of the Andromeda Galaxy (M31), using various filters and found an enormous cloud of ionized oxygen hovering above that galaxy. It had gone unnoticed because it is so dim. They notified professional astronomers, who are studying the cloud. Follow-up spectroscopic observations are planned to assure the cloud is moving the same direction that M31 moves, as proof the cloud is associated with M31 and not a foreground object.

**Binary Star Planet** – Using the radial velocity technique, astronomers detected a gas-giant exoplanet orbiting both stars of a binary pair, taking 215 Earth days per orbit. Its mass is about 65 times that of Earth. It is dubbed TOI-1338/BEBOP-1c and joins another planet orbiting the binary that was discovered by transit. This is only the second confirmed multi-planet system orbiting a binary star.

**Polar Exoplanet Orbits** – Yet another exoplanet, this one dubbed TOI-640 b, has been found to be in polar orbit about its star. Planet formation theory says that planets should form and remain in orbit in the same plane as the equators of their stars. Indeed, that is where the majority of exoplanets orbit, at least of the ones whose orbital inclination has been measured. The orbital inclination of an exoplanet can be calculated from extremely sensitive redshift and blueshift measurements made while the planet is transiting in front of its star. But there are too many of these polar orbits being found, so the theorists are coming up with ways to migrate a planet's orbit to be perpendicular to the plane in which it formed. No one such theory seems to apply to all the observations of polar orbits, so there may be more than one cause for this migration. Significantly, exoplanets with inclinations between equatorial and polar are rare. So the migration to polar may take little time and there seems to be no migration that moves past polar.

**Centaur Rings** – JWST confirmed two rings circling Chariklo, which is a Centaur, or asteroid orbiting between Jupiter and Neptune. Chariklo was predicted to pass in front of (occult) a star last October, so JWST was scheduled to observe it. Indeed the starlight dimmed where the previous Earth-based observations indicated 2 rings. The rings were shown to be about 4 miles and 2 miles wide, separated by over 5 miles. This is the smallest Solar System body known to have rings. A spectrum of Chariklo itself was also taken, detecting water ice.

**Trans-Neptunian Ring** – Observations of Quaoar, a trans-Neptunian dwarf planet, show that it has a ring. Normally rings can exist only within an object's Roche limit, that distance inside of which tidal forces will tear apart a moon into tiny particles. Material that orbits outside the Roche limit tends to conglomerate into moons quickly. But Quaoar's ring is at more than double the Roche limit, so the ring's existence is unexplained. Quaoar has one known moon, named Weywot, with an orbit roughly 3 times the size of the ring.

**Jovian Moons** – A new search for moons of Jupiter found 12 new ones, bringing to 92 the number of known Jovian moons. This surpasses Saturn's moon count, which sits at 83. The newly discovered Jovian moons are all tiny, just a few miles across, and orbit far from the planet, taking more than 340 Earth days per orbit.

**Jovian Moon Auroras** – Astronomers using various ground-based telescopes used a new technique to search for dim aurora at the Galilean moons of Jupiter. To avoid sunlight from overwhelming the auroral light, the observations were made while each moon was in eclipse caused by the planet. The search was made using visible light and infrared. Visible light auroras were found at all 4 of those moons, and infrared at Europa and Ganymede. Spectra were obtained, showing much of the aurora is from oxygen. Io had sodium and potassium aurora also.

**Spokes** – Every Saturnian year (which lasts 29 Earth years), around equinox times, the rings of Saturn grow spokes, or lines crossing the rings radially. It is believed the spokes are composed of fine particles lifted slightly above the ring plane by magnetic force. The northern autumnal equinox is approaching in May, and HST got its first image of spokes for this season.

**Tiny Asteroid** – JWST has detected a very small asteroid, likely the smallest body yet seen by that space telescope. It is estimated to be between 300 and 650 feet across. The object photobombed JWST images being taken of a different asteroid for calibration purposes. The object was about 60 million miles away at discovery.

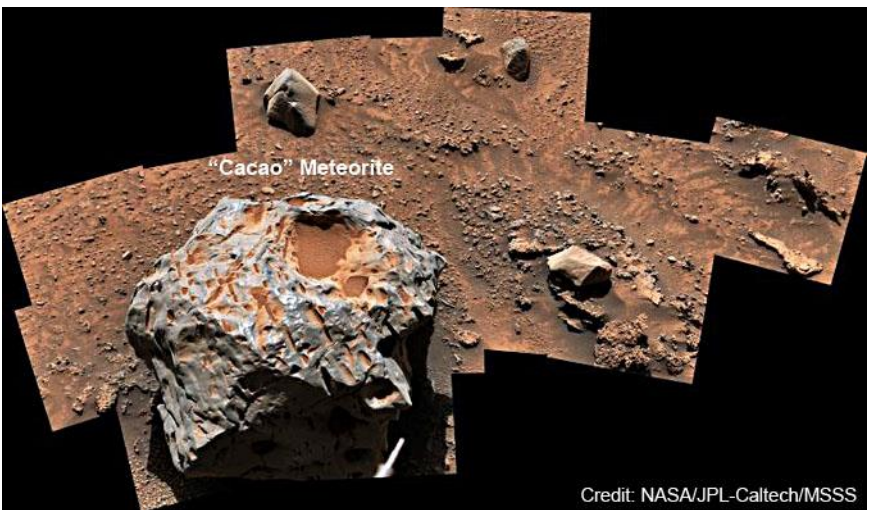


**Rubble Pile Asteroids Persist** – A study of a few dust particles returned by the Japanese Hayabusa 1 spacecraft from asteroid Itokawa determined that the particles were formed by an impact at least 4.2 billion years ago. Itokawa is a rubble pile, not a single lump of rock. This study surprised astronomers that such a rubble pile could persist for billions of years. Statistically, Itokawa should have suffered numerous collisions during that time. But apparently objects hitting a rubble pile do not break it up. This has implications for those scientists trying to develop means of preventing asteroid collisions with Earth.

**Asteroid Near Miss** – An asteroid known as 2023 BU passed only 2200 miles above South America on January 26 in one of the closest asteroid encounters on record. It was estimated to be about the size of a delivery truck, which is small enough that it would likely have broken up harmlessly if it had hit Earth’s atmosphere. It was discovered only 5 days earlier by Gennadiy Borisov, the same amateur astronomer who discovered interstellar Comet Borisov, which visited the Solar System in 2019.

**Asteroid Target Added** – The Lucy spacecraft is on its way to fly by 9 asteroids over 12 years, most of them Trojan asteroids, those near Jupiter’s orbit, either ahead or behind the giant planet. Another asteroid, known as 1999 VD7, was found to be not far off the planned trajectory, and a slight course correction has been planned to yield another close flyby to the mission. VD7 orbits in the inner main asteroid belt and will be visited in November. The visit will be used to test Lucy’s innovative tracking system that locks on its next target to assure the best imaging of that target without guidance from spacecraft controllers on Earth.

**Meteorite On Mars** – The Mars rover Curiosity has found an iron-nickel meteorite, which rover controllers nicknamed Cacao. Curiosity, as well as some other Mars rovers, has found a few meteorites previously. Cacao is about a foot across. Scientists have no way with just the rover instruments to date when the meteorite fell on Mars. The rover shot Cacao with its ChemCam laser to determine its composition.



**Mars Helicopter** – The Ingenuity helicopter has continued to scout for the Mars rover Perseverance as the rover gathers soil and rock samples for eventual return to Earth. It has completed 42 flights. Its primary mission was planned for only 5 flights.

**JUICE** – The European Space Agency (ESA) plans to launch in April the JUICE mission to study Jupiter and its 3 large icy moons. Its primary mission will be spent orbiting first Jupiter and then Ganymede from 2031-2034. This will be the first spacecraft to orbit a moon other than Earth’s Moon. JUICE has 10 instruments including cameras, spectrometers, radar, altimeter, magnetometer, and particle detectors. It is hoped that JUICE will confirm if liquid oceans exist beneath the icy moons’ surfaces.

## Help Wanted (Volunteering Opportunities)

- OC Astronomers Club representative to WAA (Western Amateur Astronomers)

Carpooling OC to Anza

contact

Gene Kent

[kenthouse@cox.net](mailto:kenthouse@cox.net)

714-604-8396

I’m Gene Kent, a long time OCA member. I live in Tustin, CA. I’m looking to find someone to share the drive to and from Anza. I have a Chevy Trail Blazer. It will hold all the astronomy stuff for 2 people. I usually set up on the ball field below Anza House. If you have a pad or an observatory, I can drop you and your gear off there.

# Another Look

Dave Phelps, 2023 March

New Moon on March 21, Full Moon on March 7

Named the Worm Moon by southern Native American tribes and the Sap Moon by northern tribes.

Pueblo tribes called it the "Moon when the leaves break forth."

Importantly if the full moon occurs before the spring equinox, it is called the Lenten moon.

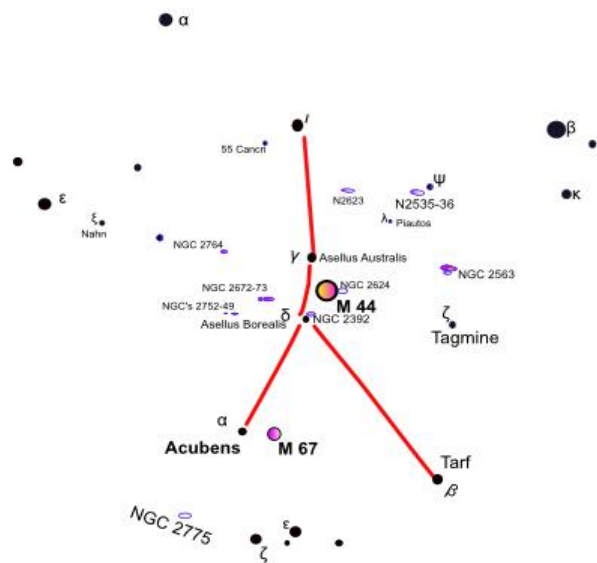
Other names include chaste moon, death moon, crust moon, crow moon and warming moon.

First point of Aries, i.e., Vernal Equinox is March 20, 2023 at 1424 hrs

Daylight saving begins March 12, 2023

*Raged with storms, wave and shingle were shackled  
in ice until another year appeared in the yard as it does  
to this day, the seasons constant, the wonder of light  
coming over us. Then winter was gone, spring comes,  
earth's lap grew lovely, longing woke in the cooped-up  
exile for a voyage home— Beowulf*

Cancer is part of that blank slate the ancients saw when they looked up between the twins, the bear and the lion. In China Cancer and M44 were known, as the "Exhalation of Piled-up Corpses," the source of mischief and blindness. The Hindus called it Flower. The Arabs stretched Leo out as far as Castor and Pollux and called Cancer the muzzle of the Lion. A blank canvas ready to be brushed with their imagination, Cancer was known well before the Greeks and Romans. In the land of the two rivers, the Babylonians, Assyrians and before them the Chaldeans identified the area as a Tortoise and also as a Crab. As early as 4000BC and perhaps even earlier, the Egyptians placed a Scarab in the sky, an emblem of immortality, and from the Chaldeans to the Greeks it was a gateway through which souls descended to rest in Man and Woman. The Crab eventually replaced the Beetle. From long ago this portion of the sky was significant because the Sun's apparent motion begins its retrograde and its oblique move downward.



*"The nebula called Praesepe, which is not one star, only, but a mass of more than forty small stars. I have noticed thirty stars besides the Aselli." Galileo*

So, what are the Aselli? The Greeks placed two donkeys, one above and one below the little mist or cloud we now know as the more or less recent Latin name Praesepe. These two stars are Asellus Borealius and Asellus Australis, Delta  $\delta$  and Gamma  $\gamma$  Cancri. We now identify over one hundred stars brighter than 6.5 and only one, Tarf the end, Beta  $\beta$  Cancri as bright as 3<sup>rd</sup> magnitude. Cancer contains 10 named stars. Acubens from the arabic claws, Asellus Australis who holds the record for the longest name, "Arkushanangarushashutu", derived from ancient Babylonian language, which translates to "the southeast star in the Crab." Next Asellus Borealius (Copernicus) named after the astronomer Nicolaus Copernicus, Meleph the stall, Nahn the nose (Persian), Piatos bright fire (Chinese), Tarf the end, and Tegmine-zeta the cover. Gakyid and Copernicus are recent names, Copernicus obvious and Gakyid from the nation of Bhutan meaning Happiness. Of interest Bhutan's official name is Druk Yul, Land of the Thunder Dragon.

The most ancient scientific observation of Jupiter that is known to us was noted by Ptolemy as having occurred eighty-three years after the death of Alexander the Great, when Jupiter happened to pass over the Praesepe. This was in 240 B.C.

<https://ocastronomers.org/wp-content/uploads/2019/01/m044.jpg>





As early as several century's BC, the invisibility of M44 has been considered an omen of coming rain. I will let the poets speak for themselves of the one thing they ascribed to Cancer, the weather.

From Aratos, a third century BC Greek poet who wrote the Phenomena and the Prognostica:

*And watch the Manger like a little mist.  
Far north, in Cancer's territory, it floats,  
Its confines are two faintly glimmering stars,  
One on the north, the other on the south,  
These are two asses that the Manger parts,  
Which suddenly, when all the sky is clear,  
Sometimes quite vanishes, and the two stars  
Seem closer to have moved their sundered orbs.  
No feeble tempest then will soak the leas.  
A murky Manger with both stars  
Unaltered, is a sign of rain.  
If while the Northern Ass is dimmed  
By vaporous shroud, he of the south gleams radiant,  
Expect a south wind. Vapour and radiance  
Exchanging stars, harbinger Boreas.*

Pliny wrote: "If Praesepe is not visible in a clear sky it is a presage of a violent storm."

Plenty has been said already about M44. Ptolemy called it the nebulous mass in the breast of Cancer and its presage to storms. Scientifically it's not very old but oddly enough 60% of its stars are red dwarfs. It is beautiful to look at.

The other open cluster, M67, is a little further down near Acubens  $\alpha$ . M44 is half a billion years old and M67 is 5 billion years old. M44 has a thousand stars, M67 one hundred. Most of its stars are main sequence like the sun but has a few red giants. M67 is also beautiful to look at.

Caldwell 48, NGC 2775 is a large, 10<sup>th</sup> magnitude galaxy low in the constellation near the head of Hydra. It is rather odd looking. You will see a bright nucleus and, if you have the resolution, tightly knit spiral arms.

Tegmine –  $\zeta$  Cancri (Zeta Cancri) is the only star in Cancer that Camille Flammarion chose to include in his book "Popular Astronomy" first printed in 1888. As Flammarion writes:

*A triple star more easy to observe is  $\zeta$  of Cancer, composed of three orbs of fifth magnitude, at a distance of 1" and 5"; the first two revolve round their common center of gravity in fifty-nine years, the third takes over three hundred years.*

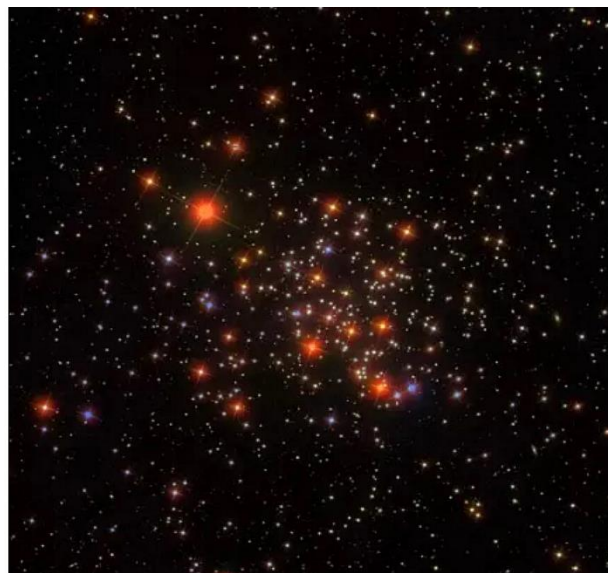
*CAMILLE FLAMMARION "POPULAR ASTRONOMY" OBSERVATORY OF JUVISY, November, 1903.*

Not surprisingly, there have been new discoveries in the last few hundred years. A fourth star, a red dwarf, of 10<sup>th</sup> magnitude is in orbit with C, separated by only 0.3".

Located near the southern end of Cancer and just below M67 is Sharpless 2-290, also known as Abell 31. This is a large faint planetary that is a challenge to all. I estimate its size as 15' and can't figure out a magnitude because it can't be seen unfiltered. Astrophotographers are using OIII and H $\alpha$  filters.



<https://esahubble.org/images/potw2026a>

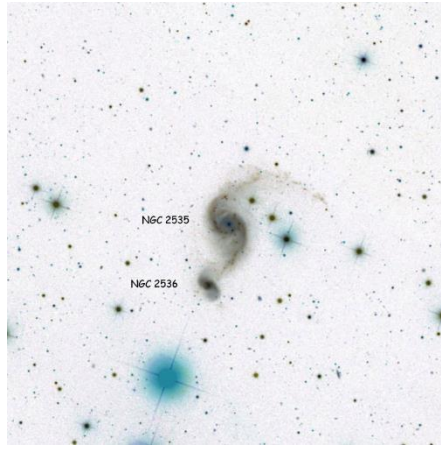


Messier 67, image: [Sloan Digital Sky Survey](#).

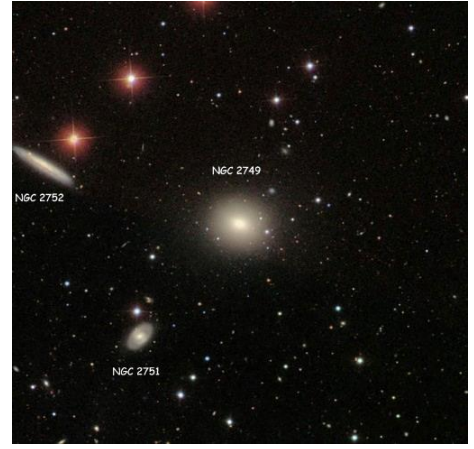




<http://annesastronomynews.com/photo-gallery-ii/nebulae-clouds/abell-31-by-adam-block/>



NGC 2535 and NGC 2536

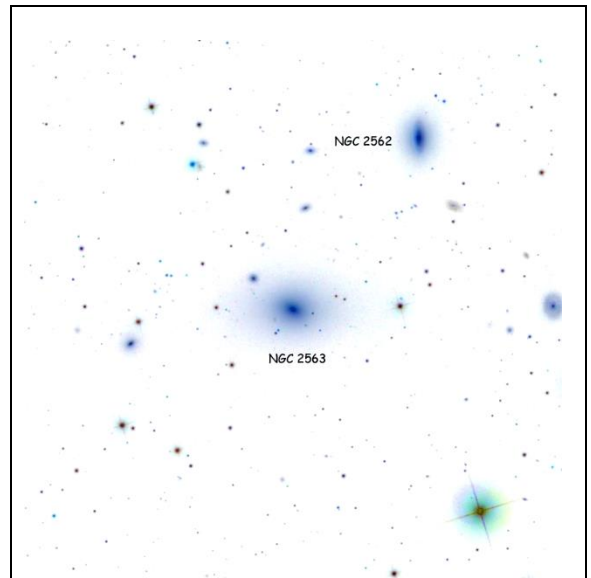
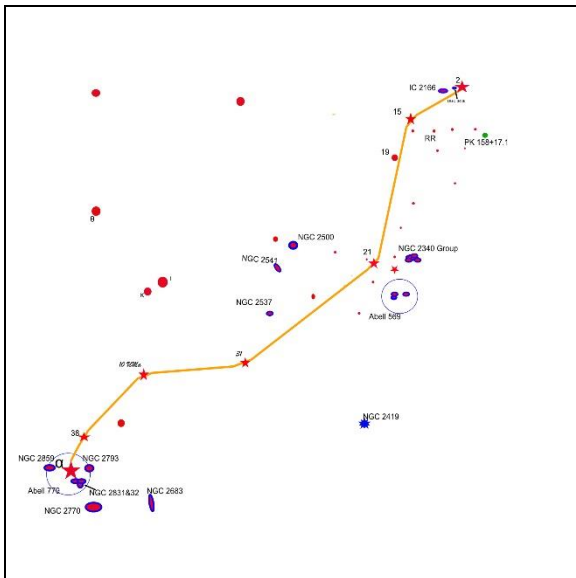


NGC 2749, 2751 and 2752

There are varying estimates of magnitude for the double galaxies NGC 2535 and NGC 2536, but the NGC gives magnitude of 12 and 14. The object is an extended pair of interacting galaxies, 2 to 3 arcmins across, so likely visible to some extent in our backyard scopes.

NGC 2749, 2751 and 2752 are three close-by galaxies of 11, 13 and 14<sup>th</sup> magnitude and three different visual classifications: Elliptical, Edge-on spiral and Tilted spiral. These are really faint fuzzies. ***Galaxy Images were copied from the New General Catalog.***

If your taste for faint galaxies hasn't been sated yet, slip over to the NGC 2562 and 2563 group. We have two 12<sup>th</sup> magnitude galaxies presenting different aspects and possibly visible in a single field.



"High in the evening sky in late March lies one of the great vacant spaces of the celestial vault. Between the cluster-studded sparkling of Auriga and the hordes of galaxies in Ursa Major is a void that was ignored by celestial cartographers until the late 17<sup>th</sup> century. Then Polish astronomer and instrument maker Johannes Hevelius, unable to resist the temptation of a blank space, filled the area with his constellation Lynx"  
 -- Scott Houston

So, in 1690 Hevelius added the Giraffe, the Unicorn, the Little Lion, the Little Triangle, Herschel's Telescope and the Lynx. Although you needed the eyes of a Lynx to observe it, Webb mentions that Lynx is noted for the number and beauty of its multiple stars.

2 Lyncis is the furthest northern star in Lynx that you can see visually at 4<sup>th</sup> magnitude. It's a fairly interesting star, not only because it's the jumping off point for three deep sky objects but also because it's a variable spectroscopic double. They think maybe the variable part comes from the unseen companion crossing between #2 and us.

3.5 degrees due south of 2 is a huge planetary that was only recently found off the Palomar survey plates. It's PK 158+17.1 also known as PuWe 1, (Purgathofer-Weinberger). Although it's on the Uranometria charts I never noticed it before I started studying Lynx. I never spent much time in Lynx before, with Auriga, Gemini and all the other fancy constellations around, now if I can, I'll try to rectify that mistake.



*Urania's Mirror*

PuWe 1 is a large, 20 arcmin, faint 15<sup>th</sup> magnitude, per Simbad, planetary recently, 1980 or so, discovered off the Palomar plates. The main reddish nebula is about 20' and I picked this particular image from Astroanarchy because it shows the expanded halo around the object taking it up to full moon size. I also like this image because it compares PuWE 1 to the Dumbbell, M27. This image was done in H $\alpha$  and OIII, so you will need a big mirror and quality filters.

IC 2166 and UGC 3446 are the other galaxies up by 2 Lyncis. Both are smallish, around the one to three arcmin size and findable at 12<sup>th</sup> magnitude. Straight down from there is the NGC 2340 group and Abell 569. They are about 13<sup>th</sup> magnitude and one to three arcmin size, but a nice test for your eye.

<https://astroanarchy.blogspot.com/2011/03/puwe1-planetary-nebula-project.html>

A big mirror is also appropriate for NGC 2419, Caldwell 25, aka "The Intergalactic Wanderer", so called because it is the furthest visible visually globular cluster to our Milky Way. N2419 is 8<sup>th</sup> magnitude and is a rather compact 2 arcmin. Burnham lists N2419 as 11.5 magnitude and describes it as very rich and extremely condensed. A 12 arcmin field of view will show a bright star next to the cluster while a 6 arcmin field will blow it up.

The awesome Schmidt camera at Palomar has found more intergalactic globulars, too faint for us to see. Still, you can find globulars around M32 as described a couple of months ago to sate your globular sachet.

Down at the bottom of Lynx is a neat little asterism of galaxies that use alpha  $\alpha$  Lyncis as a finder. These three galaxies NGC 2859, NGC 2793 and NGC 2832 which is a member of Abell 779. They are all within a degree of Alpha but small. N2832 is 13<sup>th</sup> magnitude and the prominent member of the group. You should be able to glimpse its companion 14<sup>th</sup> magnitude 2831 and then the lenticular NGC 2830. NGC 2859 is the brightest member of the three, 12<sup>th</sup> magnitude and actually within Leo Minor.



<https://cseligman.com/text/atlas/ngc2419.htm#2419>

Dark Skys     Dave Phelps

Dave's column has been abbreviated to fit the space available this month - The editor

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| <p>Contact Bill Prats <a href="mailto:b.bill.p@gmail.com">b.bill.p@gmail.com</a> Shipping is extra. All items can be picked up in Huntington Beach.</p> |         |            |  |            |

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