



Craig Bobchin captured this wide-field image of the Flame nebula (NGC2024), Horse head (IC434), Running Man (NGC1975), and the Orion nebula (M42) in November 2019 from Corona, CA using Pentax K-1 camera and William Optics Redcat 51 refractor.

Upcoming Events - free and open to the public

Beginner's class	Friday, 5 January at 7:30 to 9:30 PM IN PERSON This is session 5 of the class: "How to Use Your Telescope" to which the attendees bring their own telescope systems and get hands-on instruction.
Club Meeting	Friday, 8 December at 7:30 to 9:30 PM IN PERSON at Chapman University and ONLINE "What's Up?": John Garrett from from TVA Main speaker: Chris Butler presenting "Brave New Worlds"
Open Spiral Bar	Saturday, 9 December at 10:00 to 11:30 PM ONLINE Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.
Star Parties	Saturday, 10 December at the OCA Anza site. ??? 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

It doesn't seem possible that we're approaching the end of 2023, but the Winter Solstice (and longest night of the year) is coming up fast on December 21 as one facet of the year-end holiday season. Another sign of the season – Orion and other winter constellations are showing up in the evening sky. One of the pleasures of astronomy is welcoming old favorites and exploring new targets as each season brings different sections of the sky into convenient view. And we can even see out-of-season constellations, like Orion in August, if we're willing to stay awake into the early morning hours...

The OCA Election

Another sign that the New Year is coming is our annual election for the OCA Board of Trustees. All the nominations are in, and you should find a copy of the ballot showing all of the candidates for the 2024 OCA Board in the December issue of the Sirius Astronomer. By the time you see this you should also have received an email with instructions for voting electronically. If you didn't receive it, please contact John Hoot (scopes@ssccorp.com), as he has kindly agreed to set that up again for us. The ballot should also be posted on the website. If you are unable to get a copy and need it emailed to you, please contact Alan Smallbone (alan@ocastronomers.org).

Most members seem to find electronic voting convenient, but you can still vote by paper ballot if you prefer. Voting instructions are on the ballot, and you can mail it in or turn it in at the in-person meetings in December or January. Whichever way you choose to vote, get it in or be sure it's postmarked no later than the January general meeting, on January 12, 2024. Also, of course – only one ballot per member!

Our Board has had the same members for the last four years, which has worked well for dealing with the challenges of Covid 19 and resuming in-person activities when the shut-down period ended. For 2024, though, Helen Mahoney and Cecilia Caballero have decided to step down from the Board. We'll really miss them, but I'm happy to say that we have two new candidates for Trustee positions who I think will be excellent additions to the Board: Mark Price and Brett Nordby.

Mark managed to keep the AstroPhysics SIG going through Covid and has been expanding its scope beyond the original concept to help keep it relevant to its members; he's also been the person in our club most frequently in contact with the current leadership at the Heritage Museum. Brett has been very actively involved in projects at Anza, and, among other things, has generously applied his expertise, resources and energy to improving the WIFI system there. We're really glad they're willing to run for the Board, and I'm looking forward to working with them.

Please get your votes in, to let the Board know you're watching – and Happy End of 2023!

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Help Wanted (Volunteering Opportunities)

- Communications Coordinator doing social media presence and announcements to members.
- Coordinator for Adopt a Scope Program

We are in need of a new Coordinator for this program, which has been very successful in uniting people with donated telescopes under John Hoot's leadership. If you are interested in taking on that program, please send an email to our Secretary, Alan Smallbone, at alan@ocastronomers.org. If you have any questions about what's involved, please contact John Hoot at scopes@ssccorp.com. We look forward to hearing from you!

AstroSpace Update

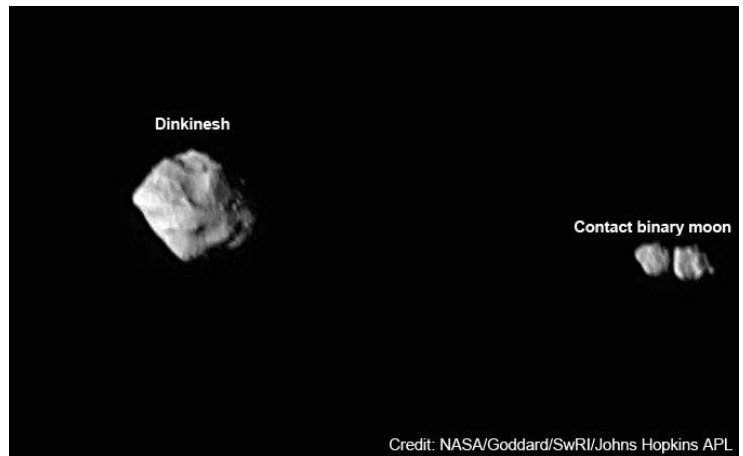
December 2023

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

Neptune Desert – Exoplanet astronomers have been puzzled by a lack of Neptune-sized planets orbiting close to their stars and have dubbed this the Neptune Desert. In contrast, Jupiter-sized planets are commonly found at both far and near distances from their stars. A leading theory is that orbiting near their stars subjects planets to harsh radiation that strips the planets of their atmosphere, leaving them smaller than Neptune-sized. However, Jupiter-sized planets, having more mass, and therefore stronger gravity, are simply more resistant to atmospheric stripping. Study of a Neptune-sized planet found in this desert zone supports this theory. The planet is known as LTT 9779 b and it orbits a Sun-like star about 260 light-years away. It is so close to its star that it takes less than an Earth day for each orbit. It still has its Neptune-sized atmosphere, but its star is unusually faint in X-rays and other harsh radiation. This faintness may be a result of the star's unusually slow rotation. Also, the planet has an unusually high content of heavy molecules in its atmosphere and unusually high atmospheric reflectivity, both of which would impede atmospheric stripping.

Earth-Sized Exoplanet – The Hubble Space Telescope has accurately measured the diameter of an exoplanet discovered by the TESS planet-finding space telescope in 2022. TESS doesn't have the resolution to measure precision diameters, hence the use of Hubble. The planet, known as LTT 1445Ac, was found to have a diameter just 7% larger than Earth, making it a rocky planet with about the same surface gravity as our planet. However, in other ways it does not resemble Earth: it orbits a red dwarf star, and orbits it so closely that its surface is about 500°F. Its star is part of a triple star, so there are 3 suns in the sky of this planet. There are two other planets found in the system, both larger. The orbits of the planets and the orbits of the stars appear to all lie in a common plane. The system lies 22 light-years away in the constellation Eridanus.

Lucy mission was designed to visit 7 asteroids, most of them Trojan asteroids, those bodies trapped in Jupiter's L4 and L5 Lagrange zones. But astronomers keep finding more asteroids that the mission will approach. The number of asteroids to visit is now up to 11, or 12 if you count a contact binary as 2 bodies. The contact binary, meaning what appears at first glance to be two objects, but are found to be actually touching, was discovered orbiting as a moon of the asteroid Dinkinesh when Lucy flew by it on November 1. This contact binary is the only one known that orbits another asteroid. Dinkinesh means "marvelous" in the language of Ethiopia. The flyby of Dinkinesh was planned as a test of Lucy and its instruments and they performed excellently. The next Lucy asteroid flybys are of Donaldjohanson in April 2025 and Eurybates in August 2027. The latter will be the first Trojan asteroid ever visited by spacecraft.



Mineral Salts on Ganymede – The Juno spacecraft orbiting Jupiter made a close pass by the moon Ganymede two years ago and recent analysis of data collected then found mineral salts and carbon-containing compounds on the surface of that moon. This chemistry was found to be most abundant at latitudes that are protected by the magnetic field from particle bombardment. Such particles would degrade the chemistry that Juno's observations found. A liquid water ocean is believed to lie beneath that moon's icy surface, and the newly found chemistry likely came from this ocean.

Mars' Interior – New analysis of seismometer data from the Insight lander on Mars found that a molten layer of silicate rock surrounds Mars' molten metallic core. Also, that metallic core was found to be somewhat smaller and denser than previous work calculated. The newly found layer prevents heat from escaping from the core, which would reduce the magnetic field strength generated in the core. It has long been known that Mars has a very weak magnetic field, and this helps explain that. It is believed that Mars' weak magnetic field allowed the Sun's solar wind to blow away much of the planet's atmosphere over billions of years.

Bursty Star Formation – Astronomers have been puzzled by the larger numbers than expected of very bright galaxies found existing in the very early Universe in observations by the James Webb Space Telescope (JWST). Bright galaxies are usually massive galaxies, and these very early times in the Universe should not have had enough time to grow galaxies to large masses. New research appears to explain this. Star formation in the early Universe was found to occur in very bright bursts, with quiet times between, to far greater extent than bursts of star formation occur now. So, these early galaxies were not actually as massive as their brightness might indicate. Computer simulations show that bursty star formation should occur much more often in less massive galaxies, which should have been more prevalent in the early history of the Universe.

Termination of Star Formation – Cosmic Noon is a term that astronomers have applied to the period roughly 2 to 4 billion years after the Big Bang, when star formation greatly exceeded that which occurred before or since. A new study used JWST to examine 113 galaxies whose great distances meant we are seeing them as they were when the light left them during the Cosmic Noon period. About ¼ of the galaxies were found to have outflows of neutral cold gas powered by AGNs. Previous studies looking for outflows in this time period searched for ionized gas (because it is easier to detect) and found much less than the neutral gas in the new study. In galaxies that were quenching (stopping the high rates of star formation), the gas outflow was particularly strong. The new study supports the theory that galaxy quenching occurred at the end of the Cosmic Noon period because active galactic nuclei (AGNs) powered by supermassive black holes expelled or heated the cold gas needed for further star formation.

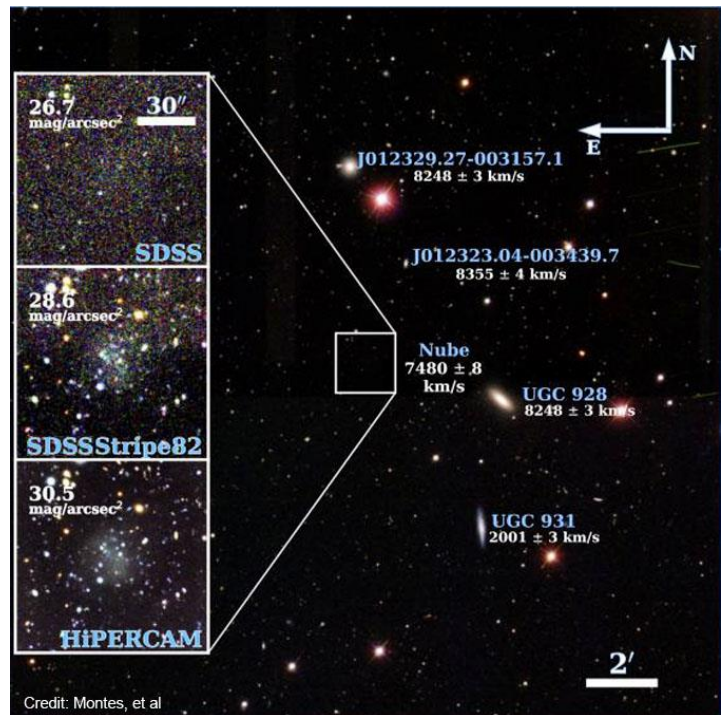
Distant Black Hole – The most distant black hole observed in X-rays has been discovered. The new discovery is so distant that we are seeing it as it was about 13.2 billion years ago, when the X-ray light left it. It was seen through a gravitational lens created by a massive cluster of galaxies that happened to lie in front and magnified and brightened it. Estimates of the masses of the black hole and of its surrounding galaxy are surprisingly similar. Galaxies today have far larger masses than their central black hole’s mass, typically a ratio of roughly 1000. This may answer the question of whether galaxies or their central black holes formed first. It might also imply that black holes can form with huge masses, rather than growing from stellar mass to supermassive.

ADG – A dwarf galaxy has been found that is almost all dark matter. Such are known as Almost Dark Galaxies (ADGs). Only a few of these are known. This may be explained by the difficulty of finding galaxies that have very few stars. If there are more ADGs to be found, this could explain why computer simulations of galaxy formation predict more dwarf galaxies in proportion to large galaxies should exist than have been observed. The newly found ADG, nicknamed Nube, was spotted in deep images taken in the Stripe82 phase of the Sloan Digital Sky Survey and was confirmed by radiotelescope observations and deeper visible-light images.

Distant Barred Spiral Galaxy – Astronomers using JWST have found the most distant known barred spiral galaxy, the same type of galaxy as our Milky Way. Galaxy formation theories tend to predict that large barred spiral galaxies would take roughly 7 billion years to develop. The new discovery, dubbed ceers-2112, took far less time, since we are seeing it as it was roughly 2 billion years after the Big Bang.

Merging Neutron Stars – JWST, among other telescopes, was used to study the second brightest ever gamma-ray burst (GRB), which was caused by two neutron stars merging about a million light-years away. These observations showed the presence of the element tellurium and some lanthanide series metals, reinforcing the theory that merging neutron stars are a substantial source of elements heavier than iron. (Elements with masses up through iron are created by the normal fusion that occurs in main sequence stars.) The JWST observations also showed that atoms were being thrown off at high speed by the explosion that merging neutron stars create. The two stars that merged were themselves traveling at high speed, having scurried 120,000 light-years from their home galaxy.

Planet Formation – JWST has observed icy pebbles in a planet-forming region and nearby water vapor interior to the pebbles and the snow line (the radius from the planets’ star where temperatures will evaporate snow). This is exactly what is predicted by the theory that planets form from icy pebbles conglomerating. The researchers using JWST observed 4 planet-forming disks, 2 small and 2 large, about Sun-like stars. All systems were between 2 and 3 million years old, when planets are likely forming. The differences observed between the small and large disks also fit the same planet-forming theory.



7 Planet System – More exoplanets are still being found in data from the Kepler spacecraft, though its mission ended in 2018. The star Kepler 385 was found to have a few confirmed planets back in 2014. But new analysis brought the number of planets in that system up to 7. The system is 4670 light-years away. All 7 are larger than Earth, but smaller than Neptune. The star is a little larger and hotter than our Sun. All the planets are too close to their star to be in the habitable zone, that area where temperatures should allow liquid water on planets. 5 of them appear to have thick atmospheres, while the other 2 have little or none.

8 Probable Super-Earths – A project named VaTEST is validating exoplanet candidates using statistical methods. They have released a list of 8 planets validated that are likely in the size range of super-Earths. They have diameters ranging from 1.4 to 1.8 times that of Earth. 6 of them have been declared keystone planets, those of particular interest for further study because their diameters lie in a range where few exoplanets are known. Two of the planets are good candidates for JWST study of their atmospheres.

Possible Binary Star Planet – Astronomers have found evidence for an exoplanet in the disk about the binary star AC Herculis. The disk is nearly perpendicular to the plane of the orbit of the binary stars about each other. Such a tilted orbit of a planet about a binary star has never been seen before. The evidence for the planet is a gap in the disk, though the planet itself has not been directly detected. The primary star of the binary pair has already passed through its red giant phase, which should have destroyed any nearby planets. Thus, the new possible planet could be a second-generation planet, formed after the red giant phase. At least one other binary star (HD 98800) is known to have a perpendicular disk, but no evidence of a planet has been found there.

Massive Runaway Stars – A team of astronomers searched two catalogs of massive stars and then looked up their motions measured by the Gaia spacecraft in order to find stars that are speeding out of our Milky Way galaxy, known as runaway stars. The search found 175 runaway stars, of which 89 had not been previously classified as runaway. The fraction of massive stars that are runaway was found to be substantial. There are two theories to explain how massive stars can become runaway stars: 1) one star of a binary pair explodes as a supernova, blasting away the other; 2) stars in a densely packed region can encounter other stars, particularly binary stars, and be gravitationally thrown out. The properties of O-type stars (the most massive) that were runaway were found to support the second theory. B-type stars (somewhat less massive) were also included in this study but had somewhat different properties.

Rogue Planet Origins – New computer simulations show that rogue planets, those exoplanets that do not orbit a star, most likely originate when they are gravitationally thrown out of a two-star system. The simulations showed it is possible to be thrown out of a one-star system (by other planets), but less probable than from a two-star system. When the orbital planes of planets of the two stars are not aligned, the probability rises for throwing out a planet. The simulations showed that there should be a larger proportion of smaller rogue planets than have been discovered. This is probably explained by the difficulty of finding small unlit objects.

Spacecraft Speed Record – The Parker Solar Probe is approaching the Sun more closely on each orbit about it by means of flybys of Venus that bend the spacecraft orbit closer to the Sun. So, Parker keeps setting records for the closest spacecraft pass to the Sun and for the fastest spacecraft speed. Parker's pass near the Sun next year will reach about 430,000 mph, 25 times the speed of a spacecraft in low Earth orbit. The speed on the current orbit exceeded 394,000 mph, of course a new record. Parker is the first spacecraft to enter the corona, or outer atmosphere, of the Sun.

Apollo Astronauts – The world has lost two pioneers of space exploration, who passed away recently: Frank Borman and T. Ken Mattingly II. Borman commanded the first mission with people that orbited the Moon: Apollo 8. He retired from NASA before he could be assigned to one of the Moon missions that landed. Mattingly was bumped from the Apollo 13 crew when he was exposed to rubella and played a leading role in the ground crew that got 13 back to Earth despite its oxygen tank exploding. Mattingly then was assigned to Apollo 16 where he commanded the craft that orbited the Moon while the other 2 crew members landed. Of the 12 people who have set foot on the Moon, only 4 remain alive, and of the 12 who only orbited the Moon, there are also 4 remaining.

Another Look - Cetus

December 2023
Dave Phelps

December's New Moon is on Tuesday the 12th. Fridays the 8th and the 15th have smallish moons that will contribute to dark skies for your star parties. The Full Cold Moon will be on Tuesday the 26th and will be the first full moon of winter. The winter solstice is on December 21 at 1927 hrs.

Native American names for the December Full Moon include Drift Clearing Moon, Frost Exploding Trees Moon, Hoar Frost Moon, Little Spirit Moon, Long Night Moon and Moon of the Popping Trees.

The Old English and Anglo-Saxon names are the Moon, Before Yule or the Long Night Moon while the Celts added the Oak Moon and the Full Cold Moon. In French its Pleine lune de Décembre. In German - Vollmond im Dezember, in Spanish Luna Ilena de Diciembre and in Greek Φεγγάρι Γεμάτος Δεκεμβρίου, or Fengári Gemátos Dekemvríou,

There are a number of conjunctions this month, one with Venus on the 9th and one with Saturn on the 17th. Neptune will be occulted by the moon on the 19th. Occultation visibility will be in the southern Indian Ocean off the southwest coast of Australia. In the southwestern US, we can expect a close approach.

This year 1st magnitude, El Nath, Beta β Tauri, will be occulted on December 25th from 1657 to 1920 hours.

The constellation of Cetus is identified across the world. In French we have Baleine, In Italian its Balaeua, and in German Wallfiseh and in classical Greek its Ketos (Ketos). Cetus is the fourth largest constellation; it has dimensions of 50 degrees East to West and 20 North to South. At one time it was written that Cetus is the largest constellation yet contains few telescopic objects of interest.

There appears to be some thought on how Cetus died. We are accustomed to the story of Perseus unmasking the head of the Medusa and turning our sea monster to stone. This is a very popular legend bolstered by the accounts of historians claiming the petrified remains were carried to Rome. No less a personage as Jerome, who first translated the bible from Greek to Latin, claimed to have seen them in Tyre.

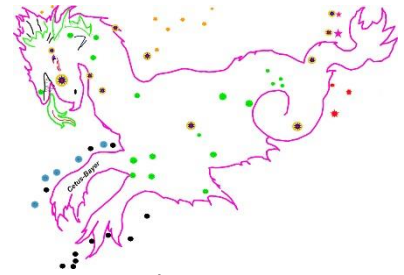
Charles Kingsley has so beautifully told the story:

*"On came the great sea-monster, coasting along like a huge black galley, lazily breasting the ripple, and stopping at times by creek or headland to watch for the laughter of girls at their bleaching, or cattle pawing on the sandhills, or boys bathing on the beach. His great sides were fringed with clustering shells and seaweeds, and the water gurgled in and out of his wide jaws as he rolled along, dripping and glistening in the beams of the morning sun. At last he saw Andromeda, and shot forward to take his prey, while the waves foamed white behind him, and before him the fish fled leaping."
"Then down from the height of the air fell Perseus like a shooting-star—down to the crest of the waves, Andromeda hid her face as he shouted. And then there was silence. 'Slowly she looked up trembling, Perseus springing toward her; and, instead of the monster, a long, black rock, with the sea rippling quietly round it."*

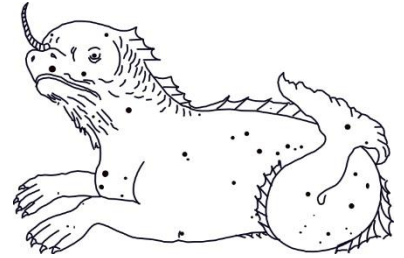
(Adapted from "Astronomy with an Opera Glass" Garrett P. Serviss 1888)

An alternative view, though not as poetic, is that Perseus had to put up a fight, using his sword to slay the monster.

Commonly depicted by the Greeks as a hybrid creature, Cetus had forefeet, huge jaws, and a scaly body like a giant sea serpent. Even though the constellation is also known as the Whale, the mythical creature does not in fact look like a whale. Historically, we can track Cetus back to the Two Rivers and the Babylonians, at least 4000 years ago. We believe the original Cetus was the dragon Tiamat, a creature still feared in fantasy novels today.



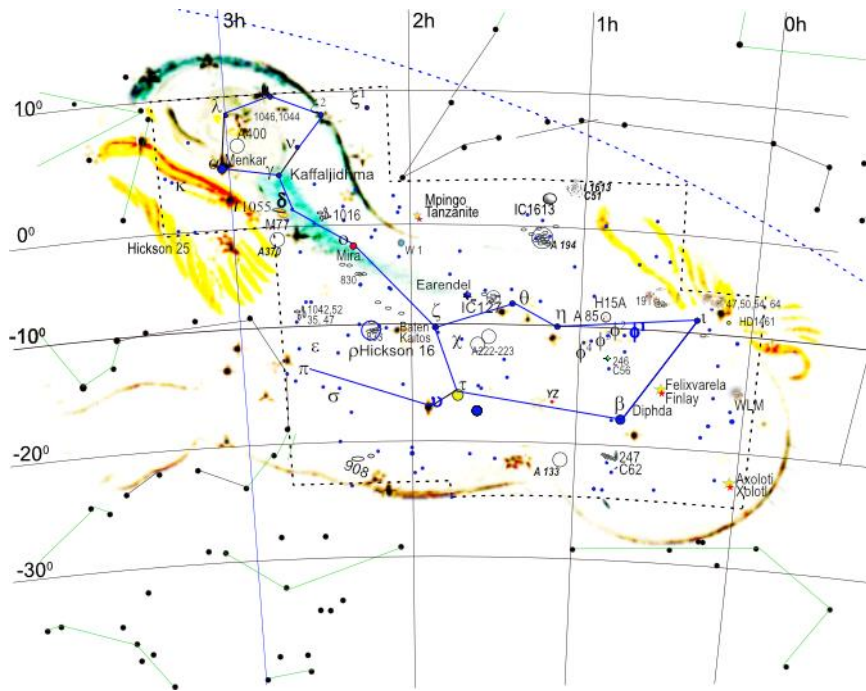
Johann Bayer



Urania's Mirror



Percy Jact at
Skylarks



Of course, Chinese culture has also named the stars around Cetus, seeing farms silos, and even a farm manager.

- In that time and for thousands of years water was feared as “Chaos” and Tiamat was one of the agents of Chaos. In the centuries before, during and after the agrarian civilizations of the Euphrates, water was the source of life. The story of the flood almost certainly originated with the annual flooding of the Tigris and Euphrates. It was paralleled by early Egyptians who also relied on the annual flooding of the Nile to reinvigorate the land with new soil and nutrients. It was along the coast of the Mediterranean, for millennia the sea was the source of food, commerce, travel and trade.

Is it any wonder than that those same ancients, trying to understand their existence, created connections with the nature surrounding them and ascribed

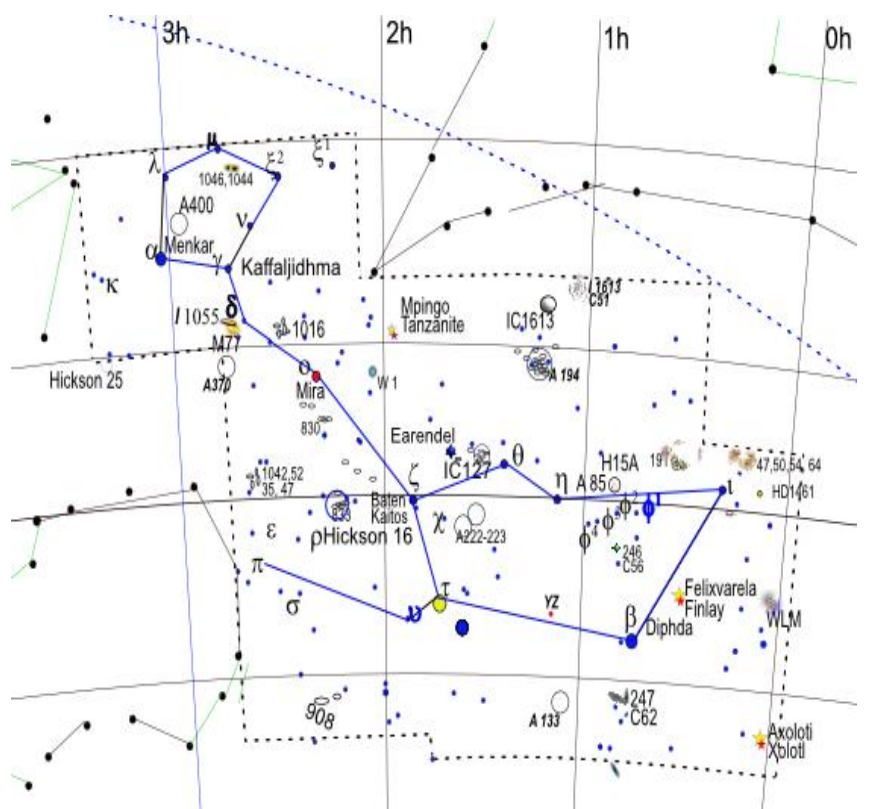
reason to the rising of the constellations and reason to the movement of the sea. Our first sea monsters, our first Cetus’ were demigods in need of appeasement to bring the rain, grow the crops, calm the water and bring luck to the fishing. It is little wonder that in times of drought, flooding and wild storms, we offered gifts and sacrifices, even, if necessary, a young woman.

To the original Babylonian astrologers, a large portion of the sky became “The Sea”; water-related constellations: Cetus, Aquarius, Pisces, Eridanus. Pisces Austrinus and Capricornus the sea goat.

*With gills pulmonic breathes the enormous whale,
And spouts aquatic columns to the gale;
Sports on the shining wave at noontide hours,
And shifting rainbows crest the rising showers.
- Darwin.*

Cetus is a somewhat faint constellation without any stars brighter than 2nd magnitude. However, it is still a rich hunting ground for double, multiple and variable star observers. Plus, since it is away from the glare of the Milky Way it is a wealthy hunting ground for galaxies. It even has a planetary nebula bright enough to reach from your backyard. Also in Cetus, Patrick Moore chose three objects for inclusion in his Caldwell catalog.

Cetus has several stars with wonderful names that show a little of the Arab influence in the constellation. Alpha α Ceti’s name is Menkar, meaning Nose. It is also a part of one of the Chinese celestial granaries and in Arabic a hand, Beta β Ceti has two names, Diphda and Deneb Kaitos. β is the brightest star in Cetus, a bit brighter than α . Diphda comes from the Arabic “southern tail of the frog” and Deneb Kaitos from the Arabic “tail of the whale”. In China this star bore the strange title of “Superintendent of Earthworks.” Gamma γ Ceti has the tongue twister name of Kaffaljidhma, meaning the “Short Cut Hand”, the name actually includes several other stars in the Arabic cosmos. γ is a triple star system.



The most famous star in Cetus is Mira, "The Wonderful, Omicron o Ceti. Mira is the first variable star scientifically described and the first variable I reported to the AAVSO. There are 19 more stars in Cetus with Bayer designations, many of them multiple systems, 18 stars are named either alone or in system combinations.

There are 61 planetary systems and close to Mira, on the line between δ and ζ is a star with the beautiful name Earendel, the Morning Star. You will not see Earendel, she is 27th magnitude and 28 billion light years away. She is the oldest star we've found yet. You see her on the distortion caused by the gravitational lensing in the center of the red circle.

Another beautifully named star is Axólotl, named in Mexico, Axólotl means water animal and is a species of salamander. Axólotl is a planetary system having a massive planet named Xolotl after the god of fire and lightning.

Felixvarela and its planet Finley were named by Exoplanets in honor of a great human being. The first to teach science in Cuba.

Mpingo is an ebony type of wood used in Tanzanian music. It is also a star with a planet named Tanzanite.

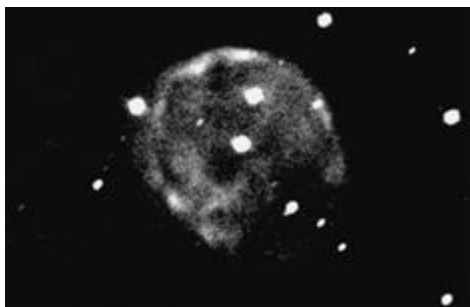


Cetus' distance from the Milky Way allows us to spend some quality time searching for galaxies away from the dense background of the Milky Way. Historically, Cetus was considered rather boring, with no bright stars or star clusters. Certainly, we have some individual galaxies we love to come back to time and time again, and it is my experience that galaxies tend to like to group together. There always seems to be another just a bit out of the field of view. Cetus is no exception. It has Abell clusters, a Seyfert galaxy called Cetus A, planetary nebulae and Caldwell objects.

M77 is close to δ and is 9th magnitude so will be easy to find. It's a big face on spiral with an easy to see bright nucleus. M77 is also known as Cetus A. NGC 246, Caldwell 56 is an 8th magnitude planetary nebula that you will enjoy finding. It's big enough and bright enough that you will see some detail. This image by John Sanford taken back in 2003 will help you get an idea of what it will look in your eyepiece.



<https://www.astrobin.com/91f58r/B/?q=M77>



John Sanford, OCA
<https://ocastronomers.org/wp-content/uploads/2018/12/NGC246Cet.jpg>



Abell 370
<https://www.astrobin.com/352w9d/B/>

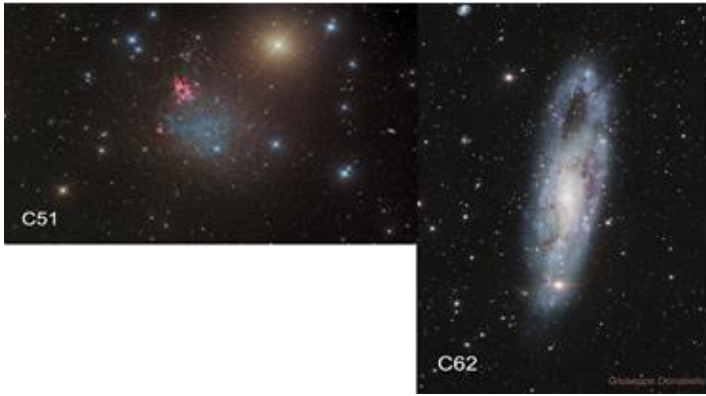


[https://upload.wikimedia.org/wikipedia/commons/7/73/XDCP_J0044.0-2033_\(Gioiello_cluster\).jpg](https://upload.wikimedia.org/wikipedia/commons/7/73/XDCP_J0044.0-2033_(Gioiello_cluster).jpg)

There are 5 galaxy clusters in Cetus. Abell 133, Abell 222, Abell 370 and Abell 400. There is also JKCS 041, near Mira, and in 2009 the furthest cluster of galaxies seen from earth. Also, not too far from Mira is IRC 0218, the most distant strong gravitational lensing galaxy currently known. Very close to β is a galaxy cluster with the curious name Gioiello, which is Italian for Jewel. Gioiello, found in 2011, is, at that time, the most distant massive galaxy cluster found. It got its name from the jewel-like colors in its image.

Two of our Caldwell objects in Cetus are C51 and C62, both 9th magnitude, however C51 is a dwarf galaxy, i.e. low surface brightness. It'll be fun to find it.

For you guys with big mirrors, Whiting1 is a 15th magnitude Globular Cluster in the halo of our Milky Way galaxy. It is not too far from Mira. I have its location labeled W1 on the chart.

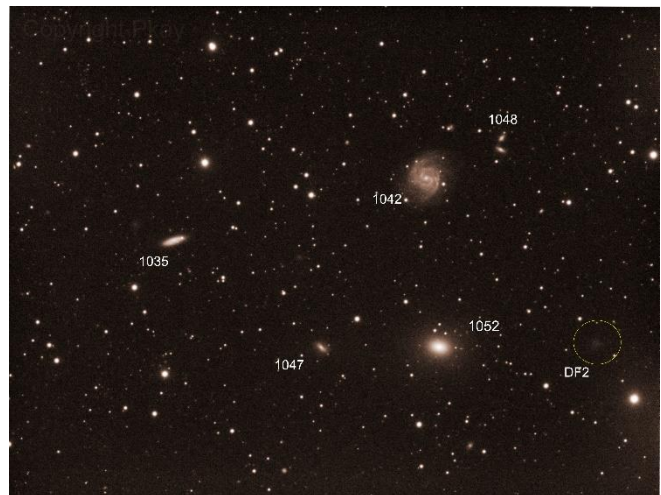


C51 = IC 1613 <https://www.astrobin.com/zss9uq/?q=ic 16>
 C62 = NGC247 <https://www.astrobin.com/search/?q=ngc+247#vv7eq7>

WLM- from ESO VST OmegaCam Local Group Survey

Holmberg 15A is also on the chart at RA 00h 42m and -90. It is almost 15th magnitude. It anchors Abell 85, which is faint. Holm 15A is a huge elliptical galaxy with a huge central core, which you can find in your larger scopes. The closest bright galaxy to H15A is NGC 191, a 12th magnitude colliding pair of galaxies, a good starting point.

Over close to Eridanus is a small group of galaxies and an extremely diffuse rather strange galaxy. NGC 1052 is an 11th magnitude elliptical galaxy close to 14th magnitude 1042 and in a tight group with 12th magnitude 1035 and 13th magnitude 1047. Interestingly, the group contains NGC 1052-DF2 an ultra-diffuse galaxy with no visible magnitude determined and reportedly with no Dark Matter. DF2 would be an incredible find.



[jclopez01 @https://www.flickr.com/search/?text=wlm galaxy](https://www.flickr.com/search/?text=wlm galaxy)

It will be interesting to observe Wolf-Lundmark-Melotte. It's 11th magnitude and 11' x 4' in size, so not too small. WLM stands for the three astronomers who had a hand in finding and figuring out what it is. They determined that it's an irregular galaxy as seen in this image from the VST survey by ESO. It's way out there on the outer edges of the local group, so not a bad galaxy to put on your life list.

So Cetus, the 17th, 18th, 19th and early 20th century astronomers did not have too much to say about it except for the obvious. They didn't have the equipment we have today for visual work, so it was mainly a large open area sprinkled with some interesting stars and whatever their four and six inch Clark's could find. Best of luck stretching your observing chops and . . .

Dark Skys

From the Editor

Due dates for submission of articles, pictures and advertisements

Issue	Due date
January 2024	21 December (early due date because of holidays)
February	20 January
March	17 February
April	23 March

Advertisements

Buy, Sell or Trade some of your gear? This is where club members can place advertisements. Please contact the editor at newsletter@ocastronomers.org to place an advertisement or to learn more about placing one. There is no cost to club members for non-commercial advertisements in the newsletter.

For Sale	contact	Ron Choi	rchoi1983@gmail.com	
<ul style="list-style-type: none"> • Orion StarShoot AutoGuider further reduced price \$ 200 • Tele Vue 8mm plossl 1.25" eyepiece \$ 80 • 				

For Sale	contact	Bill Prats	b.bill.p@gmail.com	
<ul style="list-style-type: none"> • QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 \$ 30 3 Pieces, Bright red finish, no scratches • Losmandy Servo motor/Gemini 2 cables (pair) recent & hardly used Make offer • Losmandy Gemini 2 Hand Controller, recent & hardly used Make offer 				
Contact Bill Prats b.bill.p@gmail.com Shipping is extra. All items can be picked up in Huntington Beach.				

For Sale	contact	Eric Mjolsness	emj@uci.edu	
<ul style="list-style-type: none"> • Mars Hill Pad # MH-05 OCA license is up for sale. Includes solid equatorial pier. \$ 2300 obo Price in 2010 was \$2300. I am seeking that amount back or best offer. 				

<ul style="list-style-type: none"> • Telescope: Orion's Sirius 8" Go-To Reflector, Focal Length: F6, 1200 mm, Case: for 8 x 6 OTA \$ 450 reduced Mount: Sirius EQ-G Go-To Equatorial with tripod Controller: Synscan 42,000 Celestial object database Lens: Siriusplossl 26 mm Viewfinder: 8 x 50 mm Rt. Angle Note: Equipment is used, but all functional 				
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For Sale	contact	Ami Dvir	amiaddvir@gmail.com	949-294-1073
<ul style="list-style-type: none"> • Eyepiece Celestron X-CEL : 12mm,9mm,7mm, with boxes and all \$ 170 • Eyepiece Meade 5000 PWA 28mm [like new in the box], list price is \$330 \$ 220 • Eyepiece Meade 5000 PWA 16mm [like new in the box], list price is \$190 \$ 120 • 				

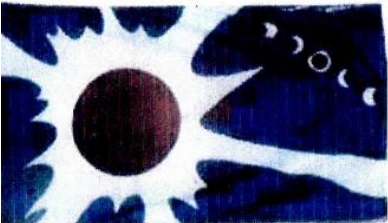
For Sale	contact	David W. Pearson	p.davidw@yahoo.com	
<ul style="list-style-type: none"> • Star Splitter 20 inch Dobsonian telescope with servo-cat go-to capability \$ 6000 obo Includes 8 eyepieces, laser collimator, telerad, plus more. The equivalent bought today from Obsessiont would be \$15,385+shipping without extra accessories. • Intes MK66 6" f/12 Maksutov-Cassegrain OTA includes rings/dovetail, case, finderscope, and diagonal \$ 600 obo 				
These items are local pickup only. If interested, please send me email requesting a complete description.				

For Sale	contact	Nick McMillan	wforacer@rocketmail.com	
<ul style="list-style-type: none"> • Technical Innovations Pro-Dome Ten-Foot (PD10), includes three Wall-Ring-PD10 (WR10) \$ 5000 which add ~48" height to the walls and making it 10' tall and 10" wide. • Digital Dome Works controller (DDW), hardware and software. • Electric Dome Motors 10 (ED10), Electric Shutter Motor 10 (ES10), Shutter Auto Stop (SS1). • Power Supply 10 (PS2E), ES Pulley upgrade (ESP), Wind Restraint System, Anti Sag Brace. 				
Pictures are on Flickr here: https://www.flickr.com/photos/123906448@N08/albums/72177720309596327/ . The dome and components must be picked up in Costa Mesa.				

For Sale	contact	Bill Frank	949-254-4662 cell	
<ul style="list-style-type: none"> LX200 Maksutov-Cassegrain telescope with cover, Meade mount, base controller, power and control cables, carrying cases. Accessories in case #1: Meade Dew Shield MFR#07284, main scope cap, guide scope caps, 2 green laser sights with controller Accessories in case #2: Televue eyepieces: 19mm Wide Field, 74 mm Plossl, 10.5 mm Plossl, Meade Super 26 mm Plossl, setup eyepiece, assorted locking rings and covers, adapter sleeve, power supply 10 (PS2E), ES pulley upgrade (ESP), wind restraint system, anti-sag brace, 2 Starlite red reading lights, lens cleaning brush, laminated list of Messier objects and bright stars Camera: SBIG ST-5C with CPU, P/S, cables Software: CCDOPS Version 4.0, SkyX Professional Edition User Guide 				\$ 500 OBO
Photos are available here: https://tinyurl.com/h3e6hxcn . Please call me to arrange inspection / pickup / delivery.				

For Sale	contact	Barry Acton	714-603-2182 cell	
<ul style="list-style-type: none"> Meade LX200R GPS & Tripod (with original box). New is priced around \$5,500 Meade Zero Image-Shift Electronic Micro-Focuser Meade AutoStar II Hand Controller, manual Eyepiece Meade Meade 26mm Plossl 5 Element 1 1/4" 1.25" 90° Mirror Star Other accessories that came with the telescope... 				\$ 2000
<ul style="list-style-type: none"> Meade SF #1200 10" Solar Filter 				\$ 50
I am the original owner, and it has been for about 15 hours. It is in extremely good condition as it has sat inside the house when not in use. Everything is in perfect condition.				

For Sale	contact	Roger Mills	909-627-4122	
<ul style="list-style-type: none"> 8 inch pyrex mirror plank ground and polished to f/7 with polishing tool and materials Fiberglass telescope tube 9.25 inch O.D., tube rings, equatorial mount, synchronous drive, counterweight, Book: "Making Your Own Telescope" by Allyn J. Thompson. 				\$ 200 obo
The mirror has not yet been figured to parabolic shape				

For Sale	contact	Kandra Kargo	teapotsagit@earthlink.net	714-349-9137 cell
<ul style="list-style-type: none"> Total Solar Eclipse Flag is back! Take one with you to Texas (or Mexico) next April 2024! 				\$ 45 + S&H
Limited supply from Teapot Sagittarius. American made. Call or text for more information and to order.				
				

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The Newsletter of the Orange County Astronomers

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