SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

January 2024 Free to members, subscriptions $12 for 12 issues **Volume 51, Number 1**

Jupiter taken July 2020 by Sam Pitts from out club site in Anza using a Celestron C-14 and 2x barlow with a ZWO120 camera. The picture was produced using lucky imaging techniques.

Upcoming Events - free and open to the public

Beginner's class	Friday, 2 February at 7:30 to 9:30 PM **ONLINE** This is session 6 of the class:_Covers basics of astrophotogrphy, type of cameras, and other equipment.
Club Meeting	Friday, 12 January at 7:30 to 9:30 PM **IN PERSON** at Chapman University and **ONLINE** "What's Up?": Chris Butler from OCA Main speaker: Joel Harris presenting "The [2nd] Great North American Solar Eclipse"
Open Spiral Bar	Saturday, 13 January 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, 13 January 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

Welcome to 2024! Traditionally, January is when we get to retrain our reflexes to get the year right when we have to give dates – a challenge than can be comparable to dealing with the switch to Daylight Savings Time (or back). January is also when we start to see the nights getting shorter, as we're past the Winter Solstice; and they're generally getting colder, letting us know that we're in true winter. At Anza we sometimes even get snow, though it usually doesn't last long, and it can get cold enough for pipes to freeze. Orange County generally doesn't give us that kind of winter experience.

Other authentic winter experiences can be enjoyed in Orange County as well as at Anza including observation of the bright winter constellations and the objects associated with them. For most of us, this starts with Orion and the Great Orion Nebula. It really is a great time for viewing, and there are many ways to deal with the cold, from old-fashioned dressing-in-layers-with-good-gloves-and-hat to more technologically advanced items such as chemical or battery powered hand-warmers (great for warming the body behind the pockets they're kept in as well as hands). However you decide to deal with the cold and wherever you do it from, I hope you enjoy some good viewing during this winter season!

Last Call on the OCA Election…
As a reminder, the OCA election ends at the end of the general meeting on January 11, 2024 – you can submit your ballot at the in-person meeting, electronically or by mail (if mailed, it has to be postmarked January 11, 2024 to be counted). If you haven't gotten your ballot in yet, please do!

Outreach Program
While we appreciate Jeff Gray's enthusiasm and willingness to help our Outreach Program out when Cecilia Caballero had to stop, the Board has decided that we need to return to a program that is organized more along the highly successful lines established by Jim Benet during his many years as our Outreach Coordinator. Specifically, a program that gives a range of club volunteers a chance to participate and that is centered on giving students and other members of the public the experience of seeing objects in the night sky themselves though a telescope. For many people who have attended our outreach events over the years, that direct connection with the sky through a telescope has been something they remember for years. We want to continue to provide that experience, which is a very different experience than seeing an image on a monitor.

We're exploring different options at this point. If you're interested in participating in the program, as a volunteer at outreach events or, more on the administrative side, as the coordinator for the program or someone assisting the coordinator, please contact Alan Smallbone, our current Club Secretary (Alan@ocastronomers.org). Jim Benet left extensive information on how he organized and calendared events, his contacts at schools and other locations where we had events, etc., so getting it going again should be a lot easier than if we were starting it up from scratch.

Many of us have fond memories of doing outreach events at different schools and other locations, which was an incredible way to introduce students and others to wonders in the night (and sometimes daytime) sky. I'm looking forward to having that kind of outreach program again.

Something New for the 4/8/24 Solar Eclipse
If you want to do something more for the upcoming total solar eclipse than view or image it, I just learned from an article in the 4/18/23 issue of Science News (p. 32) that there are a number of citizen science projects related to the eclipse that you could become involved in. They mentioned four in particular:

SunSketcher (sunsketcher.org), which uses an app on smartphones to get video images from as many places along the eclipse path as possible to help determine the solar shape and test theories of gravity by looking at such things as how the shape of the sun affects the orbits of planets.

Dynamic Eclipse Broadcast Initiative (debinitiative.org) and Citizen Continental-America Telescope Eclipse project (eclipse.boulder.swri.edu), two programs that provides different types of equipment and training to teams of volunteers to collect information on the sun and solar corona during the eclipse. If you're interested, the recommendation is to contact them quickly as they have limited equipment available.

Eclipse Soundscapes (eclipsesoundscapes.org) has some sound recording kits available and instructions for preparing your own sound-recording kit. Their interest is in getting data on the effects of the eclipse on wild animals. This is apparently building on a project from 1932, but with more sophisticated equipment. From their website, they're one of the programs funded by NASA Science Activation, and they are hoping to coordinate activities with another program that is also funded by NASA Science Activation, Globe Eclipse, which is collecting data on weather and temperature changes during eclipses. Their website also has a link to all of NASA's current citizen science projects, a fascinating collection (most of them not eclipse-related).

Best wishes to you all as this new year gets under way and may you all have many wonderful viewing and/or imaging experiences in 2024!

AstroSpace Update

January 2024

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

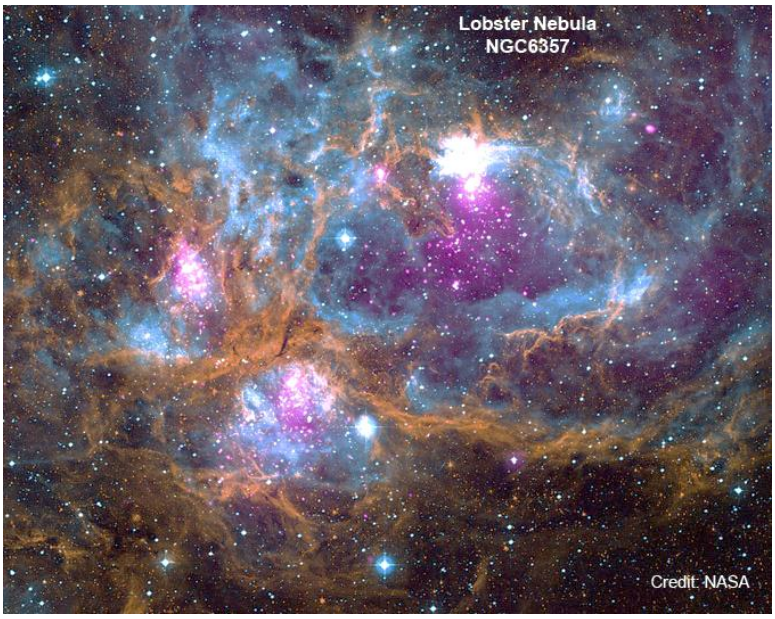
Exoplanet Atmosphere – The James Webb Space Telescope (JWST) was used to study the atmosphere of an exoplanet known as WASP-107b. The planet is in the Neptune mass class, but due to its expanded fluffy atmosphere, it is much larger than Neptune, nearly as large as Jupiter. The expanded atmosphere is due to its close orbit about its star, resulting in a high temperature, over 900°F in the outer atmosphere. This expanded atmosphere's lower density allows JWST to see much farther into the atmosphere than is normal for a gas giant planet. The new observations found silicate (sand) clouds, water vapor and sulfur dioxide. It was not expected to find sulfur dioxide. Apparently motions within the atmosphere bring sulfur to a place where temperatures support the formation of sulfur dioxide. Methane, which is frequently found in gas giants, was not seen in WASP-107b. The planet orbits a star that is a little less massive and cooler than our Sun. The system is about 200 light-years away in Virgo.

Another Exoplanet Atmosphere – JWST was also used to study the atmosphere of the exoplanet WASP-80b. In this case, methane was found. Starlight tends to destroy methane over time, so planets that exhibit methane must have a source that creates methane to replenish it. On Earth, much methane is sourced from life, but life is very unlikely to exist on a gas giant planet such as WASP-80b. Methane is seen on some other gas giants, so chemical reactions that produce it without life do exist. Water vapor was also found by JWST. The planet is classified as a warm Jupiter, with a temperature of about 1000°F, due to its proximity to its star. WASP-80b has about half the mass of Jupiter and orbits a main sequence star somewhat cooler than our Sun, lying 162 light-years away.

Resonant Exoplanets – Scientist have found that the 6 exoplanets orbiting a star known as HD110067 have resonant orbits. Every pair of consecutive planets has a 3/2 or 4/3 resonance. For a 3/2 resonance, the inner planet of a pair orbits exactly 3 times while the outer one completes 2 orbits. Astronomers believe that planets tend to form in resonance but are usually disturbed from resonance over their lifetimes. About 1% of planet systems observed exhibit resonance, implying the other 99% have been disturbed. So, the new discovery is quite unusual because all 6 planets have apparently remained undisturbed over their age of billions of years. This system is about 100 light-years away in Coma Berenices. The first detection of planets in this system happened about 3 years ago by the TESS planet-finding space telescope.

Exoplanet Mass Loss – A spacecraft known as CUTE is observing hot Jupiter exoplanets (gas giants hot due to their proximity to their star) using ultraviolet light. Hot Jupiters often are losing atmosphere, essentially blasting away from the heat. Such loss shows up easily in ultraviolet. What makes this really newsworthy is that CUTE is a tiny spacecraft, only 14 inches long. CUTE has measured the atmospheric mass loss from planet WASP-189b at about 880 million pounds per second. Its atmospheric temperature is about 5800°F. At the other extreme, CUTE found almost no atmospheric loss from planet KELT-9b, where the temperature is about 6800°F. CUTE is currently orbiting 326 miles above the Earth's surface but is expected to be brought down by atmospheric drag in 2027.

Planet Forming – JWST was used to study a planet-forming disk about a star in the Lobster Nebula (NGC 6357). This nebula is about 5500 light-years away in Scorpius. Many of the stars in the Lobster are very massive and therefore produce strong ultraviolet light, which tends to break down many of the molecules normally found in planet-forming disks. Some astronomers had expected not to find easily disrupted molecules in disks within the Lobster. However, the new observations found water, carbon monoxide, carbon dioxide, hydrogen cyanide, acetylene and silicate dust. These were found even in the inner part of the disk where rocky planets typically form. Thus, it appears that planet formation likely can occur even when bathed in strong ultraviolet light.



Exoplanet Collision – A group of astronomers found that the brightening and then dimming of a star was caused by a collision of two ice giant planets orbiting the star. At least 9 of these astronomers are amateurs. They contributed observations, including spectra, and found archived data regarding the brightening. The star is known as ASASSN-21qj because its dimming was first captured by the ASASSN automated supernova search. The star is about 1800 light-years away in the constellation Puppis.

Betelgeuse – The most accepted theory to explain the 2020 Great Dimming of Betelgeuse was that a cloud of dust caused it. A new study that included 15 years of archived data on the star from a robotic telescope with a spectrograph came to a different conclusion. Tomographic analysis showed 5 different layers of the star's photosphere. Two powerful shock waves traveling through those layers would cause the brightness variations seen in the Great Dimming.

Distant Disk – Astronomers discovered a planet-forming disk around a star in our neighboring galaxy the Large Magellanic Cloud. It's the first such disk found outside the Milky Way. The observation was made with the ALMA radiotelescope array in Chile. It was made as a follow-up to an observation made with the Very Large Telescope, also in Chile, which detected a jet at this star.

Distant Star Stream – A number of streams of stars are known about our Milky Way and some of the other nearby galaxies. The streams are believed to be the remains of tiny galaxies that were torn apart by tidal forces. Now the first really distant star stream has been discovered. It stretches between two galaxies about 300 million light-years from us. It is the largest stream yet known at about 10 times the length of the Milky Way. The discoverers are calling it the Giant Coma Stream.

Probable Hypernebula – A hypernebula is a cloud of magnetized plasma (electrically charged gas) that is illuminated by a powerful nearby source. A team of astronomers has found an apparent hypernebula that appears to be associated with a source of repeating fast radio bursts (FRBs). This was observed by the European very long baseline radiotelescope network. This is only the second case known of an FRB source illuminating a hypernebula. The FRB was discovered with the FAST 500-meter radiotelescope in China. The source illuminating the hypernebula is suspected to be a magnetar (extremely magnetic neutron star), which could also be the source of the FRBs. The radio observations showed the hypernebula to be at most 30 light-years across.

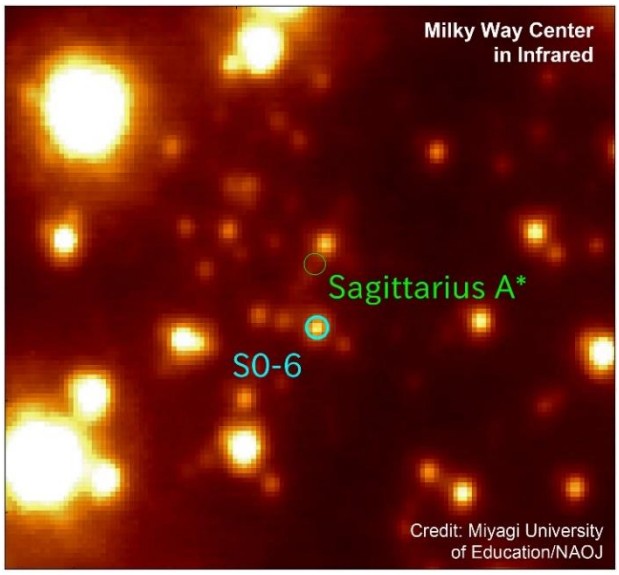
Carbon in Distant Galaxy – JWST took a deep field image to look for very distant galaxies. One of the galaxies found had a surprising amount of carbon in its spectrum. Other lines seen in the spectrum are possibly from oxygen and neon. We are seeing this galaxy as it was when the light left it, merely 350 million years after the Big Bang. Elements heavier than hydrogen and helium, which are necessary to build planets, accumulate slowly through the actions of stars and supernova explosions. Thus astronomers had expected little carbon to have accumulated in this young galaxy. It has a redshift (a measure of how far back in time we are seeing) of 12.5. This is the largest redshift of any galaxy that has been confirmed by spectra. It took 65 hours of exposure time to get this spectrum due to the faintness of the galaxy.

Unexpected Nickel – Astronomers using JWST employed an unusual technique to get spectra of very faint galaxies. 23 galaxies seen fairly early in the history of the Universe were selected and their spectra were added together to get a brighter spectrum that was the average of all of those galaxies. The galaxies that were selected were from a time when they were going through growth spurts. The astronomers looked for light emission from nebulas, which are an indicator of spurts of star formation. These nebula emissions showed spectral lines of hydrogen, helium, nitrogen, oxygen, silicon, sulfur, argon and nickel. All of these are expected in nebula emissions except nickel. The nickel is giving theorists plenty to explain. The other elements heavier than hydrogen and helium give indications of how much material had been processed through stars and supernovas.

Gamma-Ray Burst – Scientists found that a distant gamma-ray burst was powerful enough to disturb the Earth's ionosphere. The gamma rays were caused by a supernova explosion about two billion light-years away. The burst lasted 800 seconds, which is unusual for a gamma-ray burst. It was probably the brightest gamma-ray burst ever seen. The effects on the ionosphere were similar to those caused by a major solar flare.

Gravitational Lensing Search – Strong lensing occurs when a massive foreground object gravitationally bends the light from a more distant object, thus magnifying and distorting the more distant one. Astronomers like to find these strong lenses because it allows them to see objects that are more distant and dimmer than is possible without lensing. A team of researchers trained a computer to sift through images of the sky and identify the strong lenses. This was done using a huge sample of images with lenses and non-lenses. The program was applied to images taken with the Dark Energy Camera on the Victor Blanco Telescope in Chile. That camera is imaging huge areas of the southern sky in detail. The results selected by the computer were then examined by eye. 581 instances passed the final eye test as being strong lensing, of which 562 were not known before.

Intruding Star – Using infrared, astronomers are able to see through the intervening dust to the center of our Milky Way galaxy. They have been monitoring for many years the progress of several stars that are orbiting about the central supermassive black hole, which is known as Sagittarius A*. A recent study of those stars showed that one of them, designated SO-6, does not match the composition of stars that formed near the Milky Way center, but instead matches stars found in small galaxies near our galaxy. The star is more than 10 billion years old, so has had time to travel from a nearby small galaxy. This is the first star found near the center of the Milky Way thought to have originated from outside our galaxy.



Fermi and Pulsars – A team of astronomers has released a new catalog of the 294 gamma-ray pulsars that have been discovered by the Fermi Gamma-ray Space Telescope since its launch in 2008. Most of the 3400 known pulsars are seen to pulse in radio waves, with only about 10% of them pulsing in gamma rays. More than 80% of the known gamma-ray pulsars were discovered by Fermi. Only 11 were known before Fermi launched. Pulsars are neutron stars that emit beams, and this causes us to detect pulses when the beam rotates past Earth.

Chiron's Rings – Chiron, a body orbiting the Sun beyond Saturn, was declared at its discovery in 1977 to be an asteroid. Later comet-like activity got Chiron a comet designation also. Chiron was the first Centaur, the class of asteroids orbiting beyond Jupiter but inside Neptune (though different authorities have varying definitions of the class). Later analysis of Chiron eclipsing a star in 2011 showed that it had two rings. Two new analyses of Chiron eclipses show that there are now 3 rings and properties of the rings, such as density, have changed. The changes may be related to cometary outburst behavior, though there are other possible causes. Only one other Centaur, Chariklo, out of the hundreds of Centaurs now known, has been observed to have rings.

Hubble Safe Mode – The Hubble Space Telescope (HST) was in safe mode, performing no science observations, from November 23 to December 8. The reason was fluctuating readings from one of the gyros, which are used to point and stabilize the telescope. Tests show that the gyro operates correctly when in a high-precision mode, so operations will now be made in that mode. HST normally operates with 3 gyros, one for each dimension, but can be operated with as little as one gyro. Of the 6 gyros installed in 2009, 3 have failed entirely. Without Space Shuttles, parts in HST can no longer be replaced. At least one gyro is expected to remain working for many more years.

Contact-Binary Moon Named – It was reported here last month that a contact binary moon was found orbiting the asteroid Dinkinesh in images taken by the Lucy spacecraft. A contact binary is what appears to be two asteroids but are actually touching. The International Astronomical Union has accepted an official name for the contact binary: Selam, which means "peace" in the language of Ethiopia. Selam is also the name of an early human-like fossil discovered in Ethiopia, as is Lucy.

Halley's Comet – Many of you readers will remember when Halley's Comet swung through the inner Solar System in 1986. Seeing the comet was called a once-in-a-lifetime experience because each orbit takes about 75 years. On December 9, 2023, Halley's reached halfway around its orbit, that is, reached its aphelion (farthest point from the Sun). How time flies when you are a comet. Halley's has not been observed since the Very Large Telescope imaged it in 2003 at magnitude 28.

Another Look - Perseus

January 2024
Dave Phelps

The new moon in January is on the 11th at 0657. The Full Moon is on Thursday, January 25, at 1254.
January's Full Moon is the Wolf Moon. Other Native American names are the Goose Moon, Center Moon, Cold Moon, Freeze Up Moon, Hard Moon and Spirit Moon. Anglo Saxon names are Moon after Yule and Snow Moon. In Spanish its Luna Nueva de Enero, in Greek its Νέα Σελήνη Ιανουαρίου – Néa Selíni Ianouaríou, in French its Nouvelle Lune de Janvier, in Ukrainian its Січневий Молодик – Richness Molodyk.

The 8th, 9th and 10th of January are big days. Mercury is highest in the sky. There is a conjunction of the Moon and Venus and Antares will be occulted, on the 9th the moon and Mercury are conjoined and on the 10th, its the Moon with Mars. The Moon has a conjunction with Saturn on the 14th and Jupiter on the 18th. On January 20, the Moon will be less than a degree from the Pleiades.

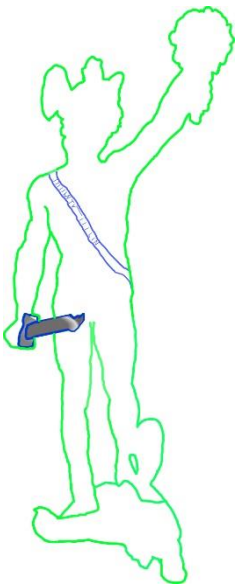
> Perseus - seek for by her feet,
> Which, ever at his shoulder, are revolving.
> Tallest of all his compeers at the North
> He towers. His right hand stretches toward the chair
> Of his bride's mother.
>
> Frothingham's Aratos

Perseus the champion, the French Persee, the Italian Perseo, and the German Perseus, formerly was cataloged as Perseus et Caput Medusae. Perseus is a member of the Cepheus/Cassiopeia family, whose members are Cepheus, Cassiopeia, Andromeda, Perseus, Pegasus and Cetus. Perseus is also a member of a different group of constellations, not often identified as such.

In prehistory, men and woman began to combine the stars into individual groupings and give those groupings identity and meaning. There is Sirius the Dog star rising at the beginning of summer heat. Water carriers and wheat carriers rising as the rivers begin to flood and bring back life. Many of these myths abound from the era of Gilgamesh and even earlier, from Homer and the later Greeks and finally to Ptolemy who codified the star shapes for the cartographers and globe makers that followed.

If we go back even before the "modern" civilizations of the Nile, Jordan, Tigris, Ganges, Mekong, and Yangtze, there are mud walled civilizations growing around these riverbanks determined to understand their place in the world.

These civilizations looked at the stars for meaning, help and understanding. Andromeda is one story in the chapter of human sacrifice, one saved by a hero who killed not only the Sea Monster but also a Gorgon whose gaze turned men to stone. The story of Andromeda and Perseus marked the end of an eon where the sacrifice of a child could abate the humor of a god.



Perseus is also a member of a different community of constellations, ones that portrayed winning against the direst adversaries. Hercules against the fetid swamp (portrayed by Hydra), Ophiuchus fighting death, represented by a snake's bite, Sagittarius, a man and a horse, aiming his arrow at the Scorpion. There is Orion, fearless against the stampeding bull and Sagitta, the arrow that killed the Eagle tormenting Prometheus and maybe of most important is Centaurus, the Centaur Chiron, whose weapon was education – to kill ignorance.

Seven constellations show a Man's and a Woman's indomitable spirit, alive in the unfathomable, though consigned to a short, brutal, sad and ugly life.

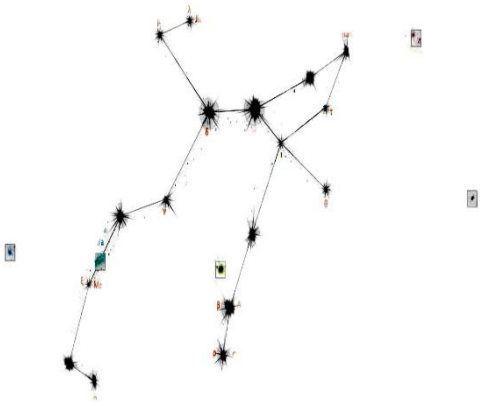
Perseus was the son of Jupiter and Danae. Danae was imprisoned by Jupiter who then turned himself into a shower of gold and landed in her lap. So begot Perseus. Then they were crammed into a box and thrown into the Aegean, rescued, and raised as a fisherman's son. The stories vary at this point, ending when he agreed to kill Medusa. He got some help from the gods: wings, a diamond sword, an invisibility helmet and a copper shield that reflected like a mirror. You know the story from here. He takes the head, turns a bunch of people and a sea monster into stone, along with a giant who became a mountain range, marries a girl named Andromeda, has many kids and lives happily ever after.

There are several intriguing postscripts to the story, however. One is of their son who was named Perses, taken 4000 years ago by Persian astrologers and made their own. Another recalls Medusa's head as it rolled to the ground. From her blood the winged horse Pegasus was born fully formed as was the armed warrior Chrysaor. These children, born of a Gorgon, were fathered by none other than Poseidon. Since Medusa is a Gorgon, her hairs are snakes, her hands brass, her body scaled, and growing from her back are yellow wings. Imagine the tryst between those two?

Perseus next,
Brandishes high in heaven his sword of flame,
And holds triumphant the dire Gorgon's head,
Flashing with fiery snakes! the stars he counts
Are sixty-seven; and two of these he boasts,
Nobly refulgent in the second rank —
One in his vest, one in Medusa's head."

Double Cluster

NGC1499 California Nebula



Credits: Don Lynn
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https://ocastronomers.org/wp-content/uploads/2019/01/calif01.jpg

I have always seen a waterfall. Curving across from Cassiopeia to Capella is this beautiful waterfall of stars spilling across the night sky. That's been Perseus for me. That and the Double Cluster (Caldwell 14, NGC 869 & NGC 884, h & χ). Then the California Nebula. (NGC 1499) Back then it was faint and hard to see, easier with today's filters. Also in Perseus was the reason I went up to Lone Pine each August to watch my favorite meteor shower.

No less a person than Serviss, in his "Astronomy with an Opera Glass" said: "With a telescope of medium power, it is one of the most marvelously beautiful objects in the sky – a double swarm of stars, bright enough to be clearly distinguishable from one another and yet so numerous as to dazzle the eye with their lively beams." Wow, there's some writing for you.

Perseus is packed. A significant portion of its 615 square degrees lies in the Milky Way. There are 20 exoplanets and Burnham lists 126 double and multiple stars, 73 variable stars, 10 star clusters, 6 diffuse nebula, 2 planetary nebula and 7 galaxies brighter than 14th magnitude; and this is just the easy stuff. Out of 20 exoplanets in Perseus are two that are named. One HAT-P-15, called Berehynia, is a 12th magnitude star with a Jupiter sized planet named Tryzub.

Berehynia is the Ukrainian goddess of nature, representing the strength, resilience, and wisdom of Ukrainian women. The painting here is by Pollypop92, trade name for Ukrainian artist *Polina Skurykhina*. The planet Tryzub, is Ukrainian for Trident. It comes from the coat of arms of a Ukrainian royal house and its image is still prevalent across Ukraine today. The other named exoplanet comes from Denmark. HAT-P-29, named Muspelheim, is 11th magnitude. Muspelheim is guarded by its hot Jupiter sized planet named Surt. Muspelheim is a land of fire, home to the giants and guarded by Surt, the fire giant.

In the midst of this clash and din the heavens are rent in twain,
and the sons of Muspell come riding through the opening.
Surt rides first, and before him and after him flames burning fire.
He has a very good sword, which shines brighter than the sun.
As they ride over Bifrost it breaks to pieces, as has before been stated.
The sons of Muspel direct their course to the plain which is called Vigrid...
The sons of Muspel have there effulgent bands alone by themselves.
From the Prose Edda section Gylfaginning

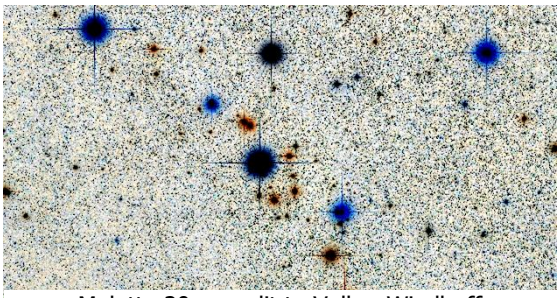
Alpha **α** Persei is Mirfak, meaning elbow, Atik, **ο** Omicron – shoulder, Menkhib, **ξ** Xi – shoulder and Miram **η** eta, Misam **κ** kappa Persei – his wrist and Seif φ Phi Persei - sword. Of some interest are the stars of Medusa's head. **ρ** Rho Persei is Gorgonia Tertia, **ω** Omega Persei is Gorgonia Quarta and **π** Pi Persei is Gorgonia Secunda. Not named as such, also in the head is 2nd magnitude Algol, **β** Beta Persei, the demon star.

"Its horror and its beauty are divine.
Upon its lips and eyelids seem to lie
Loveliness like a shadow, from which shine,
Fiery and lurid, struggling underneath,
The agonies of anguish and of death." Shelly

Other stars in Perseus with a Bayer designation are **ζ** Persei, **γ** Persei and **δ** Persei. An interesting star is X Persei, near **ζ**, at the foot. X Per is a 6th magnitude main-sequence(?) star with a neutron star companion. X Per is slightly variable, probably because of the rise and fall of expelled material.

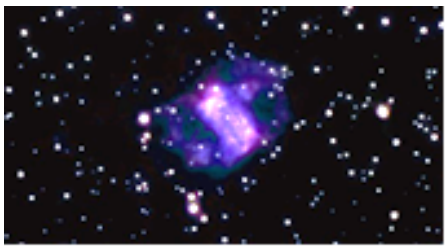
A Persei is a 1st magnitude star and noticeable as the brightest member of open cluster, Melotte 20. Melotte 20 has about a dozen members 6th magnitude and brighter and includes **α, σ, ψ** and **δ**. Melotte 20 also goes by the name "**α** Perseus" cluster and Collinder 39.

Bernd Gooßmann
https://www.astrobin.com/g6msx3/?q=ic 348 & NGC1333

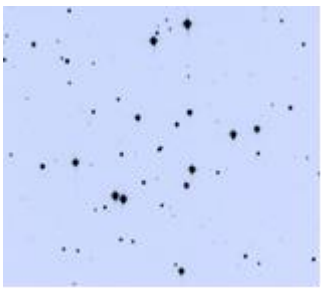


Melotte 20 – credit to Volker Wiedhoff
https://www.astrobin.com/us7wq1/?q=melotte 20

The Perseus Molecular Cloud has Barnard's dark nebula 1 through 5, IC 333 and IC 348 and is home to our neutron star X Persei. It is like an invisible M42, a stellar birthplace with a mass of 10,000 stars.



M76



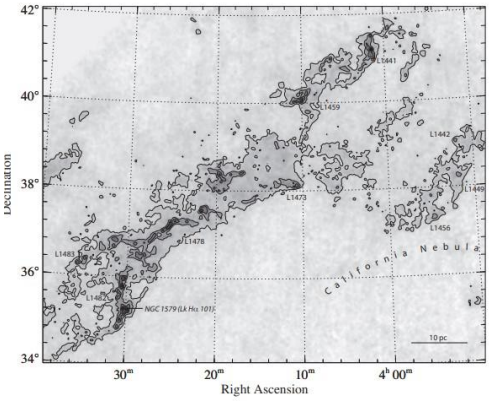
M34

Ngc1579

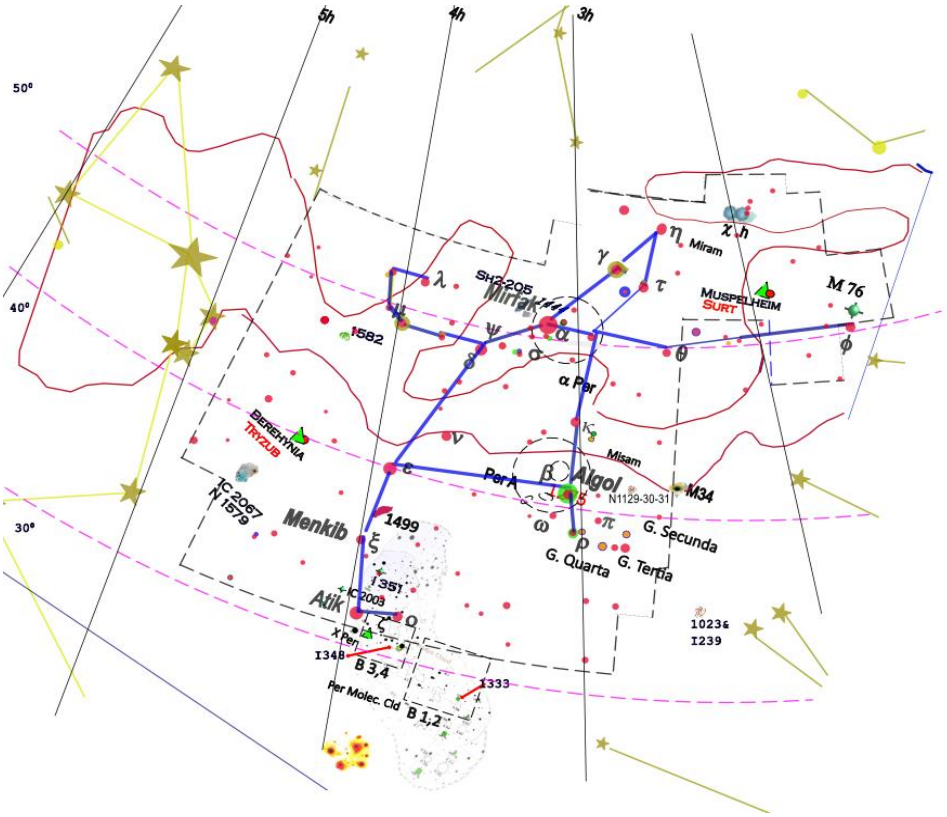
https://ocastronomers.org/wp-content/uploads/2018/12/M76.2-6LRGBP2sm.jpg credit Dave Radosevich & Don Lynn.
https://ocastronomers.org/wp-content/uploads/2019/01/m034

The two Messier's in Perseus are M76 and M34. M76 is 10th mag., a fuzzy spot in your binoculars. Of the two, M34 is the brighter at 5th magnitude. Once you look at M76 in your telescope, however, you will understand some of the issues with which early astronomers had to deal. M76 has two NGC #'s, 650 and 651. You will easily see the double lobe of the planetary that confused our earlier brethren.

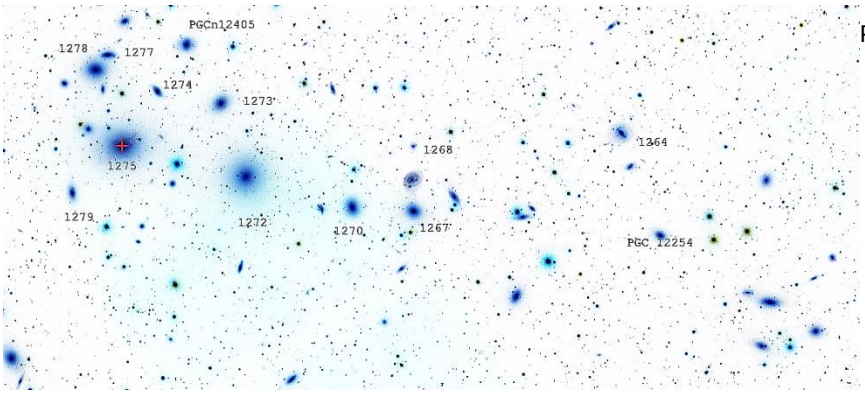
There are eight planetary nebulae potentially visible in Perseus, one Messier (M76), two IC objects, (IC's 351 and 2003, in the 12th magnitude range), two Abell planetaries, (A's 4 & 5, in the 16th magnitude range), two Minkowski planetaries, (M1 2 & 4), only one potentially findable in the 13th magnitude range, and one Böhm-Vitense, (BV 3) in the 14th magnitude. IC 351 is near **ξ** in the molecular cloud. IC 2003 is a little closer to the boot, on the edge of the cloud.



A fun little nebula is over on the west side of Perseus near the Auriga border. NGC 1579 is an H II region and IC 2067 is a bright nebula nearby. They are a part of the California Molecular Cloud, shown on this chart from a series of professional papers. You gotta figure, that if we can pick up the wisps in M57 and NGC 6960 et. al., we will be looking at it visually the next really dark, really clear night.
https://lweb.cfa.harvard.edu/~clada/pubs_html/pubs/california.pdf



Another huge stellar association in Perseus is Abell 426, the Perseus Cluster and part of the Perseus-Pisces super-cluster. Abell 426 is one of the most massive objects we've found. It has millions of galaxies floating in a medium of superheated gas. Perseus A, a 12th magnitude spiral, is also Caldwell 24. Abell 426 is anchored by NGC 1275, Perseus A1. Not in the image is NGC 1265, an elliptical brilliant in the radio frequencies.



Perseus Cluster – Abell 426

Dark Skys

*** Slightly abbreviated by the editor ***

From the Editor

Due dates for submission of articles, pictures and advertisements

Issue	**Due date**
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

- Orion StarShoot AutoGuider further reduced price $ 200
- Tele Vue 8mm plossl 1.25" eyepiece $ 80
-

For Sale contact Eric Mjolsness emj@uci.edu

- 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.

For Sale contact Val Akins akins7821@gmail.com 949-301-5956

- 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

For Sale contact Ami Dvir amiaddvir@gmail.com 949-294-1073

- 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

- 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 Bill Frank 949-254-4662 cell

- LX200 Maksutov-Cassegrain telescope with cover, Meade mount, base controller, $ 500 OBO
  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: Teleview 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

Photos are available here: https://tinyurl.com/h3e6hxcn . Please call me to arrange inspection / pickup / delivery.

For Sale contact Roger Mills 909-627-4122

- 8 inch pyrex mirror plank ground and polished to f/7 with polishing tool and materials $ 200 obo
- Fiberglass telescope tube 9.25 inch O.D., tube rings, equatorial mount, synchronous drive,
  counterweight, Book: "Making Your Own Telescope" by Allyn J. Thompson.
  The mirror has not yet been figured to parabolic shape

For Sale contact Nick McMillan wforacer@rocketmail.com

- Technical Innovations Pro-Dome Ten-Foot (PD10), includes three Wall-Ring-PD10 (WR10) which add ~48" height to the walls and making it 10' tall and 10" wide. $ 5000
- 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 Flicker here: https://www.flickr.com/photos/123906448@N08/albums/72177720309596327/.
The dome and components must be picked up in Costa Mesa.

For Sale contact Barry Acton 714-603-2182 cell

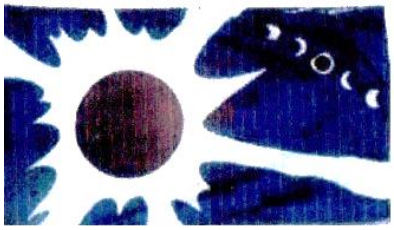
- Meade LX200R GPS & Tripod (with original box). New is priced around $5,500 $ 2000
- Meade Zero Image-Shift Electronic Micro-Focuser
- Meade AutoStar II Hand Controller, manual
- Eyepiece Meade Meade 26mm Plossl 5 Element 1 1/4"
- 1.25" 90° Mirror Star
- Other accessories that came with the telescope…

- 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 Kandra Kargo teapotsagit@earthlink.net 714-349-9137 cell

- 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.



For Sale contact Jerry Floyd jlfloyd720@gmail.com

- Celestron CG-11 scope (Losmandy G-11 Equatorial Mount with Celestron C-11 Telescope) $1000
  No tripod
  High-precision brass worm (purchased as upgrade from Losmandy), Gemini-1 control unit including motors, Counterweights, Finder-scope, Telrad finder, dew shield for telescope

Originally purchased as a single assembly in 1996; little used in the past few years but in good shape
Can demo if interested, but you would have to come to my observatory at the OCA Anza site
These items are for local delivery in Southern California only. If interested, contact me for further information.

Help Wanted (Volunteering Opportunities)

- Communications Coordinator doing social media presence and announcements to members.
- Outreach coordinator, assistant coordinator, volunteer at outreach events

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