SIRIUS ASTRONOMER

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The Newsletter of the Orange County Astronomers

January 2023 Free to members, subscriptions $12 for 12 issues **Volume 50, Number 1**

This is NGC2359, a southern sky nebula sometime scalled Thor's Helmet. It was imaged by Jerry Floyd from the OCA Anza site in January 2022 using a C-11 SCT scope, focal length reducer, and ASI1600 mono camera..

Upcoming Events - free and open to the public

Beginner's class	Friday, 3 February at 7:30 to 9:30 PM **ONLINE** This is session 6 of the class covering different types of imaging, how different types of cameras are used for this kind of photography, and other equipment and considerations for taking a good picture. This session is taught by Kyle Coker. Check OCA website to see if this class is also meeting onsite.
Club Meeting	Friday, 13 January at 7:30 to 9:30 PM **In person** at Chapman University and **ONLINE** "What's Up?": Chris Butler Main speaker: Jon Lomberg and the talk will be "Cosmic Artist: The Work of Jon Lomberg"
Open Spiral Bar	Saturday, 14 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, 21 January at the OCA Anza site ??? Irvine site dates are yet to be determined

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

President's Message

By Barbara Toy

As I write this, it is our annual Season of Lights, when lots of tiny lights suddenly adorn all sorts of buildings, bushes, tree-trunks, and even non-stationary objects – I've seen some remarkable displays this year on wagons, baby carts and even cars and trucks. Astronomer though I am, I rather enjoy all the decorative lights and other elements of creativity you see around this time of year, and I haven't really inquired into how much it all might add to local light pollution levels in December and early January.

In the past, all these additional lights conveniently went away after New Year's, when there was more time for astronomical activities anyway, once holiday activities were behind us. In the last few years, though, I've been noticing more places that keep this type of lighting in place, particularly golden-white lights wrapped around tree trunks or other pole-like objects or along the edges of roofs. There also have been more and more of the larger light-bulbs-on-a-string assemblages that are used to form a type of lighted ceiling over outdoor spaces, some commercial and some around private residences. A lot of these additional lights in our landscapes are left on all night, and since they are all unshielded bulbs, they send out light in all directions and add to light pollution in areas where they are used.

More intense outside light sources, such as upward-directed landscape lights, also seem to be on the increase, at least in the area where I live. And there are also the ongoing problems with unshielded "security" lights, street and parking lot lights (though I've noticed that a significant number of them these days are shielded so more of the light they produce is directed downward than in the past, so there have been some improvements), and commercial lighting – gas stations and car lots are generally among the biggest glare producers.

All of these add to the light domes over cities – from our Anza site, light domes blot out a lot of the sky to the south, west and north. The area to our east and south-east is still pretty dark, and hopefully won't degrade too fast, as a lot of it is a preserve. In general, our Anza site still benefits from its location in the Palomar Protected Zone, put in place to help Palomar Observatory, but that zone unfortunately is not as strong a shield against excess lighting as it was when it was first established.

The International Dark Sky Association (IDA) has been working for years to reduce light pollution and protect and improve dark skies. If you have any interest in these issues, their website (darksky.org) is an incredible source of information, and they could use your support.

If you are interested in working on lighting and dark sky issues locally, that is great. We have not been able to get a special interest group in our club together to work on these issues so far, though that is something that would benefit anyone who is interested in viewing or imaging the night sky from Orange or LA Counties. Some efforts were made in that direction in the past, and it would be a valuable addition to our activities.

If you are interested in helping to get such a group together, please let me know, and maybe I can help connect people who have interests in that area. There are a lot of activities a dark sky group could get involved in, from education and improving specific light sources at the very local level to working with city and county governments on lighting issues, and lots of possibilities in between. It would be really great if our club could get actively involved in this area. Getting some kind of dark sky group going would help make 2023 a really great year!

Still Need a New Outreach Coordinator…

Another area of even more urgent need is our Outreach Program. Since Ceci Caballero had to leave the position of Coordinator, we haven't been able to schedule any outreaches – and the schools, in particular, really want to see the program back on track.

Over the years, our Outreach Program has done a wonderful job of connecting young people and other members of the public with the universe around us by showing them some of the incredible objects they can see through the eyepiece, even from urban areas, and discussing what they are seeing with them. We've done other types of outreach but viewing through telescopes at schools and sometimes parks and other locations has been the heart of the program. It would be a real loss to the community and to the club to have the program go inactive – but we can't reactivate it without a new Coordinator.

If you have any interest in helping to educate the public about astronomy, please consider volunteering for this position. If you have any questions about how it's been organized and how it's worked in the past, or anything else about the program, I'm sure Ceci (ceci@ocastronomers.org) would be happy to discuss it with you. If you're interested in volunteering for this position, you can contact me (btoy@cox.net), Charlie Oostdyk (charlie@ocastronomers.org) or Alan Smallbone (alan@ocastronomers.org).

December's In-Person (Hybrid) Meeting:

The hybrid meeting in December went forward as planned, with parts done in person from the auditorium at Chapman University, and parts done remotely via Zoom. There were a few glitches, but overall I think it went pretty smoothly, and Tim Hogle gave us an excellent talk on the history, current activities and likely future of Voyager. In addition to the formal proceedings, for those of us in the auditorium it was great to see people in person, and as far as I know nobody suffered ill health as a result.

As I write this, we're expecting that the January meeting will go forward similarly, as a hybrid, though I believe the speaker will be remote. As a reminder, the election for the 2023 Board ends at the end of the January meeting, and those who attend in person will have the option of turning in their ballots at the meeting if they haven't already voted. One way or another – please get your ballots in! And may you all have a wonderful New Year in 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 **monthly club meeting**
Meeting via Zoom:	**Monthly club meeting**, Beginner's Astronomy class
Coming soon:	Orange County Star Parties
Cancelled until further notice:	AstroImaging SIG
Check with Coordinator:	Outreach events

Carpooling OC to Anza contact Gene Kent 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.

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 .

Due dates for submission of articles, pictures and advertisements

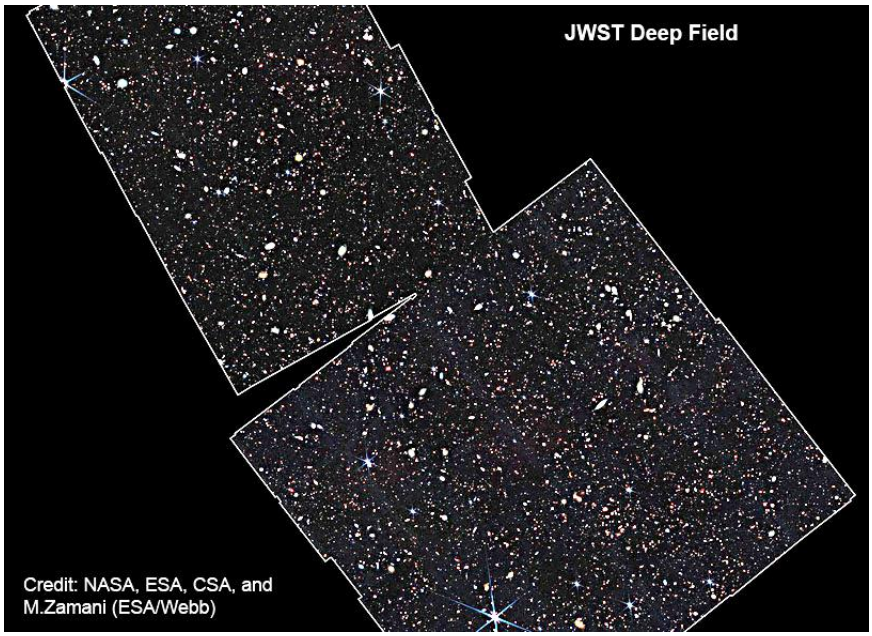
Issue	Due date
February	21 January
March	18 February
April	25 March

AstroSpace Update

January 2023

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

Distant Galaxies – The James Webb Space Telescope (JWST) followed up its earlier observations of extremely distant galaxies by taking spectra. This yields redshifts and distances more accurately than the earlier analysis using filters rather than spectra. The spectra confirmed that two of the galaxies studied were so distant that the light left there only 330 million years after the Big Bang. These were the faintest infrared spectra ever taken. Astronomers will continue to take spectra of distant galaxies using JWST, so this record distance may be exceeded. Images taken of roughly the same area of the sky as the famous Hubble Ultra Deep Field image showed over 100,000 galaxies, far more than Hubble found.



Star Formation – Analysis of the JWST image of a segment of the Carina Nebula known as the Cosmic Cliffs revealed dozens of young stars in an earlier stage of development that is not often seen because it is usually hidden by dust clouds. The infrared light used by JWST penetrates dust. The Cosmic Cliffs image taken through filters that isolate certain infrared wavelengths were used in this analysis. This stage shows forming stars generating jets and outflows. As forming stars gather gas and dust gravitationally, a fraction of that material is thrown outward in jets or outflows. This stage lasts a relatively short time in the life of a star, so has not been observed often.

Exoplanet Atmosphere – The James Webb Space Telescope (JWST) took spectra of the atmosphere of exoplanet WASP-39b and identified, among other components, water, sulfur dioxide, carbon monoxide, sodium and potassium. This is the first detection of sulfur dioxide in an exoplanet's atmosphere. The observations looked for methane and hydrogen sulfide also but did not find detectable amounts. The data also showed signs of clouds and of chemical reactions driven by its star's light. The planet is a hot Saturn, in that it is about the size of Saturn but orbits its star so closely that it is quite hot. It is about 700 light-years away. Oxygen was found to be more abundant than carbon, which would imply the planet formed farther from its star (and therefore cooler) than currently experiencing.

Super-Earths – A team of scientists announced the discovery of 2 super-Earth exoplanets (rocky planets somewhat larger than Earth) orbiting a star known as TOI-4306. The first was discovered by TESS, the planet-finding space telescope, and follow-up observations by the SPECULOOS telescopes in Chile found the second. The star is a small cool red dwarf about 100 light-years away and has accumulated the aliases SPECULOOS-2 and LP890-9. The first planet is 30% larger than Earth and orbits the star in 2.7 Earth days, while the second is 40% larger than Earth and orbits in 8.5 Earth days. Though this sounds like orbiting awfully close to its star, the second is actually in the habitable zone, that region where temperatures would allow liquid water to exist, because the star is so dim. The scientists hope to detect and analyze atmosphere of this planet, probably with JWST.

Eclipsing Quadruple Star – TESS not only finds planets, but also finds eclipsing binary and multiple star systems by monitoring their changes in brightness. One particular find, dubbed TIC 114936199, had astronomers baffled because no simple star system could explain the complex series of dimmings. They ran millions of star system simulations on a supercomputer and finally found a match: a pair of stars, now called components Aa and Ab, are in tight orbit about each other, eclipsing each other every 3 days; star B orbits that pair at a somewhat greater distance, and star C orbits the other 3 at a great distance. Star C only participates in eclipses for short periods during some of its orbits, making the pattern of eclipses complex. Star C is predicted to participate in eclipses again next in 2025 and 2071.

Light Between Galaxies – A team of astronomers used a new technique to find faint background light between galaxies, which is being called "intra-group light". What they found was about 50 times fainter than the darkest night sky. The technique subtracts the light of every known object in an observation to see what light remains. It is believed that stray stars between galaxies contribute this intra–group light. Analysis of this light shows it came from stars that are younger and poorer in heavy elements than the stars in surrounding galaxies. The galaxy group used in this work is about 2.5 billion light-years away. This team plans to use this technique on many other galaxy groups.

Artemis – The Orion space capsule, with its 3 test dummies, made a successful parachute-assisted landing in the Pacific on December 11 to end the test of the SLS rocket sending the Artemis I mission around the Moon and back. That SLS rocket also launched 10 shoebox-sized spacecraft to gather data on radiation, lunar surface ice, a solar sail, space weather, images of the Moon in infrared, deploy a lunar lander, and more. Several of the craft are not in contact with the ground stations, and so may be experiencing failures. Such low-cost tiny satellites often do fail.

Water Exoplanets – Astronomers announced the discovery that two super-Earths have densities indicating they must contain far more water than Earth, implying they should have oceans roughly 1000 miles deep. Both orbit the star Kepler-138, a red dwarf 218 light-years away in Lyra. Spectra of water have not been observed, but the density is best explained by large water contents. They are probably too warm and under pressure too high to support life. The atmospheres are likely dense steam. There are 2 other planets in the system, one of which is in the habitable zone. However, the habitable-zone planet does not transit its star, so its size has not been determined, nor has its density. The other of the 2 orbits closer than the water planets, so is likely hot, and is roughly the size of Mars.

Lava Covered Exoplanet – A new study was made of the exoplanet 55 Cancri e, which was already known to be so hot that lava must cover its surface. The IAU officially named this planet Janssen, after Zacharias Janssen, who was possibly associated with the invention of the telescope and the compound microscope. Its star was named by the IAU Copernicus, of course after the famous astronomer. The new study found that Janssen orbits Copernicus in the plane of the star's equator, unlike the other planets in the system. This was determined by measuring the Doppler shift of the part of the star being covered as the planet transits the star. This delicate measurement was made with the Lowell Discovery Telescope in Arizona. The new data implies that Janssen formed farther out and then moved inward due to gravitational interaction with other bodies while also changing its orbital plane due to tidal forces from Copernicus. Janssen is a super-Earth, likely rocky with about twice the diameter and 8 times the mass of Earth. Its year, or orbital period, is just 18 hours. This puts it so close to Copernicus that it is heated to lava temperatures.

Milky Way Halo – A new study found that the Milky Way's stellar halo, which was long assumed to be spherical, is instead shaped more like a rugby ball and is tilted with respect to the galaxy's plane. The stellar halo stretches out several hundred thousand light-years around our galaxy, much larger than the visible disk of the galaxy. It is believed that the stars that comprise the stellar halo trace out the shape of the halo of dark matter, implying that the dark matter may also be non-spherical and tilted. The new study used data from the Gaia space telescope and from the H3 survey, a ground-based-telescope study of halo stars. The new study results agree with theories that show the stellar halo being formed during a collision of a small dwarf galaxy with the Milky Way 7 to 10 billion years ago, stripping stars from the dwarf and sending them into orbits outside the Milky Way's disk.

Galaxy Poor in Heavy Elements – A dwarf galaxy known as HIPASS J1131-31 was observed by the Hubble Space Telescope. It has been given the nickname Peekaboo Galaxy because a very bright foreground star is, over the years, moving away from obscuring it with glare. Peekaboo was found to be quite poor in elements heavier than helium, strangely termed "metals" by astronomers. Galaxies in the early history of the Universe were similarly poor, but most galaxies easily seen today have accumulated heavier elements, which normally build up in stars over billions of years. Peekaboo is giving astronomers a chance to study a nearby galaxy that harbors conditions normally seen only in the early Universe. It is only 1200 light-years across, far smaller than our Milky Way. Hubble was able to resolve about 60 stars in Peekaboo, almost all of which are fairly young, at most a few billion years old. It is planned to study this galaxy further with both Hubble and JWST.

More Background Glow – Analysis of 200,000 archived Hubble Space Telescope images found a background glow that is likely caused by particles shed by comets. This analysis used a technique similar to that which found the intra-group light, that is, subtracting light from known objects to see what remained. It appears to be a shell of particles, uniform in all directions, located outside of the dust that causes the zodiacal light. A previous search for background light made by the New Horizons spacecraft from beyond Pluto's orbit seems to show that most or all of the background light that Hubble just found comes from particles closer to the Sun than where the New Horizons search was done.

Meteor Predicted – The Catalina Sky Survey, a program to discover asteroids, found a small one, dubbed 2022 WJ1, that was calculated to hit Earth. It was small enough (perhaps a yard across) to likely cause no damage. Forewarned by about 3 hours, astronomers were able to observe it streak as a meteor over southern Ontario, Canada. This is the 6th time in history that an asteroid has been discovered and tracked to a collision with our planet. There is a chance that meteorites from this might be found near the towns of Grimsby and McNab, somewhat west of Niagara Falls.

Brilliant Flash Explained – The Zwicky Transient Facility uses the Palomar 48-inch Schmidt camera to repeatedly image a huge fraction of the sky every night, looking for changes. Of the thousands of changes it finds, one was an extremely powerful flash, dubbed AT 2022cmc, which triggered follow-up observations in multiple wavelengths from X-rays to radio. The most likely cause of the flash was found to be a supermassive black hole that tore apart a star that came too close, an event known as a tidal disruption event, or TDE. When the distance of this event became known, it was calculated that the flash gave off light a quadrillion times as luminous as our Sun. Normally TDEs do not appear this bright, but this one formed a jet that spit out some of the star's material that was falling toward the black hole, and the jet happened to be aimed at Earth, making it appear so bright to us. The TDE is so distant that its light took 8.5 billion years to reach us, making it the farthest TDE yet observed. Three previous TDEs with jets aimed at us have been observed, and this was the brightest.

Supernova Study – A team of astronomers looked through archived Hubble Space Telescope images that happened to be of areas of the sky where supernovas have been seen since Hubble was launched. The hope was to find a star where a later supernova was seen, and then show that star had disappeared after the supernova. Astronomers would very much like to know the properties of stars that are about to blow up (termed supernova progenitors), and this is the best way to find that. Showing that a star has disappeared is necessary, because this rules out that the star in the "before" picture just happened to appear near the about-to-explode star. Six good candidates were found in the new study. The study also looked at how these 6 explosions themselves developed to learn more about the mechanisms that make supernovas glow so brightly for months. One of the 6 (SN 2016gkg) was found to be a core collapse supernova of a star that was interacting with a close companion, that is, material was being exchanged between the pair. The star that exploded had been stripped of much of its outer layer by the companion star's gravity.

Venus Phosphine – Over the past 2 years, various teams of astronomers have claimed both detection and non-detection of the chemical phosphine in the atmosphere of Venus. SOFIA, the 106-inch infrared telescope that flies in a jet above much of the Earth's atmosphere, observed Venus and found no phosphine. A group that previously reported detection (by radiotelescope) disputed how the SOFIA observations were interpreted and claimed this WAS a detection. This debate will probably continue until a spacecraft can look for phosphine close-up to Venus, currently scheduled for early next decade. Astronomers would like to settle this because one possible source of phosphine would be microscopic life. Unfortunately, SOFIA was retired in September after the Venus observations due to budget cuts.

Martian Storms – Astronomers made a study of dust storms on Mars using images from the Mars Express and Mars Reconnaissance Orbiter spacecraft. Storms grew in spiral shapes resembling non-tropical cyclones on Earth. Martian dust storms are made up of small cells of clouds arranged like pebbles. Earthly storms may appear similarly though on our planet they are water cloud cells instead of dust. Rising warmer air forms the cells on both planets, with cooler air falling between the cells.

New Subaru Instrument – A new instrument, called the Prime Focus Spectrograph or PFS, on the Japanese-owned Subaru Telescope in Hawaii achieved its first light for engineering testing. PFS contains about 2400 spectrographs, each connected to the image plane of the telescope by a fiberoptic cable that is placed on each celestial object by a robotic cable manipulator. Spectrographs allow astronomers to measure an object's motion, chemical composition, temperature and more. Subaru has a very wide field of view for an 8-meter telescope, so there are often thousands of objects of interest in any given observation. The instrument is planned to start full operation in 2024. This will vastly speed up spectral observations.

Jay Pasachoff, an expert on solar astronomy, passed away in November at the age of 79. During his life he observed 74 solar eclipses all over the Earth. He didn't just view eclipses but measured the properties of the solar corona with instruments during the brief minutes that the corona becomes visible during totality. He became an expert at choosing sites within the path of total eclipse with the clearest weather. He was a professor at Williams College in Massachusetts, and director of the observatory there.

Another Look

Dave Phelps, 2023 January

Full moon January 6, New moon Saturday, January 21
Other names are Wolf Moon, Stay Home Moon and Quiet Moon, Moon After Yule.
Native American names are Severe Moon and Center Moon.

As a constellation, Canis Minor has only been around for a couple thousand years. As a constellation, Procyon, under various names, has been around four thousand years, at least. Canis Minor made Ptolemy's Almagest in the 2nd century CE, but way before that the Egyptians used Procyon to clock the rising of Sirius who clocked the rising of the Nile. The Nile was not the only waterway that benefited by the ancient clock. The Tigris-Euphrates in Asia Minor, the Padma in India and the Yangtze in China all rose and fell to one extent or another annually clocked by the calendar of the stars.

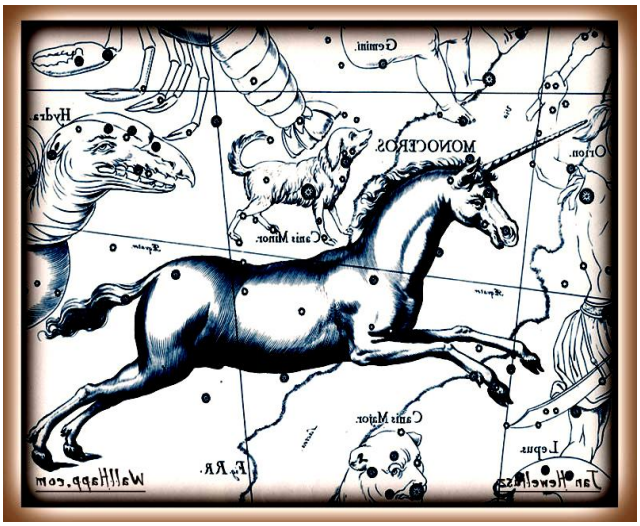
Another river marked by the ancient people is the river in the sky, the Milky Way. Rising a half hour before Sirius, Procyon was an important time marker. Not only floods, but seasons, winds, monsoons and snow melt were tracked by even the poorest people using the sky as their only calendar.

Canicula, fourteen thy stars; but far
Above them all, illustrious through the skies,
Beams Procyon; justly by Greece thus called,
The bright forerunner of the greater Dog

http://lynx-open-ed.org/OERs/Urania%27s-Mirror-Full-Page-Version.pdf

Procyon comes from the Greek "before the dog" and has been part of a modern constellation only since then. Canis Minor has for the most part a grisly history usually resulting in someone dying or getting eaten. β Beta Canis Minoris is named Gomeisa which means teary eyed or maybe bleary eyed. Gomeisa and Canopus are sisters weeping for their loved one and placed in the sky in remembrance. Procyon is a double. 1st magnitude Procyon A has as a companion 13th magnitude Procyon B. If you're in for a bit of a challenge, it is said that Procyon B is more difficult than Sirius B because of the greater magnitude differential. One for the bucket list. There are a couple of other stars of interest in CanMin. Most interesting is Luyten's star, located between δ and η on the chart. It's a little brighter than 10th magnitude and quite red. It also has two confirmed planets. Delta δ Canis Minoris is also interesting because of three stars of 5th magnitude close enough to see in your low power field. NGC 2485 is a 13th magnitude spiral galaxy. It has very diffuse spiral arms and a starlike nucleus, tough to see. Burnham did not list N2485 but did list γ and η as doubles with large magnitude differences.

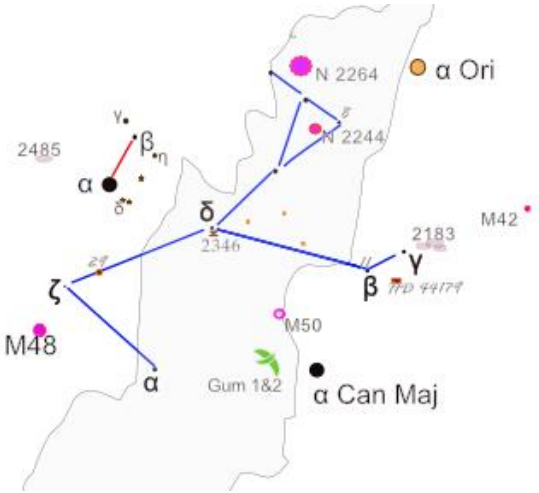
In the late 1500's cartographers used the journals given them by the surviving sea-darers and began making maps and globes. When you look at the globes the critters on them are backwards. That was because you were to imagine yourself inside the globe looking out. Being naturalists, these artists, cartographers and globe makers pulled from the natural world as they knew it, for inspiration. They covered the newly found sky and the blank areas in the known sky with a veritable menagerie of animals and birds. They drew new constellations of Bees, Birds, Lizards, Goldfish, Snakes and even a Triangle and a Cross. A decade later another globe was made showing even more wild and woolly subjects and natural features, of whom, only Camelopardalis and Monocerous remain.



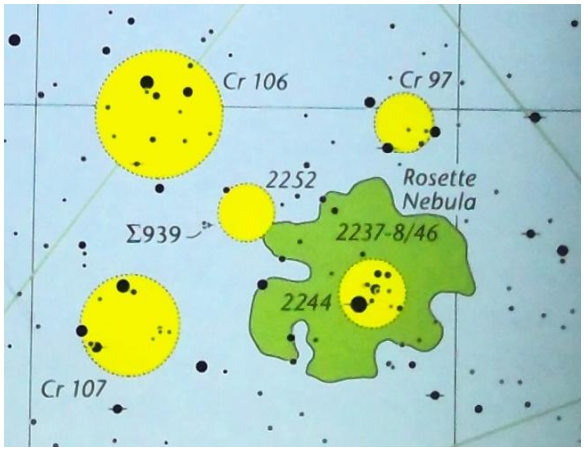
In the early 1600's Cartographers began drawing maps and celestial globes from and for returning seamen whose perilous journeys around the globe used stars and natural landmarks as navigation guides. These guides were especially important in the southern hemisphere with no north star nor timekeepers to keep them oriented. Portugal, Spain, France, Belgian, Holland and Great Britain all claimed territory and they wanted to know where it was and how to get there so they could begin their exploitation.

"a very ferocious beast, similar in the rest of its body to a horse, with the head of a deer, the feet of an elephant, the tail of a boar, a deep, bellowing voice, and a single black horn, two cubits in length, standing out in the middle of its forehead." Pliny

On a poorish kind of night, maybe with a few streetlights thrown in, you probably won't see Monocerous. It's there; between Betelguese and Procyon is a sprinkling of 4th magnitude stars and one naked-eye nebula. Living as it does mostly in the milky way, Monocerous has open star clusters, a globular, several interesting variable and multiple stars and two of the finest deep sky objects up there. Monocerous is wonderful. It has 36 Collinder's, more than any other constellation. It has two spectacular nebulae with star clusters attached and sprinklings of small clusters and nebula throughout its constellation boundaries.



Back in the mid 80's, just before Halley's Comet, I met a fellow at RTMC who had intense knowledge and a telescope. His name is Dana Patchnik and he showed me the Rosette in a 17.5 inch telescope. It is huge. Twice the size of the full moon and apparent even without filters. Screw in that filter though, and you are wowed.



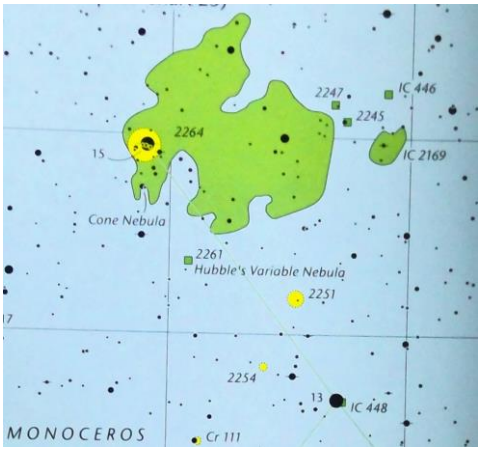
https://ocastronomers.org/wp-content/uploads/2018/12/ROSETTE-NGC2244.jpg **Credit Philip R. Stagnitto**

There are five NGC's within the Rosette. NGC 2244, Caldwell 50, is the Open Cluster you see in the center and was discovered by Flamsteed in the 17th century. NGC's 2237, 2238, 2239 and 2246 are pieces of the nebula. Sprinkled around the Rosette are several open clusters. Collinder 104 is next to 107, 106 and 97. You have to be something of an open cluster fan to scope these out. The conventional wisdom is to use wide field and low power, a biggish telescope will blow right through them. A friend of mine named Harv Pennington, made a viewer where he looked down through a pair of binoculars into a flat mirror that reflected the object to the eye. If you look up Project Moonwatch on the internet you will see all the different spotting scopes that they used back then to follow our new satellites. If ever I decide to spend some time on open clusters, I think I'll find a flat and a decent finder and cobble one together.

It's an interesting project to try to identify what parts of the nebula and what small sprinkling of stars is defined by a NGC or a Collinder number. This is a crowded piece of space, Simbad **http://simbad.u-strasbg.fr/simbad/sim-id?Ident=Rosette+Nebula** has a very good photo of the whole area. It will help you pick out the individual clusters and even Struve 939, a nice triple star system. Using Sky and Telescope's *Pocket Sky Atlas is* also a good place to start. It is from the *PSA* that I copied these charts

North of the Rosette is NGC 2264, the proper name for the Christmas Tree. The entire nebula has by itself not been given a nickname, surprisingly. Instead, it is usually referred to by its two distinct features: the Cone Nebula and the Christmas Tree Cluster. The entire nebula will take the visual observer an hour to explore. I think the Christmas Tree cluster is beautiful. It shines and it sparkles, it points to the Cone, it is visually remarkable. The picture below is from **Ray Stann** at **https://www.temeculavalleyastronomers.com/photo-gallery.html**

As most any chart will show you, there are many objects to explore around the Christmas Tree. NGC 2247 has several distinct neighbors including NGC 2245, IC 447 and IC 448. Between the two nebulae is Basel 7, another really sparse open cluster, and a couple more Collinders.



My favorite outlier is Hubble's Variable Nebula, NGC 2261. Hubble was one of my heroes. Using the biggest telescopes and making the best astro photographs during a career that spanned over 30 years, Hubble is an ideal professional for a young astronomer to model himself or herself after in their imagination. It might take a little time to find the nebula. Its bright enough, about 9th magnitude, but kinda diffuse and, once you've found it, a little unimpressive. It would be a fun project, especially for those of you with CCD cameras, to take magnitude estimates every month for the next year or two and make your own light curve, then you can publish it in this newsletter.

As the image of the region around the Cone and the Christmas Tree points out. there is a huge mass of bright nebulosity broken up by dark nebula. We can identify IC 447 as well as NGC's 2254, 2264 and NGC 2251. IC 446 and IC 447 is 7th magnitude so it can be found but much of your success in the area depends on your filters and your patience. This is a SII-NII-Ha image and can be found at: ***https://cs.astronomy.com/asy/m/nebulae/488643.aspx***

I keep seeing the image of the Christmas Tree in my mind's eye as I'm writing this. Golly, but it's beautiful. It even has a little tree topper - the tip of the cone. On the right, this 2010 image by OCA member Jeff Malrose show the Christmas Tree and its nebulosity beautifully.

IC 447 is also interesting because it has been named Dreyer's Nebula. This is the John Lewis Emil Dreyer of the NGC and IC catalogs. It seems EE Barnard (another of my hero's) found the nebula and reported it to Dreyer. Barnard then referred to it as Dreyer's 447. We have since then called it Dreyer's Nebula, not Barnard's.

https://cs.astronomy.com/asy/m/nebulae/488643.aspx **https://ocastronomers.org/wp-content/uploads/2018/12/NGC-2264-.jpg**

There is an unusual protostar and a planetary in Monocerous that are easy to find and unusual to look at. NGC 2346 is a planetary nebula right next to delta δ. It is 9th magnitude and squarish. HD 44179 is a protoplanetary nebula right near beta β, it's also 9th magnitude and squarish. I have never looked for it, but visually there should be a double star at the center of the nebula blown out by the astrographs much like the the Trapezium is hidden in M42. It will be interesting to see it that's the case.

In the south of Monocerous near the border with Canis Maj., is alpha α Monocerotis, the brightest star in Monocerous at a skosh brighter than 4th magnitude Down there futher south, Monocerous has more objects of interest: M50, NGC 2506 the area around Gum 1 and Gum 2 and the Seagull.

M50 and NGC 2506, Caldwell 54, are typical open clusters of the visual magnitude ilk. They are rather sparce, M50 is 6th magnitude and N2506 is 7th. M50 will, of course, be easier to see since it has five times the stars of N2506.

https://ocastronomers.org/wp-content/uploads/2018/12/IC2177_SCH_02212012_01.jpg

A telrad field south of M50 will put you right at the left wing of the Seagull nebula, IC 2177. A little better than half the Seagull is in Monocerous, the balance in Canis Maj. NGC 2335 is at the crest of the left wing, is 7th magnitude and is centered by a brighter star. NGC 2343 is also an open cluster located in the hollow created by the left wing and body of the seagull. This whole area is active HII regions, so all you will see unfiltered is the open clusters and a little diffuse nebulosity. Gum 1 is the head of the seagull. Colin Gum did his work from Mt. Stromlo observatory in the 1950's. It is heartbreaking to remember that firestorm in 2003 that destroyed 75 years of telescopes, records and hard work.

Dark Skys Dave Phelps

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- OC Astronomers Outreach Coordinator

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For Sale contact Ron Choi rongrace2@cox.net
- Orion StarShoot AutoGuider further reduced price $ 200

For Sale contact Rick Hull hull3hull3@yahoo.com 949-636-2920 cell
- QSI 6120C OSC CCD camera with Mechanical Shutter even further reduced price $ 1625 +sh

This unit was built before the ATIK acquisition, so you know it was built to QSI quality standards.
Camera body is the "-s" version with mechanical shutter. The front end can be replaced to have an integrated OAG and/or filter wheel. Unlike more economical cameras using only desiccant, QSI 6xx series have a sealed chamber, purged and filled with a noble gas.

Built around the Sony ICX834 with EXview HAD CCD II technology, this 12M sensor is perhaps the best CCD by Sony before ending CCD production - high in sensitivity, low in noise. Pixels are 3.1um for high resolution and image array is 8.8x13.2mm in size. The 3.1um pixels are nearly ideal for those using focal lengths of 600 - 1200mm desiring to achieve maximum resolution, as seeing permits. I believe the Bayer mask is superior to most found on CMOS sensors which are designed for consumer cameras, providing less overlap of the color channel band-passes.
I can provide a few images taken at 770mm focal length out at Anza. Contact me by email.

New, this camera is now $4200, and the ATIK 4120C which is a basic lower-end cousin, is $3K. On CN I am asking $1750, any OCA member may purchase it for $1700 plus shipping. Please feel free to contact me with any questions.

For Sale contact Michael Newman mnewman2112@gmail.com
- Pad lease for LP-12 in Lower Pads section and the pier upon it New reduced price $ 1000

It includes a pier that is very nicely aligned and can support a C-8 up to a C-14 I believe although the new owner may need to drill new holes. For questions and to express your interest in the pad, please contact me via email.

For Sale contact Bill Prats b.bill.p@gmail.com
- QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 $ 30
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  1:1 magnification, end caps, precision, like new
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  the Bushnell, Green & Red variable intensity LED. 1:1 magnification, end caps, precision, like new.

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Contact Bill Prats b.bill.p@gmail.com Shipping is extra. All items can be picked up in Huntington Beach.

For Sale contact Dave Cook 2cookies@earthlink.net 949-689-0853 (cell)
- ORION ASTROVIEW EQUATORIAL MOUNT - Hardly used $ 180

- Aluminum tripod with 8" dovetail mounting plate
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- 7.5 Lb. counterweight included.
- Total weight 27.5 Lbs.
- Original cost $330, including electronic drive. Current Orion version, EQ-13 costs $230 without electronic drive.

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