SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

August 2022 Free to members, subscriptions $12 for 12 issues **Volume 49, Number 8**

California nebula (NGC1499) imaged from the OCA Anza site by David Fischer in October 2018 using an 80mm refractor and astro-modified Nikon D5300 camera

Because of the COVID-19 crisis and ongoing efforts to reduce exposure to the virus:
* **Some in-person club events are cancelled**

Please read more about how OC Astronomers has modified its activities on page 3.

Upcoming Events - free and open to the public

Beginner's class	Friday, 2 September at 7:30 to 9:30 PM This is session 1 of the class. It covers a general overview of objects one can see in night and day skies. Some current scientific understanding is also presented. Class materials can be downloaded from OCA website.	ONLINE
Club Meeting	Friday, 12 August at 7:30 to 9:30 PM "What's Up?": Chris Butler from OCA Main speaker: Dr. Larry Molnar from Calvin University and the talk will be "The Backstory of Contact Binary Stars"	ONLINE
Open Spiral Bar	Saturday, 13 August at 10:00 to 11:30 PM Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.	ONLINE

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

President's Message

By Barbara Toy

It appears that we are in Neowise season – or at least in Neowise memorial season based on my current calendar collection. In June there was a lovely picture of Comet Neowise in scenic surroundings that I admired through the month, so I felt a bit sorry to bid it farewell when advancing the calendars to July. Not to worry – we now have four different views of Neowise on three different calendars (actually, a smaller picture of the comet on one calendar shows it reflected in a lake, so that would make a fifth view).

Sadly, we don't get many comets that can be seen naked eye. Neowise caused quite a bit of excitement around this season in 2020. It was literally a bright spot in a dismal time. I didn't see it in its full glory but did enjoy following it in binoculars from home even though it was dimmed by our local light dome. The COVID-19 pandemic was in full swing at the time making it hard to get out to dark skies to see it well. Many people captured it in pictures, so we could all appreciate its beauty, even if it wasn't quite as spectacular as the two comets I remember from the 1990s, Hyakutake and Hale-Bopp. It would be really cool to see comets like those spread out across the sky again…

One of the curiosities about those comets for me was that despite being big, bright and easy to see (even in Orange County), many people, including the people I was working with at the time, never bothered to look. My co-workers thought me peculiar for getting up early or staying up late (depending on where the comets were at that point) to see them. That gave me the same sense of incredulity as an encounter I had when I'd set up a small telescope in my driveway to look at Mars. A neighbor who was walking by asked what I was looking at. I told him and offered to show it to him, and his response was "Oh, my eyes can't see that far." I pointed to where Mars was in the sky at the time, bright and very visible to the naked eye, but he wouldn't even look in that direction, just continued his walk, apparently thinking his response made sense. Another time I was in a Costco parking lot with binoculars admiring a full (and colorful) lunar eclipse yet none of the people who were walking by even looked up at it. Experiences like these increase my doubt of accounts of UFOs, as they mostly seem to be from non-astronomers who don't generally pay much attention to what is going on in the sky and have no context for understanding the sometimes unusual (but explainable) phenomena that can be seen in it.

Closer to the Present…

There was great excitement in mid-July that even reached the general press when NASA released the first formal images from the James Webb telescope. It's great when an astronomical image is displayed on the front page of the LA Times – though, to do them justice, the LA Times does report regularly on the space program, astronomical discoveries and science in general in spite of a much-reduced science staff. I didn't do a survey of other publications, but it seemed that there was a lot of general interest in these images, and I did see a recent update from the BBC on interpretations of data from the Webb deep field.

Well, the images are fascinating and give a good foretaste of what we can expect during the Webb's years of active data gathering. I've always liked the Hubble Deep Field images, so I took particular pleasure in Webb's first deep field – and was further impressed by the spectra information they released showing that two of the arcs in the image show the same, more distant galaxy, confirming the effects of gravitational lensing. Then there was the detail in the image of Stephan's Quintet, showing signs of disruptions from the interacting galaxies. The composite image of the "Cosmic Cliffs" in the Carina Nebula looks three-dimensional – an incredible cloud of dust. The composite isn't as colorful or dramatic as the NIRCam image they released separately, but I like the additional detail and the wider field of view.

The Webb has its own website, where you can see these and other images and information about the telescope and its activities: https://webbtelescope.org/.

I'm glad NASA and others realize the value of processing and releasing images like these. Some great images from the Hubble made it into popular culture and I think there will be new pictures from the Webb telescope that prove to be genuinely inspiring. They may serve as gateways to thinking more deeply about the universe around us and their popularity gives the general public a more direct stake in projects like this, which should help for funding.

Orange County Star Parties – We Need a Host!

Steve Mizera, the coordinator for the Orange County Star Parties, has been scheduled to work Saturday evenings indefinitely, which is the main reason those star parties haven't restarted. He is willing to continue doing the back-stage duties of the coordinator position, like sending out the emails with information on upcoming star parties and other announcements but needs someone to act as host for the star parties themselves. If you can help us out with this, please contact Steve Mizera as soon as possible (MizeraS@cox.net). It would be really great if we could get someone in place for this in time to have an Orange County Star Party in August.

These star parties are important for members who can't make it out to Anza, or who want, at least on occasion, to attend a more local star party. Hosting doesn't require a lot of experience as an astronomer, just availability and reliability. It would even be possible to have more than one person covering the position, maybe trading off on when each would host. And if what you really want is to take over the full responsibilities of coordinator of the star parties, I'm sure that could be worked out as well.

G. Bruce Blair Award:
Elsewhere in this issue there should be an article on the 2022 recipient of the G. Bruce Blair Award, our own Tim Hogle, and I defer to it on the many reasons he's a worthy recipient of the award – I'm very glad that WAA agreed with us that he should receive it. For those who may not be familiar with the award, here is some background:

Western Amateur Astronomers (WAA) has given this award since 1954 to recognize people who have made important contributions to amateur astronomy. The list of recipients, which you can find on the WAA website (waastro.org), includes many you may find familiar. Examples are Clyde Tombaugh, discoverer of Pluto, John Dobson, sidewalk astronomer and popularizer of "Dobsonian" telescopes, Patrick Moore, author and popularizer of astronomy, David Levy, also an effective popularizer of astronomy as well as teacher, author and comet discoverer, and Ed Krupp, director of Griffith Observatory and popularizer of astronomy. Past OCA members who have received this award include:

- John Sanford, teacher, astrophotographer and one who filled many roles in his many years in the OCA, including as president and long-time editor of the Sirius Astronomer.
- Monsignor Ron Royer, recognized for his astrophotography and work on the tri-color photo process.
- Chris Butler, artist, speaker and program/exhibits director at Griffith Observatory, whose skills and sense of humor we have enjoyed regularly in his "What's Up" presentations and other talks.
- Robert Buchheim, past club secretary and also a board member for SAS, researcher and author of two books on astronomical experiments for non-professionals.
- Jim Benet, who built our Outreach Program into a major educational resource for the schools in Orange County and neighboring areas.
- Wally Pacholka, known particularly for his images of astronomical objects seen from different national parks and other picturesque areas, one of the early proponents of "night photography," showing the night sky in contexts that general members of the public can relate to.

Tim Hogle, who I think is our last remaining Charter Member, will fit well with all who have been honored with this award, and we are delighted that he will be presented with it, if all goes as currently planned, at our August meeting. Although it will be a remote proceeding and he won't be able to hear the well-earned applause, I hope you will tune in for the presentation and send in your electronic applause for this great event!

I hope you are enjoying your summer and staying healthy – unfortunately, as I write this Covid rates are going up again. I hope this latest surge is on its way out by the time you see this, and that you have clear skies for your astronomical activities!

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
Meeting via Zoom:	Monthly club meeting, Beginner's Astronomy class
Coming soon:	Orange County Star Parties
Cancelled until further notice:	AstroImaging SIG, in-person club general meetings
Check with Coordinator:	Outreach events

From the Editor

Sirius wants photograph submissions from club members
Sirius is running low on pictures. 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
September	20 August
October	18 September
November	22 October
December	19 November

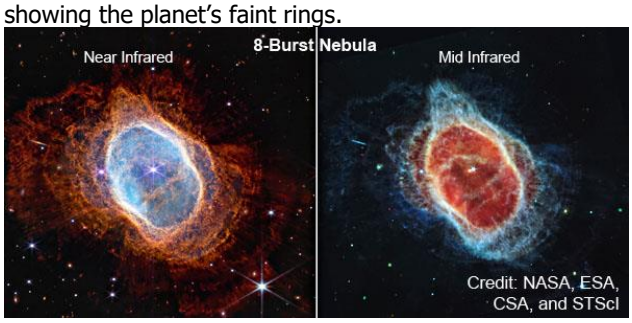
AstroSpace Update

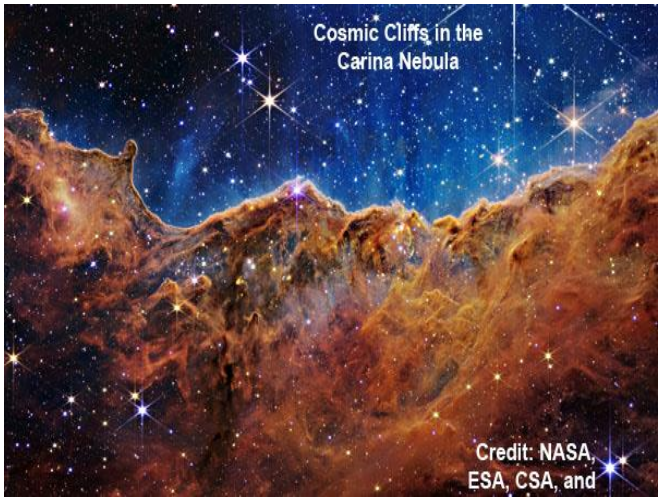
August 2022

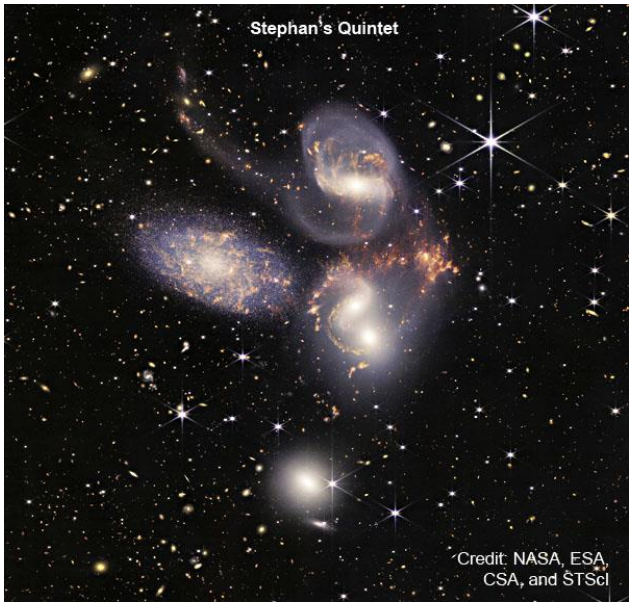
Astronomy and space news summarized by Don Lynn from NASA and other sources

Webb Observations Released – NASA released a selection of images and spectra taken by the James Webb Space Telescope, the first such other than alignment and test images. The telescope operates in infrared, so for humans to be able to see Webb images, the wavelengths detected are shifted to visible light wavelengths such that they appear to be color images. The selection was made with the intention of showing various capabilities of Webb. The first released is the deepest image of distant galaxies ever taken in infrared, looking through a galaxy cluster known as SMACS 0723. It shows galaxies so distant that the light left there an estimated 300 million years after the Big Bang. The distant galaxies gain from the gravitational lensing effect of the closer galaxy cluster, which magnifies and brightens their light.

Other images are of the 8-Burst or Southern Ring, a planetary nebula about 2000 light-years away with unusual structure; Stephan's Quintet, a grouping of galaxies in Pegasus of which 4 are gravitationally interacting, showing more detail than ever seen before, including tails of gas, dust and stars; a section of the Carina Nebula known as the Cosmic Cliffs, showing areas shaped by ultraviolet light and stellar winds from massive, hot stars; and Jupiter and some of its satellites, showing the planet's faint rings.







Spectra of some asteroids and of the atmosphere of a hot puffy exoplanet known as WASP-96b were measured. The latter shows the signature of water and evidence of clouds and haze. The asteroid data demonstrate Webb's ability to track and observe moving objects.

Cosmic Ray Source – Cosmic rays are charged particles traveling nearly the speed of light. They have been studied for more than a century and yet scientists still don't know the source of them (except ones that come from our Sun) and how they attain such high speeds. The problem is that charged particles' trajectories are bent by magnetic fields, so the direction they originate from is not the direction they strike Earth. But the production of cosmic rays is believed to also produce neutrinos, which are not charged. A study using the IceCube neutrino detector at our South Pole show that blazars produce high-energy neutrinos like those expected with cosmic rays. A blazar is an active (that is, accreting much matter) black hole at the center of a galaxy that happens to have a jet aimed nearly in our direction. More study of blazars is needed to determine how they accelerate charged particles (and neutrinos) to such high energies.

Accretion Disk with Arms – An international team using the ALMA radiotelescope array in Chile discovered a young star that has an accretion disk with 2 spiral arms. Based on computer simulations, it is thought that the spiral arms were created when an object flew close by and gravitationally disturbed it more than 10,000 years ago. The star is still in the process of forming and now has a mass 32 times that of our Sun. It is among the most massive forming stars known to have an accretion disk, so little is understood of the role accretion disks play in forming massive stars. The disk is 2000 times the diameter of the Earth's orbit about the Sun.

TDE – When a star approaches a black hole too closely, the tidal forces of the black hole tear apart the star in what is known as a tidal disruption event (TDE). Recent studies of TDEs show that a significant fraction of the star's mass is blown away by winds from the black hole. One of those recent TDEs occurred in 2019 about 215 million light-years away and was observed in polarized light. The polarized observation showed a spherical cloud of gas being blown out that obscured much of the high-energy emissions interior to the cloud. This explains why X-rays are often not seen from TDEs, though X-rays should be produced where material is falling into the black hole.

Star Orbiting Black Hole – Quite a few stars are known that orbit the supermassive black hole at the center of our Milky Way galaxy, with orbital periods ranging from 10 to 166 years. Another has been discovered, this time with a period of only 4 years. It has been dubbed S4716. It is 4 times the mass of our Sun and orbits the black hole at a distance about 100 times the size of Earth's orbit about the Sun. Like the other stars orbiting the galaxy center, this newly discovered one was found in infrared images, since infrared penetrates the dust between the galaxy center and us. It was then confirmed in archived infrared images.

Black Hole Orbiting Star – Black holes that are dormant, that is, not consuming substantial matter, are difficult to find. Most black holes are found by the X-rays emitted from the material falling in. No dormant black holes outside our Milky Way were known until a new discovery in the Large Magellanic Cloud, a small satellite galaxy to the Milky Way. The motion of a massive (25 times the Sun's mass) hot star indicated it was being orbited by a mass of about 9 times the Sun's mass. A spectrum of that companion was taken, and it showed no spectral lines. A number of possible explanations were considered, but only the glow of a little material falling into a black hole fit all the observations. The glow is dim enough that the black hole is considered dormant. There has been no evidence of supernova remnant found, indicating that the black hole may have formed from the direct collapse of a star at the end of its life rather than forming as the collapsed core remaining after a supernova explosion blew away the outer parts of a star.

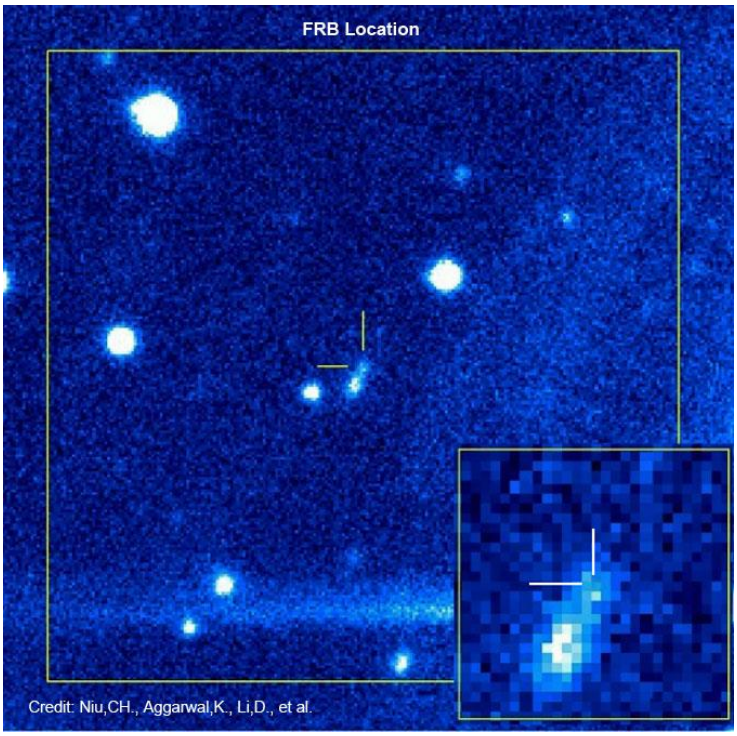
Speeding Pulsar – Astronomers discovered that a pulsar, known as G292.0+1.8, is speeding through space at over 1 million mph. Although a few speeding pulsars are known, how they attained their speeds is still a mystery. The two leading theories are acceleration by neutrinos or by asymmetric supernova. Pulsars are believed to form as remnants of stars exploding as supernovas at the end of their lives. This pulsar is estimated to be about 2000 years old.

Strongest Magnetic Field – Astronomers using the Chinese X-ray satellite Insight-HXMT have measured the strongest magnetic field ever, 1.6 billion Tesla, near the surface of an accreting pulsar known as Swift J 0243.6+6124. It is the first ultraluminous X-ray pulsar found within the Milky Way though several are known in other galaxies.

White Dwarf Consumes Planetary Matter – White dwarfs have been observed to display material captured from gravitationally broken up planets, either from rocky planets or icy planets, but not both types until now. The newly observed white dwarf, known as G238-44, must have disturbed both its inner and outer planetary systems, where respectively rocky and icy planets are formed. The disturbance would have occurred during the star's red giant phase, where a star swells to huge size before collapsing to a white dwarf. The new observations found nitrogen, oxygen, magnesium, silicon, iron, and other elements. Studying shattered material being absorbed by white dwarfs gives astronomers an opportunity to see what its planets were made of, even internally.

Bennu Is Soft – Analysis of data from the OSIRIS-REx spacecraft during the time it touched its sample collector to the surface of asteroid Bennu shows that the surface material is extremely soft. The sampler penetrated farther than expected. Touching Bennu spit particles into space. The touch left a much bigger crater than expected with much more debris around it. The scientists compared it to a plastic ball pit play area, where you sink in if you stay long. Astronomers will use this information for planning future asteroid missions and for planning how to divert asteroids in danger of colliding with Earth.

Unusual FRB – Fast Radio Bursts (FRBs), as they travel toward us on Earth, are subject to a slight slowing from the thin plasma that permeates space. That slowing is frequency dependent, so the farther the FRB has traveled, the more dispersed in time the burst becomes. This has been used to determine how far away FRBs originated. Occasionally an FRB has been pinpointed to originate in a particular galaxy, and other means of determining the distance to such a galaxy has agreed with the time-dispersion distance estimate, until now. An FRB known as FRB190520 originated in a galaxy about 3 billion light-years away but showed a dispersion distance 10 times as large. Astronomers are working on an explanation for this discrepancy. The FRB was discovered by the FAST radiotelescope in China and was found to repeat more often than any other known FRB. Also making this FRB unusual is that there is a persistent weak radio signal in additional to the bursts.



Curiosity Transition – During its climb up Mount Sharp, the Curiosity Mars rover has recently transitioned from a clay-rich zone to a sulfate-rich one. The clay formed from sediments in lakes and streams, while the sulfate formed in drier times. Thus, this transition is a record of when the red planet's climate dried up.

Martian Carbon – Carbon bound to hydrogen atoms is known as organic carbon. It can be produced by life and non-life processes. For the first time, the Mars Curiosity rover has been able to measure the total amount of organic carbon in a sample that it scooped up. The result is that 200-273 parts per million of the sample is organic carbon. It is not believed this was created by past life but was instead the building blocks that life may have formed from during the period of the planet's history billions of years ago when atmospheric and water conditions would have been conducive to life forming. The relative amounts of isotopes of carbon were also measured, but the result is not conclusive as to the source that created the carbon-hydrogen compounds. The data was collected 8 years ago but took this long to analyze.

InSight – NASA has reversed its earlier decision about the demise of the InSight Mars lander. They had announced that the seismometer would be shut down soon to conserve electricity as power from the solar panel dwindled with accumulating dust. The new decision is that the seismometer data is the most valuable scientifically, so the instrument will be left on as long as possible, taking all other measures to reduce electrical usage, including turning off the fault protection system.

Mars Radar Upgraded – The MARSIS instrument aboard the European Space Agency's Mars Express spacecraft has been taking radar observations of Mars for nearly 2 decades. Its signal penetrates a few kilometers below the surface, telling scientists properties of the surface and subsurface. The MARSIS team has prepared a software upgrade to allow the instrument to improve signal reception and to preprocess the data before reporting it to Earth. This will reduce use of onboard storage and the radio relays to Earth. As a result, much longer runs of data collection with better resolution will be possible.

CAPSTONE Launched – The Lunar Gateway, a future space station to orbit the Moon, will use a unique orbit that is over the poles and has a rather low point (periselene) and an extremely high aposelene. Lunar orbits are notoriously unstable due to the uneven mass distribution in the Moon and the disturbing influence of Earth's gravity. To test the Gateway orbit, a small satellite named CAPSTONE was launched near the end of June using the Gateway orbit. It will take 4 months to reach that orbit, and then spend at least 6 months testing dynamics and stability. CAPSTONE will also test a navigation and communications system that utilizes the Lunar Reconnaissance Orbiter. CAPSTONE was launched from New Zealand using an Electron rocket.

Psyche Won't Launch – NASA announced that the planned fall 2022 launch of the Psyche mission to asteroid Psyche will not take place. Alternate launch opportunities in 2023 and 2024 are being considered, but those would result in delay of 3-4 years in arrival and increased costs. The launch date cancellation is due to problems found in flight software and testing equipment resulting in insufficient time to fully test the corrections before the October launch deadline, dictated by planetary positions. Psyche is an unusual asteroid in that its density is high, indicating a probable high content of iron. No iron-rich asteroid has been visited by spacecraft.

Another Look

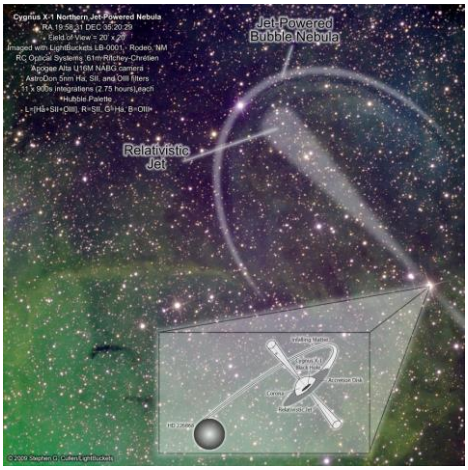
Dave Phelps, August 2022

July 28 new moon August 12 Full Moon August 27 New Moon
August: **Sturgeon Moon,** green corn moon, grain moon, and the red moon for the reddish hue it often takes on in the summer haze.

High above us on warm summer evenings is one of the linchpins of first year astronomy courses...the Summer Triangle. Made by connecting Vega, Deneb, and Altair we help our star party visitors by fixing their eyes on a high, visible, bright star grouping. The triangle includes the constellations of Lyra, Aquila, and Cygnus in addition to Sagitta and Vulpecula. I also include Delphinus in with the group, lest it be forgotten.

Delphinus has an interesting history and is also one of the original 48 by Ptolemy. In reference, the Greeks attributed two myths and an Italian gentleman may have been guilty of overweening egotism or, perhaps, a practical joke. The Greeks are easy. In one the Dolphin saves a poet and in the other Poseidon searches for his reluctant fiancée.

In reference to our Italian gentleman, we have Alpha α Delphini whose name is Sualocin and Beta β Delphini whose name is Rotanev. The names have no meaning. Italian astronomer Niccolo Cacciatore turned his family name, Venator, backward and gave Beta his family name. He did the same thing to Alpha. He turned his first name, Nicholas around and named it Sualocin. Somehow it stuck. Beta is also interesting as a double star. Very close in separation, about 44" and magnitude a slightly variable 4.1 to 5.0 magnitude.



APOD: 2009 June 8 – Possible Jet Blown Shells Near Microquasar Cygnus X1 (nasa.gov)

NGC6891 planetary nebula from https://ar.wikipedia.org/wiki/NGC_6891

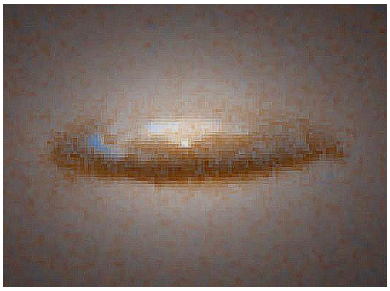
https://en.wikipedia.org/wiki/File:Sidney_Hall_-_Urania%27s_Mirror_-_Delphinus,_Sagitta,_Aquila,_and_Antinous.jpg

We also have two Caldwell globulars and two planetaries worth looking for in Delphinus. Caldwell 42, NGC 7006, is a 10th magnitude, rather pretty, globular and Caldwell 47 is a brighter 8th magnitude globular, also rather pretty. Neither NGC 6891, a rather nice planetary or NGC 6805, the Blue Flash planetary, are particularly bright but should be easily seen. N6891 is 10.5 and N6805 is 10.9. Your backyard telescope should find a smallish blueish or blue-greenish blob. An interesting note is that the four-star rhombus, Sualocin, Rotanev, Delta δ and Gamma γ Delphini are named Job's Coffin. No one seems to know why.

Vulpecula is the home of the first Pulsar discovered (1967) by PhD student Jocelyn Bell and her advisor Dr. Anthony Hewish. You won't see it but its near Brocchi's Cluster and, if you wish, you can stare at its place in the sky. It's given the prosaic name PSR B1919+21. You can check the Sinbad registry and you will find no optical component to the Pulsar.

By the way there were those who claimed that Ms. Bell should have been given equal credit for the discovery though she disputes that:

Dr. Bell Burnell has had a very vibrant career in science and is honored by her discoveries and her generosity. She was awarded the Special Breakthrough Prize in Fundamental Physics which included a $2.8 million dollar prize. She donated the award to support women, ethnic minorities, and aid refugee students in physics research.
(Jocelyn Bell Burnell and the Discovery of Pulsars – SciHi BlogSciHi Blog).

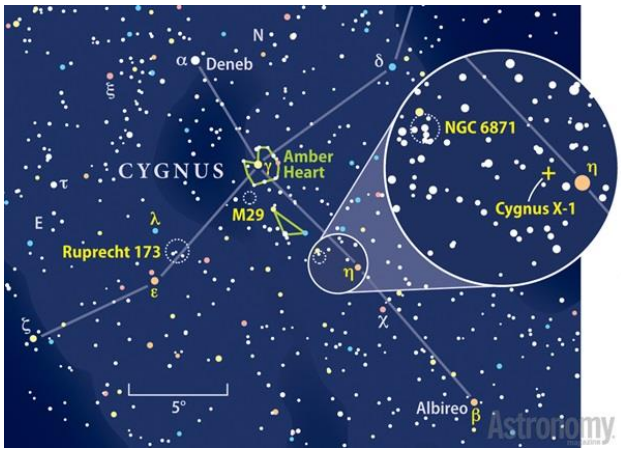


https://apod.nasa.gov/apod/ap980622.html

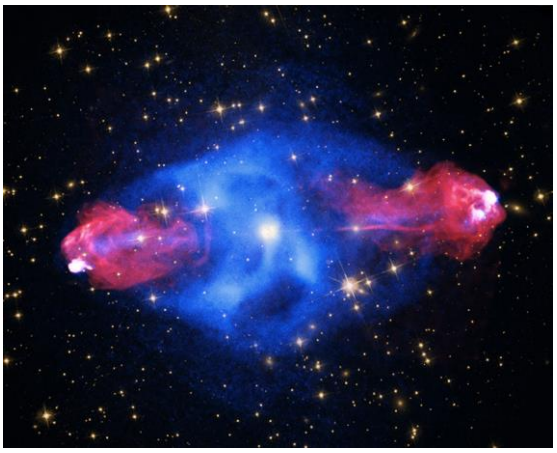
If you are interested in supermassive black holes, and who isn't, look for 13th magnitude NGC 7052 near the border of Vulpecula and Pegasus. I massaged this 1998 Hubble image to show more detail.

Another awesome discovery was Cygnus X-1, a distant X-ray binary containing a supergiant and an unseen massive companion that was the first object we thought to be a black hole. If you would like to see for yourself, Cyg X-1 is close (within an inner telrad circle) to Eta η Cygni, the middle star in the Neck and is 9th magnitude.

A third major discovery was Cygnus A, the first radio galaxy discovered at a distance of 730 million light-years from Earth, it is the closest powerful radio galaxy but, alas, it shines at only 16th magnitude so you will have to be satisfied with this image. Cyg A's location is along the left wing of the Swan, not too far from Delta δ. While there, be sure to look more closely at δ. It is a triple star system that is together brighter than 3rd magnitude. Interestingly enough, Delta's proper name is Farwaris, from the Arabic for rider, nothing at all to do with the various Greek myths of the Swan.



(Credit:AstronomyMagazine / Roen Kelly Https://astronomy.com/magazine/weirdest-objects/2015/04/37-black-hole-cygnus-x1)



APOD: 2015 January 24 – Light from Cygnus A (nasa.gov)

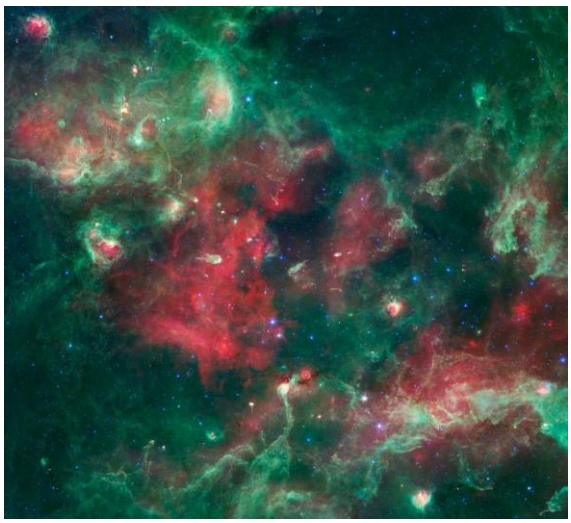
Cygnus X (confusing, isn't it ?) is the largest star-forming region nearby and includes not only some of the brightest and most massive stars known (such as Cygnus OB2-12), but also Cygnus OB2, a massive stellar association thought by some to be a young globular cluster. The nebulosity around Sadr, Gamma Cygni γ is a part of the association. The Spitzer Space Telescope image shows a region of complex and frenetic activity, quite beautiful to the eye.

If you go to **https://skyandtelescope.org/observing/a-trip-down-the-great-rift/** you see where they point out the Cygnus Rift and the Northern Coalsack. Cyg X is partially hidden behind it. It explains why we need the Spitzer.

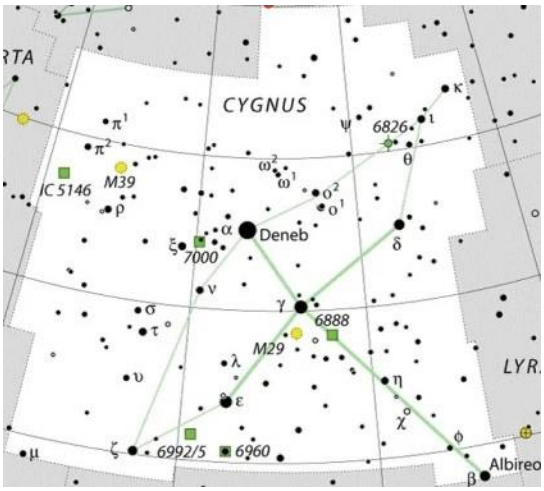
Cygnus has seven Caldwell objects. Caldwell 12 is known as the Fireworks galaxy and NGC 6946, though at least one list puts it into Cepheus. It is notable for 10 supernovae but is rather small and 9th magnitude. You will it by searching among the stars of the Milky Way.

There is an abundance of deep-sky objects, with many open clusters, nebulae of various types and supernova remnants found in Cygnus because it sits right on top of the Milky Way. When you look, be aware that some open clusters can be difficult to make out from such a rich background of stars.

Caldwell 15, NGC 6826, was discovered by Herschel way back in 1793. It is in a way a perfect example of visual astronomy. C15 is called the Blinking Planetary. Its bright 8th magnitude central white dwarf takes over the eyepiece. When you use averted vision, the planetary seems to "blink" into view. The 1997 APOD image by J. Balick **(APOD: December 19, 1997 - NGC 6826: The Blinking Eye (nasa.gov)** was also featured in 2001. C15 is located 3 or 4 degrees from Theta θ and can be found easily in your atlas and the chart below.



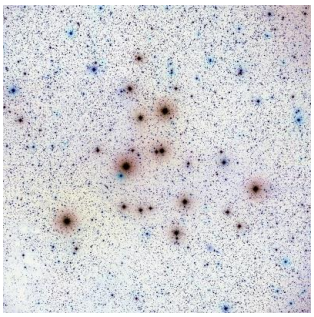
https://www.spitzer.caltech.edu/image/ssc2012-02a-stars-brewing-in-cygnus-x
Credit: NASA/JPL-Caltech/Harvard-Smithsonian CfA



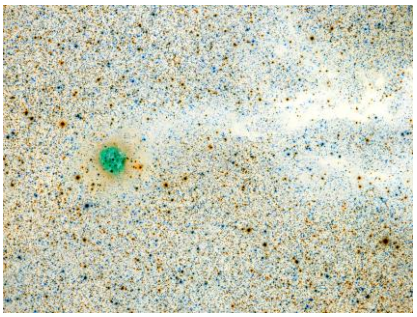
https://www.constellation-guide.com/constellation-list/cygnus-constellation

Look for the Open Cluster M39, NGC 7092. This is an open cluster 950 light-years from Earth that is visible to the unaided eye under dark skies. It is loose, with about 30 stars spread out. One sees that it has a rather triangular outline, something to confirm visually.

https://freestarcharts.com/messier-39



M39



IC5146 Cocoon nebula

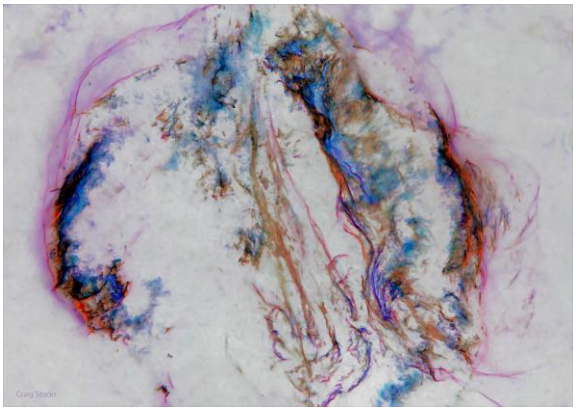
It's part of the tour you take with your telescope when you scan the North American and Pelican nebulae. It is a Messier, so you go to it and it's not bad, a bright sprinkling of stars 4th or 5th magnitude and rather pretty to look at. So, there you are, and you decide to move your telescope a little westward and Wow! You discover a really great dark nebula: B168, a long cylindrical darkness that leads you right to another two really great objects; Caldwell 19, IC 5146 and Sharpless 2-125. C19 is a mottled light and dark nebula with an open cluster embedded. **APOD: 2011 September 29 – Cocoon Nebula Wide Field (nasa.gov)** The Cocoon is a great name for everything put together. This 2011 wide field by non-other than Tony Hallas is a job well done.

Caldwell 20, NGC 7000, the North American Nebula is not as good, I think, in photographs as visually. The camera blows everything out. Visually, with a nebular or pollution filter, you will be able to trace the outlines of the continent and maybe even pick up a little Alaska. Hudson Bay will also be readily visible.

One of the great objects to search for in Cygnus is the Crescent Nebula. It's on the line from Deneb to Sadr to Eta η. Start at Sadr, the center star in the cross and try to find traces of the nebulousity that Sadr is immersed in, Cygnus X. I remember one year when an amateur from Phoenix, Arizona showed us a black and white image of the whole region between Deneb, Delta and Eta including the northeastern part of Cygnus. It was a spiderweb of nebulousity that I have not seen before or since. It was an amazing piece of work for 30 years ago. If you start at Sadr and scan down less than a Telrad you will find the Crescent aka Caldwell 27 and NGC 6888. Be sure to study it well, with and without filters. It is possible to fill in the area inside the Crescent.

Recently a fellow amateur was talking about filters fitted onto his binoculars and how the Veil was tremendous. Still, I remember how pleased I was with myself the first time I found the Veil. I was soon able to move my telescope between the individual pieces and look at the lace-like structure of the east and the west lit up by its embedded star, Caldwell's 33 and 34, while there be sure to find the little triangular notch between the two.

One night I was trekking up through Scutum looking for dark nebula. The area is full of nebula and clusters so there is plenty to find. There are a ton of dark nebulae in the area: B-111 B-117 and B-119a are prominent dark nebulae just across the border into Scutum, but I wanted to try to stay in Aquila. Specifically, I wanted to find a triple Barnard's, B-130 B-129 and B-127, a grouping of dark nebulae at the tail of Aquila. Eta η Aquilae is a 3 to 4th magnitude variable at the tail of the Eagle. Close by and between Eta and Lambda is 4th magnitude 12 Aquila, finder star for our Barnard's. They are not all that easy to see except for the dense Milky Way background. While there I noticed that 12 was a part of a hook of stars that led directly to the deepest red star I had seen. V Aquilae is a genuine carbon star, variable from 6.5 to 8.5 magnitudes and a wonderful surprise in your eyepiece.

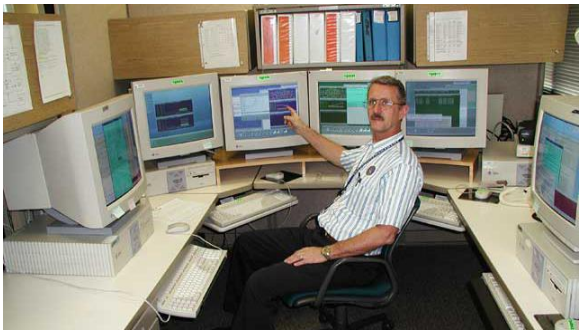


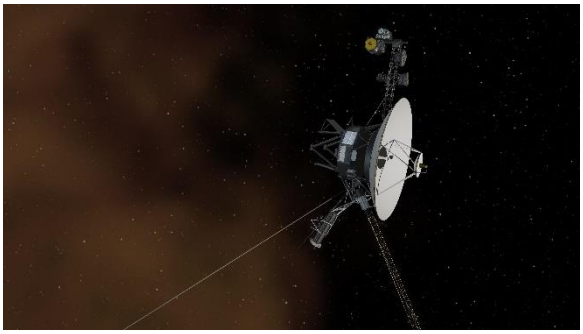
Veil Nebula Image Credit & Copyright: Craig Stocks (Utah Desert Remote Observatories)

Dark Skys - Dave Phelps

2022 WAA G. BRUCE BLAIR AWARD

OCA is proud to announce that the Western Amateur Astronomers (WAA) have selected our club member Timothy B. Hogle (Tim) as the 2022 G. Bruce Blair award recipient. The G. Bruce Blair Medal is the highest honor which the WAA bestow to an individual. It is awarded only to a living professional or amateur astronomer who has made an important contribution to amateur astronomy. Past recipients of the award include Clyde Tombaugh, John Dobson, David H. Levy, and Ed Krupp.





Tim was a Spacecraft Systems Engineer at JPL for the Voyager mission to the outer planets from 1978 to 2006. As a member of the Flight Team, he was part of operations in almost all post-launch aspects of the mission. He worked on anomaly analysis for almost every problem that occurred on Voyager 1 and 2, evaluated possible scenarios of what else could go wrong, and created detailed contingency plans for those possibilities. He interacted with the science teams to plan for the encounters with Jupiter, Saturn, Uranus, and Neptune, as well as the extended mission as Voyager 1 and 2 continued into interstellar space. During his time with Voyager, Tim was involved in outreach, educating the public about the missions through frequent public speaking engagements. Tim has been instrumental in shaping the minds of teachers and students in the classrooms.

Tim is one of the founding members of Orange County Astronomers. He and a handful of other amateur astronomers met in the garage of a friend in 1968 and started what would become one of the largest amateur astronomy clubs in the world. Tim was instrumental in getting the club moving and continues to be an active member to this day. He participated in meetings to design the observatory building for OCA's dark observing site near Anza, California, which houses the club's 22" Ritchey-Crétien (Kuhn) telescope. This observatory is used every month for star party viewing by members and guests and has also been used for research and supernova discoveries.

Tim served as a Trustee on the OCA Board during the 1990s and has served as the ballot counter and certifier of elections for several years.

He is also an amateur telescope maker and has built several personal telescopes of 3-to-16-inch aperture, including grinding the mirrors for most of them. He has used those and an 18-inch Dobsonian (his current instrument of choice) for personal observing and outreach events. He has observed and documented the position of Pluto every year since perihelion in 1989 and has delighted other astronomers and non-astronomers alike by sharing views of it at RTMC, Night Fall, and many other events when it is dark enough. He has a continuing project to observe, log, and describe as many NGC objects as he can.

Tim has been the OCA representative to WAA since 1982 and has helped the organization in its mission to promote understanding of astronomy and encourage collaboration between professional and amateur astronomers for astronomical research. He has served as the Vice President of WAA for the past 9 years.

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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	rongrace2@cox.net	
• Orion StarShoot AutoGuider			further reduced price	$ 200

For Sale	contact	Rick Hull	hull3hull3@yahoo.com	949-636-2920 cell
• SBIG ST-i Mono; Guide/Planetary camera with mechanical shutter			reduced price	$ 280
Price includes shipping and PP fees				

For Sale contact Rick Hull hull3hull3@yahoo.com 949-636-2920 cell

- QSI 6120C OSC CCD camera with Mechanical Shutter reduced price $ 1800 +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 $1900, any OCA member may purchase it for $1800 plus shipping.
Please feel free to contact me with any questions.

For Sale contact Jerry Floyd jlfloyd720@gmail.com

- Denkmeier Binoviewer II $ 999 or make offer

Complete with SCD holders, Power X Switch, Newtonian spacer tube, 2" nosepiece, 2" Multipurpose OCS cell, 2x14mm Denkmeier eyepieces, but does NOT have 1.25" nosepiece.

For Sale contact Bill Prats b.bill.p@gmail.com

- QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 $ 30
  3 Pieces, Bright red finish, no scratches

- Bushnell Red Dot Finder 1X30RD with mounting rail, Green & RED variable intensity LED. $ 30
  1:1 magnification, end caps, precision, like new

- Bushnell type Red Dot Finder made by Comunite 1X30RD with mounting rail. Almost exactly like $ 20
  the Bushnell, Green & Red variable intensity LED. 1:1 magnification, end caps, precision, like new.

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

For Sale contact Michael Newman mnewman2112@gmail.com

- Pad lease for LP-12 in Lower Pads section and the pier upon it $1250

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 Jim Benet jimbenet@pacbell.net 714-693-1639
$1000.00

- Anza pad license for TP-05 pad on Ten Pad Alley at 33.48384°N, 116.72166°W.

Includes bench, pier with 4 electrical outlets and Losmandy mount adapter. Excellent view of valley and Omega Centauri.

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