SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

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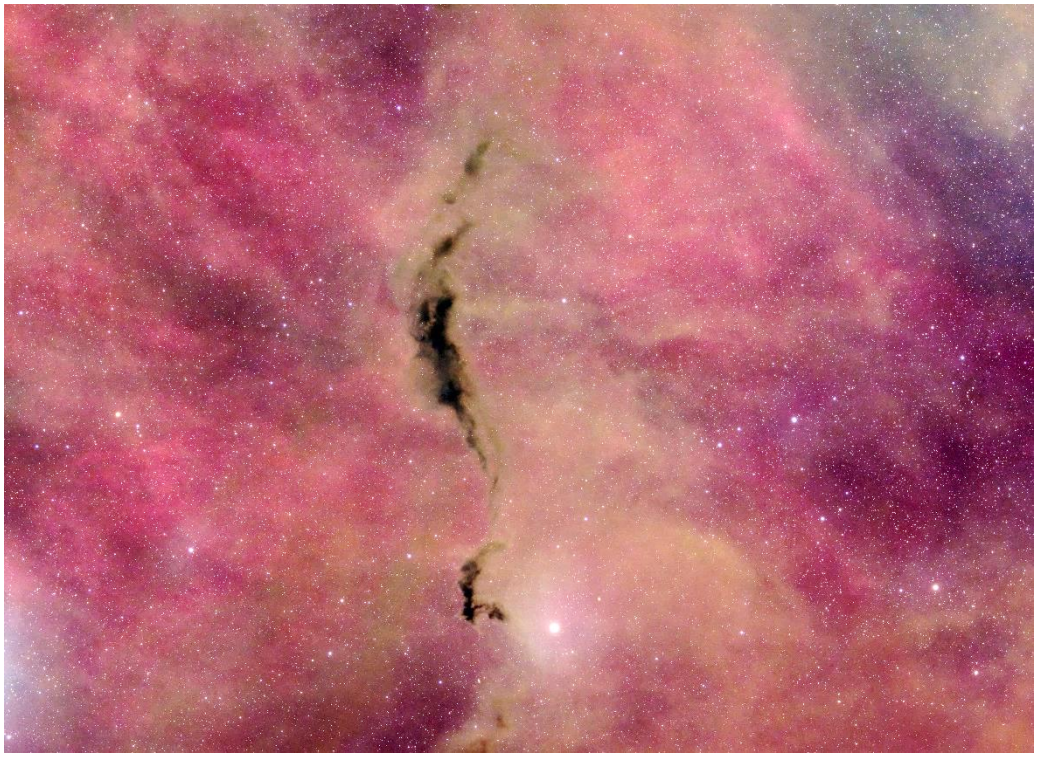


The dark nebulas LDN204 and LDN234 are shown here against the backdrop of the large emission nebula SH2-27. This was taken by David Fischer in May-July 2024 from the OCA Anza site using ASI2600MC camera with dual narrow-band filters on a FMA230 refractor.

Upcoming Events - free and open to the public

Beginner's class	**Monday**, 6 January at 7:30 to 9:30 PM **ONLINE** This is session 5 of the class, the in-person session "How to Use Your Telescope". Bring your telescope to class and get some help learning to set it up and use it. New location: This class is at Orange Coast College, near Building 40, Astronomy House
Club Meeting	Friday, 13 December at 7:30 to 9:30 PM **IN PERSON** at Chapman University and **ONLINE** "What's Up John Garrett from TVA **IN PERSON** Main speaker: Dr. Robert Nemiroff from Michigan Technological University **ONLINE** whose talk will be "NASA's Best Images and Videos 2024"
Open Spiral Bar	Saturday, 14 December at 10:00 to 11:30 PM **ONLINE** Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.
Star Parties	Saturday, 29 December at the OCA Anza site. ??? Irvine site dates are yet to be determined

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

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

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

President's Message

By Barbara Toy

Final Information Round-up on the OCA Election:
As you may recall, nominations for the 2025 OCA Board ended at the end of November 8th, the day of the November General Meeting. We now have a final ballot, and I am happy to report that we have a nominee for each position on the ballot. Mark Price unfortunately had to leave the Board earlier this year, and John Hoot also decided to leave the Board due to his other commitments in the next year, so we had two open Trustee positions. David Pearson, who has run our Beginners Class for many years, and David Fischer, editor of the Sirius Astronomer, both agreed to run for Trustee positions, and both will be great additions to the Board if elected.

You'll see that there are places on the ballot to write in candidates for each of the officer positions and four write-in spaces for Trustee positions. As a matter of courtesy, if you want to write someone in, please check with them first to be sure to be sure they are OK with the write-in. There is, after all, a chance they could wind up on the Board through your write-in, and it would be unfortunate if that wasn't something they wanted. Please also remember that anyone you write in for a Trustee position must have been a member in good standing for at least a year, and that anyone you write in for the President or Vice President positions must also have served on the Board for a year to be eligible.

Copies of the paper ballot are sent to the members in the December Sirius Astronomer, so you should find it in this issue. If you want to vote by paper ballot, the instructions are on the ballot itself. You should be able to download additional copies from the club's website; if you have any problems with that, please contact Reza AmirArjomand (our Vice President and webmaster, Reza@ ocastronomers.org) or Alan Smallbone (our Secretary, Alan@ocastronomers.org). Each voting member in a household must submit a separate ballot for their votes to be counted.

The paper ballots can be mailed to the address on the ballot up to the day of the January General Meeting (January 16, 2025; they must be postmarked by midnight of that day to be counted). Alternatively, they can be turned in at the January meeting (we'll have our usual ballot box at the meeting). Tim Hogle has generously agreed to handle counting of the paper ballots again this year.

You also have the option again to vote electronically. John Hoot has kindly agreed to manage the electronic voting again, and you should get an email at the address we have for you in the club's records with the link to the electronic ballot. If you don't get the email by the end of the second week in December, please contact John Hoot (scopes@ssccorp.com) or Charlie Oostdyk (Charlie@ocastronomers.org).

Please do vote and encourage other members to vote as well – it's an important reminder to the Board that we hold our positions to serve the interests of the club and its members. I can say from personal experience that all of the candidates have done a lot of hard work for the club and take their obligation to act in the club's best interests seriously. They deserve your votes, and getting your votes in is one way to show them that their efforts and dedication are appreciated.

As to the presidency, nobody else has said that they would run for that position, and I enjoy the challenges, so that's why my name is on the ballot again. If you entrust me again with this position, I will continue doing all I can, working with my fellow Board members and our volunteers, to keep the club running smoothly and with our members' interests in mind.

On Other Matters…
For anyone who has unsuccessfully tried to reach me in the last couple months, I apologize – everyone has times of greater problems in their lives, and this year has proven to be filled with an unusual set of challenges for Alan and me and our entire family. Fortunately, things are improving, and I hope that both of us will be able to participate fully in the meetings and other club activities again before too long.

On a brighter note, we're heading into the Holiday Season now, with Christmas lights and decorations going up all over. That can make viewing and imaging the night sky more of a challenge, but I hope you are able to find reasonably dark locations when you want to check out what's going on in the night sky this season.
I hope that all of you and your families enjoy the season fully – and maybe you'll even find some nice astronomical treats among your presents….

AstroSpace Update

December 2024
Astronomy and space news summarized by Don Lynn from NASA and other sources

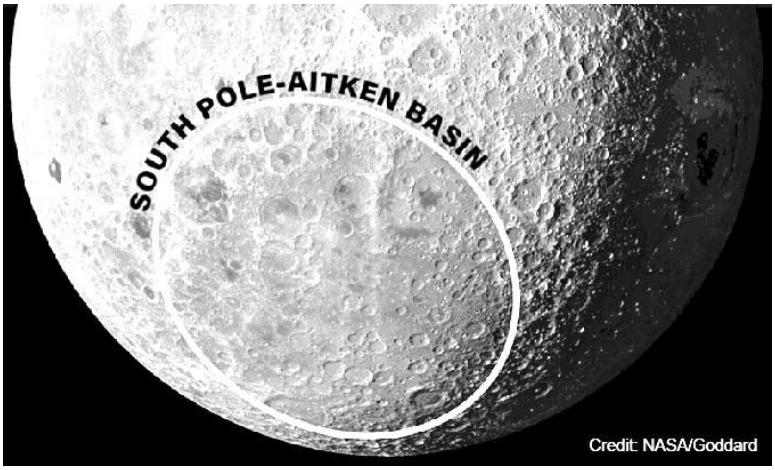
Double Brown Dwarf – Back in 1995, astronomers made the first conclusive identification of a brown dwarf, which is designated Gliese 229 B. Brown dwarfs are too massive to be planets, but too small to sustain hydrogen nuclear fusion that powers ordinary stars. The brown dwarf orbits a red dwarf star (Gliese 229 A). Now astronomers have found that Gliese 229 B has another companion object. This was detected by its gravitational effect on the motion of 229 B, which was measured spectrographically with the Keck Telescope in Hawaii. Astronomers had found it difficult to get consistent results in attempts to determine 229 B's mass, but the new discovery of the companion solves this puzzle. The additional motion induced by the new discovery will affect some mass determinations for 229 B. Initial estimates of the newly found object's mass are between 15 and 35 times Jupiter's mass. Further observations will refine this, but anywhere in this range makes it a brown dwarf.

Brown Dwarf Population Found – The James Webb Space Telescope (JWST) and Hubble Space Telescope (HST) were used to study the young star cluster NGC 602, which lies in the Large Magellanic Cloud (LMC), a neighboring galaxy to our Milky Way. Stars are still forming in the cluster. The study found 64 probable brown dwarfs in this cluster, the first population of brown dwarfs found outside the Milky Way. The brown dwarfs were found mixed in with young ordinary stars, indicating they probably formed the same way: by collapse of gas clouds. The LMC has a much lower content of heavier elements than exists in regions near us in the Milky Way, and this lower heavy element content is expected to change the way that stars form. This study may reveal much about star formation.

LMC Gas Halo – Astronomers for the first time have measured the gas halo surrounding our neighboring galaxy the Large Magellanic Cloud (LMC). It was about 10 times smaller than halos about similar sized galaxies. Apparently when the LMC passed close to the Milky Way, that larger galaxy stripped most of the gas halo away. However enough gas remains for the LMC to continue to form new stars. The observations were found in archived ultraviolet spectra made by HST. The halo was traced by its effects on light from distant quasars passing near the LMC.

Element Enrichment – Each generation of stars in a galaxy generates heavier elements and distributes them to be included in future generations of stars and their planets. Astronomers have long debated which types of stars contribute most to this heavy element enrichment. A new study using JWST looked at the spectra of distant young galaxies and found strong indications of carbon, oxygen, vanadium and zirconium, which are likely generated by thermally pulsing asymptotic giant branch (TP-AGB) stars, a late stage in the life of Sun-like stars. So, this type of star is now the best candidate to perform much of the heavy element enrichment of galaxies.

Lunar Basin Age – The South Pole-Aitken (SPA) Basin is a huge impact crater located just barely onto the back side of the Moon. A new study of a meteorite believed to have been blasted off the Moon (by a later impact) from a location in the SPA Basin indicates an age of SPA of 4.33 billion years. This makes it the oldest impact basin on the Moon. This is believed to be early during the time of heavy bombardment of the Moon by asteroids, or perhaps even before some estimates of this bombardment period. The other basins on the Moon formed a bit later.

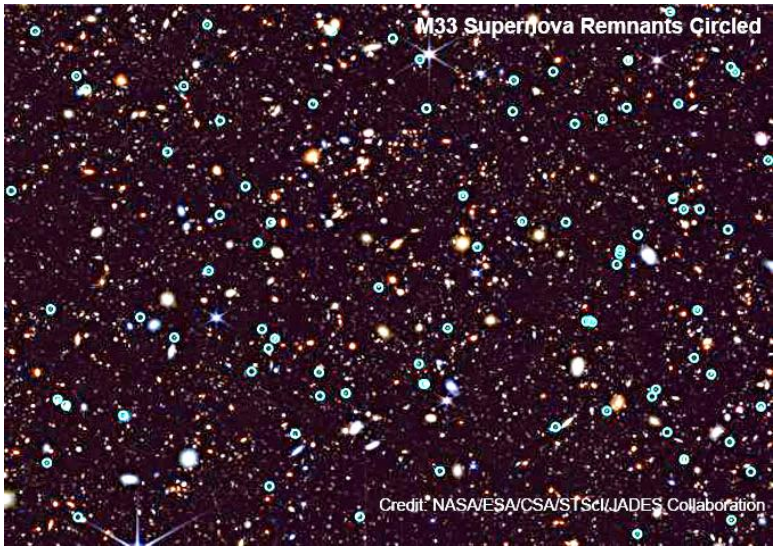


Triple With Black Hole – V404 Cygni has long been known to be a binary system consisting of an ordinary star and a black hole orbiting each other. Data from the Gaia spacecraft show that another star that appears nearby is actually orbiting the pair (but distantly), making this the first known triple system that includes a black hole. Many black holes have been found to have been kicked out of multiple star systems by the processes that form them. But V404 shows that sometimes black holes form with little or no kick, since its black hole did not escape from even the distantly orbiting companion.

Closely Orbiting Binary Black Hole – A burst of light was seen in a distant galaxy in March 2021. It was at first thought to be a supernova, but the next year it repeated, which is impossible for a supernova. Eventually it was found to repeat every 60 to 90 days. One theory proposed is that the cause was a gas cloud interacting with a pair of black holes. Monitoring the object with the Swift space telescope found oscillations in ultraviolet and X-ray light that matched computer simulations of a black hole pair and gas cloud. Observations indicate the black holes have a combined mass of about 40 million times the Sun's mass. They orbit each other every 130 days. The black holes' orbit is decaying, and they will merge in about 70,000 years.

Black Hole Without Supernova – Massive stars usually end their lives as supernova explosions, which leave behind a black hole or neutron star. A very few massive stars have been observed to disappear, indicating they collapsed to a black hole without exploding first. One of these disappearances was well observed over the past few years. The star was located in the Andromeda Galaxy and is designated M31-2014-DS1. It brightened in infrared in 2014, held constant for about 3 years, then dimmed dramatically for about 3 years. By 2023 the star could not be detected in visible light or infrared, except for a recently ejected dust shell. No explosion was ever seen and the ejected material left afterwards was far less than a supernova would leave. Theorists are working on explaining how a massive star could collapse without an explosion.

Supernova Remnants Found – Archived images from JWST, along with HST and ALMA radiotelescope data, were used to study an area within one arm of the nearby spiral galaxy M33. The study discovered nearly 800 newly forming stars and 43 supernova remnants. A surprise finding was molecular hydrogen infrared emission from some of the supernova remnants, indicating shocks moving through hydrogen clouds. Astronomers hope to use JWST to find supernova remnants in other nearby galaxies.



Unusual Supernova Remnant – The Keck Cosmic Web Imager instrument on the Keck Telescope was used to observe a supernova remnant known as Pa 30. This supernova explosion was observed in the year 1181. The new observation showed filaments of sulfur protruding from a dusty shell. The filaments are expanding at about 600 miles per second. The remnant was discovered by amateur astronomer Dana Patchick in 2013. This supernova is unusual in that it did not leave the usual black hole or neutron star, but instead left a partial white dwarf star. The remnant nebula is unusual in that it does not contain hydrogen or helium, it is asymmetric, and the distribution of elements in it is patchy. Astronomers believe it was a Type Iax supernova, an unusual type.

Vega Disk – About 40 years ago the star Vega was found in infrared light to have a disk about it like those proposed to form planets. HST and JWST were used recently to get higher resolution images of the disk, expecting to find gaps in the disk that would be caused by forming planets sweeping up the material in their orbits. Such gaps have been found in the disks of other young stars which are forming planets. No gaps were found in Vega's disk however, with the exception of a faint one quite far from the star (about twice the size of Neptune's orbit).

Penetrating Galactic Dust – The plane of the Milky Way, particularly near the core, contains so much dust that it thoroughly blocks most wavelengths of light from objects beyond. This became known as the Zone of Avoidance. Astronomers used the MeerKAT radiotelescope array in South Africa at a frequency that penetrates dust well and is emitted by the gas surrounding galaxies to map the area where the Vela supercluster of galaxies is known to lie behind this Zone. The result showed hundreds of galaxies of this supercluster, many of which had not been detected with other wavelengths.

Black Hole Corona – Theoretically a black hole should have a corona about it, somewhat like the Sun's corona in that it is a faintly glowing cloud. It should lie between the black hole and its accretion disk and should be roughly 1000 times hotter than the Sun's corona. For the first time, astronomers were able to observe the corona about a black hole. The observations, made on a dozen black holes, were done by detecting X-rays emitted by the corona after they were reflected off gas or dust while the overwhelmingly bright accretion disk was hidden by that gas or dust. The corona was found to have a doughnut shape, not spherical.

Fastest Spin – Astronomers have discovered a neutron star that ties the record for the fastest neutron star spin known. It rotates 716 times per second. Astronomers are interested in establishing what the limit is for rotation, because it will constrain what kind of internal structure neutron stars have in order not to fly apart with this huge centrifugal force. The reason that some neutron stars reach such high spin rates is that a close companion star can gravitationally dump material onto the neutron star that speeds up its spin.

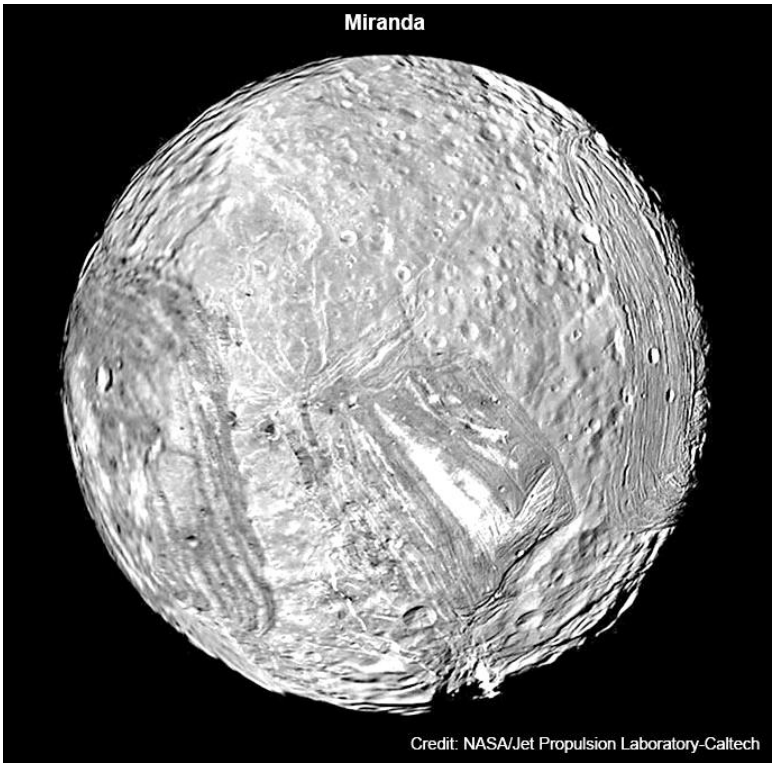
Steam World – JWST observations show that the atmosphere of the exoplanet GJ 9827 d is almost entirely hot water vapor, the first of its kind. Theorists had proposed such and termed it a "steam world". It's about 100 light-years away, about twice the diameter of Earth and 3 times the mass.

XRISM – Initial observations made by XRISM, launched about a year ago, have been released. XRISM is an X-ray space telescope is a joint project of NASA and the Japanese space agency with spectrographic ability. Discoveries include a supernova spewing iron and a warped disk about a black hole. XRISM is designed to work in concert with the existing X-ray space telescopes Chandra and XMM-Newton though it will have to replace their observations if those aging space telescopes fail.

Chandra – Financing NASA, as well as other government agencies, is a complicated drawn-out process. The first budget proposal for next year saw large cuts in NASA funding, including basically shutting down the Chandra X-ray space telescope, despite its history of discovery and its working condition. Due to voluminous objections from scientists and the public, the next iteration restored Chandra funding for one more year. Astronomers hope to extend operation of Chandra as long as it functions.

Uranus Observations Explained – When Voyager 2 flew by Uranus in 1986, observations of the planet's magnetic field showed it is like no other planet's. The charged particle belts were too close to the planet and too intense, there was no obvious source for those charged particles, the magnetosphere was almost devoid of charge particles other than the particle belts, and the magnetic field was too close to the planet. A new study shows that these effects were all temporary results of a blast of solar wind that arrived days before Voyager 2's encounter with Uranus. The study estimated that the conditions observed occur only 4% of the time, and the rest of the time, the planet's magnetic behavior much more closely matches that seen at other planets.

Miranda Ocean – New research proposes that Uranus's moon Miranda was recently (in astronomical terms, a few hundred million years ago) heated internally by tidal forces from other moons sufficiently to melt a subsurface ocean. The ocean would have been up to 60 miles thick below a frozen crust about 20 miles thick. This history run through a computer simulation best matched certain unusual patchwork surface features of Miranda seen now. We have close-up images of Uranus and its moons only from the Voyager 2 flyby of 1986. It is probable that Miranda was in orbital resonance that produced tidal forces with other moons in the past, but their orbits have drifted away from that condition.



Voyager 1 – In the middle of October Voyager 1 went silent. A search for a radio signal from the 47-year-old spacecraft found a weak signal on another radio band from a backup transmitter that had not been used since 1981. It appears that some condition kicked the spacecraft into a safety mode that included turning off the main transmitter. The controller team is working on a plan to bring the spacecraft back to normal operation.

Coronagraph Launched – The recently launched GOES 19 spacecraft, part of a long series of weather satellites, carries a coronagraph, which will monitor the Sun's corona while the other instruments on the spacecraft are monitoring Earth's weather. A coronagraph is a solar telescope that has an opaque disk that eclipses the Sun's light so the telescope can observe the far dimmer light of the corona near the Sun. For about 29 years the corona has been monitored by the coronagraph aboard the SOHO spacecraft, but that craft is long past its design life and could fail. This newly launched coronagraph is ready to replace it.

Martian Soil – The Mars InSight spacecraft, which landed on the red planet in 2018, included the mole, an instrument that was designed to hammer its way about 16 feet down into the soil and measure heat conduction from the interior of the planet. Unfortunately, the mole never made it even 2 feet below the surface despite more than 2 years of efforts. The mission ended in 2022 when dust on the solar panels reduced their power output below usable levels. The mole did record temperatures anyway for the life of the mission, even though heat conduction was polluted by daily and seasonal temperature changes from the surface. Scientists have now completed an analysis of those temperature measurements and learned something about core heat conduction toward the surface as well as about the properties of the soil near the surface. They found that the top 8 inches of soil are seasonally subjected to salty liquid, which later hardens the soil into a crust. That crust strongly contributed to the failure of the mole to pound down to its designed depth. Below the crust lies a layer of volcanic sand and debris. The crust somewhat insulates the soil below from the large daily and seasonal temperature changes that the surface undergoes. The density of the top foot of soil was calculated and found to be comparable to earthly basaltic sand.

Astro-Imaging Special Interest Group Meetings

Alan Smallbone

There will be an online meeting via zoom on Dec 6. starting at 7pm. The first online meeting will be an important one to see how this is all going to work out and finding out what the real interest level is for these meetings. So please attend the online meeting or email me with your intentions for the meetings. I will provide links before the online meeting.

The first in-person meeting will be on Jan 3, 2025 at 7pm with more details to follow. The meetings will not be held all months - there will be some months without meetings. I will provide updates at the online meeting on the remaining schedule.

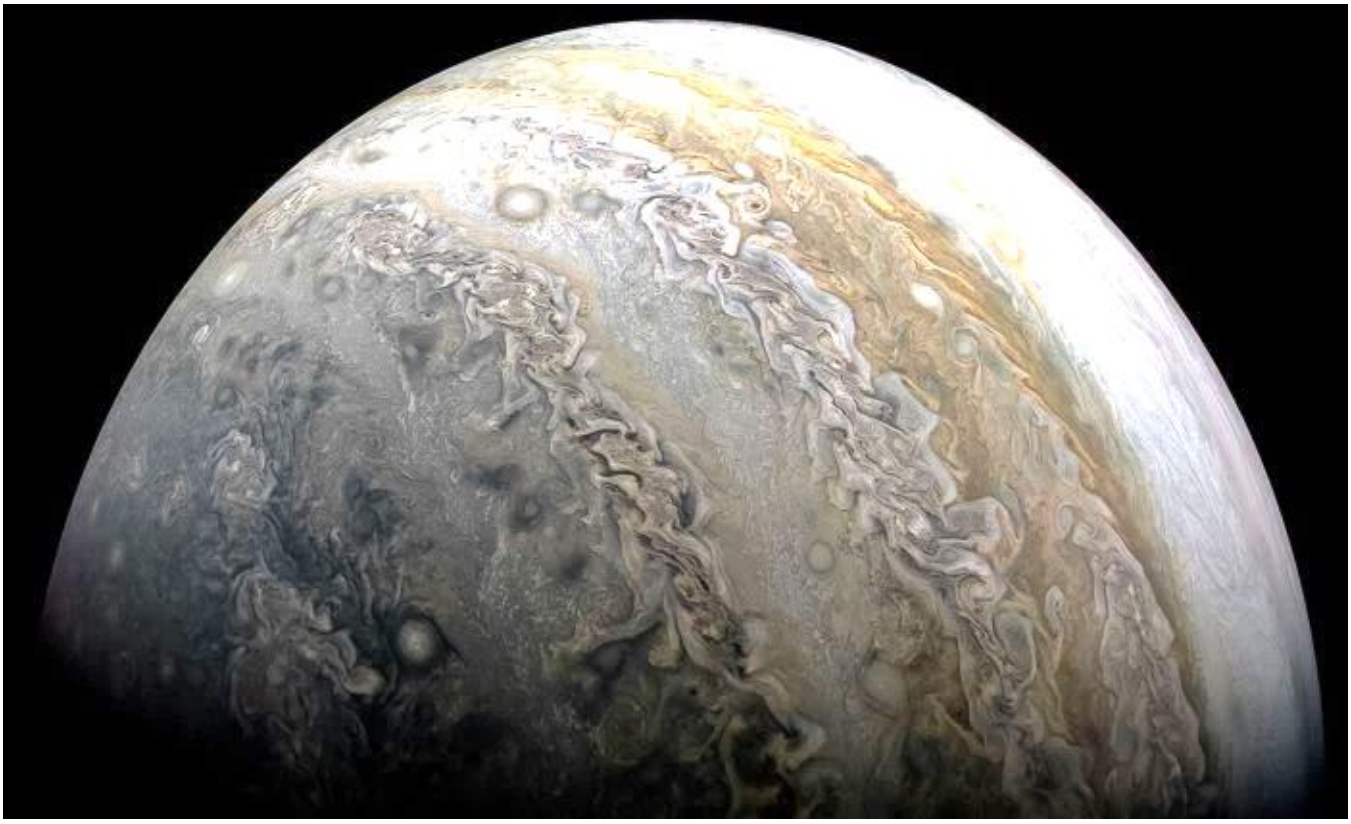
I will be asking for volunteers to do various tasks for the meetings such as talking about their equipment, techniques, potential imaging targets, or just showing recent images or favorite images.

The only way these meetings will work is with some participation. Sharing and learning will help you on your own path to being a better astroimager. The meetings and the voluntary participation are open to any skill level, so I encourage anyone interested in doing astroimaging to attend and ask questions. I learned a lot by doing that and by sharing my failures along with my successes. We welcome all skill levels. Currently I am mostly imaging using a tracker on a photo tripod and a mirrorless camera with lenses, not a lot is needed.

If you have any questions or concerns, please feel free to contact me. If you want to chat on the phone I can send you my cell number. Just send me an email if you do not have it.

December's Night Sky Notes: Spot the King of Planets

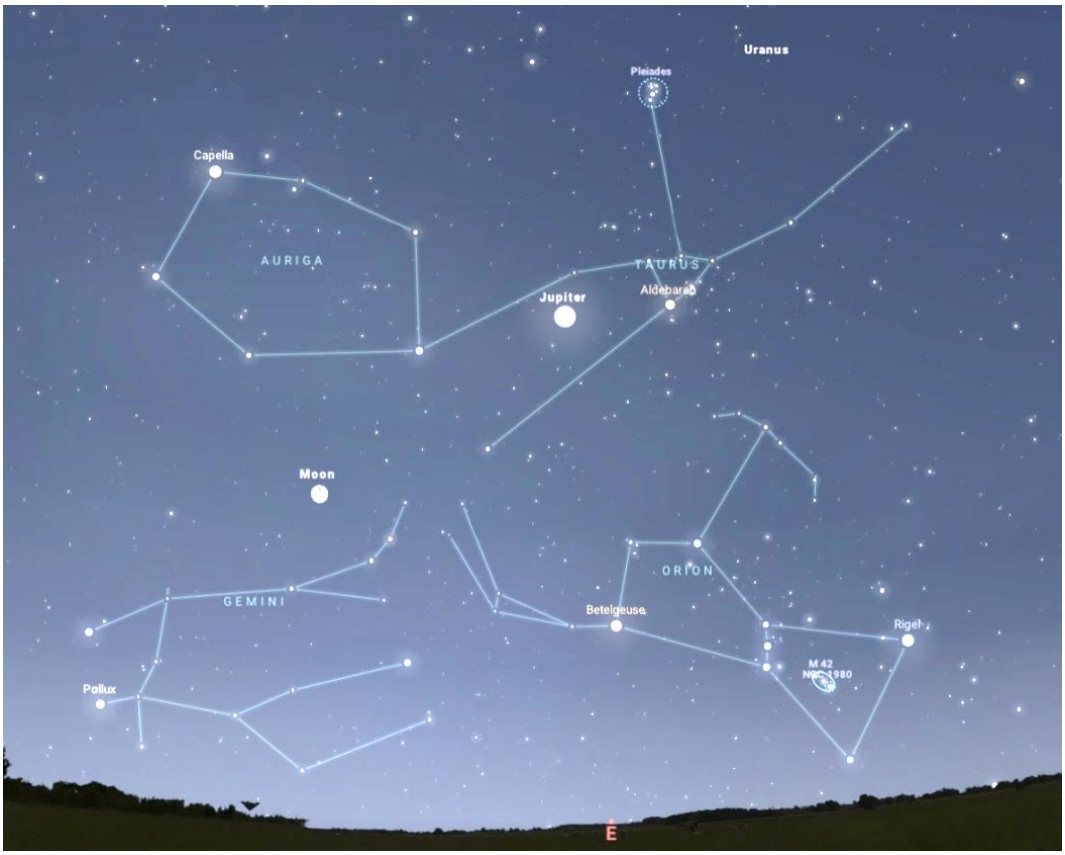
Originally posted by Dave Prosper: February 2023, last updated by Kat Troche: November 2024



NASA's Juno mission captured this look at the southern hemisphere of Jupiter on Feb. 17, 2020, during one of the spacecraft's close approaches to the giant planet. This high-resolution view is a composite of four images captured by the JunoCam imager and assembled by citizen scientist Kevin M. Gill. Credit: NASA, JPL-Caltech, SwRI, MSSS | Image processing by Kevin M. Gill, © CC BY

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its formidable size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together, they would still only be half as massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe but also by observers back on Earth!



Look for Jupiter near the Eye of the Bull, Aldebaran, in the Taurus constellation on the evening of December 15, 2024. Binoculars may help you spot Jupiter's moons as small bright star-like objects on either side of the planet. A small telescope will show them easily, along with Jupiter's famed cloud bands. How many can you count? Credit: Stellarium Web

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million km)! While the King of Planets has a coterie of 95 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Calisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front of Jupiter or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening – and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

Now in its eighth year, NASA's Juno mission is one of just nine spacecraft to have visited this impressive world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. What else will we potentially learn in 2030 with the Europa Clipper mission?

Find the latest discoveries from Juno and NASA's missions to Jupiter at science.nasa.gov/jupiter/

OCA Club Meeting Raffle

Reported by Helen Mahoney

A deserving new OCA member won a telescope in the raffle at the November General Meeting at Chapman University. Julie Schrock was the lucky person with the winning ticket in the lecture hall.

Our Adopt-a-Scope coordinator Jake Brown selected the ETX 125 telescope from the program's inventory, along with an ETX tripod, GOTO hand controller, and eye pieces. Jake also did a great job of conducting the raffle.

Julie has been interested in astronomy since she was a child. Her first telescope, a Celestron 4SE, was a gift from her spouse about 8 years ago. She commented, "Saturn is my favorite. I cried the first time I saw its rings. It never gets old".

She attended David Pearson's Beginner Classes and joined OCA last month. She was considering an upgrade, so winning this telescope fit right into her plans. She and her 7-year-old son have been having star parties in their backyard, and now she is looking forward to using her new scope at Anza and showing him more of the universe from a darker site.

Another raffle is planned for the near future. Jake will post notices in the Sirius Astronomer and on the Web Site with details.

Raffle at the OCA Club Meeting in January 2025

Prize: (Approximate Description)
An 8 inch diameter Telescope, Schmidt-Cassegrain design
with hand controller and motorized sky tracking in working order.
(Inclusion of GoTo functions and tripod are TBD).
This scope will be taken from the club's inventory of used telescopes

When: January 10, 2025, 7:30 pm.
Where: OCA General Meeting at Chapman University.

Participation is OPEN to OCA club members ONLY. Interested parties must be present IN PERSON at the meeting. Tickets for the RAFFLE are FREE to those in attendance.

Outreach Activities

November 2024 Outreach Events

Event Date	Type	Site Name	Address	Start Time
6 Dec 2024	School	Beacon Park Elementary	200 Cultivate, Irvine	7:00 PM
17 Jan 2025	School	Cielo Vista Elementary	21811 Avenida de los Fundadores , Rancho Santa Margarita	7:00 PM
24 Jan 2025	School	Cypress Village Elementary	355 Rush Lilly, Irvine	7:00 PM
28 Jan 2025	School	Castille Elementary	24042 Via la Coruna, Mission Viejo	7:00 PM
31 Jan 2025	School	Portola Springs Elementary	12100 Portola Springs, Irvine	7:00 PM
6 Feb 2025	School	Ball Junior High	1500 W. Ball Rd, Anaheim	6:00 PM

Please also check with Martin Christensen for updates to this list.

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.

Each advertisement may be run for 3 consecutive issues, after which it will be removed. The advertiser may resubmit it for inclusion after a one-month hiatus.

For Sale contact Dave Cook 949-689-0853 cell

- MEADE LX200 GPS, 10-inch diam. mirror $1995
- Includes heavy-duty mount and tripod, 10-inch OTA, Heavy-duty optional equatorial wedge, 115-volt AC to 12-volt power adapter, all normal accessories
- Accessory & eyepiece utility tray, padded soft carrying case, soft dew shield, 1-1/4 90-degree diagonal
- Peterson Engineering modifications: ball-bearing focuser mod, precision brass drive gear mod
- Electronic focuser is included.

This system can be used in either azimuth or equatorial mode. Mount and telescope just returned from Meade factory mechanical/electrical refurbishment and update costing $500+ (still in shipping box from Meade). Current equivalent Meade LX200, 10-inch GPS, priced new is $5899

Note: This is my favorite telescope, but due to anti-cancer drugs, I no longer have the strength to singlehandedly maneuver this system.

For Sale contact Izzy Oleinik izzy1000@mac.com

- Sky Watcher EQ6R mount $1400
- Equatorial GoTo mount with built-in USB PC control, belt driven with no internal gear box providing minimal backlash and significantly reduced periodic error
- SynScan Hand Controller, QHY PoleMaster electronic polar scope worth over $225
- Steel tripod for rock-solid performance
- Two 11-pound counterweights

Available for pickup in Mission Viejo

For Sale contact Izzy Oleinik izzy1000@mac.com

- Avalon - M-Zero Single Arm Equatorial/Alt-Az mount (WIFI Version) $3300
- HQ 400 step high resolution stepper motors on both RA and DEC axes
- StarGo GoTo Control System, Polar scope
- Avalon - X-Guider tangent assembly for guiding scopes valued at $400
- T-90 tripod
- Soft bags for mount and tripod

Available for pickup in Mission Viejo

For Sale contact Dr. John Glassco 949-922-5037cell

- Complete Astrophotography Outfit $1500
-
- Camera: ZWO ASI678MC Planetary/Deep Sky – 8.3 PMxl color
- Mount: MEADE LXD-55 Goto German Equatorial (GEM), with Autostar Goto Control Model #497, Heavy-duty tripod, A/C Adaptor, Mighty Max Battery, Model ML-9-12, 12 Volt, 9 Amp w/ cables, Neewer Padded, Soft Carrying Case
- Telescope: Explore Scientific AR 102 (102mm) f/6.5 Achromatic Refractor, Orion 2" 90-degree Diagonal, Parks 8 X 50 Finder Scope, 1 1/4 "diagonal w/ lighted reticle
- Oculars: Celestron Zoom 8-24mm Zoom w/ case 1 ¼", Celestron 2x Barlow Ultima SV Series 1 ¼", Celestron 25 mm 1 ¼", Baader Hyperion MK-IV Universal Zoom 8-24mm w/case 1 ¼", 2" adaptor
- Accessories: Meade Flip Mirror System, Model 644, Celestron Radial Guider
- Laptop computer: ASUS ROG GL552VW, 15" Gaming Laptop Intel Caore i7, Windows 10, some astronomy software is installed

This system has been used together only once. The telescope has excellent optics, especially when coupled with the Baader zoom ocular. I'm no longer interested in spending cold nights out doing imaging/observing.

Local pickup or deliver to OCA meeting venue only. Photos of all items in the astrophotography package for sale are available upon request. Located in Laguna Niguel

From the Editor

The newsletter is once again looking for front cover picture contributions.

Due dates for submission of articles, pictures and advertisements

Issue	**Due date**
January 2025	21 December
February 2025	25 January
March 2025	22 February

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