

M94 galaxy imaged by Sam Saeed using a 10 inch Ritchey-Chretien telescope and QSI-583 camera. This was done in 2017 from the OCA Anza site.

Upcoming Events - free and open to the public

Beginner's class	Friday, 6 December at 7:30 to 9:30 PM ONLINE This is the 4th session of the Beginners Astronomy Class. It covers the science behind the telescope: how our eyes perceive objects seen by telescope and the physics involved.
Club Meeting	Friday, 8 November at 7:30 to 9:30 PM IN PERSON at Chapman University and ONLINE "What's Up?": Lonny Buinis from United Astronomy Clubs of New Jersey Main speaker: Pranvera Hyseni whose talk will be "From Vision to Reality: The Journey of Kosovo's First Observatory"
Open Spiral Bar	Saturday, 9 November 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, 30 November 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

As I write this, the astronomical news of the moment is the comet, C/2023 A3 (Tsuchinshan-ATLAS) to be more precise. Club members viewed and imaged it from a lot of different locations – Anza, of course (Bill Warden, Jerry Floyd, Dave Fischer), but also such places as Stonewall, TX (Craig Bobchin), Kodachrome Basin, Cedar Breaks, Goblin Valley and other UT locations (Wally Pacholka), Palos Verdes (Alan Lang), Laguna Beach (Alan Smallbone), Idaho (Rick Hull), Anza Borrego (Tom Munneke), Long Beach (Helen Mahoney and Doug Millar), Huntington Beach (Tom Bash) and Seal Beach (Tom Bash), as a sampling. My apologies if I missed anyone who posted about it – it's been a hot topic on the AstroImagers email group (if you're not on that group, you've been missing a lot, including recent Aurora shots from Anza – check our homepage for the link to the email group). Alas, by the time you see this, the comet will be out of view, speeding on its way back to the outer solar system, but some of the images taken by some of our members should be in this issue of the Sirius Astronomer.

I'm happy to report that there are also ongoing discussions and planning for getting the AstroImager SIG meetings going again, as well. If you're interested in participating in the planning committee for the SIG, please contact Alan Smallbone (alan@ocastronomers.org). As details are worked out, updates will be posted to the AstroImagers email group, so please keep an eye out for them. When dates are set up and the location is finalized, that information will be put on the website calendar.

It would be nice to have member images posted regularly on our website again; I've been told that members who have log-ins can post images now. If you want to do this but don't have a member log-in yet, please contact Charlie Oostdyk (charlie@ocastronomers.org) for how to obtain one. If you have a log-in (which is used to access the Members Only section) and can't figure out how to post an image, please contact Reza AmirArjomand (Reza@ocastronomers.org) or Alan.

OCA Election

The day of the November General Meeting marks the end of nominations for the OCA Board for 2025. If you're interested in running as a candidate for a Board position, please send an email with your contact information to Alan Smallbone, current Club Secretary (email is above), letting him know so he can add you to the ballot. The email needs to get to him by midnight on November 8 (the second Friday in November).

Aside from notifying Alan, the requirements for running for a position are pretty simple: you have to have been a member in good standing for at least a year before you would take office (if elected) and must remain a member in good standing during your membership on the Board. If you want to run for President or Vice President, you also must have served on the Board for at least a year at some point in the past. From personal experience, if you are running for either of these positions, it helps if you have served on the Board or attended some Board meetings close in time to when you would take office, to be familiar with current issues facing the Board. If any member is interested in attending any Board meeting, please let Alan know at least a few days before the meeting so he can send a link.

Once the ballot is finalized, usually within a few days after the November meeting, it will be posted on the website and a copy goes out with the December Sirius Astronomer, for those who want to vote on paper. We also plan to use electronic voting again, as it has made voting easier for a lot of members. Voting ends at the end of the January General Meeting, and we generally have a few paper ballots available at the in-person part of that meeting, in case there are people who haven't yet voted and still want to. Of course, electronic voting will remain open that full day, so you can get your votes in that way whether you are at the in-person meeting or not. Thank you in advance for taking part in our election process, which helps keep the club healthy and the Board accountable to our membership. And I hope you are enjoying good views of the late fall/early winter skies!

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AstroSpace Update

November 2024

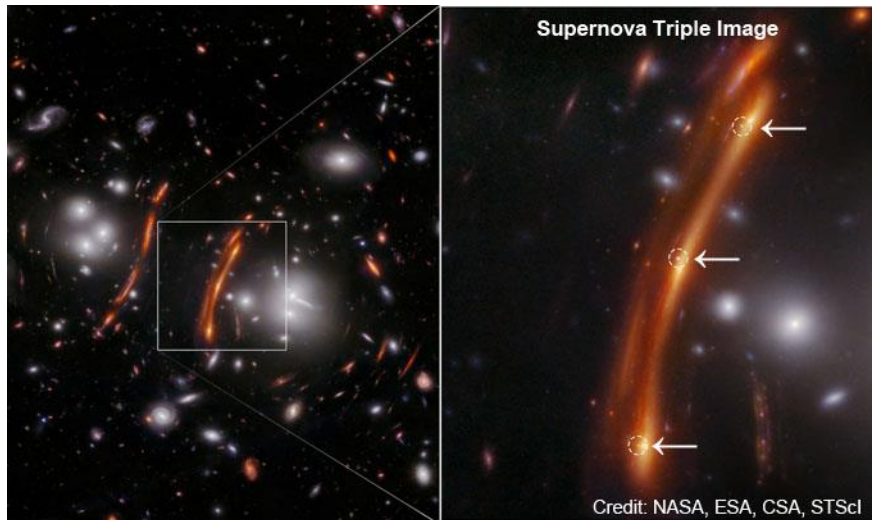
Astronomy and space news summarized by Don Lynn from NASA and other sources

Early Galaxy – In images taken by the James Webb Space Telescope (JWST) astronomers found a galaxy designated GS-NDG-9422 that has an unusual spectrum. It showed that the galaxy's light is mostly produced by hot gas, not by stars. It is so distant that when the light we are seeing left there, it was only a billion years after the Big Bang. Astronomers think the galaxy may be in a phase that occurs between galaxy formation and the galaxies we are familiar with, which shine mostly by starlight. Computer simulations showed that the very massive stars that form first in a galaxy could heat surrounding gas to produce what JWST saw with this galaxy.

Novas And Jets – Astronomers using the Hubble Space Telescope (HST) searched over a 9-month period the giant galaxy M87 for novas. They found that more novas occur near (but not in) the jets spewing out of the supermassive black hole at M87's center than novas in the rest of the galaxy. A nova is caused when one star of an orbiting binary star pair dumps hydrogen onto its companion white dwarf star until that hydrogen gets so hot it explodes as a nuclear bomb. Astronomers have not yet come up with an explanation of how the jets could influence their surroundings to produce more novas. It was found that on average one nova explodes every day somewhere in M87.

QPEs Explained – Astronomers have occasionally seen a phenomenon known as a quasi-periodic eruption (QPE), in which bursts of soft X-rays are seen every few hours or weeks at the center of a galaxy. The leading theory is that a star or small black hole is orbiting a supermassive black hole and that black hole is feeding on a different star that is being torn apart by black hole tidal forces. The X-rays are emitted every time the star or black hole in its orbit crosses the accretion disk of star debris. Astronomers believe they have caught this scenario in the act. A tidal disruption event (TDE), where a black hole is tearing a star apart, was spotted in 2019 by the Zwicky Transient Facility (the program using the Palomar Schmidt Telescope to look for changes in the sky). Then the Chandra X-ray space telescope observed the TDE and found X-ray flashes about every 48 hours. This strongly supports the leading theory of QPEs.

Gravitational Lens Triple Image – JWST was used to observe a gravitational lens, where the gravity of a cluster of galaxies bends the light of objects behind, magnifying and distorting those objects. A supernova happened to explode in the background objects, and the lens caused three images of it. Different timings of the brightness changes in the 3 images relate to different path lengths that the light took through the lens. The path lengths depend on, among other things, the expansion rate of the Universe, known as the Hubble Constant. This supernova is allowing astronomers an independent way to calculate the Hubble Constant. Though this calculation was not very precise, it tends to agree with Hubble Constant values calculated from supernova surveys while disagreeing with those calculated from the Cosmic Microwave Background.



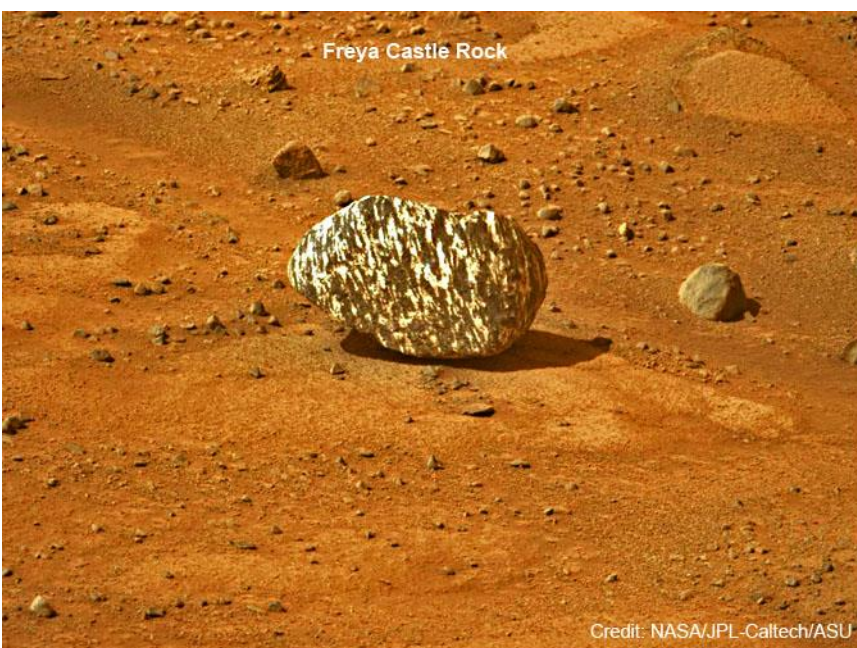
Runaway Stars – Astronomers searched data from the Gaia spacecraft to look for fast-moving stars near the huge open star cluster R136 in the Large Magellanic Cloud, a satellite galaxy to our Milky Way. They discovered 55 stars that appear to have been thrown out of that cluster. Only about a tenth as many such runaway stars were previously known in this region. This could represent as many a third of all the very massive stars that were in R136. It was found that the newly discovered runaway stars were thrown out of the cluster in two episodes: one soon after the cluster formed 1.8 million years ago, and the other only 200,000 years ago. The first episode threw stars out in random directions, while the second threw stars in a preferred direction. Astronomers think the second episode occurred when another star cluster came nearby and interacted. This is the first time dozens of runaway stars have been found about any single star cluster. R136 is an unusual star cluster because of its huge number of stars and because it contains some of the most massive stars known.

Triple Star – TESS (planet finding space telescope) has found a triple star whose components are quite close, with one pair taking only 1.8 Earth days to orbit and the third taking 25 days. It is the closest known triple. The orbits of the 3 stars would fit inside Mercury's orbit. Astronomers believe that the 3 stars will eventually merge into one larger star, which will explode as a supernova in about 20-40 million years. The 3 stars eclipse each other from Earth's point of view, which is how TESS spotted them. TESS does not ordinarily look for eclipsing stars, only transiting planets, so astronomers had to use a special program, as well as search by citizen scientists, to look for eclipsing stars. There are likely no planets in this system because regions anywhere close to the stars would be unstable to planets' orbits.

Nearby Exoplanet – Astronomers have a few times in the past announced the discovery of an exoplanet orbiting Barnard's Star, one of our closest neighbors at only 6 light-years distance. But they have all been unverifiable, so the discoveries were canceled. However, the latest discovery announcement of a planet at Barnard's has been confirmed. It is less massive than Earth and orbits every 3 Earth days. These observations also showed that a 2018 announcement of a planet there was definitely wrong. There are hints in the confirmation observations that there are more planets there, so observations will continue to try to find and confirm them. The confirmed planet is known as Barnard b, as were several of its debunked predecessors.

Asymmetric Exoplanet – Astronomers used JWST to observe the atmosphere of a hot puffed-up exoplanet known as WASP-107b and found differences between the east and west sides. This asymmetry is a first. The planet has only a tenth the mass of Jupiter, yet its atmosphere is puffed up by high temperature (nearly 900 °F) to about the diameter of Jupiter. The planet is tidally locked to its star, so that one side always faces the star and the other side is always dark.

Strange Martian Rock – Perseverance Mars rover has imaged a strange rock, which controllers have nicknamed Freya Castle. It has black and white regions and resembles some metamorphic rocks on Earth. However conditions on Mars do not point towards a metamorphic history for this rock. On Earth rocks that appear similar are generally formed deep underground where temperatures and pressures are quite high and are brought to the surface by tectonic activity, of which Mars has little. More work needs to be done to explain this rock.



Centaur Activity – JWST was used to observe the Centaur 29P and found outgassing, which is unusual at its distance from the Sun. Centaurs are bodies in the region roughly from Jupiter's to Neptune's orbit. Some display properties of both comets and asteroids. 29P is a comet designation, and it is also known as Comet Schwassmann-Wachmann 1. The new observations showed both carbon monoxide and carbon dioxide in the jets of outgassing. Water vapor was looked for, but not found. A jet of carbon monoxide toward the Sun that was previously seen in radio observations was seen by JWST. The jets of carbon dioxide had not been seen before. Astronomers are planning further observations.

Charon Chemistry – JWST was used to observe Charon, Pluto's largest moon. Carbon dioxide and hydrogen peroxide were found. Previous work had found such chemicals as water ice and ammonia, but not these two newly observed ones. The carbon dioxide appears to be a thin layer over a water ice base. Astronomers believe that this carbon dioxide originally existed in subsurface regions and was released to the surface by meteorite impacts. The source of the hydrogen peroxide is probably the action of the Sun's ultraviolet light or particles hitting water ice.

Voyager 2 Instrument Turned Off – Spacecraft controllers have turned off the plasma science instrument aboard Voyager 2 to reduce electricity consumption. Since the spacecraft was launched in 1977, the available electric power from its plutonium-powered generator has been slowly diminishing. This instrument has contributed little scientific value since Voyager 2 left the heliosphere about 6 years ago, and so was chosen to be turned off. The spacecraft will likely be down to only one running instrument at some time in the 2030s.

Europa Clipper Launch – In October, after a short delay for a hurricane, the Europa Clipper spacecraft launched from Florida atop a SpaceX Falcon Heavy rocket on its 6-year trip to Jupiter, where it will orbit the planet and fly by the moon Europa 49 times. On the way, Clipper will use gravity-assist flybys at Mars and Earth. Clipper is the largest planetary spacecraft ever, partly due to its monster solar panels, necessary to power 9 instruments at Jupiter, where solar energy is 27 times weaker than on Earth. The main goal of the mission is to study Europa, including the liquid ocean believed to lie beneath its icy surface, and determine if that ocean has conditions that could support some form of life. A key instrument is an ice-penetrating radar.



Starship – Back in June SpaceX made the 4th test flight of its Starship rocket atop its Super Heavy booster and was able to guide both the booster and Starship back to water landings. The goal is to land and reuse the Super Heavy boosters and the Starships, though on this flight the booster was heavily damaged. Recently the booster was located on the bottom of the Gulf of Mexico and recovered. Then in October, SpaceX flew the 5th test flight of Starship with Super Heavy booster, and this time guided the booster back to the launch pad, performing a vertical landing followed immediately by capturing the booster with two long arms (which SpaceX calls the Chopsticks), for a complete recovery of the booster. The Starship re-entered Earth’s atmosphere and landed in the Indian Ocean, precisely where aimed. The Starship with booster is the largest, most powerful rocket ever flown. It is planned as part of the Artemis project to use Starship to land astronauts on the Moon from lunar orbit and also return them to lunar orbit.

Hera Launch – The European Hera spacecraft launched in October on its mission to observe the aftermath of the DART spacecraft collision with asteroid Dimorphos in 2022. After a gravity-assist at Mars, it will arrive at the asteroid in 2026 and observe it for 6 months. The mission includes two mini-spacecraft that will measure dust and observe Dimorphos with a ground-penetrating radar. What Hera finds will help scientists determine how to deflect an asteroid from colliding with Earth when such an asteroid is found.

From the Editor

The newsletter is once again looking for front cover picture contributions. We are also looking into improving the visual quality of the pictures in the printed version of the newsletter.

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
December	23 November
January 2025	21 December
February 2025	25 January
March 2025	22 February

Outreach Activities

November 2024 Outreach Events

Event Date	Type	Site Name	Address	Start Time
11/6/2024	School	Stanley Elementary	12201 Elmwood Garden Grove	7:00 PM
11/22/2024	School	Portola Hills Elementary	19422 Saddleback Ranch Rd Lake Forest	7:00 PM

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

Outreach Speaking Opportunity

Sathvik, an 8th grader at Legacy Magnet Academy in Tustin, wants speakers for the meetings of the astronomy club he founded at the school. Meetings take place between 11:40 and 12:10 on the third Tuesday of each month during the school year. The presentations should be about 15 minutes long, including a little room for Q & A. OCA members are invited for this role: contact Martin Christensen at martin@ocastronomers.org if you want to be placed on the list. Ideally, we will have five speakers, each speaking twice during the year, and talking about the latest developments in astronomy.

Raffle at the OCA Club Meeting

Prize: Meade ETX125 Telescope System, Maksutov-Cassegrain design with GOTO Hand Controller and ETX Tripod. Tracking and GOTO functions are working.
This scope has been taken from the club's Inventory of used telescopes.

When: Friday, November 8, 2024, 7:30 pm.

Where: OCA General Meeting at Chapman University.

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

Note: A second RAFFLE is being planned for the OCA General Meeting for December and will be open to OCA club members ONLY. There will be more information on this later.

Comet C/2023 A3 Tsuchinshan-ATLAS

Here's a collection of images of this comet taken by club members, both distant and local. These are all copyrighted by their owners.



Bill Warden - taken at OCA Anza site
Copyright Bill Warden



Rick Hull - taken at Glens Ferry, Idaho
Copyright Rick Hull



Dave Cook - taken near Adelanto, CA
Copyright Dave Cook



Craig Bobchin - taken at Stonewall, Texas
Copyright Craig Bobchin



Dave Kodama - taken at Newport Coast
Copyright Dave Kodama



David Fischer - taken at OCA Anza site
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Eric Goodnight - taken at Crystal Cove park
Copyright Eric Goodnight



Jens Thielmann - taken at Black Star Canyon
Copyright Jens Thielmann



Jerry Floyd - taken at OCA Anza site



Don Lynn - taken at Golden, Colorado
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Mark Maier - taken at OCA Anza site
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Tom Bash - taken at Huntington Beach
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Tom Munnecke - taken at Anza Borrego
Copyright Tom Munnecke



Tyler Morrison - taken at Grizzly Peak near Berkeley
Copyright Tyler Morrison



Wally Pacholka - taken in Arches national park, Utah
Copyright Wally Pacholka



Alan Lang at Palos Verde peninsula
Copyright Alan Lang

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		\$2300
•		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.		
<p>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</p> <p>Note: This is my favorite telescope, but due to anti-cancer drugs, I no longer have the strength to singlehandedly maneuver this system.</p>				

For Sale	contact	Marten Seth	949-892-7790	info@sethfamilyoffice.com
•		Glass Solar Filter ST425G 4" from Spectrum Telescope.		\$ 50
		Inner Diameter 4.25"/108 mm/ clear aperture 3.5		
		Bought from OPT, never used, in original box.		
<p>Located in Laguna Niguel.</p>				

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		
<p>Available for pickup in Mission Viejo</p>				

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		
<p>Available for pickup in Mission Viejo</p>				

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Webmaster	Reza AmirArjomand	webmaster@ocastronomers.org

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Astrophysics SIG	Mark Price	mark@ocastronomers.org
Dark Sky SIG	Barbara Toy	btoy@cox.net
Youth SIG	Doug Millar	doug@ocastronomers.org