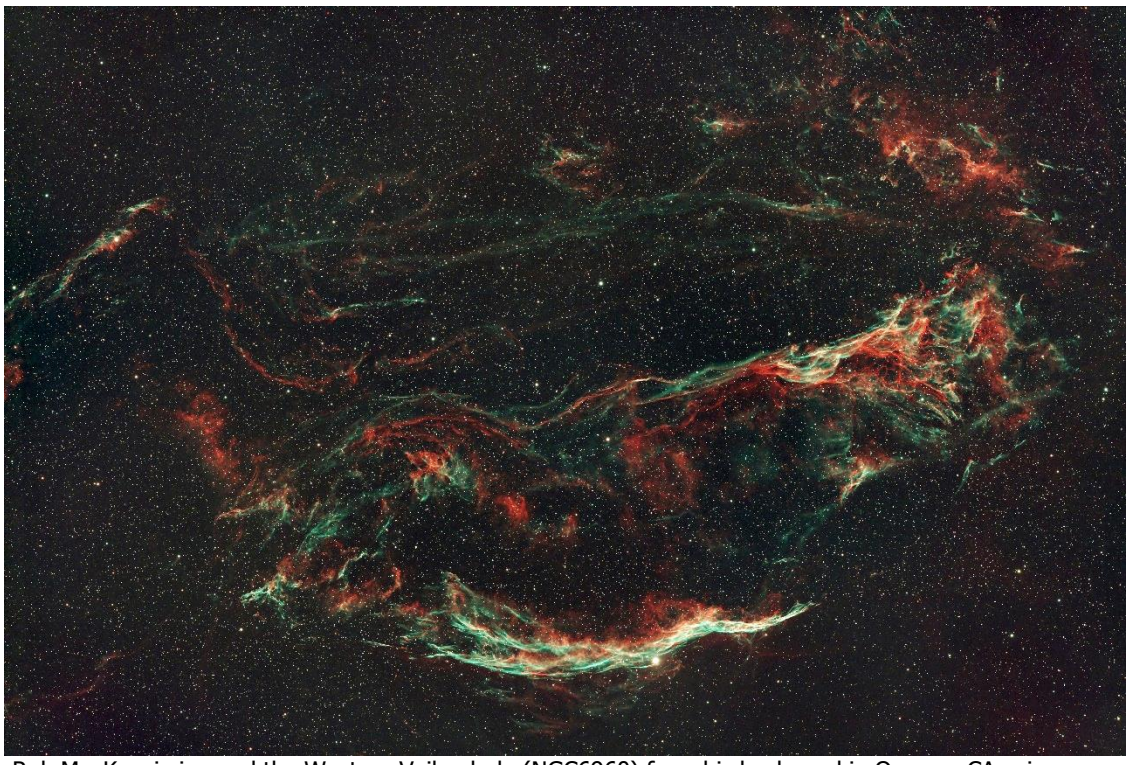
SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

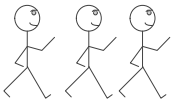
General information and contacts for the Orange County Astronomers club can be found at www.ocastronomers.org

October 2025 Free to members, subscriptions $12 for 12 issues **Volume 52, Number 10**



Rob MacKenzie imaged the Western Veil nebula (NGC6960) from his back yard in Orange, CA using an Askar FRA 600 refracto, ZWO 2600 MC camera, and a dual-narrowband filter. This was taken in Sesptember 2024.

Upcoming Events - free and open to the public

Beginner's class	Friday, 7 Nov at 7:00 to 9:30 PM This is the 3rd session of the Beginners Astronomy Class. It covers various methods of finding objects in the night sky.	**ONLINE**
Club Meeting 	Friday, 17 October at 7:30 to 9:30 PM "What's Up": Chris Butler from OCA Main speaker: Dr. Jessie Christiansen from Caltech whose talk will be "The Search for Earth 2.0"	**IN PERSON** and **ONLINE** **IN PERSON** **IN PERSON**
Astro-Physics SIG	Friday, 17 Oct 2025, at 7:00 PM to 10 PM Chapman University – Irvine Hall with general OCA meeting	**IN PERSON**
Astro-Imagers SIG	Friday, 14 Nov at 7:00 to 10:00 PM Orange Coast College, Building 40, Astronomy House	**IN PERSON**
Star Parties	Saturday, 18 October at the OCA Anza site.	

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://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

Reminder - October and November General Meeting Dates

As I mentioned last month, our October general meeting is scheduled a week later than usual, on October 17, and our November meeting is scheduled a week earlier than usual, on November 7, because Chapman University needed the auditorium where we hold the in-person side of the meetings. We'll be back to meeting on our regular second Friday of the month in December.

Get Your Nominations in for the 2026 OCA Board!

Another reminder – the deadline for getting your nomination for Trustee or officer for the 2026 Board in is the day of the November general meeting, November 7. This is a great chance to contribute to the club and help keep us on the right track – so please send your notice that you want to be on the ballot by emailing Alan Smallbone at Alan@ocastronomers.org. Please include your full name, email address, a telephone number where you can be reached most easily, and the position you want to run for. For more details on the Trustee and other positions, see last month's President's Message.

We look forward to hearing from you!

Farewell to Doug Millar from the Board

I'm sorry to announce that Doug Millar has decided to leave his Trustee position on the Board and devote more of his energy to other interests. This was formalized at the September Board meeting. Fortunately for us, he is still willing to be part of the group that deals with equipment issues at the general meetings and we'll still be seeing him regularly. I understand that he will still be doing the annual OVRO excursions, so I expect we'll be hearing from him with details as the next OVRO date approaches.

Doug and his wife, Helen Mahoney, were both active on the Board in the 1990s, before I joined the club. Helen is a former club President. It was a real boon to the club when they decided to rejoin the Board several years ago before Covid. Both have contributed a lot since they rejoined the Board, offering new ideas, helpful analyses, new projects (Helen runs the improved coffee and snack table for the general meetings, as one example), and helping to keep discussions on track. It has been a real pleasure working with them and getting to know them better. Helen formally left the board a while ago, but has remained an active participant in our meetings, and I hope she and Doug will both continue to offer their perspectives on issues before the Board.

As a silver lining to the cloud of Doug's leaving, we were able to fill his position for the remainder of the year by appointing Liam Kennedy as a Trustee. Liam is also a past Board member and past President who recently was able to become more involved in club activities again, and we are looking forward to working with him again.

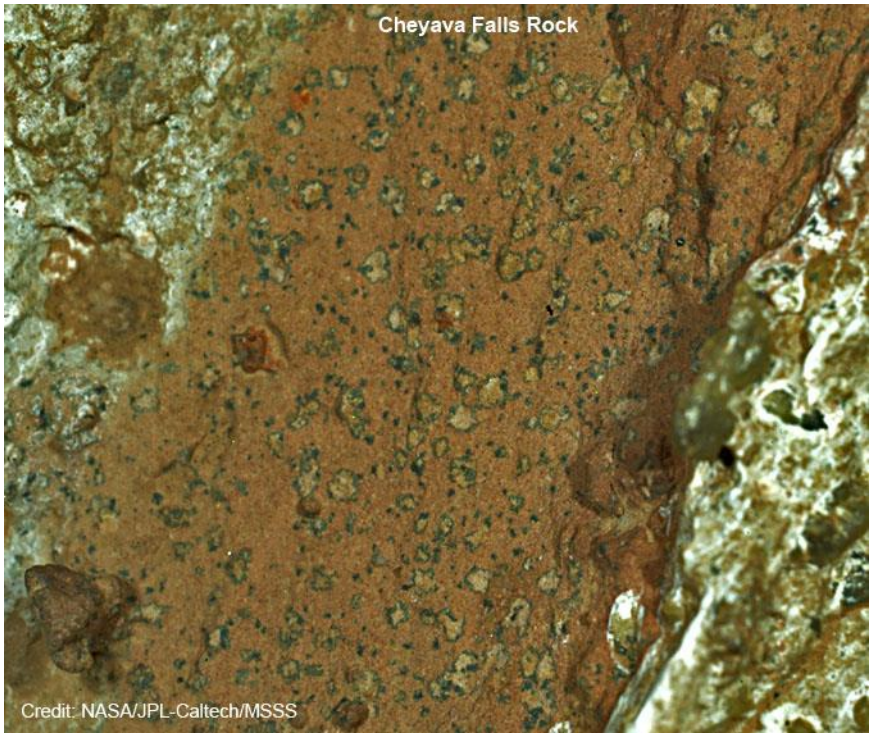
Help Wanted

- OCA representative to the Western Amateur Astronomers
- Coordinator to organize star parties in Orange County

These are pretty easy jobs. Both you and the club can benefit with your participation. Please send Barbara an email and give her a chance to tell you about them.

AstroSpace Update

October 2025
Astronomy and space news summarized by Don Lynn from NASA and other sources



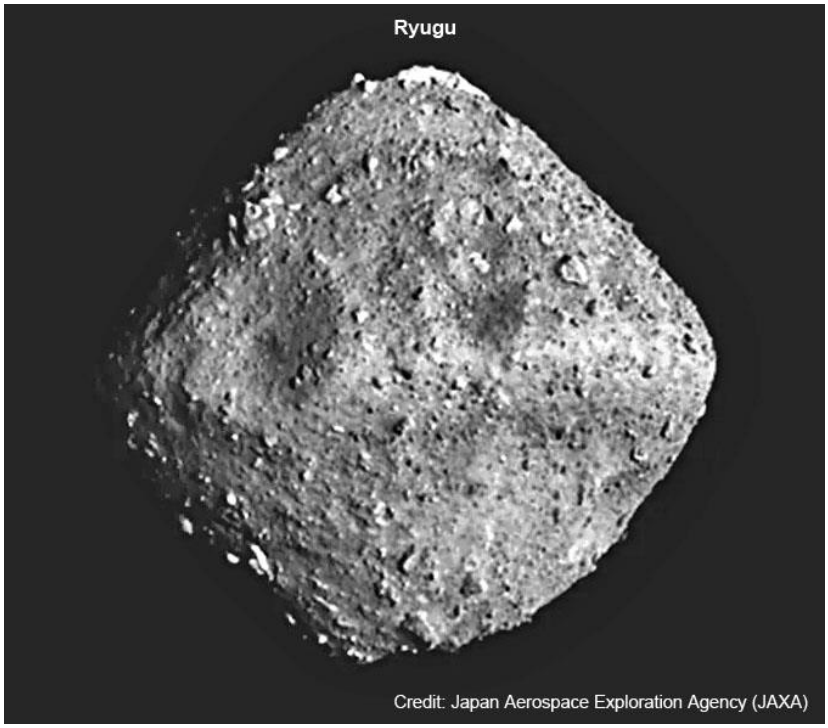
Possible Martian Microbes – Scientists announced that a sample found on a rock and analyzed by instruments on the Mars rover Perseverance could have been created by microbes billions of years ago. This is not certain proof that life existed on Mars. That would probably require bringing the sample back to Earth and subjecting it to every possible test in labs on Earth. The sample could come back to Earth if NASA and the European Space Agency can agree on an affordable way to complete the Mars Sample Return mission. However, at this time, the rover analysis is the strongest evidence that life existed on Mars. The rover analysis showed that the sample consisted of the minerals vivianite and greigite. On Earth these are normally created by microbes. They can also be created without life involved, but under conditions (such as high heat) not thought to have occurred on Mars. The sample was nicknamed Sapphire Canyon and was found on a rock nicknamed Cheyava Falls.

Boosting Swift – Since its launch in 2004, the Neil Gehrels Swift Observatory has been the workhorse space telescope for observations in gamma-ray light. Unfortunately, atmospheric drag is threatening to end its life. In a first, NASA has awarded a contract to a company (Katalyst Space) that will launch a robotic servicing spacecraft to grasp Swift and boost it into a higher safer orbit. This could be the first in a new era of extending the lives of spacecraft.

Hayabusa2 Extended Mission – Japan's Hayabusa2 spacecraft in 2020 completed its mission of retrieving a sample from the surface of asteroid Ryugu and dropping it off at Earth. The spacecraft was then redirected to visit two more asteroids: 2001 CC $_{21}$ in 2026 and 1998 KY $_{26}$ in 2031. Further Earth-based observations of the latter during a close pass by Earth show that it is much smaller and much faster rotating than previous estimates. This will make an attempt at landing on it more difficult. The best estimate now is that 1998 KY $_{26}$ is only 36 feet across, barely larger than the spacecraft at 20 feet across. It rotates once every 5.4 minutes.

Quasi-moons are asteroids that, though orbiting the Sun, not the Earth, happen to spend much time near Earth, and may even appear to circle Earth. They tend to escape the Earth's vicinity after intervals of years to centuries. Another quasi-moon has been found, designated 2025 PN$_7$, becoming the eighth known one. It was discovered by the Pan-STARRS telescope in Hawaii in August. Tracing its path forward and back, it appears to have been in the Earth's vicinity for about 60 years and will drift away in another 60 years. It appears to be an elongated solid rock somewhere in the range of about 40 to 100 feet across.

Asteroid Water – Examination in labs on Earth of the sample from the surface of asteroid Ryugu showed that liquid water had flowed through the asteroid more than a billion years after it formed. This probably was triggered by a collision on Ryugu or its parent asteroid melting ice within the asteroid. Earlier theories held that asteroids should have lost their ice sooner after such bodies formed, so that a later collision should not produce liquid water flowing. The dating of the water flow was done by radioactive dating of the elements lutetium and hafnium. The lutetium showed evidence of having been dissolved in liquid water that flowed through cracks in the asteroid.



Pluto-Like Object Consumed – The Hubble Space Telescope (HST) was used to observe a white dwarf star and found that it was consuming an object containing water ice and other volatile substances. These constituents point to the consumed object being similar to Pluto. HST's ultraviolet spectral capabilities make it the only telescope that could make these observations. The observed white dwarf is about 260 light-years away.

Jets Observed – Astronomers used the James Webb Space Telescope (JWST) to observe a still-forming star near the edge of our Milky Way galaxy, about 10,000 light-years away. It is blasting a pair of jets stretching across 8 light-years. The size and strength of the jets make this a rare object. The forming star has a mass about 10 times that of our Sun. It appears that the size of jets emitted by forming stars scales up with the mass of the star. The star is in a region low in content of heavy elements, so observing it shows astronomers how stars formed early in the history of the Universe, when all regions had low content of heavy elements.

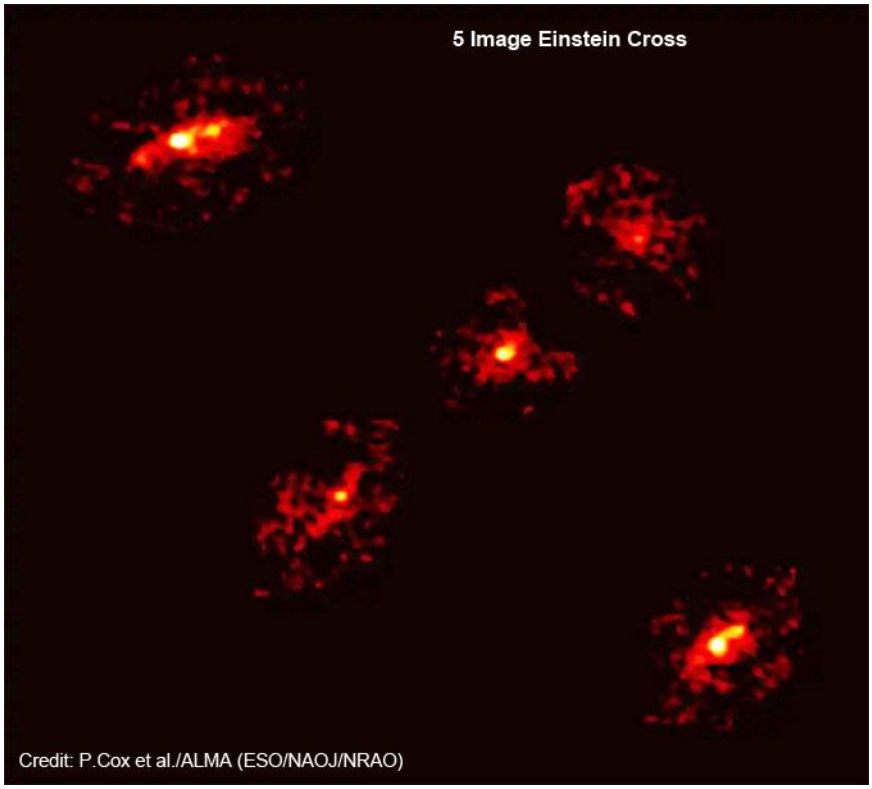
Dark Matter Sub-Halo – Astronomers for the first time used timing of pulsars to detect accelerations induced by gravitational attraction to map where matter, including dark matter, is located around our Milky Way galaxy. They found a sub-halo, that is, a lump of dark matter within the known halo of dark matter that surrounds our galaxy.

6000 Exoplanets – The first exoplanet orbiting an ordinary star was discovered just 30 years ago. The 6000th exoplanet was confirmed last month. Most were found either by their blocking of a little of the light while passing in front of (transiting) their star or by the wobble that their gravity induces in the motion of their star. Only several dozen have actually been imaged due to the difficulty of seeing a very dim object next to a much brighter star. There are about 8000 additional candidates to be an exoplanet, which need to be further studied to eliminate the possibility that some other phenomenon is causing the observation, such as wobble or transit.

Exoplanet Atmosphere – Astronomers using JWST found an atmosphere on exoplanet TOI-561 b. This was unexpected because the planet is too hot, small and old to theoretically have kept an atmosphere. It is hot (estimated at more than 3600°F) because it orbits so close to its star. This is hot enough to cause its side facing its star to be covered in lava. It is about twice the mass of Earth. Its age is about twice that of our Earth, so it has had plenty of time for conditions there to rid it of atmosphere. One theory to explain the atmosphere's presence is that it boils out of the surface lava. More observations are needed to determine the constituents of the atmosphere.

Carbon Atmosphere – JWST was used to observe an exoplanet that orbits a pulsar. The pulsar, known as PSR J2322-2650 is a black widow type pulsar, that is, one that is consuming its companion. In this case the exoplanet is the companion. Strangely the exoplanet's atmosphere is mostly carbon in the forms of dicarbon or tricarbon. It is a mystery how this carbon atmosphere formed.

Einstein Cross – When a massive foreground object gravitationally bends or lenses the light of a more distant object precisely behind, it forms multiple images of the distant one, usually with 4 images in a cross pattern. This is known as an Einstein cross because it was predicted in Einstein's Relativity. Occasionally, if the foreground object is dim, a fifth image appears in the center of the cross. Astronomers using the ALMA radiotelescope array in Chile found a 5-image Einstein Cross. The distant object is a galaxy known as HerS-3 and it lies 11.6 billion light-years away. A galaxy group at 7.8 billion light-years does the gravitational lensing. This is the first such object seen in radio light. Analysis of the 5 images shows there is a dark matter halo of roughly a trillion times the Sun's mass surrounding the foreground galaxy group.



Silane – Astronomers have found for the first time the gas silane, which consists of silicon and hydrogen chemically bonded, in the atmosphere of a brown dwarf. The brown dwarf has been nicknamed The Accident. It was overlooked by automated systems to find brown dwarfs because it has unusual properties and was discovered accidentally by a citizen scientist. Silane was predicted by theoretical planetary astronomers to be present and form clouds in gas giants and brown dwarfs but was not found until now. The Accident is a very old object, more than 10 billion years old. It is possible that conditions to form silane no longer exist.

Makemake Methane – Observations by JWST of the dwarf planet Makemake detected methane gas. It is possibly being emitted in plumes similar to how water plumes are emitted by Enceladus. However, it has not been ruled out that Makemake has a thin methane atmosphere. Further observations may be able to distinguish these sources of methane.

Quaoar Moon – The dwarf planet Quaoar was known to have a moon and two rings. When it passed in front of a star last June, observations picked up an extra dimming of the star. It was likely caused by a second moon, though possibly by another ring.

Asteroid Features Named – The Lucy spacecraft, which is on its way to flyby several Trojan asteroids (Trojans share Jupiter's orbit, ahead or behind the planet), also flew by a main-belt asteroid named Donaldjohanson. Lucy was named after the famous human predecessor fossil, which was discovered by Donald Johanson. From Lucy images taken during the Donaldjohanson flyby, scientists identified a number of features such as boulders and craters, and suggested names for them to the IAU, which has now accepted them. All the names are related to paleoarchaeology.

Martian Core – New analyses of old data from the Mars seismometer on the InSight mission show that Mars' mantle is lumpy and viscous, and that its inner core is solid. The Earth also has a solid inner core, but the effects of those similar cores on the two planetary magnetic fields and atmospheres have been completely different. It will take a lot of further work to explain these differences. It is believed that the lumps in Mars' mantle are debris from impacts early in the planet's history, perhaps more than 4 billion years ago. This process likely also produced lumps in Earth's mantle then, but tectonic activity on Earth would have destroyed such lumps.

Jupiter Auroral Footprints – The 4 large moons of Jupiter are believed to each send particles down magnetic field lines to the planet, leaving an auroral footprint where they hit the planet, but only 3 of these footprints have been observed in the past. Analysis of old data from the Juno Jupiter orbiter found the last auroral footprint, that of Callisto. It is normally impossible to find because it is faint and because it happens to fall on the main auroral oval that the Sun's particles create. But back in 2019 magnetic conditions had slightly shifted the main auroral oval, and so the footprint showed up in Juno data from then.

JUICE Venus Flyby – The European JUICE spacecraft made a gravity slingshot maneuver at Venus in late August. It still has two more of these to make at Earth before it is finally thrown toward Jupiter, to arrive there in 2031. No science operations were made at Venus because the instruments were too hot from proximity to the Sun, even though the dish antenna was used as a sunshade to prevent extreme heat. However, spacecraft controllers say they soon will be able to use JUICE's instruments to make observations of the interstellar comet 3I/AtlAS. Just a few weeks before the Venus encounter, contact with JUICE was lost. Engineers found a timing error in the spacecraft software and corrected it in time for the Venus flyby. JUICE is planned to observe during flybys of Jupiter's moons Europa, Ganymede and Callisto and then in 2034 go into orbit about the latter moon.

Triple Launch – NASA launched 3 spacecraft on one rocket, all on their way to the L1 Lagrange point, and all to study the Sun's influence on Earth. L1 is a gravitationally stable point about a million miles from Earth toward the Sun. The IMAP spacecraft will map the heliosphere, that region about the Solar System planets affected by the Sun's solar wind. The Carruthers Geocorona Observatory will study the outermost layer of Earth's atmosphere and how it responds to space weather. The SWFO-L1 spacecraft will monitor space weather, which is what the Sun throws outward toward the planets.

Venus Mission Ends – Japan's Venus orbiter Akatsuki has been turned off to end its mission. It had developed a communications problem and efforts to fix it were unsuccessful. In the nearly 10 years that the spacecraft orbited Venus, it had found the mechanism that drove high-speed atmospheric rotation, discovered the largest mountain wave (an atmospheric phenomenon) in the Solar System, and more.

Adopt-a-Scope

Raffle at the OCA Club Meeting in December 2025

Prize: Schmidt-Cassegrain Telescope on a fork-style mount (Currently evaluating)
Scope size in the range of 8 to 12 inch diameter
Motorized tracking in both axes
GoTo style hand controller
Metal tubular Tripod
Accessories: TBD
When: December 12, 2025, 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.

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

Night Sky Notes [Article to use in Club Newsletters]

Target Audience Adult, Teen 09/21/2025

Since 2018, the NASA Night Sky Network has provided articles featuring the latest stargazing and NASA news to share with your organization's readership. As of October 1, 2025, Night Sky Notes will be suspended until further notice, as cuts and restructuring are part of NASA's Fiscal Year 2026 budget.

This is the final issue -- editor.

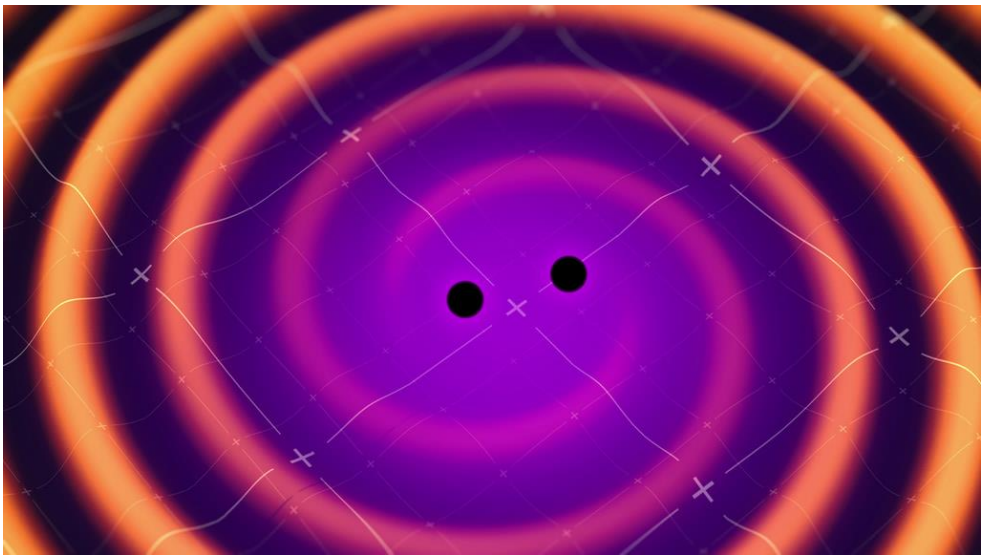
October's Night Sky Notes: Let's Go, LIGO!

By Kat Troche

September 2025 marks ten years since the first direct detection of gravitational waves as predicted by Albert Einstein's 1916 theory of General Relativity. These invisible ripples in space were first directly detected by the Laser Interferometer Gravitational-Wave Observatory (LIGO). Traveling at the speed of light (~186,000 miles per second), these waves stretch and squeeze the fabric of space itself, changing the distance between objects as they pass.

Waves In Space

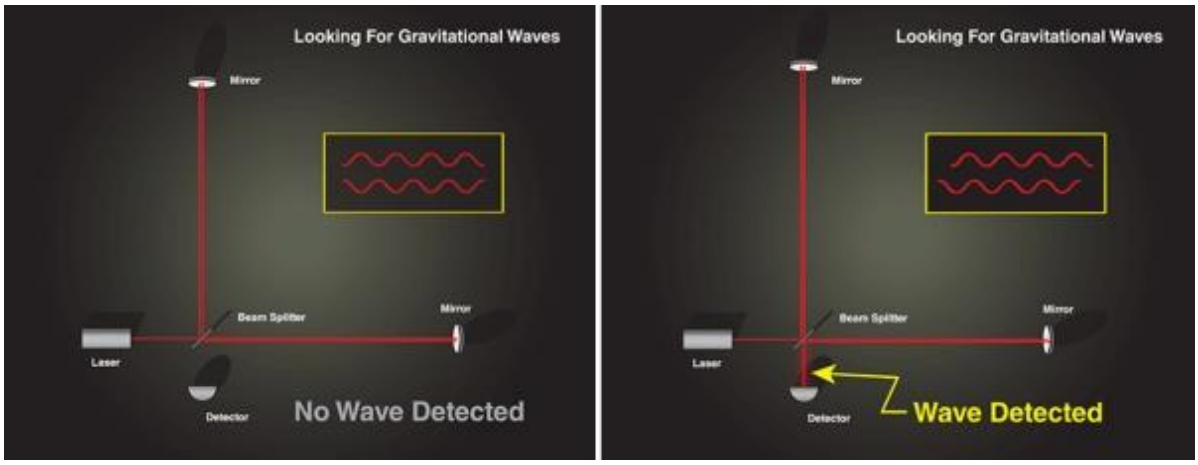
Gravitational waves are created when massive objects accelerate in space, especially in violent events. LIGO detected the first gravitational waves when two black holes, orbiting one another, finally merged, creating ripples in space-time. But these waves are not exclusive to black holes. If a star were to go supernova, it could produce the same effect. Neutron stars can also create these waves for various reasons. While these waves are invisible to the human eye, this animation from NASA's Science Visualization Studio shows the merger of two black holes and the waves they create in the process.



Two black holes orbit around each other and generate space-time ripples called gravitational waves in this image.
Credit: NASA's Goddard Space Flight Center Conceptual Image Lab

How It Works

A gravitational wave observatory, like LIGO, is built with two tunnels, each approximately 2.5 miles long, arranged in an "L" shape. At the end of each tunnel, a highly polished 40 kg mirror (about 16 inches across) is mounted; this will reflect the laser beam that is sent from the observatory. A laser beam is sent from the observatory room and split into two, with equal parts traveling down each tunnel, bouncing off the mirrors at the end. When the beams return, they are recombined. If the arm lengths are perfectly equal, the light waves cancel out in just the right way, producing darkness at the detector. But if a gravitational wave passes, it slightly stretches one arm while squeezing the other, so the returning beams no longer cancel perfectly, creating a flicker of light that reveals the wave's presence.



Still images of how LIGO (Laser Interferometer Gravitational-Wave Observatory) detects gravitational waves using a laser, mirrors, and a detector. You can find the animated version here. Image Credit: NASA

The actual detection happens at the point of recombination, when even a minuscule stretching of one arm and squeezing of the other changes how long it takes the laser beams to return. This difference produces a measurable shift in the interference pattern. To be certain that the signal is real and not local noise, both LIGO observatories — one in Washington State (LIGO Hanford) and the other in Louisiana (LIGO Livingston) — must record the same pattern within milliseconds. When they do, it's confirmation of a gravitational wave rippling through Earth. We don't feel these waves as they pass through our planet, but we now have a method of detecting them!

Get Involved

With the help of two additional gravitational-wave observatories, VIRGO and KAGRA, there have been 300 black hole mergers detected in the past decade; some of which are confirmed, while others await further study.
While the average person may not have a laser interferometer lying around in the backyard, you can help with two projects geared toward detecting gravitational waves and the black holes that contribute to them:

- **Black Hole Hunters:** Using data from the TESS satellite, you would study graphs of how the brightness of stars changes over time, looking for an effect called gravitational microlensing. This lensing effect can indicate that a massive object has passed in front of a star, such as a black hole.
- **Gravity Spy:** You can help LIGO scientists with their gravitational wave research by looking for glitches that may mimic gravitational waves. By sorting out the mimics, we can train algorithms on how to detect the real thing.

You can also use gelatin, magnetic marbles, and a small mirror for a more hands-on demonstration on how gravitational waves move through space-time with JPL's Dropping In With Gravitational Waves activity!

Astroimaging Special Interest Group

The October meeting had two presentations on Earth's aurora phenomenon. Kyle Coker showed images from a trip taken to the Fairbanks Alaska area depicting a variety of shapes as well as slides and animation explaining how the these occur.

Alan Lang showed images from his recent cruise of the Norwegian coast on which he saw and imaged aurorae on a few different nights. The dynamic character of these displays was emphasized with several time lapse sequences. Alan provided additional technical explanation for how some of the structures are created by Alfvén waves in the plasma of the incoming solar particle stream.

This month's meeting had only 4 attendees and there is concern that there may not be enough participation in this SIG to continue meeting. This will be evaluated after the next couple of sessions. Next meeting will be 14 November.

News About Our Anza Site

Some club members got together last month to repair the fencing at the northeast corner of our site. It was damaged during the removal of trees and excess vegetation a few months ago.

We will be cleaning up the club's shipping / storage container located near the Kuhn observatory, probably in January. This hasn't been done in quite a few years, and we are expecting to find both treasures and trash within. David Fischer will be organizing this effort and would appreciate hearing from people who know about the items that have been stored there. We will need knowledge to decide what to keep. Send email to dkn.fischer@gmail.com to let him know of your interest to help.

The pads comprising the Lower Pad area are going to be broken up and removed in the near future. The electrical power is also being removed. Following this, the area will be re-graded to be safe to walk on. Some of the rubble from those pads will be used to repair Bonny Lane with the intent of making it less prone to developing ruts in the future from rain runoff.

The gully forming between 10 Pad Alley and Jupiter Ridge areas is going to be filled in with rock and gravel to prevent further erosion. The timing for this may depend on when the pads from the former Lower Pads area are broken up for disposal. We may be able to deploy some of that rubble to the gully.

Upper Pads area will be getting more gravel to improve the walkability of recently bulldozed areas.

Weed Control:
We created fire breaks around and inside our site earlier this year by bulldozing and removing the brush. This process tilled the soil and weeds have since been growing profusely in them. These areas are really too large for a person to manage with a simple week trimmer.

At some point in the past, the club was given a field mower which seems not to have been used in several years. We "rediscovered" it in the club's storage container. The plan is to get it working again so that we can keep the weeds down to a minimum in the fire breaks, hopefully without having to spend money hiring someone to do this for us.

Scenes from Anza

24 Sept 2025: These pads are aligned with geographic North and here we see the sun setting just a little South of West, 3 days after the autumnal equinox.

This is what the astro-imaging members of the club do NOT like to see when they are at Anza.

From the Editor

Has anybody an idea for a new article for the newsletter ? The NASA column will no longer be available.

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

Due dates for submission of articles, pictures and advertisements are generally 13 days prior to the subsequent general club meeting.

Issue	**Due date**		
November	1 November	<<	changed from prior issue
December	29 November		
January 2026	27 December		

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. The editor may resize and re-arrange ad content to fit and will feed back the formatted ad for approval prior to publishing.

Some policy changes have been made to reflect the expanded capacity of the electronically published newsletter.

- Each advertisement may now occupy up to ½ of a printed page and may include small pictures within the space permitted. The editor may resize and re-arrange ad content to fit and will feed back the formatted ad for approval prior to publishing.
- Each advertisement may be run for 3 consecutive issues, after which it will be removed unless the advertiser requests extension of the ad by contacting the editor of the newsletter.

For Sale contact Christophe Chasle chaslec@yahoo.fr

- William Optic Zenithstar 61 telescope (flattener included) $ 120
- ZWO (ASI120MC-S) guide camera with ZWO 30F4 mini-scope $ 60
- iOptron Skyguider Pro mount $ 40
- Celestron Powertank Lithum Pro (LiFePO4) that I give (free)

For Sale contact Sam Pitts sam@samsastro.com (541) 954-5021

- PlaneWave 12.5" CDK f/8, with motorized 2.75" Hedrick Focuser, Hand controller, EFA control box, Piggyback Dovetail Bar, wired for Delta T Heater (Delta T heater not included), adapters and accessories. $7000

It is in great shape, mirror has very minor dust, not enough to clean. Telescope has great visual views, and is excellent for imaging.

- AP1200 GoTo CP3 mount, lots of accessories, ATA Custom cases $7000
- Advanced Telescope Systems (ATS) 42" Portable pier 10" diameter, AP rotating adapter and ATA type case ($3,295 new). This is separate from the permanent pier in the observatory. $1800

Will consider bundling OTA and AP 1200 mount in a discounted package deal

For Sale contact Ron Choi rchoi1983@gmail.com

• Orion EON 115mm f/7 Triplet APO Refractor with Orion 3" Field Flattener	$1100
• Celestron 8" Edge HD Optical Tube with Celestron Padded Soft Case	$1200
• Sky-Watcher EQ6R Pro Equatorial Mount	$1000
• Optcorp TRIAD Filter 2" Ultra	$ 750
• Altair 2 inch Magnetic Filter Drawer	$ 70
• ZWO ASI071MC PRO	$ 700
• ZWO ASI533MC PRO	$ 550
• ZWO ASI174mm Mini	$ 320
• ZWO ASI224MC	$ 100
• QHYCCD Pole Master	$ 190
• ASIAIR PLUS 256 GB	$ 280
• Tele Vue Delite 11mm	$ 200
• Tele Vue Plossl 32mm	$ 100
• Tele Vue Plossl 8mm	$ 70
• Tele Vue 2x 1.25" Barlow	$ 90
• Orion OAG Off Axis Guider	$ 240
• Orion 9x50 mm Correct-Image Right Angle Finder Scope	$ 100