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

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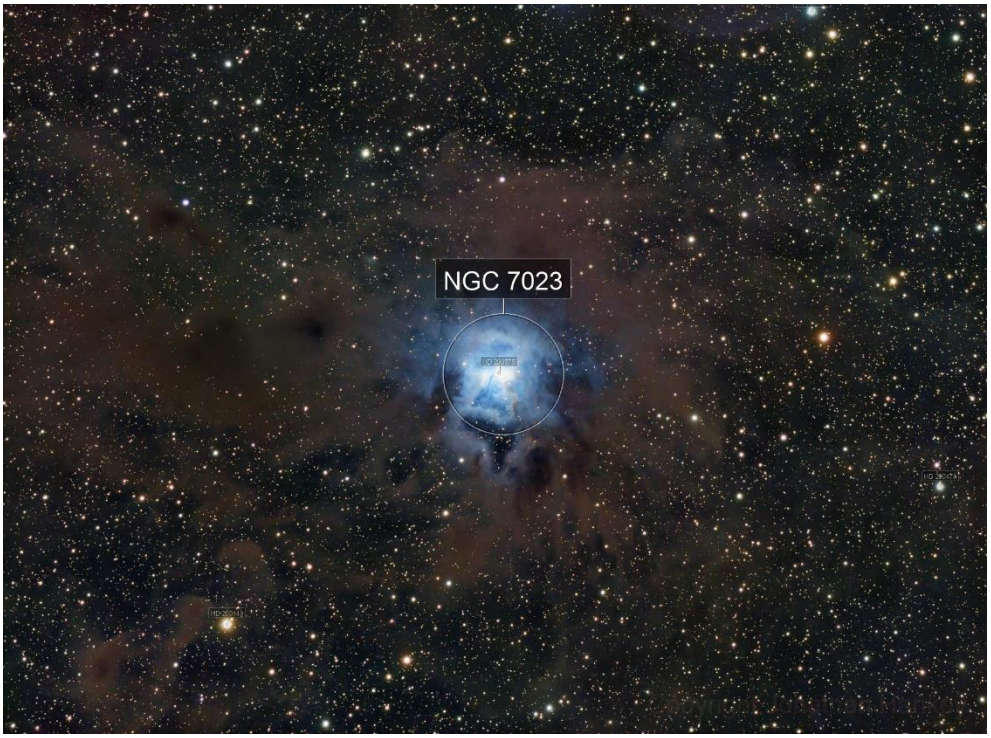
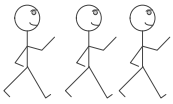


This is NGC7023, often called the Iris nebula for its resemblence to the flower. Jonathan Hankey captured it from Joshua Tree in June 2025 using a 102mm refractor and ASI1600MC camera.

Upcoming Events - free and open to the public

Beginner's class	Friday, 3 Oct at 7:00 to 9:30 PM This is the 2nd session of the Beginners Astronomy Class. It covers the different types of equipment used to observe the night sky, including telescopes, mounts, eyepieces, filters, and advantages and disadvantages of different options. This will be very useful for those shopping for a telescope.	**ONLINE**
Club Meeting 	Friday, 12 September at 7:30 to 9:30 PM "What's Up": John Garrett from TVA Main speaker: Jeffrey Bennett whose talk will be "Pathway to a Post-Global Warming Future"	**IN PERSON** and **ONLINE** **IN PERSON** **IN PERSON**
Astro-Physics SIG	Friday, 19 Sept 2025, at 7:00 PM to 10 PM Orange Coast College, Building 40, Astronomy House	**IN PERSON**
Astro-Imagers SIG	Friday, 3 Oct at 7:00 to 10:00 PM Orange Coast College, Building 40, Astronomy House	**IN PERSON**
Star Parties	Saturday, 20 September 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

October and November General Meeting Dates Have Moved

Most years we have one or two months when Chapman needs the Chapman Auditorium, where the in-person portions of our general meetings take place, on our usual night, the second Friday of the month. When this happens, our meeting moves to a different Friday night. This year, Chapman needs the auditorium on our usual night in October and November.

Because of this, our October meeting will be a week later than usual, on October 17, and our November meeting will be a week earlier than usual, on November 7. Please note the changes, and we look forward to seeing you then. We'll be back to our regular schedule in December.

OCA Election

We are at the start of the annual election for the OCA Board, our club's governing body. We take nominations through midnight of the day of the November general meeting, November 7. The ballot is finalized and voting takes place in December and January, ending on the day of January General Meeting, January 9, 2026. All members can vote, and we again plan to have the option of voting electronically as well as by mail or turning in ballots at the January meeting.

There are eleven positions on the Board, seven Trustees and four officers, President, Vice President, Secretary and Treasurer. To qualify for any of the positions, you must have been a member in good standing for at least a year and also at the time of the election. For President or Vice President, there is an additional requirement that you must have served on the Board for at least one year, but that can be any year, not just the year immediately before the election.

Why be on the Board? Of course, the club needs good people on its Board to continue to function well, and we've all benefited from all of the great people who have served on the Board over the years. Many Board members got involved to give back to the club for the benefits they've had from membership – that's an excellent way to help make sure that those benefits continue for future members. Board membership is also a great way to learn about and influence aspects of the club that members generally take for granted, such as maintenance and possible development at our Anza site, issues with our newsletter and general meetings, and so on. It is also a great way to meet other club members – other Board members, of course, and Board membership can be a bridge to good conversations with other club members as well.

To get on the ballot for the 2026 Board, please email our Secretary, Alan Smallbone (Alan@ocastronomers.org), and include your full name, email address, a telephone number where you can be reached most easily, and the position you want to run for.

Do take advantage of this opportunity to join in the management of our club – we look forward to hearing from you!

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

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

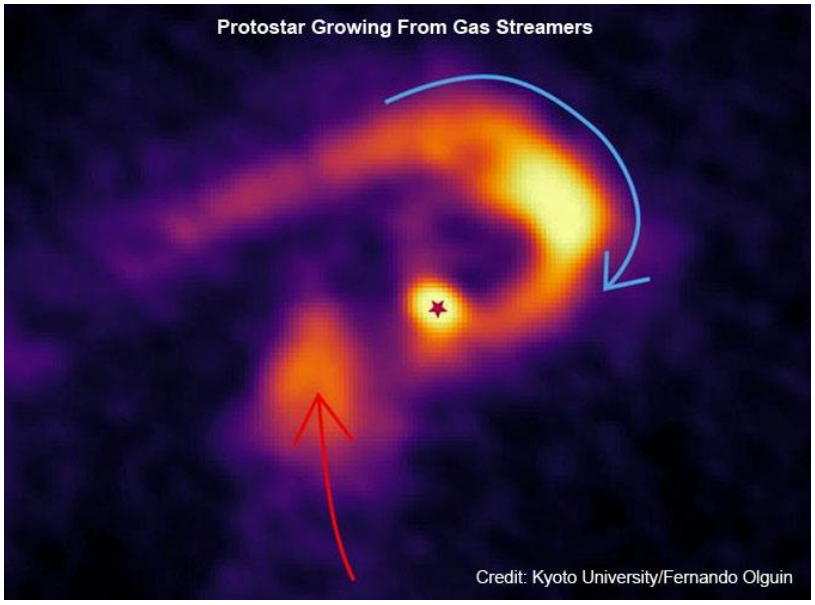
Alpha Centauri Exoplanet – The James Webb Space Telescope (JWST) has found evidence that an exoplanet orbits Alpha Centauri A. The nearest star system to our Sun is Alpha Centauri, consisting of the triplet A, B and Proxima. A and B are Sun-like stars and Proxima is a small red dwarf star. There are 3 confirmed planets orbiting Proxima, but no planets had been found at A or B until now. The new find appears to be a gas giant about the same mass as Saturn with a fairly elliptical orbit ranging from 1 to 2 AU from its star (where 1 AU is the distance of Earth from the Sun). It is more than 10,000 times fainter than its star but JWST's sensitivity was able to image it. The feat was still difficult, in part due to the planet appearing too close to its star, and therefore lost in its glare, when some of the initial images were taken.

Exoplanet Atmosphere Search Fails – JWST was used to take spectra of the exoplanet TRAPPIST-1 d, the third planet out in the system of 7 rocky planets, in hopes of finding an atmosphere. However, none was found. The lack of detection means either the planet has no atmosphere, or an atmosphere too thin for JWST to detect, or high-altitude clouds block the view of nearly all the atmosphere. The planet is at the edge of the habitable zone, that distance from its star where temperatures would allow liquid water to exist. But so are the next three planets: e, f and g. So, efforts will be made to search for atmospheres on those planets. The star TRAPPIST-1 is known to flare high-energy radiation, which in the long run could blow away atmospheres on its planets. The star is a dim red dwarf, so its habitable zone is quite close to the star. Planet d is 50 times closer to its star than Earth is to the Sun. Its orbital period (year) is only 4 Earth days. The TRAPPIST-1 system is 40 light-years away.

Another Exoplanet Atmosphere Search – Orbiting another dim red dwarf star is an exoplanet known as GJ 1132 b, which has in the past had conflicting observations as to whether it has an atmosphere or not. So new observations with JWST were made to disambiguate the situation. The new result is that GJ 1132 b almost certainly has no atmosphere, and the contrary previous observation probably mistook the effects of star spots on a spectrum for evidence of the planet's atmosphere.

Merged White Dwarf – A team of astronomers discovered a massive white dwarf star that was created when a smaller white dwarf merged with a red giant star. Most white dwarfs are created when a star reaches the end of its life and collapses, making the merged white dwarf rare. Only 6 other white dwarfs from mergers are known. The discovery was made with the Hubble Space Telescope observing in ultraviolet light. The star is known as WD 0525+526 and is 128 light-years away. The spectrum of the star showed a small amount of carbon, which is only stirred to the surface if the star has undergone a merger.

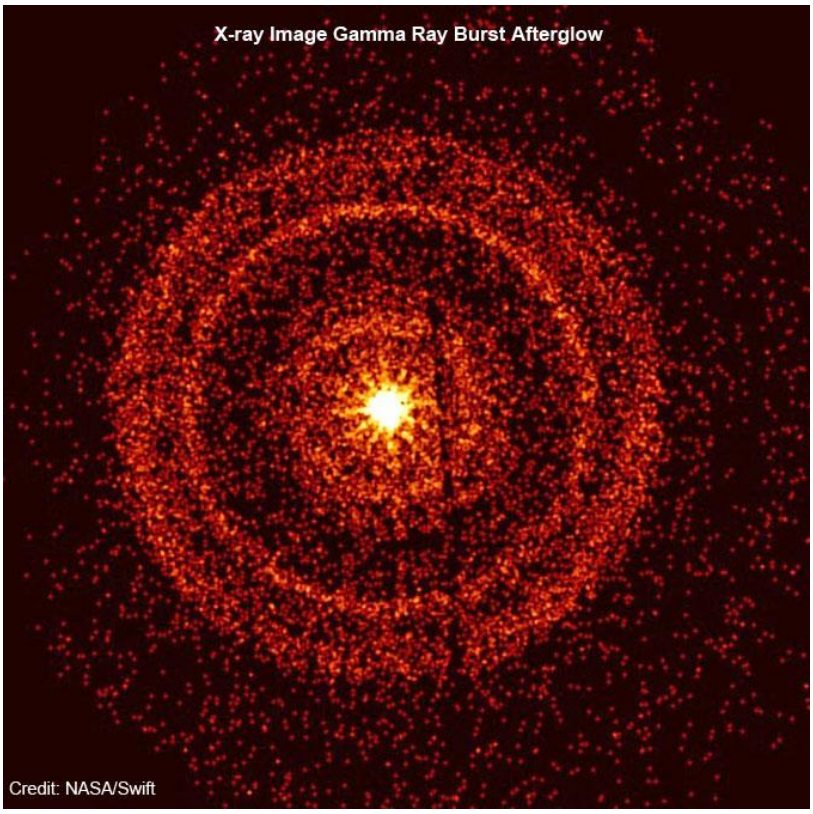
Massive Star Formation – Computer simulations of star formation have had difficulty producing stars with masses more than roughly 20 to 40 Sun's masses. The problem is, as the stars grow past this limit, they throw off material in jets and through stellar winds as fast as material can be forced through an accretion disk and into the forming star. Yet lots of much more massive stars, some over 100 and even 200 Sun's masses, are known. Somehow nature is producing these in ways scientists do not understand. The process is usually hidden by gas clouds, making it difficult to learn how nature is doing this. New observations with the ALMA radiotelescope array in Chile of a high-mass star formation region showed streamers feeding material directly into a forming star without an accretion disk forming. This may be how massive stars form. More work is needed to verify this.



Disappearing Star – For 8 months beginning in late 2024 a star known as ASASSN-24fw (named after the ASASSN automated supernova search system that discovered it) dimmed by 97% then returned to its previous brightness. A study concluded that the star's light was blocked by a dust disk about it. The star likely has a companion star that disturbs the position of the disk so that sometimes it is blocking the light from our point of view. If the astronomers' computer simulation of the system is correct, the star should dim again in 2068. The star is about 3000 light-years away.

Blazar Explained – Astronomers used the VLBA to observe the blazar PKS 1424+240. A blazar is a supermassive black hole actively feeding, that emits two opposing jets of material, one of which happens to be aimed at Earth. The VLBA is an array of radiotelescopes spread across the entire USA, ganged together to act as one. Previous observations of the blazar showed a slow-moving jet, but it emits high-energy gamma rays and neutrinos. Astronomers had expected from the emissions that the jet would also have high energy, that is, be fast moving. The VLBA has extremely high resolution and showed that relativistic effects are brightening the emission and making the jets appear slower moving.

Most Powerful GRB – In late 2022 gamma ray telescopes detected the most powerful gamma ray burst (GRB) ever. GRBs are believed to be caused by either neutron stars colliding or massive stars collapsing into a black hole. Follow up observations were made by many telescopes of the afterglow (because the burst itself usually lasts only seconds or minutes while the afterglow lingers much longer). These observations showed that this burst involved a jet of material with an extremely fast-moving core and a slower surrounding shell. Observations of more GRBs are needed to better understand exactly how such powerful bursts are created.



Most Distant FRB – Astronomers using the MeerKAT radiotelescope array in South Africa discovered the most distant fast radio burst (FRB) known, so distant that its radio light took more than 10 billion years to get here. At first nothing was found at the source location for the FRB, but JWST was able to find a very dim dwarf galaxy undergoing a burst of star formation, which had to be the FRB source. The redshift of light from the galaxy was measured, which translates to its distance. Many astronomers believe that FRBs are emitted by magnetars, extremely magnetic neutron stars. There are two theories of how magnetars form: 1) soon after a neutron star forms from the collapse of a star at the end of its life, 2) when neutron stars collide long after they have formed. The observations of this FRB and its galaxy tend to support theory 1.

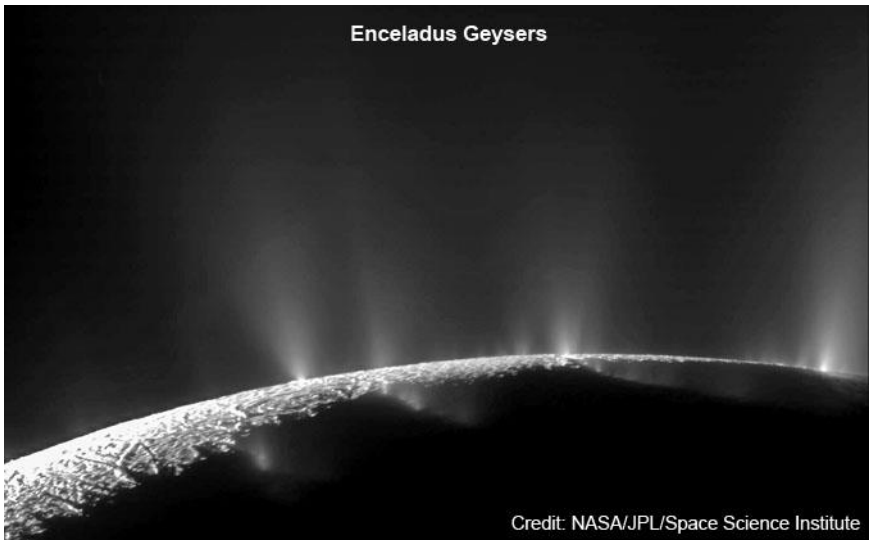
FRB Origination Pinpointed – The CHIME radiotelescope in British Columbia was designed to observe a huge fraction of the sky simultaneously in hopes of catching FRBs, even though astronomers don't know where or when they will briefly occur. In about 7 years of operation it has raised the number of known FRBs from dozens to nearly 4000. Resolution of where any FRB originated is not very good. Astronomers are lucky if they can determine what galaxy an FRB came from. Now the CHIME team has built 3 outriggers, which are basically copies of CHIME located long distances away (farthest is in West Virginia). Analysis of arrival timing differences can pinpoint the origin within a tiny fraction of an arcsecond. The first FRB to be detected by CHIME and its 3 outriggers, seen last March, was shown to originate near, but not precisely in, a star-forming region of the spiral galaxy NGC 4141 in Ursa Major. Review of archived radiotelescope observations of the origin area did not turn up any emissions, implying that this FRB is probably not a repeating FRB. No X-ray emissions have been found at this location. Observations with JWST found an object in infrared light quite near the origination, but it is not a magnetar, which many astronomers believe is the type of object that could generate an FRB. It however could be a star with a dim magnetar as a binary star companion. The CHIME team expects to continue finding pinpoint origination locations for FRBs to try to answer the questions that this latest discovery has raised.

Black Hole Induced Supernova – Astronomers have announced that a supernova discovered in 2022 is of a new type, like no other ever seen. It was discovered by the Zwicky Transient Facility, a program that repeatedly images much of the sky using the Palomar Schmidt camera to look for changes. It was designated SN 2023zkd. It was classified as Type IIn, which is a massive star exploding when it runs out of nuclear fuel that occurs in a gas cloud. But continued observation noted oddities: it reached two (not one) peaks in brightness, and archived observations made before it exploded showed the star had been brightening for 4 years. A computer program that analyzes supernova observations flagged this one as being odd enough to merit further study. The conclusion after study is that the symptoms best fit that the star was near the end of its life and it had a binary companion that was a stellar-mass black hole. When their orbit decayed to a certain point, the gravity of the black hole triggered the star to explode as a supernova, somewhat prematurely. The second brightening was caused by shock waves hitting material that had been thrown out of the star earlier in this process.

Deep Field Image – JWST spent nearly 100 hours observing the same small piece of the sky that the Hubble Space Telescope used for its Ultra Deep Field image. Even more galaxies were revealed, many of them even farther away. Due to the time it took the light to get here, the new image is looking even further back in time, closer to the time of the Big Bang.

Most Distant Black Hole – The most distant known black hole has been confirmed in a galaxy known as CAPERS-LRD-z9. It is so distant that its light left there when the Universe was 3% of its current age. The distance was confirmed by redshift measured spectroscopically. The black hole is estimated at a mass of as much as 300 million Sun's masses (though the uncertainty is fairly large) is unexpectedly large for creation so early in the history of the Universe. The mass of the stars in this galaxy is estimated at less than 1 billion Sun's masses. This supports the theory that in the early Universe, supermassive black holes developed before their surrounding galaxies.

Space Rainbows – A few astronomers were wondering if the Sun shining through the water or ice particles in the geysers on Saturn's moon Enceladus would create a rainbow or similar phenomenon. So one of them, a student, studied old Cassini images of the geyser plumes for any evidence of this. He found that there were indeed stripes of light that had no apparent cause other than sunlight interacting with geyser particles.



New Uranian Moon – Astronomers using JWST spotted another moon orbiting Uranus, bringing that planet's total to 29. It is temporarily designated S/2025 U1. Most of the Uranian moons are named after characters from Shakespeare, so this moon may eventually acquire such a name. From its brightness the moon is estimated to be about 6 miles in diameter. This makes it too small to have been seen by Voyager 2, the only spacecraft that ever visited Uranus. The moon orbits a bit outside of the inner set of rings.

Ocean Source – Computer simulations of how the Earth formed tend to show that any water present would be dispersed by the high temperatures. Therefore, the oceans here today must have come from water added after Earth formed and cooled somewhat. The only good candidates to bring water to the Earth are asteroids and comets. But all measures of the isotopes of hydrogen and oxygen in water in asteroids and comets have not matched the isotopes found in our oceans, until now. Observations by the ALMA radiotelescope in Chile and the IRTF infrared telescope in Hawaii made of comet 12P/Pons-Brooks matches our oceans quite well. This comet is a Halley-type, that is, one with a period of 10 to 100 years. Different types of comets were probably born in different places within the Solar System, which would result in different constituents. The implication of the new measurement is that the Earth's oceans probably came from Halley-type comets during the Heavy Bombardment period about 4 billion years ago, when objects are known to have frequently hit Earth.

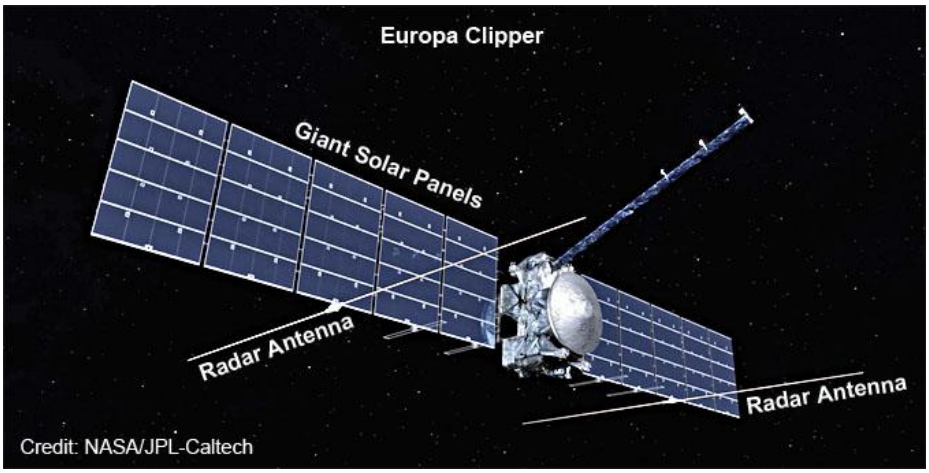
Meteorite Fall – On June 26 a bright fireball meteor was widely heard and seen in daylight over Georgia. A resident near Atlanta afterward found a hole in his roof, a dent in his floor and meteorite debris scattered about. A geologist from the University of Georgia examined some of the debris and dated its formation by radioactive means. It is 4.56 billion years old, slightly older than the Earth. It was found to belong to a group of asteroids in the main asteroid belt.

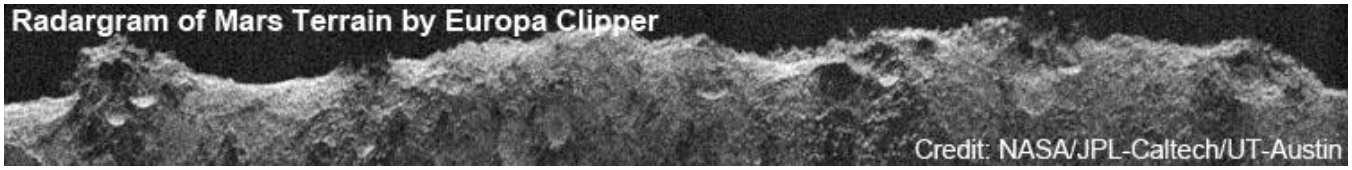
Starship Test – The 10th flight test of SpaceX's Starship atop a Super Heavy Booster, the most powerful rocket ever, was almost completely successful. It launched from Texas and landed in the Indian Ocean as planned. Both stages re-entered the Earth's atmosphere successfully and slowed for soft landings, though some re-entry damage occurred. Both were intentionally allowed to sink in the ocean. A number of maneuvers were successfully tested, as was deployment of dummy small satellites. The upper stage did explode in flames upon landing in the ocean, but this was not unexpected. It reached the water within 10 feet of the designated landing point.

Radar Satellite Launched – A satellite designed to radar the surface of the Earth repeatedly was launched late in July from India. It is named NISAR and is a joint project of NASA and ISRO, the Indian space agency. It can detect any movement of the ground or ice exceeding a centimeter. It uses two frequencies of radio waves, one that measures surface movement and also soil moisture and forest mass, while the other monitors changes in agriculture and grasslands.

Astronaut Jim Lovell passed away at age 97. He had flown to the Moon twice, on Apollo 8 and Apollo 13 missions. The latter was the disaster caused by an oxygen tank in the Service Module exploding part way to the Moon. If you have seen the movie, you know that the crew survived in the lunar lander instead of the damaged Command Module and returned to Earth safely. Apollo 8 was the first mission where people reached the vicinity of the Moon, though it was 3 missions later when they first landed on the Moon. Now only 5 of the Apollo mission astronauts remain alive, out of the 24 who landed on or circled the Moon.

Europa Clipper Mars Test – Europa Clipper is on its way to a mission orbiting Jupiter with frequent flybys of its moon Europa. This past March, the Clipper made a gravity slingshot by Mars and used the opportunity to test its radar system. The results of the test were just released and all worked as designed. The radar system could not be deployed for testing in a clean room, so the Mars test was the first full radar test, though the parts had been individually tested before launch. At Europa, the radar will be used to map the surface topography, measure the tides in the solid surface, look for water pockets within the ice shell, measure the depth of the ice above the underlying water ocean, and look for places where ocean water may pass to the surface. The Clipper is scheduled to arrive at Jupiter in 2030.





Astroimaging Special Interest Group

The group resumes meeting on Friday, 5 September. There will be a presentation on how PixInsight was used to produce some images.

Adopt-a-Scope

Raffle at the OCA Club Meeting in September 2025

Prize: (Currently evaluating:) Celestron Nexstar 8i (8 inch) SCT
on a 2-axis motorized Celestron dual fork mount
with GoTo Nexstar hand controller,
medium-duty steel tubular tripod, power supply. Setup is ALT/AZ.
Accessories are TBD.

When: September 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.

Looking Beyond the Stars

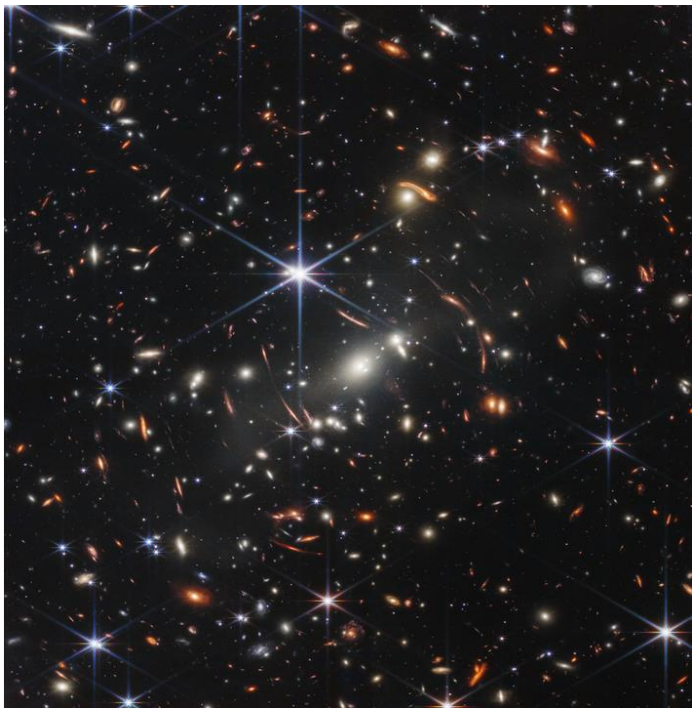
Brian Kruse Originally published September 2023

Looking up in awe at the night sky, the stars and planets pop out as bright points against a dark background. All of the stars that we see are nearby, within our own Milky Way Galaxy. And while the amount of stars visible from a dark sky location seems immense, the actual number is measurable only in the thousands. But what lies between the stars and why can't we see it? Both the Hubble telescope and the James Webb Space Telescope (Webb) have revealed that what appears as a dark background, even in our backyard telescopes, is populated with as many galaxies as there are stars in the Milky Way.

So, why is the night sky dark and not blazing with the light of all those distant galaxies? Much like looking into a dense forest where every line of sight has a tree, every direction we look in the sky has billions of stars with no vacant spots. Many philosophers and astronomers have considered this paradox. However, it has taken the name of Heinrich Wilhelm Olbers, an early 19th century German astronomer. Basically, Olbers Paradox asks why the night sky is dark if the Universe is infinitely old and static – there should be stars everywhere. The observable phenomenon of a dark sky leads us directly into the debate about the very nature of the Universe – is it eternal and static, or is it dynamic and evolving?

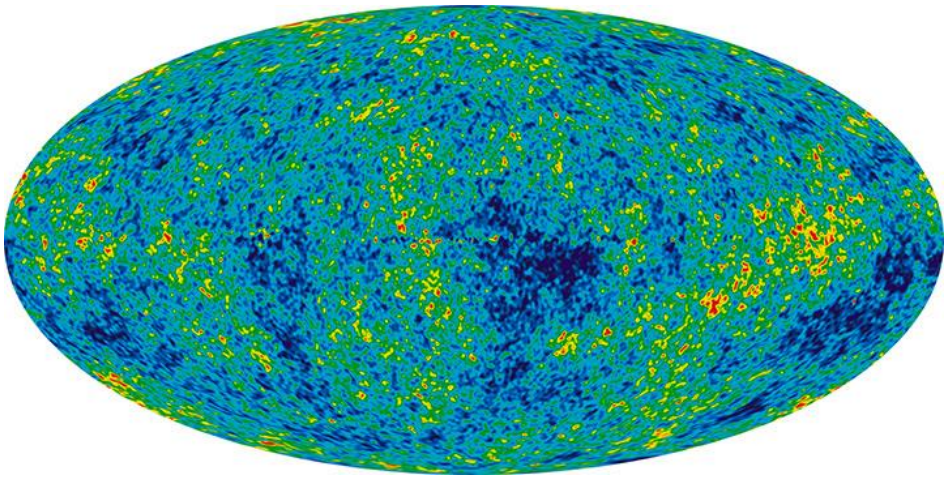
It was not until the 1960s with the discovery of the Cosmic Microwave Background that the debate was finally settled, though various lines of evidence for an evolving universe had built up over the previous half century. The equations of Einstein's General Theory of Relativity suggested a dynamic universe, not eternal and unchanging as previously thought. Edwin Hubble used the cosmic distance ladder discovered by Henrietta Swan Leavitt to show that distant galaxies are moving away from us – and the greater the distance, the faster they're moving away. Along with other evidence, this lead to the recognition of an evolving Universe.

The paradox has since been resolved, now that we understand that the Universe has a finite age and size, with the speed of light having a definite value. Here's what's happening – due to the expansion of the Universe, the light from the oldest, most distant galaxies is shifted towards the longer wavelengths of the electromagnetic spectrum. So the farther an object is from us, the redder it appears. The Webb telescope is designed to detect light from distant objects in infrared light, beyond the visible spectrum. Other telescopes detect light at still longer wavelengths, where it is stretched into the radio and microwave portions of the spectrum. The farther back we look, the more things are shifted out of the visible, past the infrared, and all the way into the microwave wavelengths. If our eyes could see microwaves, we would behold a sky blazing with the light of the hot, young Universe – the Cosmic Microwave Background.



The next time you look up at the stars at night, turn your attention to the darkness between the stars, and ponder how you are seeing the result of a dynamic, evolving Universe.

NASA's James Webb Space Telescope has produced the deepest and sharpest infrared image of the distant universe to date. Known as Webb's First Deep Field, this image of galaxy cluster SMACS 0723 is overflowing with detail. This slice of the vast universe is approximately the size of a grain of sand held at arm's length by someone on the ground. (Image Credit: NASA, ESA, CSA, STScI) https://bit.ly/webbdeep



The oldest light in the universe, called the cosmic microwave background, as observed by the Planck space telescope is shown in the oval sky map. An artist's concept of Planck is next to the map. The cosmic microwave background was imprinted on the sky when the universe was just 380,000 years old. It shows tiny temperature fluctuations that correspond to regions of slightly different densities, representing the seeds of all future structure: the stars and galaxies of today. (Image credit: ESA and the Planck Collaboration - D. Ducros) https://go.nasa.gov/3qC4G5q

From the Editor

The editor would appreciate comments and suggestions for helping the newsletter take advantage of it no longer being bound to a set number of pages.

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

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

Issue	**Due date**
October	4 October – General meeting is on new date
November	25 October – General meeting is on new date
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.

- Observatory: Jupiter Ridge #4; 10 x 10 roll off roof observatory with 10" permanent steel pier $5000
- 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, AP 1200 mount and Observatory in a discounted package deal