

Here is IC1848, often called the "Soul" nebula for its location directly adjacent to one called the "Heart" nebula. This was imaged by Ryan Noonan in October 2021 using a SVX80T-3SV refractor, ASI294MM Pro camera and narrow-band filters

Upcoming Events - free and open to the public

Beginner's class	Friday, 1 November at 7:30 to 9:30 PM ONLINE This is the 3rd session of the Beginners Astronomy Class. It covers various methods of finding objects in the night sky.
Club Meeting	Friday, 11 October at 7:30 to 9:30 PM IN PERSON at Chapman University and ONLINE "What's Up?": Alex McConahay from RAS (in person) Main speaker: Dr. Slava Turyshev from JPL (in person) presenting "Direct Multipixel Imaging and Spectroscopy of Exoplanets with a Mission to the Focal Region of the Solar Gravitational Lens".
Open Spiral Bar	Saturday, 12 October 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, 2 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

Our Recent Insurance Adventures:

One of the sad facts of life these days is that insurance is a necessity, even for a club of astronomy enthusiasts. To have our meetings at Chapman, interest group meetings in other locations, our Orange County star parties on county property (when we can get them going again) and various other events, we must provide proof that we have liability insurance. Over the years, our liability policy has generally been our club's largest regular expense.

In the past, fire insurance coverage has been part of our liability policy. This year, even though we have never filed a claim, our policy was cancelled. After our broker did a lot of searching, we obtained a replacement liability policy but were not able to get one that included fire coverage. Our broker continued to look for a fire policy, but no private company would provide one, apparently because our Anza site is in an area at high risk for wildfires. Our insurance issue is part of the broader problem that people all over California are having, as insurers have restricted the coverage they'll provide, radically increased premiums, and some have pulled out of the market altogether. If any of you are having similar problems, you definitely have my sympathy. We were ultimately told that our only fire insurance option would be to get a policy through the California FAIR Plan. After a delay (during which the Nixon fire burned close to our site, which probably didn't help), they gave us a quote: \$15,500 for one year of about \$55,000 in coverage. To put that in perspective, that is more than twice as much as we paid for all of our insurance coverage combined in past years, for minimal fire insurance coverage alone. Since our liability policy now costs more than \$8000, that would raise our total annual insurance costs to more than \$23,000, which is not sustainable.

We held an emergency Board meeting to discuss this and decided unanimously that the FAIR Plan proposal would be too great an expense for the club and that it would be more cost effective to put our resources into making our Anza site more fire-resistant and the buildings on the site as defensible as possible in case we do have a fire come through.

Plans for Anza:

We did a survey of the entire Anza site before our regular Board meeting on September 8, 2024, and had a lengthy discussion of how best to approach this project. The first areas where you will likely see additional clearing of shrubs and grasses are around the propane tank for Anza House, the power panels and well for the site, and the site's water tank.

Those responsible for different structures on the site that have encroaching brush, generally observatories and storage sheds and containers, will be receiving notice that clearance is needed. The Board has the authority to pay to have clearing done around observatories, pads and associated storage areas, and to bill the responsible observatory and pad holders for those costs, and we will have to be more aggressive about doing that in the future when the observatory and pad holders have not cleared their areas by set deadlines, to help safeguard the site as a whole.

Using heavy equipment or power tools in dry brush could spark a wildfire - that's how the Airport fire that has now burned through Cariso Village along the Ortega Highway in the Santa Ana Mountains got started. To minimize any chance of starting a fire ourselves, we plan to hold off on the heavier work we need to do on site until there's more moisture in the vegetation. Hopefully that won't delay us long.

With our increased insurance costs this year, even without a fire policy, and increased maintenance and utility costs at Anza, our expenses now exceed our income. After extensive discussion at the Board meeting, we decided that, because most of our increased expenses are related to our Anza site, and because our annual observatory license fees are low compared with outside rates and have not increased for many years, the fairest approach for our members will be to raise the observatory fees to \$500.00 per year, starting January 1, 2025. That won't cure the shortfall for 2024, but we can cover it if our finances are back in the black next year.

On the bright side, our club and our Anza site are generally in good shape – and should be in even better shape before too long. I hope all of you are in good shape, too, and able to enjoy a bit of astronomy while coping with the challenges of daily life!

© Barbara Toy, September 2024

AstroSpace Update

October 2024

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

Early Galaxies – Past analysis of images taken by the James Webb Space Telescope (JWST) of galaxies that existed very early in the history of the Universe concluded that some of those galaxies had formed too many stars and had grown too massive too soon according to galaxy formation theory. The star and mass numbers had been estimated using average ratios of stars or mass to total brightness. New research shows that those ratios did not apply in the early Universe because galaxies back then typically were much brighter due to glowing accretion disks about their supermassive central black holes. In other words, galaxies had more active black holes than later in history. When newly found star and mass to brightness ratios that take into account the glow of accretion disks are applied to those early galaxies the result is more reasonable masses and star counts, though they are a little higher than predicted by galaxy formation theory.

Black Holes Found – The Hubble Ultra Deep Field image was released in 2004. It was a very long exposure taken by the Hubble Space Telescope (HST) and so showed many of the most distant galaxies ever seen. The same area has been imaged again and a team of astronomers has compared the new and original images. The only changes within these few years are likely changes in the feeding rates of the supermassive black holes in some of those early galaxies. Every change in brightness of a galaxy is believed to be evidence for a supermassive black hole. Quite a few of these were newly found, more than were previously found in the Hubble Ultra Deep Field by other methods. The same technique will be used to search for black holes in JWST images.

Intermediate Black Hole – Lots of black holes are known with about the mass of a large star and lots are known in the supermassive range (millions or billions of times our Sun's mass). But extremely few black holes are thought to have intermediate masses, say hundreds or thousands of Solar masses. A new study of a star that appears to have been thrown out at high speed from globular cluster M15 concluded that the most likely cause of it being thrown out is gravitational interaction with an intermediate mass black hole. All other explanations do not fit the observations. The core of M15 is extremely dense, which favors growth of black holes to intermediate size by means of collisions, and favors encounters between black holes and stars.

Red Giant Surface Imaged

The ALMA radiotelescope array was used to image the red giant star R Doradus, which is 350 times the diameter of our Sun. The new images were able to resolve bubbles on the star's surface. Astronomers were surprised that the bubble features lasted less than a month, which is about 3 times faster than theory had predicted. What was imaged was not directly convection bubbles, but shock waves of the bubbles in a higher layer of the star's atmosphere. The Sun also has convection bubbles, but they are roughly 100,000 times smaller than those on R Doradus because conditions on a red giant are so different from Sun-like stars.



Outer Galaxy Star Formation – JWST was used to observe star-forming regions very far out in the fringes of the Milky Way. The regions are known as Digel Clouds 1 and 2 (named after the astronomer Digel, not the antacid of the same name). The observations showed protostars, jets and outflows. The clouds were shown to be deficient in heavier elements, and so star formation there resembles star formation in the early history of the Milky Way, before heavier elements had been generated and distributed over most of the galaxy. Now such deficiencies exist only in remote areas of the galaxy, such as the newly studied area. This deficiency is expected to affect the relative distribution of various masses of stars and the lifetimes of circumstellar disks.

Gas Galaxy Halo – New research measured how far gas extends beyond the visible edge of a starburst galaxy known as IRAS 08339+5617. It has long been suspected that galaxies' gas extends farther than the visible stars, but measurements have been difficult because it is diffuse. An integral field spectrograph (which takes spectra of separate pixels) on the Keck Telescopes in Hawaii was able to make the measurement. The observations were able to find the boundary between gas associated with the galaxy and intergalactic material.

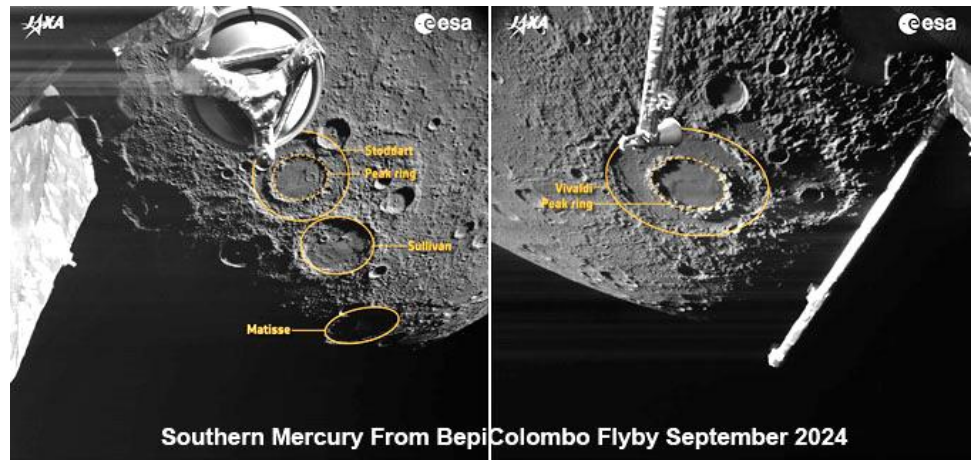
Iron Winds – An exoplanet known as WASP-76 b has long been known to be extremely hot (over 2000°) due to its very close proximity to its star. A new study found iron vapor winds on the planet using a spectrograph on the Very Large Telescope in Chile. The winds were blowing from lower levels to higher levels in the atmosphere.

Rogue Planets – JWST was used to search a star cluster and nebula where stars are forming, looking for planet-sized bodies. The search found six of these that did not appear to be related to any star, so are likely rogue (starless) planets. The area searched is known as NGC 1333, which is located about 1000 light-years away in Perseus. All six are gas giants more massive than Jupiter, but not massive enough to be brown dwarf stars. The search also confirmed 19 known brown dwarfs and discovered one new one. The brown dwarf and planet-sized bodies appear to have formed by the same process that is forming stars (that is, gravitational collapse of gas clouds), not by the process that forms planets orbiting about stars. There has been much discussion about how small of an object can be formed by the star-forming process. These new observations show clearly that the process yields objects at least down to gas giant planet size.

Unusual Exoplanet Pair – A second massive gas giant exoplanet has been discovered orbiting a star known as HD 118203. Each is more massive than Jupiter and each has a fairly elliptical (non-circular) orbit. The new discovery takes 14 Earth years to orbit the star, while the previous discovery (made in 2006) is far closer to the star, taking only 6 Earth days to orbit. This is an unusual combination of planets, one so close to the star, the other so far. The star is about 20% more massive than our Sun. A search capable of detecting any exoplanets larger than twice the Earth's size failed to find any more planets in this system.

Solar Wind – Two different spacecraft studying the Sun, the NASA Parker Solar Probe and the European Solar Orbiter, were able to measure the same piece of solar wind. They were able to confirm a long-held suspicion that the fast solar wind is boosted up to its high speed (nearly 2 million mph) by Alfvén waves, which carry energy along magnetic fields. The new observations showed the Alfvén waves lost energy at the same place that the fast solar wind gained energy.

Mercury Flyby – The European/Japanese spacecraft BepiColombo (named after the Italian scientist who explained Mercury's rotation) made its 7th gravitational slingshot, this one past Mercury, getting good views of the south polar region of the planet. The spacecraft consists of two separate orbiters that will begin circling Mercury in late 2026. Originally orbit was to have been achieved about a year earlier, but a partial loss of power in the spacecraft propulsion system, discovered last April, caused the rescheduling. Ten of the 16 instruments aboard the orbiters were taking data during this flyby.



Southern Mercury From BepiColombo Flyby September 2024

DART Meteors – Scientists used computer simulations to study what is happening to the ejecta thrown off by the intentional collision of the DART spacecraft with the asteroid Dimorphos. It showed that within several years some of the ejecta will come within the gravitational vicinity of both Mars and Earth, and so may contribute to meteors at both those planets. The Hera mission will visit Dimorphos in 2026 to follow up on the effects of the DART collision. Data from Hera may improve the simulation of where ejecta have gone.

Martian Water Loss – Scientists combined HST observation with those of the MAVEN spacecraft to determine how fast ordinary and heavy hydrogen (and therefore water) is escaping from Mars. They were surprised to find out that the escape rate varies substantially over a Martian year. This is apparently due to the changing effect of the Sun as Mars traverses its fairly elliptical orbit. Roughly 3 billion years ago, Mars had a lot of liquid water on its surface. Since then, nearly all of that water was lost either by going underground or by escaping to space. The new measurements help pin down how much of the loss was to space. The peak rate of loss measured was more than can be explained by the well-understood process of water breaking into hydrogen and oxygen with those atoms exceeding Martian escape velocity by thermal motion. The additional escape rate is attributed to the action of solar wind particles hitting the hydrogen and knocking it above escape velocity.

New Volcano – The Juno spacecraft has imaged multiple lava flows from a volcano on Jupiter's moon Io at a place that was featureless when the Galileo spacecraft imaged it years ago. Juno's sensitive camera was able to image this area of Io when it was actually night there, lighted only by Jupiter shine. Nine previously known volcanoes were spewing plumes into space in the new Juno images.

Near Earth Asteroid – A small asteroid (about 1150 feet long) designated 2024 ON passed fairly close to Earth (about 2.6 times the Moon’s distance) on September 17. It was imaged by the Goldstone Radar in the California desert. The images show it has two lobes probably narrowly connected, making it likely a contact binary, that is two objects barely touching. About 14% of small near-Earth objects that have been radar imaged have been found to be contact binaries. 2024 ON is not likely to collide with Earth as far ahead as its orbit has been reliably predicted.

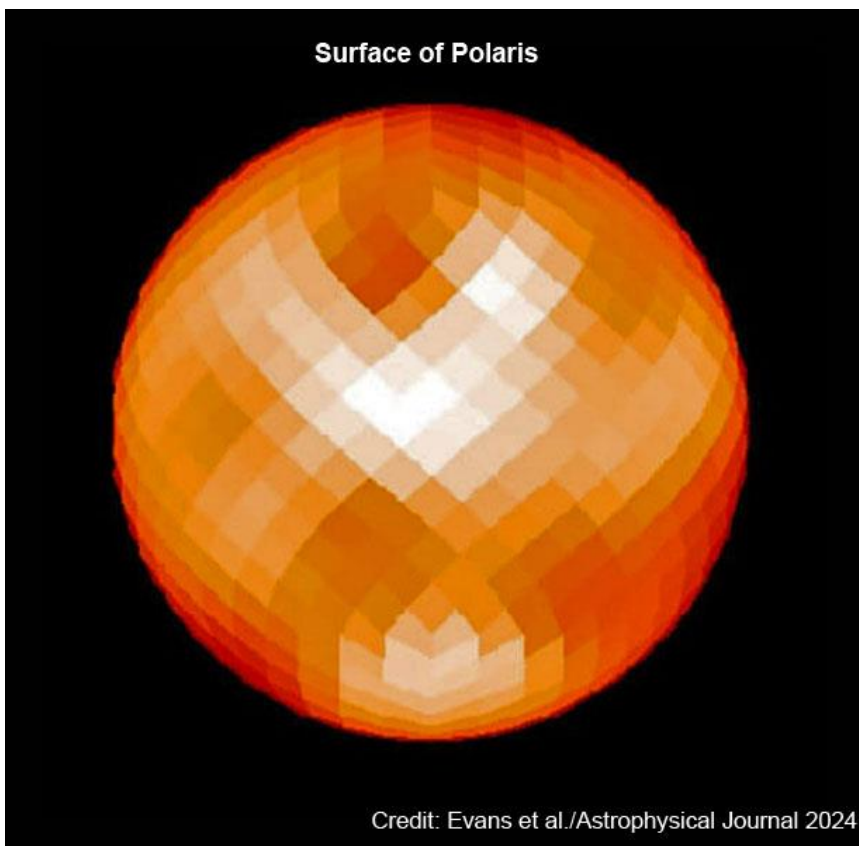
Lunar Volcanism – The Chinese spacecraft Chang’e 5 returned material scooped up from the Moon about 3 years ago. New analysis of the material found 3 glass beads that were of volcanic origin and uranium dating of the beads showed they were created only 123 million years ago. Most volcanic activity on the Moon has been dated at 3 billion and more years ago, though a few crater-counted ages of lunar lava flows have implied far more recent volcanic activity. This new finding raises the question of whether lunar volcanic activity could have persisted until the present. Finding the 3 glass beads was tedious because they were mixed in with thousands of glass beads that were identified as ejecta from crater impacts.

Background Sky Measured – Past attempts to measure the faint visible light brightness of the sky between stars have been hampered by the Solar System being embedded in the dust that creates the zodiacal light and that much of the sky contains Milky Way dust. A new attempt to measure the sky brightness was made using the camera aboard the New Horizons spacecraft (which visited Pluto in 2015), which has left behind the zodiacal light dust of the Solar System. The new measurement compensated for Milky Way dust using data from the Planck space telescope. The very faint brightness measured agreed well with the total brightness of all distant galaxies seen in very deep images taken by JWST. So, astronomers do not expect to find any unknown sources of visible light in the Universe.

Black Hole Pair – Scientists combined observations of a pair of colliding galaxies from HST and the Chandra X-ray space telescope to show they contained a pair of supermassive black holes about 300 light-years apart (quite close for such black holes). The pair of galaxies is known as MCG-03-34-64 and is located about 800 million light-years away. The first HST image showed only 3 diffraction spikes where they were not expected and follow up X-ray and archived radio observations showed two of those were caused by the glow of material falling into the black holes. It will take perhaps 100 million years for the two black holes to spiral together and merge.

Longest Jets – The longest known pair of jets shooting out of a black hole have been discovered. They are about 24 million light-years long, end to end. This is many times larger than the size of the largest known galaxy. We are seeing the jets as they were when the light left there 7.5 billion years ago. The jets were measured using radiotelescopes. Astronomers are calling the jets Porphyrion, named after the mythological giant. In order for jets to attain this length, their black hole must have been feeding steadily for a billion years or so, the black hole’s magnetic field must have remained undisturbed for those billion years, and the surrounding space must not contain material that blocks jets. Astronomers had not expected those conditions to be met so long as to allow jets of this size.

Polaris, the North Star, is the nearest Cepheid variable star. Such stars alternately swell and shrink over periods of days or weeks, changing their brightnesses in a regular way. Because their absolute brightness is related to the period of variability, Cepheids are used to determine cosmic distances by how bright they appear. Astronomers would like to know more about how Cepheids operate to substantiate the distances derived from them. A team of astronomers used the CHARA array of 6 telescopes as an interferometer to resolve the surface of Polaris. Several dark and light spots were resolved that change over time. The star is 46 times the diameter of our Sun. The astronomers are also tracking Polaris’ 30-year orbit about its companion star to try to pin down its exact mass. The best estimate now is that Polaris has 5.1 times the mass of our Sun.



Polaris Dawn, a project using SpaceX Dragon spacecraft, has completed its first mission. Four private astronauts were launched to 875 miles altitude, the farthest that people have reached since the Apollo lunar missions. The first private (not space agency) spacewalk was performed. More than 35 science experiments were performed, including testing of a new SpaceX space suit during the spacewalk and a test of a new optical communications system talking to Starlink internet satellites. The flight passed through the Van Allen radiation belts and monitored the radiation effects on the astronauts. The Polaris Dawn flights are sponsored by billionaire Jared Isaacson.

Boeing Starliner – As was previously reported here, the first test flight of a Boeing Starliner spacecraft with crew to ISS in June experienced problems with thruster operation. After extensive delays for testing Starliner, NASA decided that the thruster problems had too much uncertainty to risk having its two astronauts (Butch Wilmore and Suni Williams) fly Starliner back to Earth. It landed at White Sands, New Mexico, without crew and without incident on September 6. The SpaceX Crew-9 mission launched to ISS September 25 with two empty seats reserved for Wilmore and Williams. It is scheduled to return to Earth late February.



Outreach Activities

October-November 2024 Outreach Events

Event Date	Type	Site Name	Address	Start Time
10/24/2024	School	Springbrook Elementary	655 Springbrook N. Irvine	7:30 PM
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

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.

Astrophysics Special Interest Group

In April, the Astrophysics Special Interest Group (ASIG) toured NASA's Jet Propulsion Laboratory (JPL). The tour kicked off in the JPL auditorium, where we were introduced to its mission and its integral role within NASA, surrounded by full-scale models of the Voyager and Cassini spacecrafts and other NASA deep space satellites. One of the tour highlights was visiting Mission Control (that you have likely seen in the media many times), where NASA's deep space missions are monitored and operated. We also toured the Vehicle Assembly Building, where satellites and spacecraft are assembled and prepared for installation on their rocket boosters. JPL's tours are truly exceptional and highly recommended for anyone interested in space science, STEM in general, or if you just want to see where your tax dollars are going in development of US space science and exploration capabilities. A photo of happy OCA JPL tourists and their guests is shown here.



We are pleased to announce a change of venue for ASIG meetings. Starting in September, ASIG's monthly meetings will take place at the Astronomy House on the Orange Coast College (OCC) campus. This new "Astronomy Friendly" venue offers an enhanced setting for our activities. Additionally, we look forward to strengthening our relationship with the OCC Physics and Astronomy Department who sponsored our move to OCC. Look for directions in our monthly agenda announcement.

Our monthly meetings incorporate a growing number of speakers drawn from our attendees with special expertise in astronomy and astrophysics. Upcoming presentations include topics such as "Climbing the Cosmic Distance Ladder: A Backyard Observatory Project" and "Eclipse Photography and Corona Astrophysics". Please attend our monthly meetings (Third Friday of the Month at OCC) to hear relevant and well delivered presentations by knowledgeable OCA members and ask your "I always wanted to know" questions. We continue our video Great Course series, now including "Introduction to Astrophysics" and branching out into Astrobiology, with the course, "Life in the Universe". Astrobiology may seem a little remote from Astrophysics at first thought, but this course has shown that Astrobiology and the question, "are we alone", and Astrophysics are tightly integrated subjects. Attend our meetings and learn more about our place in the Universe as well as how it all works.



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!

October's Night Sky Notes: Catch Andromeda Rising!

By Dave Prosper

Updated by Kat Troche

If you're thinking of a galaxy, the image in your head is probably the Andromeda Galaxy! Studies of this massive neighboring galaxy, also called M31, have played an incredibly important role in shaping modern astronomy. As a bonus for stargazers, the Andromeda Galaxy is also a beautiful sight.



Spot the Andromeda Galaxy! M31's more common name comes from its parent constellation, which becomes prominent as autumn arrives in the Northern Hemisphere. Surprising amounts of detail can be observed with unaided eyes when seen from dark sky sites. Hints of it can even be made out from light polluted areas. Use the Great Square of Pegasus or the Cassiopeia constellation as guides to find it. Credit: Stellarium Web

Have you heard that all the stars you see at night are part of our Milky Way galaxy? While that is mostly true, one star-like object located near the border between the constellations of Andromeda and Cassiopeia appears fuzzy to unaided eyes. That's because it's not a star, but the Andromeda Galaxy, its trillion stars appearing to our eyes as a 3.4 magnitude patch of haze. Why so dim? Distance! It's outside our galaxy, around 2.5 million light years distant - so far away that the light you see left M31's stars when our earliest ancestors figured out stone tools. Binoculars show more detail: M31's bright core stands out, along with a bit of its wispy, saucer-shaped disc. Telescopes bring out greater detail but often can't view the entire galaxy at once. Depending on the quality of your skies and your magnification, you may be able to make out individual globular clusters, structure, and at least two of its orbiting dwarf galaxies: M110 and M32. Light pollution and thin clouds, smoke, or haze will severely hamper observing fainter detail, as they will for any "faint fuzzy." Surprisingly, persistent stargazers can still spot M31's core from areas of moderate light pollution as long as skies are otherwise clear.

Modern astronomy was greatly [shaped by studies of the Andromeda Galaxy](#). A hundred years ago, the idea that there were other galaxies beside our own was not widely accepted, and so M31 was called the "Andromeda Nebula." Increasingly detailed observations of M31 caused astronomers to question its place in our universe - was M31 its own "island universe," and not part of our Milky Way? Harlow Shapley and Heber Curtis engaged in the "Great Debate" of 1920 over its nature. Curtis argued forcefully from his observations of dimmer than expected nova, dust lanes, and other oddities that the "nebula" was in fact an entirely different galaxy from our own. A few years later, Edwin Hubble, building on Henrietta Leavitt's work on Cepheid variable stars as a "standard candle" for distance measurement, concluded that M31 was indeed another galaxy after he observed Cepheids in photos of Andromeda, and estimated M31's distance as far outside our galaxy's boundaries. And so, the Andromeda Nebula became known as the Andromeda Galaxy.



Generated version of the Andromeda Galaxy and its companion galaxies M32 and M110. Credit: Stellarium Web



While M31's disc appears larger than you might expect (about 3 Moon widths wide), its "galactic halo" of scattered stars and gas is much, much larger – as you can see here. In fact, it is suspected that its halo is so huge that it may already mingle with our Milky Way's own halo, which makes sense since our galaxies are expected to merge sometime in the next few billion years! The dots are quasars, objects located behind the halo, which are the very energetic cores of distant galaxies powered by black holes at their center. The Hubble team studied the composition of M31's halo by measuring how the quasars' light was absorbed by the halo's material. Credits: NASA, ESA, and E. Wheatley (STScI)

These discoveries inspire astronomers to this day, who continue to observe M31 and many other galaxies for hints about the nature of our universe. One of the Hubble Space Telescope's longest-running observing campaigns was a study of M31: the Panchromatic Hubble Andromeda Treasury (PHAT). Dig into NASA's latest discoveries about the Andromeda Galaxy, on their [Messier 31](#) page.

*Originally posted by Dave Prosper: September 2021
Last Updated by Kat Troche: September 2024*

From the Editor

The newsletter is open to suggestions for new content to replace the column "Another Look". We are trying out a monthly column from NASA which they provide for use in Astronomy club newsletters. It also appears in newsletters of some other local clubs. Please let the editor know what you think of it.

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
November	19 October
December	23 November
January 2025	21 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.

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	Jerry Floyd	jlfloyd720@gmail.com	
•	Celestron AVX mount, no tripod Excellent condition - includes SkySync GPS accessory and 11-pound counterweight			\$ 450

The buyer can either pick it up at my house in Hemet at their convenience, or I can deliver it in Southern California at my convenience.

For Sale	contact	Vince Laman	lamanvp@aol.com	
•	Celestron CGX-L mount package. Mount and Tripod. Star Sense AutoAlign, Polar Axis Finderscope 75 lb rating for astrophotography. Higher rating for visual. All new in box. Never used. Retail value of these items \$5300.			\$ 2600

These items are local pickup only. If interested send me an email requesting a complete description.

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.			

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	Marten Seth	949-892-7790	info@sethfamilyoffice.com	
					\$ 50
<ul style="list-style-type: none"> • Glass Solar Filter ST425G 4" from Spectrum Telescope. Inner Diameter 4.25"/108 mm/ clear aperture 3.5 Bought from OPT, never used, in original box. 					
Located in Laguna Niguel.					

For Sale	contact	Izzy Oleinik	izzy1000@mac.com		
					\$1400
<ul style="list-style-type: none"> • Sky Watcher EQ6R mount • 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		
					\$3300
<ul style="list-style-type: none"> • Avalon - M-Zero Single Arm Equatorial/Alt-Az mount (WIFI Version) • 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					

Yearbook of Astronomy 2025

The newest edition of the Yearbook of Astronomy will be released at the end of October. The editor of this book, Brian Jones, tells us that a 25% discount is being offered to members of our club. Here is more information taken from an email from Mr. Jones.

The Yearbook contains comprehensive jargon-free monthly sky notes and an authoritative set of sky charts to enable backyard astronomers to plan their viewing of the year's lunar phenomena [phases, lunar occultations, eclipses of the Moon (and Sun), apsides, node crossings (with references to eclipses) and lunistics/lunar standstills], comets, meteor showers and minor planets. The book also charts and describes the locations of the planets throughout the year.

To supplement all this is a variety of entertaining and informative articles, those for the 2025 edition including, amongst others, Recent Advances in Astronomy; Recent Advances in Solar System Exploration; Skies over Ancient America: Mystical Mounds and Landmarks of the Prehistoric Americas; Astrophysicist Cecilia Helena Payne and Professor H. N. Russell; Saturn at its Equinox: A History of Ring-Plane Crossings from 1612 to 2025; Signals from the Magnetosphere; and How to Read a Scientific Paper.

The cover price of the book (before discount) is \$34.95

The book will be available in the United States from late-October. I would like to offer the members of your astronomical society a discount code that will allow them to get a pre-order reduction of 25% from the price of the book. This discount can be applied by hitting the 'BUY' button on the ordering site and then entering the code ASTRO in the panel 'Add Coupon' on your shopping cart. A direct link to the ordering site is . . .

<https://www.casemateipm.com/9781036115159/yearbook-of-astronomy-2025/>



ASTRONOMER

The Newsletter of the Orange County Astronomers

Nonprofit Organization
U.S. Postage
PAID
Santa Ana, CA
Permit No. 1468

NEWSLETTER OF THE
ORANGE COUNTY ASTRONOMERS
P.O. BOX 1762
COSTA MESA, CA 92628

**DATED MATERIAL
DELIVER PROMPTLY**

RETURN SERVICE REQUESTED

CONTACT LIST

WEBSITE: <https://ocastronomers.org> Phone 949-266-9777 Starline 24-Hr. Recording: 714-751-6867 Anza Observatory: 951-763-5152

BOARD OF DIRECTORS

President	Barbara Toy	board@ocastronomers.org
Vice President	Reza AmirArjomand	btoy@cox.net
Treasurer	Charlie Oostdyk	reza@ocastronomers.org
Secretary	Alan Smallbone	charlie@ocastronomers.org
Trustee	David Searle	alan@ocastronomers.org
Trustee	-- open --	dwsearle@gmail.com
Trustee	Doug Millar	doug@ocastronomers.org
Trustee	Sam Saeed	sam@ocastronomers.org
Trustee	Brett Nordby	brett@ocastronomers.org
Trustee	Gary Schones	gary378@pacbell.net
Trustee	John Hoot	jhoot@ssccorp.com

COORDINATORS

Anza House Coordinator	Manuel Baeza	manugb33@yahoo.com
Anza Site Maintenance	Don Lynn	dlynn@ieee.org
Beginner's Class	David Pearson	p.davidw@yahoo.com
Orange County Star Parties	Steve Mizera	mizeras@cox.net
Explore the Stars	Bob Nanz	bob@nanzscience.com
Librarian	Karen Schnable	karen@schnabel.net
Membership / Anza Pads	Charlie Oostdyk	charlie@ocastronomers.org
Observatory Custodian / Trainer / Member Liaison	Barbara Toy	btoy@cox.net
Outreach	Martin Christensen	outreach@ocastronomers.org
Sirius Astronomer Editor	David Fischer	newsletter@ocastronomers.org
Social Media Coordinator	Rich Cormier	social@ocastronomers.org
Telescope Adoption Program	Jake Brown	scopes@ocastronomers.org
WAA Representative	Jon Montgomery	56scooter@gmail.com
Webmaster	Reza AmirArjomand	webmaster@ocastronomers.org

SPECIAL INTEREST GROUPS (SIGs)

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