SIRIUS ASTRONOMER

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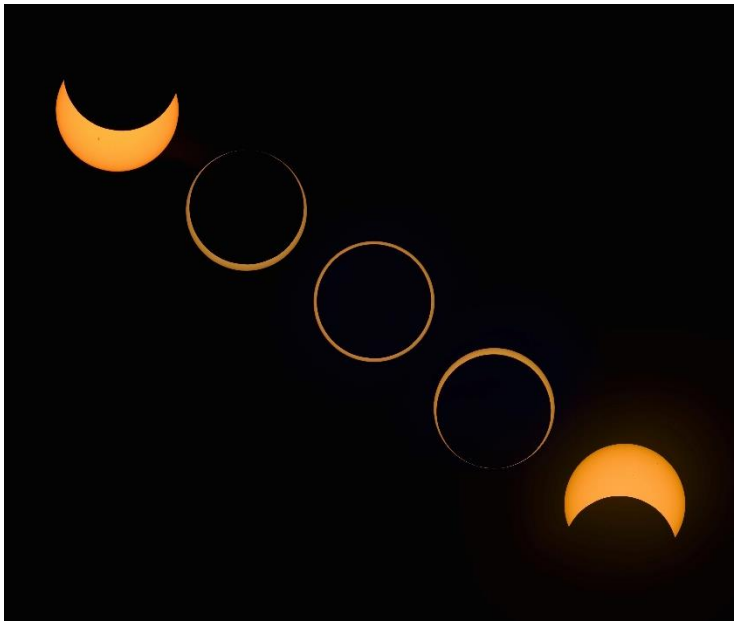
The Newsletter of the Orange County Astronomers

November 2023 Free to members, subscriptions $12 for 12 issues **Volume 50, Number 11**



Phases of the October 2023 annular eclipse captured by Alan Smallbone in Albequerque, New Mexico and composited.

Ron Pepitone's sillouette with the eclipsed moon showing through holes in his straw hat, taken in Los Alamitos, CA.

Upcoming Events - free and open to the public

Beginner's class	Friday, 3 December at 7:30 to 9:30 PM **ONLINE** This is session 4 of the class: It covers the science behind the telescope – the physics and biology involved in seeing celestial objects.
Club Meeting	Friday, 10 November at 7:30 to 9:30 PM **In person** at Chapman University and **ONLINE** In person performance: The Ladies Harp Ensemble "What's Up?": John Garrett from TVA Main speaker: Richard Lederer whose talk "Racing With the Moon, Dancing With the Stars", the etymology of words and phrases derived from celestial objects.
Open Spiral Bar	Saturday, 11 November at 10:00 to 11:30 PM **ONLINE** Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.
Star Parties	Saturday, 11 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

I'm happy to report that the annular eclipse on October 14 was excellent as seen from Albuquerque, New Mexico. Alan and I viewed it from the parking lot for our hotel, which turned out to be as good a viewing location as we could hope for – plenty of room, no obstructions (Alan's photo app helped make sure of that), mostly clear skies – overall, a really great experience. There were other club members in Albuquerque for the eclipse, including Charlie Oostdyk, our Treasurer, I hope they all had great experiences, too!

At our site we had some other eclipse-watchers come by to share the excitement of the experience. They were viewing it with eclipse glasses and no magnification or other equipment (though some might have taken pictures with their cellphones). Alan imaged it using his Fuji camera on a tracking mount and shared views on his camera screen with those who came by. He and other imagers in the club posted some of their images to the AstroImage email group (AstroImagers@groups.io) as they processed them in the days after the eclipse. If you're not in that email group, you missed some great images and commentary, particularly a couple of images from Jim Windlinger taken with an H-alpha filter, showing flares along the limb of the sun and some texture on the solar surface around the shadow of the moon. Alan made a 5-image composite showing the sequence of the eclipse that may be elsewhere in this newsletter.

Although I took some pictures of crescent-shaped projections of the eclipsing sun in the shadows of a couple of trees that were near us, that was the limit of my imaging. Mostly I observed the different stages of the eclipse through binoculars with solar filters or eclipse glasses. That's a lot easier than dealing with a tracking mount and other equipment needed for good images of an event like that – and then I can also enjoy the fruits of our imagers' labors afterwards. After all, we have a lot of talented imagers in our club who are generous about sharing their images!

That weekend was also the last weekend of the Albuquerque Balloon Festival, so we saw a lot of hot air balloons passing near our hotel in the couple hours before the eclipse started. I understand the festival management distributed hundreds of eclipse glasses to festival-goers that Saturday, turning it into a balloon-and-solar-eclipse-viewing event - a generous and creative approach to include people who hadn't thought about viewing it interested in seeing the eclipse.

One young couple who chatted with us a bit were in Albuquerque on their honeymoon and hadn't known about the balloon festival or the eclipse before they got there – they were totally enjoying both and were following the eclipse with eclipse glasses in the comfort of their convertible with the roof down. They first went to a park in central Albuquerque to view it, found that it was far too crowded with eclipse-watchers, so they came back to the hotel and found the viewing conditions much better.

It seems that thousands of people saw the eclipse from Albuquerque, and many more viewed it from other areas on (or near) the center line while others watched it in real time on-line. Astronomical events do have broad appeal – even though that popularity at times can lead to major traffic jams!

Lowell Observatory

As a bonus for Alan and me, our route home took us through Flagstaff and we were able to visit Lowell Observatory. Even better, Kevin Schindler, the speaker for our October general meeting, was there and we were able to meet him in person and learn more about their facilities and various programs. They're open every afternoon and evening, with a pretty full schedule of activities, including observatory tours, talks and nightly viewing when the weather permits. If you're in the Flagstaff area, it's worth a visit – it's easily accessible and really impressive. You may also check out Kevin's book, "The Far End of the Journey: Lowell Observatory's 24-inch Clark Telescope". This is much more than the history of that impressive telescope and is filled with many historical and other pictures.

Club Election

On other matters, we're now in the club's election season, specifically the part when those who want to run for a position on the Board can get on the ballot. The process is easy – just email your name, contact information and the position you're seeking to our Secretary, Alan Smallbone (Alan@ocastronomers.org), and he'll put you on the ballot after checking to be sure you qualify.

Our Board has four officers, President, Vice President, Secretary and Treasurer, and seven Trustees. The minimum requirement for any Board position is that you must have been a member of the club in good standing for at least a year. If you want to run for President or Vice President, you must also have served on the Board for at least one year at some point.

As an overview, the Board is the club's governing body and oversees all club activities. It meets every other month, in odd-numbered months, via Zoom on Sunday mornings (the exact start time varies) and the meetings usually last around 1½ hours. We keep updated between meetings through emails and contact at other club events. Historically, some Board members have taken on projects as needed based on their interests, expertise and availability, and an informal sub-group of around eight members handles different aspects of the monthly general meetings.

Our Board is a congenial group that's a pleasure to work with, and we hope you'll send in your nominations, and that some of you will be joining the Board for 2024!

The last day for getting on the ballot is November 10, the day of our November general meeting. Please don't wait until the last minute to send your email to Alan – accidents can happen, and it would be really sad if it didn't get to him in time.

AstroSpace Update

November 2023

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

Asteroid Sample – On September 23 the spacecraft OSIRIS-REx dropped onto Utah a sealed capsule containing a sample of rocks and dust that were collected from the asteroid Bennu. The parachute landing went perfectly, and the capsule was immediately retrieved and placed in a clean-room environment. It was shipped to a lab to protect and study the sample, located in Houston. The first look showed that the sample was overflowing, so there is plenty of material to work with. The sample contains carbon and oxygen among other constituents. Some of the water is within clay minerals. This is the first asteroid sample retrieved by NASA, though Japan has returned two smaller asteroid samples. Scientists worldwide will study the new sample. Much of the sample will be preserved for study in future years. OSIRIS-REx is continuing its spaceflight to visit asteroid Apophis, though it will not be able to take a sample there.

Ages of Saturn's Moons – A new study of the impact scars found on some moons of Saturn, coupled with computer simulations of impacting bodies there, showed that all of them have been in place between 3.8 and 4.4 billion years. Thus, they have been there since shortly after Saturn formed. These ages were a few hundred million years older than previous Saturn moon age estimates. This applies only to some of that planet's larger moons, as most of the 146 known Saturnian moons are small bodies that are believed to have been captured later. The major moons of Saturn were found to fit a pattern of increasing age with increasing distance from the planet, except Mimas and Enceladus.

Not Lightning on Venus – Observations by the Parker Solar Probe during a recent flyby of Venus indicate that some of the flashes of light previously observed on that planet are likely disturbances the planet's magnetic field, not lightning as previously thought. A previous paper had attributed some "lightning" flashes to instead being caused by meteors.

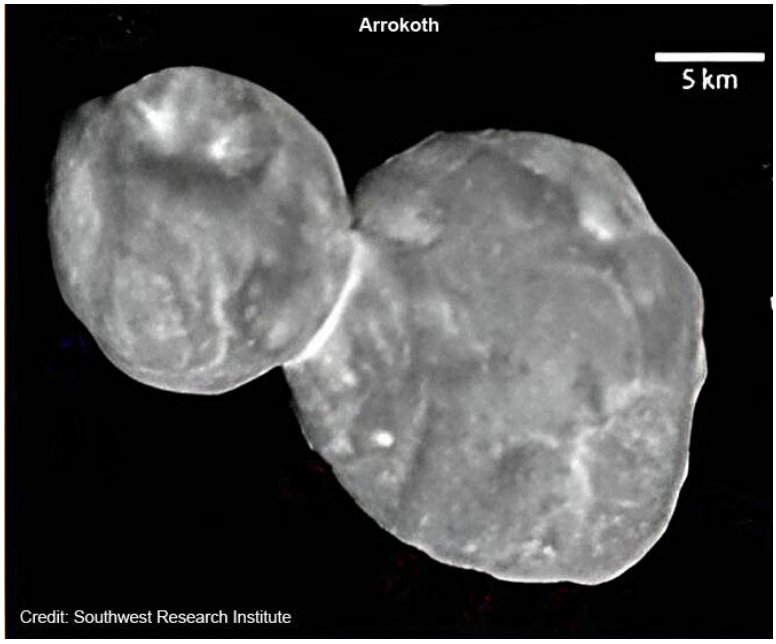
Carbon Dioxide on a Centaur – Centaurs are small Solar System bodies found orbiting roughly between Jupiter and Neptune. They typically have properties of both asteroids and comets. New observations with the James Webb Space Telescope (JWST) of the Centaur Oterma have detected carbon dioxide for the first time on any Centaur. Carbon monoxide and water were not able to be detected in this observation. Oterma is frequently active, that is, giving off material, and was given the comet designation of 39P long ago.

Jupiter Jet Stream – In new images taken by JWST using infrared wavelengths not previously used to observe Jupiter, astronomers have discovered a jet stream that flows near the planet's equator about 25 miles above the cloud tops seen in visible light. It is more than 3000 miles wide and moves at 320 miles per hour. Additional JWST observations are planned to see if any properties of the jet stream change over time.

Psyche Launch – On October 13 the Psyche spacecraft launched atop a SpaceX Falcon Heavy rocket on its way to orbit and explore the largest known metallic asteroid, also named Psyche. This asteroid may be part of the core of a planetesimal. The spacecraft uses solar electric propulsion and a gravity slingshot at Mars to reach the asteroid. Psyche's instruments include a multispectral imager, a magnetometer and a gamma-ray and neutron spectrometer. An unrelated mission is also onboard the same spacecraft, which will test laser communications (rather than radio) for the first time beyond the Moon.

Free-Floating Planets – A survey of the Orion Nebula made by JWST in infrared has found 540 objects that are likely free-floating planets, that is, planet-size bodies that do not orbit a star. They are also known as rogue planets. This promises to be by far the largest discovery of free-floating planets. The new discoveries include 42 pairs of planets orbiting each other. Astronomers are calling these Jupiter Mass Binary Objects, or JuMBOs. Astronomers don't know how such a pair can escape a star and still orbit each other. There are several theories as to how free-floating planets may escape their stars, including: gravity of a passing star, blast of a supernova, or a star dies and leaves its planets. Free-floating planets are almost impossible to image in visible light but are much more easily imaged in infrared.

Mounds on Arrokoth – A study of the images of Arrokoth, the small Kuiper Belt object visited by the New Horizons spacecraft, found more than a dozen mounds of similar size, shape, color, and reflectivity. It appears that icy material accumulated to form each of these mounds. Astronomers have surmised that the mounds are part of the process of building small bodies such as Arrokoth (which is only 22 miles long). Missions to other small bodies, such as Lucy on its way to the Jupiter Trojan asteroids, will be looking for similar mounds on those bodies.



Exoplanet Silica – JWST spectral observations have detected silica "snow" in the atmosphere of an exoplanet known as WASP-17 b. In essence, very fine sand particles fall out of this planet's sky. This is the first detection of silica at any exoplanet, though related magnesium-rich silicates have been found on other exoplanets. WASP-17 b is a hot Jupiter, that is, a gas giant planet orbiting its star so closely that it is quite hot. It has about 7 times the volume of Jupiter, but only about half its mass, giving it quite low density. The high temperature there has apparently puffed up its atmosphere. It is about 1300 light-years away. The planet is tidally locked to its star, that is, it keeps the same face always turned toward its star. This will result in extremely high winds blowing from the hot side to the cold side. The silica will vaporize on the hot side and condense as solid particles as winds carry the silica into the cold side.

Exoplanet Collision – Several years ago an astronomer noticed that a particular star brightened in infrared for about 1000 days, then dimmed for about 500 days. A team of astronomers studied the star and determined the brightness changes were the result of the collision of two giant planets that orbit the star. The result of the collision has not been determined, but astronomers continue watching the star and are watching for other similar brightenings and dimmings of stars to learn more.

Unusual Supernova – A Type II supernova explosion occurs when a red giant star with mass in the range 8-25 times the Sun's mass collapses when it runs out of nuclear fuel. Supernova **2023ixf** was such a Type II event, discovered last May in the galaxy M101, but it has shown some unusual characteristics, found in multiwavelength follow-up observations made by both professional and amateur astronomers. Usually Type IIs produce a flash of light within hours of the collapse, caused by the shock wave from the core collapsing reaching the star's surface, but **ixf** took several days to produce the flash. The delay was caused by dense material surrounding the star that had been thrown out by the star in the past year or so. The thrown-off material had roughly the mass of our Sun. This huge mass loss just before explosion is unusual for a Type II.

Mysterious LFBOT – Luminous Fast Blue Optical Transients (LFBOTs) are objects that rise to huge brightness in blue light then fade in a matter of days. The fading is too fast for them to be supernovas. The first time one was noticed was in 2018, and only a handful have been seen since. Observations of a recent LFBOT by the Hubble Space Telescope show that, unlike any other LFBOT, it occurred far from any galaxy. This rules out many possible explanations of the cause of LFBOTs. Remaining explanations include a black hole tearing a star apart and colliding neutron stars, though there are problems with both of these. The temperature and distance of the new LFBOT have been measured, but astronomers still don't know what the object is. Observations using JWST are expected, hoping to shed more light on LFBOTs. Discovery of more LFBOTs may help.

Quasars Eating – It has long been debated how quasars consume enough matter as quickly as they must to produce their bright light. New research using computer simulations of black holes and their accretion disks shows that the black hole's gravity rips the accretion disk into 2 parts and then swallows the inner part almost all at once. The accretion disk forms again and the process repeats in a matter of months. The result is that the black hole swallows material at a greater average rate than previous simulations showed.

Microsecond Radio Bursts – Fast Radio Bursts (FRBs) were discovered in 2007, and they consist of powerful flashes of radio light, usually lasting less than 1 thousandth of a second. They contain as much energy as the Sun puts out in a day. Their sources are in distant galaxies. The objects emitting them may be magnetars (extremely magnetic neutron stars), but this has not been firmly established. There has long been speculation about even shorter bursts, perhaps around 1 millionth of a second, but astronomers did not know how to find them. A team of researchers solved this by running a computer search on a public archive of radio data that was taken at extremely fast rates by Breakthrough Listen, a project to look for radio signals from extraterrestrial life. They found 8 radio bursts lasting 10 millionths of a second or shorter (believed to be of natural cause, not extraterrestrial life). Researchers expect to find other extremely short bursts now that they know how to look for them.

Dark Matter Halos – It has been known for some time that quasars (supermassive black holes that are actively swallowing matter) usually have massive halos of dark matter about their galaxies. A new study was made of very distant quasars to see if this characteristic applied to distant quasars also. Very distant quasars are seen as they were when the light left them many billions of years ago, so this new study was determining if massive halos about quasars were also present during the early history of the Universe. The new study found the prevalence of those dark matter halos was the same for both ancient and more modern quasars. The dark matter halos were measured by their influence on gravitational lensing, or the bending of light by gravity. Multiple telescopes were used in the study, the main one being the Japanese Subaru Telescope located in Hawaii.

Black Hole Spin - The massive galaxy M87, located 55 million light-years away, holds at its center a supermassive black hole with a mass 6.5 billion times our Sun's mass. The accretion disk of that black hole has jets whose direction swing about 10 degrees. A new study of 23 years of radiotelescope observations of these jets shows that the swing has a period of 11 years. The prevailing theory is that spin of the black hole itself powers the swinging of such jets. The new study indicates that the black hole spin indeed powers the swinging of the jets, and that the axis of spin of the accretion disk tilts with respect to the axis of the black hole spin, and this explains the 11-year period.

Molecule Distribution in M77 – The ALMA radiotelescope array in Chile was used to observe the galaxy M77 (NGC 1068) looking for the spectral lines of 23 different molecules, with resolution to find these molecules in selected parts of the galaxy, such as the central disk and the ring of very active star formation (starburst ring). The chemistry of different parts was found to differ. For example, more silicon monoxide but less cyanide was found in the central disk than the starburst ring. This was the first detection of silicon monoxide in M77, though the galaxy has been extensively studied in the past. It is believed that the jets spewing from the central supermassive black hole are responsible for changing the distribution of various molecules unevenly in the different galaxy parts.

GAIA Data Release – The GAIA team has released a new batch of data that includes, for the first time, data on the stars in the core of the globular cluster Omega Centauri. This was accomplished by using software in engineering mode, which was found to better separate crowded stars than the standard more. Over half a million stars in Omega were added in this release. The next GAIA data release will use engineering mode on 8 other crowded regions. The recent data release also added listings of gravitational lenses and lensed quasars identified in GAIA observations. Also added were longer tracking of 150,000 asteroids and information on 10,000 variables stars.

Milky Way Mass – The GAIA spacecraft has (so far) measured the precise positions and motions of nearly 2 billion stars. A new study of GAIA data for stars in the outskirts of our Milky Way galaxy allowed scientists to calculate the total mass of our galaxy. The result, 206 billion times the Sun's mass, is at least 4 times smaller than previous mass estimates. This implies the dark matter halo about the Milky Way is much smaller than previously believed. Graphing the rotation speeds of stars at various distances from the center of the Milky Way fails to produce the leveling of the graph at large distances, which is seen in other nearby galaxies whose rotation speeds have been graphed. Theoreticians are working on explaining why the Milky Way differs from other galaxies.

Hyades Mystery – The Hyades open star cluster, at 153 light-years distance, is the closest star cluster to us. Its stars are of similar ages, about 625 million years. It has been well studied. A mystery remains, and that is why it contains few white dwarf stars. A new study found in GAIA spacecraft data a white dwarf that was ejected from the Hyades, so possibly the shortage of white dwarfs can be explained by frequent loss of such stars. The recently found escapee is unusual in that it is near the upper limit of mass (of 1.44 times the Sun's mass) that white dwarfs can have.

Star Formation in M92 – Astronomers used JWST to study the stars in globular star cluster M92. Because of the sensitivity of JWST, this was able to study stars much dimmer than any previous work with M92. They found that different groups of stars within the globular have different chemical composition. This contradicts the long-held assumption that all stars in a globular cluster formed about the same time and therefore have similar chemical composition, since the heavier elements slowly accumulate over time. There are two theories to explain the varying composition: 1) the stars did not all form at one time, 2) star formation near massive stars was chemically polluted by heavy elements spread from the massive stars. The new study tends to support the first of these theories.

Supernova Distances – Previous study using radioactive dating has found that Earth was struck by the blasts of supernovas about 3 million and about 7 million years ago. A new study calculated rough distances for these explosions of a range of 65-457 light-years and roughly 359 light-years respectively. These are probably relatively safe distances for supernovas.

Extreme Solar Storm – Scientists studying ancient tree remains found in the French Alps found a strong peak in radioactive carbon caused by the largest known solar storm. The date determined from tree rings was 14,300 years ago. Evidence for the solar storm was also found having the same date in Greenland ice cores. If a similar solar storm were to hit today, it would wipe out communications and electric power, becoming a major catastrophe. This is the 9th extreme solar storm known to have happened in the past 15,000 years.

Antimatter Falls – Since 1932, when the first antiparticle, the positron, was discovered, there has been a debate whether antimatter will fall or rise under the influence of gravity. Most scientists agree it should fall, but there was still some doubt because that situation has never been tested, in part because most individual antiparticles have electric charge that influences their motion. A new experiment created antihydrogen (consisting of an antiproton and a positron) and watched to see if it fell in gravity. It did. What's more, it fell at the same rate as ordinary matter, to the limits of accuracy of the experiment.

Arecibo – Since the collapse in 2020 of the Arecibo, Puerto Rico, 1000-foot radiotelescope antenna, there have been hopes that the site will be used in some manner for radio astronomy. A new report from the National Science Foundation (NSF) dashed those hopes, stating that the site will be used only for promoting STEM (Science, Technology, Engineering, and Math) education. There remains a 39-foot radiotelescope dish on the site, but it will not be supported by NSF.

Lunar Mission Ends – India's Chandrayaan-3 lunar lander and rover were not designed to withstand the frigid temperature (as low as minus 418°F) of a lunar night, which lasts 14 Earth days. Controllers did try to contact the spacecraft anyway after the Sun rose in hopes they might have survived. But attempts were unsuccessful. The spacecraft fulfilled their goals during the lunar day of their landing.

New Horizons Extended – NASA has agreed to extend the mission of New Horizons, which previously explored Pluto and the smaller body Arrokoth, until the spacecraft exits the Kuiper Belt, expected in 2028 or 2029. NASA allowed they would support another Kuiper Belt object flyby if one were found that is reachable by the spacecraft.

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.

For Sale	contact	Ron Choi	rchoi1983@gmail.com	
• Orion StarShoot AutoGuider			further reduced price	$ 200
• Tele Vue 8mm plossl 1.25" eyepiece				$ 80

For Sale	contact	Bill Prats	b.bill.p@gmail.com	
• QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 3 Pieces, Bright red finish, no scratches				$ 30
• Losmandy Servo motor/Gemini 2 cables (pair) recent & hardly used				Make offer
• Losmandy Gemini 2 Hand Controller, recent & hardly used				Make offer

Contact Bill Prats b.bill.p@gmail.com Shipping is extra. All items can be picked up in Huntington Beach.

For Sale	contact	Eric Mjolsness	emj@uci.edu	
• Mars Hill Pad # MH-05 OCA license is up for sale. Includes solid equatorial pier. Price in 2010 was $2300. I am seeking that amount back or best offer.				$ 2300 obo

For Sale contact Val Akins akins7821@gmail.com 949-301-5956

- Telescope: Orion's Sirius 8" Go-To Reflector, Focal Length: F6, 1200 mm, Case: for 8 x 6 OTA $ 450 reduced
  Mount: Sirius EQ-G Go-To Equatorial with tripod
  Controller: Synscan 42,000 Celestial object database
  Lens: Siriusplossl 26 mm
  Viewfinder: 8 x 50 mm Rt. Angle
  Note: Equipment is used, but all functional

For Sale contact Ami Dvir amiaddvir@gmail.com 949-294-1073

- Eyepiece Celestron X-CEL : 12mm,9mm,7mm, with boxes and all $ 170
- Eyepiece Meade 5000 PWA 28mm [like new in the box], list price is $330 $ 220
- Eyepiece Meade 5000 PWA 16mm [like new in the box], list price is $190 $ 120

For Sale contact David W. Pearson p.davidw@yahoo.com

- Star Splitter 20 inch Dobsonian telescope with servo-cat go-to capability $ 8000 obo
  Includes 8 eyepieces, laser collimator, telerad, plus more.
  If the equivalent was bought today from Obsession, it would be $15,385+shipping without extra accessories
- Intes MK66 6" f/12 Maksutov-Cassegrain OTA includes rings/dovetail, case, finderscope, and diagonal $ 800 obo

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

For Sale contact Nick McMillan wforacer@rocketmail.com

- Technical Innovations Pro-Dome Ten-Foot (PD10), includes three Wall-Ring-PD10 (WR10) $ 5000
  which add ~48" height to the walls and making it 10' tall and 10" wide.
- Digital Dome Works controller (DDW), hardware and software.
- Electric Dome Motors 10 (ED10), Electric Shutter Motor 10 (ES10), Shutter Auto Stop (SS1).
- Power Supply 10 (PS2E), ES Pulley upgrade (ESP), Wind Restraint System, Anti Sag Brace.

Pictures are on Flicker here: https://www.flickr.com/photos/123906448@N08/albums/72177720309596327/.
The dome and components must be picked up in Costa Mesa.

For Sale contact Bill Frank 949-254-4662 cell

- LX200 Maksutov-Cassegrain telescope with cover, Meade mount, base controller, $ 500 OBO
  power and control cables, carrying cases.
- Accessories in case #1: Meade Dew Shield MFR#07284, main scope cap, guide scope caps,
  2 green laser sights with controller
- Accessories in case #2: Teleview eyepieces: 19mm Wide Field, 74 mm Plossl, 10.5 mm Plossl,
  Meade Super 26 mm Plossl, setup eyepiece, assorted locking rings and covers, adapter sleeve,
  power supply 10 (PS2E), ES pulley upgrade (ESP), wind restraint system, anti-sag brace,
  2 Starlite red reading lights, lens cleaning brush, laminated list of Messier objects and bright stars
- Camera: SBIG ST-5C with CPU, P/S, cables
- Software: CCDOPS Version 4.0, SkyX Professional Edition User Guide

Photos are available here: https://tinyurl.com/h3e6hxcn . Please call me to arrange inspection / pickup / delivery.

For Sale contact Barry Acton 714-603-2182 cell

- Meade LX200R GPS & Tripod (with original box) $ 1800
- Meade AutoStar II Hand Controller, manual
- Eyepiece Meade Meade 26mm Plossl 5 Element 1 1/4", Super Wide Angle 32mm
- Meade SF #1200 10" Solar Filter $ 50

I am the original owner. I purchased these new quite a few years back and have used it for a total of about 15 hours. It is in extremely good condition as it has sat inside the house when not in use. Everything is in perfect condition, and I would like pass this on to someone that has the time to enjoy it.

For Sale contact Roger Mills 909-627-4122

- 8 inch pyrex mirror plank ground and polished to f/7 with polishing tool and materials $ 200 obo
- Fiberglass telescope tube 9.25 inch O.D., tube rings, equatorial mount, synchronous drive,
  counterweight, Book: "Making Your Own Telescope" by Allyn J. Thompson.
  The mirror has not yet been figured to parabolic shape

Another Look - Cassiopeia

November 2023
Dave Phelps


Cassiopeia by Helvius

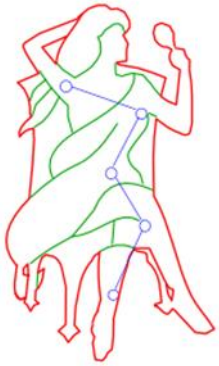
The new moon In November is on 11/13 at 0127 PST.
The full moon is on 11/27 at 0116 PST.

November is the Full Beaver Moon. Other Native American names include the Deer Rutting Moon, the Digging/Scratching Moon, the Freezing Moon and the Whitefish Moon. We also have the First Snow Moon, the Little Winter Moon and in Great Britain, the Moon before Yule.

In French its Pleine Lune de Novembre, in German its November Vollmond, in Spanish its Noviembre Luna Llena and in Greece its Νοέμβριος Πανσέληνος, Noémvrios Pansélinos

There are two lunar occultations this month. Neither of which is visible in the US. Venus will be occulted on 11/09 beginning at 0058 PST. Its totality extends from Greenland through Europe, so we should get a nice close approach. On 11/28 is a daytime eclipse of β Tauri beginning at 0840 PST. Totality is in the South Pacific and Chili.

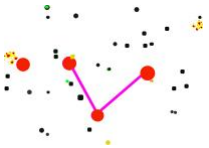
Cassiopeia
That starr'd Aethiop Queen that strove
To set her beauty's praise above
The Sea-nymph
Milton "Il Peneros"



Over the next months, a family of related constellations will arc across the night sky. There is Cassiopeia, the Queen, Cepheus, the King, Andromeda, the Princess, Perseus, the Hero, Pegasus, the Flying Steed and Cetus, the Sea Monster, all part of the same family of legends. Cassiopeia is the Queen of Aethiopia, a generalized term for inhabitants of that part of Africa above the great desert and along the Red Sea, the beginning of the end of the known world at that time. Beautiful and vain, she is typically shown seated on a throne, legs crossed, holding her long hair in her right hand and a sheaf of wheat in her left; although through time and artist, the images vary. She claimed she was more beautiful than the sea nymphs and even compared her beauty to the goddess Juno. Well, you can just imagine how they took that.

So, this guy Nereus has 50 daughters, all nymphs, and they came down on him all at once. Worse, one of those daughters, whose name was Amphitrite, was married to the sea-god Poseidon. Wonder what that wedding cost and he had another 49 to go? Poseidon agrees to wack this kingdom to appease his wife and sisters-in-law. He sends a sea monster, Cetus, to ravage the coast of Aethiopia and eat the populace. The legends then begin to blend. Cassiopeia and Cepheus, following the advice of an Oracle, chain their daughter, Andromeda, to a rock as an appetizer for Cetus to appease the gods and Nereides. Perseus, the hero, flies to save her, killing Cetus and winning Andromeda for his bride.

Centuries earlier, Greece saw the asterism as the "Laconian Key":



Not many are the stars nor thickly set
That, ranged in line, mark her whole figure out.
But like a key that forces back the bolts
Which kept the double door secured within
So shaped her stars you singly trace along. Aratos

The Eskimos imagine that α, β, and γ Cassiopeiae, three stars forming an isosceles triangle, represent the three stones supporting a celestial stone lamp. They call the constellation "Ibrosi". In other countries, the Arabians called Cassiopeia, "Al Dhat al Kursiyy", the Lady in the Chair, but earlier had one of her hands tattooed with henna. Other Arab designations includes two dogs or a deer made out the stars of Cassiopeia and Cepheus. To the Celts and the early Brits, she was the house of Don, the king of the fairies and to the Chinese, a Charioteer.

That one
White stain of light, that single glimmering yonder,
Is from Cassiopeia, and therein
Is Jupiter—

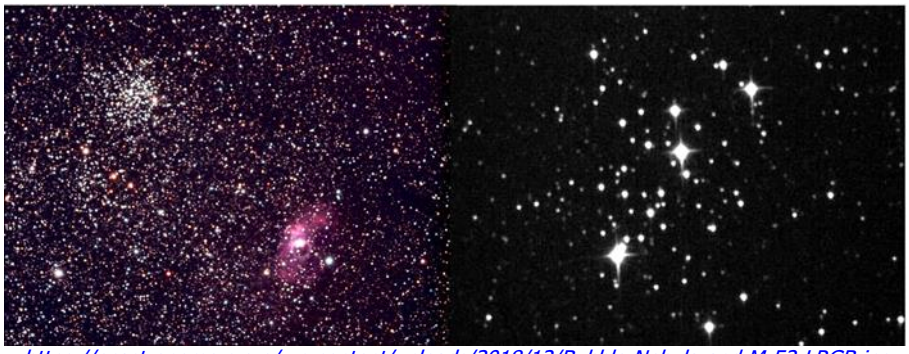
In Persia, she was drawn as a queen holding a staff with a crescent moon in her right hand, wearing a crown, accompanied by a kneeling dromedary. In India, she is a princess, and her story is also of a beautiful victim and a hero to rescue her. In ancient Egypt. The W asterism, which has through history depicted a chair, may have been seen as the throne of Osiris and, also, in the Egyptian "Book of the Dead", it was called the "Leg":

"Hail, leg of the northern sky in the large visible basin."

One school of thought claims the original story of a queen is from Phoenicia, holding a sheaf of wheat, from at least 3500 years ago; or the Assyrian Lady of the Corn, 4000 years ago, and still others have her sharing responsibly with Virgo for the seed, the grain and the harvest.

There is a lot of great stuff in Cassiopeia. Burnham lists 74 variable stars and 151 double and multiple stars. He also lists 26 open clusters, 6 diffuse nebula, 2 planetary nebula and 3 galaxies. Cassiopeia also has 199 stars 7th magnitude and brighter, 20 of which are brighter than 5th magnitude. She has over 200 binocular and deep sky objects and several of her planetaries are in the 14+ range.

Cassiopeia is an ideal constellation to get your feet wet in for observational astronomy. It is a great constellation to use to gain some experience with our 4.25 and 6 inch reflectors, 3 inch refractor's and 7×50 binoculars. With these optics, we can reach 11th or 12th magnitude.



https://ocastronomers.org/wp-content/uploads/2018/12/Bubble-Nebula-and-M-52-LRGB.jpg
https://ocastronomers.org/wp-content/uploads/2019/01/m103.jpg

The two Messier's in Cassiopeia are M52, the left-hand image and M103, the right-hand image. They are both open clusters, both bright at 6th and 7th magnitudes, though on opposite sides of the W. In the same field as M103 is NGC 7635, the Bubble Nebula. It is 10th magnitude, so it will be visible in your scope. If you have, or if you can borrow a "UHC" that is an Ultra High Contrast filter, the Bubble will be more visible. The Bubble and M103 are also great targets of your Equinox type telescope/camera.

Dr. Dimitrii Paniukov https://www.astrobin.com/nnv1vb/?q=ngc 663
William Maxwell https://www.astrobin.com/vm6jg7/?q=ngc 559

There are six Caldwell objects in Cassiopeia. Caldwell objects were compiled by a British gentleman named Patrick Moore who thought he would put together a list to place beside Messier; additional bright objects easy for the amateur to spot. In Cassiopeia, he listed 3 open clusters, 2 "dwarf spherical galaxies" and C11, which you have already met next to M103.

Caldwell 8 (NGC559) and 10 (NGC663) are fainter open clusters along the line between delta δ and epsilon ε, the flat arm of the W. Learn your Greek alphabet, it will make your life easier. C8 is the right-hand image, about 9th magnitude and C10 is the left image, magnitude 7. C13 is quite pretty, easy to find and bright at 6th magnitude.
https://ocastronomers.org/wp-content/uploads/2018/12/NGC457-m25-15x340s-011s.jpg

C13 (NGC457)

C17 and C18 are completely different animals. Known as NGC 147 and NGC 185, left to right in the image, they are dwarf galaxies, members of the Andromeda galaxy family, but should be objects you can find.

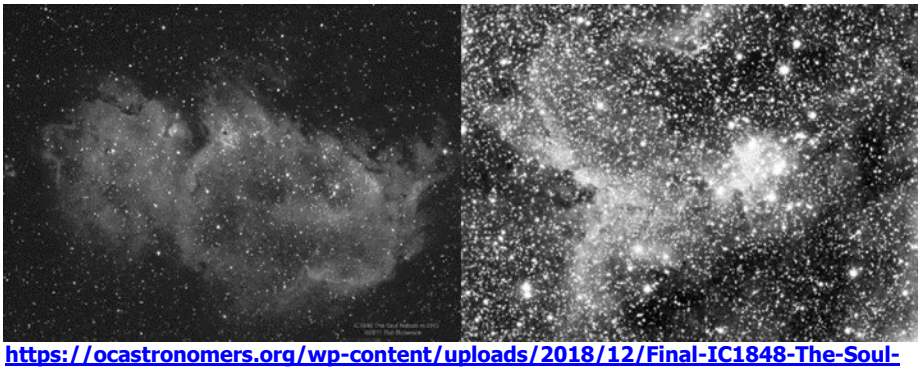
Dwarf galaxies are cool, usually close to us, usually a little weird and odd shaped and usually with low surface brightness. That means that a 9th magnitude galaxy is spread across your field of view. Looking out of the corner of your eye, we call that averted vision, will help the image pop into view. Additionally, these two galaxies are only 10 minutes of arc apart, you might be able to pick both out in the same field, like this great astrophotograph by Hannes Bachleitner .

While in that area, close to C17 and 18 is NGC 278, also a satellite galaxy of M31, the Andromeda galaxy. NGC 278 is 11th magnitude, maybe at the limit of your scope's ability, a full face on spiral with fluffy spiral arms. https://www.astrobin.com/52t9o0/E/?nc=all


https://www.astrobin.com/oc4oj7/?q=ngc 185

This month, Cassiopeia is between us and the north pole, meaning if you stand looking north, the Milky Way runs left to right, we see Cygnus and Lyra to the west and Cassiopeia is in her lopsided **M** shape. The bottom right-hand star as we see it is epsilon ε, whose name is Segin. Segin is a nice whitish 3rd magnitude star that I want you to use as a placeholder. A couple of telescope fields to the right (east) of Segin are two beautiful nebula/cluster objects called the Heart and Soul nebula. They are 6th magnitude, so you will find them with ease. If you still have that UHC filter, be sure to use it.

Check out APOD for February 14, 2023; IC's 1848 & 1805 are the featured image. Challenge yourself a little and try to pick out a few of the objects associated with these two nebulae. Clustered around the Heart Is Markanian 6, IC 1795, the Fish Head, IC 896 and IC 1027. Around the Soul are IC 1871 and Collinder's 33 & 34. Use your star chart as a guide. If you would like a good one, for free, you can download Deep Space Hunter Atlas at:


https://ocastronomers.org/wp-content/uploads/2018/12/Final-IC1848-The-Soul-Nebula-in-SHO-Narrowband-1200.jpg
https://ocastronomers.org/wp-content/uploads/2018/12/IC-1805-R_195m_G_143m_B_88m.jpg

https://www.deepskywatch.com/deep-sky-hunter-atlas.html**.** Good Hunting

There are many fine books out there for the novice and even the expert astronomer. Look for "Deep-Sky Wonders" by Walter Scott Houston. You can find a PDF version online. Scotty had a lot of recommendations for the middle of November, many of which are already listed. Study the chart and look for a stream of open clusters flowing away from β, named Caph, on the other side of the M. These OC's are 7790, 7788, Frolov 1, Berk 58, Harvard 21, King 12, and King 21. All together they are quite a sight.


https://www.astrobin.com/134259/?q=ngc 7789

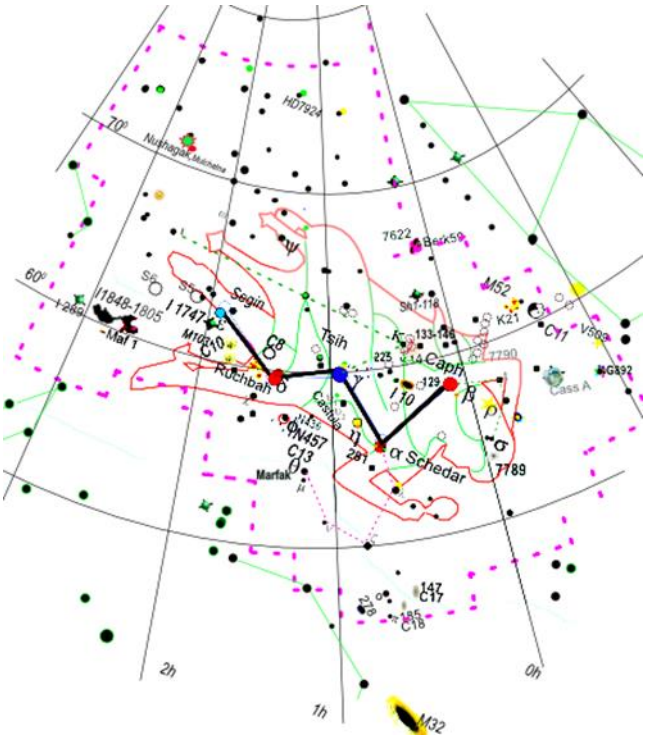
Then look for open clusters around β, γ, and κ. NGC's 129, 133, 225 and 146. Above the center of the M, near Caldwell 13 is a partner cluster, NGC 436. Caldwell 13's IAU name is NGC 437. The top star on the M is α and very close is another nice open cluster nick-named the "Pacman" from the resemblance of an overlying nebula. Over by ρ (rho) is "Caroline's Rose", NGC 7789. Named after the great Caroline Herschel, the Rose is a very rich open cluster, with lanes and spirals visually but resembling in astrophotos a loose globular.

Going across the top of the M from right to left, the names of the stars are Segin, Ruchbah, Gamma, sometimes called Navi, Schedar and Caph. Gamma γ is very interesting. It has 3 companions, only one of which can be seen, but D, the third of the companions has 3 companions of its own. In China, gamma's name is Tsih, the Whip. North within Cassiopeia is Nushagak. Nushagak is an Alaskan name for an 8th magnitude star with a very large planet named Muchatna. Nushagak is a river in Alaska and Mulchatna is one of its tributaries. A little further north in Cassiopeia is a star named HD 7924. It is kind of orangish and has three planets, all in the habitable zone. NASA has a lot of interesting things to say about HD 7924b, a huge extrasolar planet.

You will find it very satisfying if you decide to search for the supernova remnant Cassiopeia A. It is quite famous and should be visible in your 6 inch with really dark skies. Sky and Telescope magazine published one astronomer's search for Cass A. at ***https://skyandtelescope.org/observing/cas-a-supernova-remnant/***

Last month, on October 14, the National Park Service held the annual Night Sky star party at Sky's the Limit in Joshua Tree. 500 people were registered, and it seems like most of them peeked through my little 60mm refractor at Jupiter and the Pleiades. We had astronomers from Riverside, San Diego, Temecula, Los Angeles, Orange County, Tucson and one even flew in from Singapore. Visitors came from all over the US, and a fine time was had by all. I just want to say thank you and

Dark Skys Dave



Adam Mound

Help Wanted (Volunteering Opportunities)

- Communications Coordinator doing social media presence and announcements to members

- Coordinator for Adopt a Scope Program

We are in need of a new Coordinator for this program, which has been very successful in uniting people with donated telescopes under John Hoot's leadership. If you are interested in taking on that program, please send an email to our Secretary, Alan Smallbone, at alan@ocastronomers.org. If you have any questions about what's involved, please contact John Hoot at scopes@ssccorp.com. We look forward to hearing from you!

From the Editor

Due dates for submission of articles, pictures and advertisements

Issue	**Due date**
December	18 November
January 2024	**21 December** (early due date because of holidays)
February 2024	20 January
March 2024	17 February

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