



M51, the Whirlpool galaxy, consists of NGC5194 and NGC5195. This photograph by Bill Patterson was made at a location in Idlewild, CA using an RCOS 12.5 inch RC and STL11000 camera.

Upcoming Events - free and open to the public

Beginner's class	Friday, 2 June at 7:30 to 9:30 PM ONLINE This is session 4 of the class which covers the science behind the telescope - How our eyes perceive objects seen in a telescope and the physics involved in that perception.
Club Meeting	Friday, 12 May at 7:30 to 9:30 PM In person at Chapman University and ONLINE "What's Up?": John Garrett from TVA Main speaker: Dr. Farhad Yusef-Zadeh from the Northwestern University whose talk will be "The Mystery Behind the Origin of Radio Filaments in our Milky Way Galaxy"
Open Spiral Bar	Saturday, 13 May 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, 20 May 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

Not too many years ago, this time of year was marked in amateur astronomy circles in Southern California by growing excitement over planning for and attending our own regional star party, RTMC, which took place (mostly) on Memorial Day weekend. It started life as the Riverside Telescope Makers Conference and ultimately morphed into the RTMC Astronomy Expo. Regardless of the name, it was a wonderful opportunity to meet up with astronomers from all over Southern California and beyond. There were talks, chances to try out new equipment, chats with vendors, the swap meet and other bargain-hunting possibilities. For many of us the greatest pleasures were conversations and time spent with fellow attendees.

For a bit of nostalgia, RTMC still has a website (<http://rtmcastronomyexpo.org/>) with a photo archive attached (though the photos don't seem to have captions; see the "RTMC Archives" link at the top of the home page). The site still has the info, including the list of vendors and list of talks, from 2019, the last year RTMC was held (see the "News" link at the top of the home page).

I'm happy to report that the Nightfall Star Party & Imaging Conference, held in Borego Springs, an event related to RTMC, is still ongoing, and has the benefit of more amenities, darker skies and less dust than the original RTMC. It is held on the grounds of the Palm Canyon Hotel & RV Resort around new moon. A number of OCA members regularly attend this event, so you might want to check around for them if you decide to attend it yourself next fall; the next Nightfall is November 9 through 12, 2023. For more information on this event, the only remaining regularly scheduled multi-day regional star party in our area, check their website: <https://nightfallstarparty.com>.

We're still trying to determine what events have survived the Covid shut-down years. The Golden State Star Party, held near Mt. Shasta under what I'm told are superbly dark skies, is still a going concern and the next one is scheduled for Wednesday, June 14, through Saturday, June 17th. If you're interested, their website is <http://www.goldenstatestarparty.org>.

In the past, Explore the Stars was a monthly star party/public outreach and viewing event held at Observatory Campground below the Palomar Observatory. It was scheduled on Friday and Saturday nights nearest the new moon from April to October and had participation from various astronomy clubs in Southern California (including OCA). At this point, I don't know if that program will be restarting, though I hope so.

Critter Concerns

Our Anza site is in a rural area, which means that there is more wildlife around than in more urban locations. With all the rain this year, there's more food than usual for the rats, mice, rabbits and other small animals that inhabit our site, so we expect that there will be a lot more of them around than usual. Although we try, we can't really keep all the rats and mice that want a safe haven out of Anza House and the club observatory, and they may get into other buildings on site, too. To help discourage them, please keep any food you bring in sealed containers and be sure to take all leftovers and trash you generate with you when you leave. If you see droppings, please sweep them up and dispose of them.

One area of concern with rats and mice is that they love to chew on plastic-coated wires, including wiring in vehicles. Recommendations I've heard for reducing the chance this could happen to you are to not park near brush or high weeds that could provide cover to rodents and make it easier for them to get into your vehicle and try leaving the engine compartment open to make a vehicle less attractive to them. For other suggestions, you might want to talk to regulars out at Anza about anything else they do to deal with this problem.

More prey animals around probably means there will be more of the animals that hunt them, too. Though it's likely there are big cats in the area, I don't know of anyone who has seen them on our site. You're more likely to see coyotes, though they generally seem to avoid the site when there are a lot of people around. We can often hear them calling in the hills around us, but the only time I've seen one on our site was when I was the last person there on the morning after a star party, and the coyote looked as surprised by the encounter as I was. After staring at me a moment, it went off into the bushes and I didn't see it again. I'm told that the best approach if you have an encounter with any of these larger animals is not to turn your back on them, stay upright and make yourself seem as big as possible. Making a lot of noise can help scare them off, too.

Rattlesnakes are great rodent hunters, and we generally have several rattlesnake sightings on site each year. The experts say this is likely to be a boom year for them in Southern California, so we will probably see more of them on our site this year. I've been told that they usually hunt at night, and hole up during the day in spots that give them shelter, such as in brush or under things like pieces of wood that may be lying around on the ground. Once, several years ago, my husband and a friend were working on our warming room and discovered near the end of the day that there had been a good-sized rattlesnake under a piece of wood they both had walked close to several times during the day, as it was only a few feet from where they were working. Fortunately, the snake hadn't felt threatened enough to strike at them, but it did make us a lot more conscious of possible snake hiding places.

We haven't had any person bitten by a snake on our site, and we'd like to keep it that way; the only bite I know about was to a young dog who was nosing a snake it found in the brush near a regular pathway (the dog was treated and recovered). If you bring your dog with you to Anza, please keep it on a leash and don't let it go exploring in the brushy areas around the site to minimize the chance of bites.

For people, it's a good idea to stick to paths and roads where you can see the ground around you when you're moving around the site, and actively check for snakes (and other hazards) as you go. Making as much noise as you can while walking around, to warn them that you're coming and give them time to get away, is also helpful – it's not the time or place to be a stealth walker. At night, use your red light to check the area around you for snakes and other possible problems, so you can avoid them. Fortunately, we don't have really aggressive species of rattlesnakes in our area, and those on our site generally prefer to get away instead of attacking, but they'll understandably bite if they feel cornered or threatened.

If you do see a rattlesnake, please don't try to kill it unless you have the right tools and have experience dealing with snakes, as you could otherwise be putting yourself in more danger of being bitten. Also, if you see any baby rattlesnakes, treat them at least as warily as bigger snakes, as they can't regulate the amount of poison they dispense in a bite, so their bites are often worse than bites from mature snakes.

While all of this may make it seem that our environment at Anza is generally threatening, that's really not the case. Overall, we don't have many problems with local wildlife, but exercising a bit of care can reduce the risk without cutting into enjoyment of the site and our various activities there.

I hope you all have a safe and fun viewing season now that the weather is warming – and preferably free of critter problems!

© Barbara Toy, April 2023

Response to COVID-19 Crisis

Any use of the club's Anza site by members is at their own risk. Visitors should bring supplies to clean and sanitize surfaces they contact. When you leave, take any trash that you generate or find on site out with you. Please maintain social distancing if anyone else is out there.

Meeting in person:	Astrophysics SIG, Anza star parties, Beginner's class (July) and monthly club meeting
Meeting via Zoom:	Monthly club meeting , Beginner's Astronomy class (other than July this year)
Coming soon:	Orange County Star Parties
Cancelled until further notice:	AstroImaging SIG
Check with Coordinator:	Outreach events

Help Wanted (Volunteering Opportunities)

- OC Astronomers Club Representative to WAA (Western Amateur Astronomers)
- Communications Coordinator doing social media presence and announcements to members

AstroSpace Update

May 2023

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

Extra-Solar Comet Motion Explained – 'Oumuamua was the small body that sped through our Solar System in 2017, so fast that it had to have originated outside our planetary system. It experienced measurable acceleration other than gravity as it flew through; so many astronomers believed it was a comet, since comets frequently outgas when near the Sun, causing such non-gravitational acceleration. But continued observations failed to detect any of the gases or dust that comets commonly emit, and it produced no comet head or tail, like outgassing would produce. That led to all sorts of theories to explain the acceleration, including that it was an alien spacecraft. A new study that included results of lab experiments with extremely cold ice showed that cosmic rays striking water ice will produce hydrogen gas embedded in the ice, and that as the ice warms (but still at quite cold temperatures) it will release the hydrogen, but no water vapor or dust. Observations of 'Oumuamua were inadequate to have detected pure hydrogen outgassing. Mystery solved.

FRB and Merging Neutron Stars – For the first time, astronomers have found a link between an FRB (fast radio burst) and a gravitational wave detection from merging neutron stars. The FRB was detected 2 ½ hours after the gravitational waves, which is believed to be the time it would take for merged neutron stars to collapse into a black hole. Astronomers would like to have pinpointed the location of the gravitational waves to match the location of the FRB, to rule out a time coincidence, but one of the two LIGOs (gravitational wave detectors) was not operating, so location matching was not possible. However, the distances to both the gravitational wave source and the FRB could both be calculated, and they matched. Because of previous evidence linking FRBs to magnetars (neutron stars with extremely strong magnetic fields), it appears that there may be more than one process to emit FRBs. Both LIGOs and two other gravitational wave detectors will begin simultaneous operation this month, so scientists will be watching for more cases of merging neutron stars and checking them against FRB detections.

FRBs Probe M33 – Recent upgrades to the radiotelescope array at Westerbork, The Netherlands, has allowed it to find 5 new FRBs. Three of them traveled through the halo of the Triangulum Galaxy M33 on their way to Earth. When such bursts encounter electrons, the bursts are reshaped. So, astronomers were able to calculate the electron density the bursts traveled through, and therefore the density of material in M33's halo. Much of this material is not visible by any other method.

Most Powerful GRB – A gamma-ray burst (GRB) observed in October 2022 was at first thought to have been emitted by an object in our Milky Way galaxy. However further data showed that it had been traveling around 2 billion years to reach us, and so originated in a distant galaxy behind the Milky Way object. Because the source was so far away, it had to be intrinsically far brighter than a more local object with the observed apparent brightness. This made that GRB the most powerful one ever observed. The afterglow of the event in various wavelengths of light is still visible. Every time the burst penetrated one of the dust clouds that surround our Milky Way, the X-rays in the burst scattered, forming an expanding ring. The amount of expansion shows how long ago the burst hit each dust cloud, and therefore pinpoints its distance. The properties of these rings best match collisions with graphite, a form of carbon, so that is likely what the dust clouds are made of. It is believed that the GRB was produced by a supernova explosion. Observations of the GRB source with the Webb and Hubble space telescopes failed to find an object there, such as a stellar remnant or expanding supernova remnant. The best explanation is that the supernova collapsed to a black hole.

Extremely Massive Black Hole – Astronomers have used a new technique for the first time to find the mass of a supermassive black hole. They measured the gravitational bending (lensing) of light from a background object as the light passed the black hole. The result was over 30 billion times the Sun's mass, one of the largest black holes known. The black hole is hundreds of millions of light-years away. This technique can be used to measure black holes that are not currently feeding on material falling in, and thus are dark, while other techniques cannot.

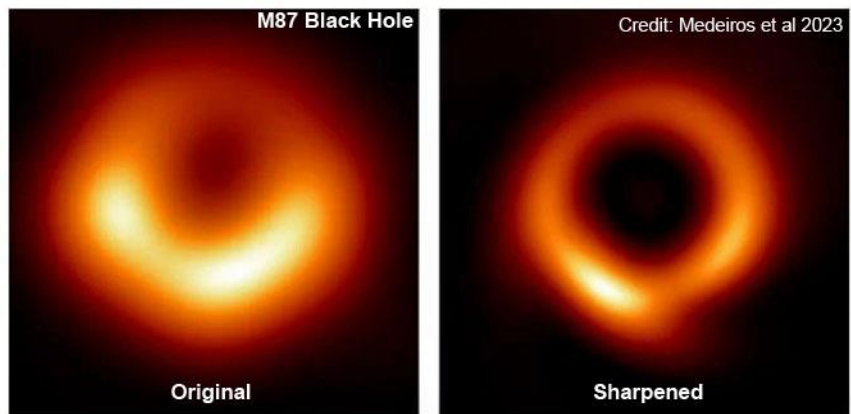
Dark Matter Map – Researchers analyzing data from the Atacama Cosmology Telescope (ACT), which began observing the cosmic microwave background (CMB) in 2007, have produced a map of all matter, including dark matter, over a quarter of the entire sky. This was done by measuring the gravitational lensing, or bending of light by mass, that modified the light from the CMB. The pattern of dark matter matched computer simulations of how matter should clump under the influence of General Relativity. The ACT ended observations in 2022 in order to replace it with an upgraded telescope scheduled to begin observations in 2024.

Double Quasar – The Hubble telescope has found a pair of quasars gravitationally bound. Quasars are supermassive black holes that are voraciously feeding on material about them, making them some of the brightest objects in the Universe. The new find is so distant that its light took about 10 billion years to reach us. Thus, we are seeing them as they were early in the history of the Universe. The pair formed when the galaxies in which they were embedded collided. The finding is fairly rare, since this sort of object requires a collision of galaxies and requires both central black holes to be actively feeding. The new find has also been observed in radio and X-rays. Hubble was observing objects seen by the Gaia spacecraft as jiggling, which is apparently caused by quasars flickering in response to uneven feeding. The Keck Telescope in Hawaii was used to rule out gravitational lensing, which could cause a single quasar to appear as two. In the 10 billion years since the light left there, the double quasar has probably merged into a single supermassive black hole, and their containing galaxies have likely merged into a large elliptical galaxy.

Flattest Explosion – A Fast Blue Optical Transient (FBOT) is a rare type of star explosion. Only five of them have ever been observed. The latest one was spotted in a galaxy 180 million light-years away. Measurements of the polarization of its light indicated that the explosion was in the form of a flat disk, flatter than any known star explosion. Explosions should expand spherically unless something deflects part of the explosion. Theorists are trying to work out what could cause this shape.

3D Galaxy Shape – It has been almost impossible to measure the depth dimensions of elliptical galaxies (as well as most celestial objects). A new technique has accomplished this on the nearby giant elliptical M87. It was found not to match either easily measured dimension (east-west and north-south). So, its shape is not like that of a football (smaller dimensions equal) or a deflated basketball (larger dimensions equal), but more like a partly deflated football. Technically this shape is known as triaxial. The new technique used the Hubble and Keck Telescopes to track the speeds and positions of stars in many places within the galaxy and then a computer simulation was made of the galaxy shape and orbital motions of its stars that best matched the observations. This also allowed the mass of the supermassive central black hole to be measured more precisely than previous methods. The new mass number is 5.4 billion times the Sun's mass.

Black Hole Image Sharpened – In 2019 the first image of a black hole was released, having been constructed from simultaneous observations by a group of radiotelescopes spread across the face of the Earth to increase resolution. That black hole is the supermassive one central to galaxy M87. Since then, a team of scientists has been applying techniques to increase the resolution and sharpen that image. The result shows the bright ring about the black hole sharper and narrower. The ring is caused by material falling into the black hole and that material glowing from frictional heat. The black center of the image is technically the shadow of the black hole.



The black center of the image is technically the shadow of the black hole.

Objects Too Bright– Long ago Arthur Eddington calculated the brightest an astronomical body could shine without the light pressure pushing the body apart, and this became known as the Eddington Limit. There exist a few types of objects that exceed the Eddington Limit in brightness, including the class known as ultra-luminous X-ray sources (ULXs). It was at first thought that ULXs must be black holes, but in 2014 a ULX known as M82 X-2 was proved to be a neutron star. The brilliant ULX X-rays almost certainly have to be generated by material falling into the neutron star, so what keeps the brightness from pushing away the infalling material? There are several theories to try to explain. One theory is that ULXs emit their X-rays in a concentrated beam, so that the total brightness in all directions is actually far less than that calculated from measurements of only the beam brightness. New observations of M82 X-2 do not support this, but instead show that strong magnetic fields are likely responsible. Apparently magnetic forces overcome the light pressure and allow material to fall in, creating the excessive X-ray light.

Exoplanet Observed – The James Webb Space Telescope (JWST) has observed in infrared the innermost of the 7 rocky exoplanets orbiting the star TRAPPIST-1, a red dwarf about 40 light-years away. The temperature in daylight was found to be about 450° F. This is the smallest exoplanet from which astronomers have detected any form of light. No atmosphere was detected spectroscopically, and the observations best fit computer simulations of the planet with no atmosphere. Having no atmosphere would support the theory that red dwarf stars can blow away atmospheres of closely orbiting planets due to the stars' strong emission of X-rays and flares. The planet is locked tidally to its star, so that one side of the planet always faces its sun.

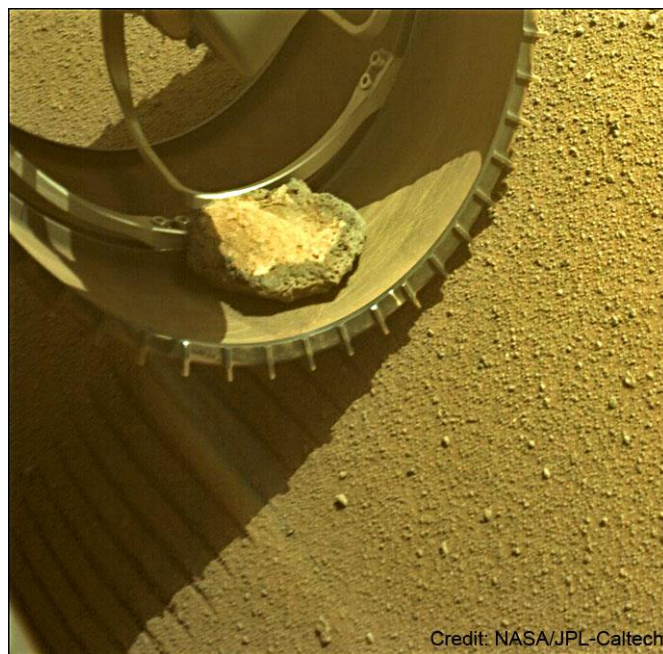
Europa's Outer Shell Rotation – It has long been known that Jupiter's moon Europa has an icy shell covering a liquid ocean, and long suspected that the icy shell rotates at a slightly different speed than the moon's core, but the reason for this difference has remained unclear. A new computer simulation of an ice-covered ocean shows that the water will naturally circulate north-south but will veer off east or west due to conservation of momentum. The east or west movement is sufficient to cause the icy shell to rotate at a different speed than the core.

Saturn Atmospheric Heating – Hubble and archived spacecraft observations were used to show that Saturn's upper atmosphere is being heated by infalling particles from the rings. It has long been established that ring particles are spiraling into the planet, very slowly depleting the rings. The heating was detected in ultraviolet light, consistently over years, ruling out other sources of heating that should have varied.

Uranus – JWST observed Uranus and the image shows the planet's family of rings, a polar cap and objects that are apparently storm clouds. The polar cap appears when the pole is seasonally in sunlight and disappears in autumn. Many of the 27 known moons appeared in the image and 11 of the 13 known rings showed up.

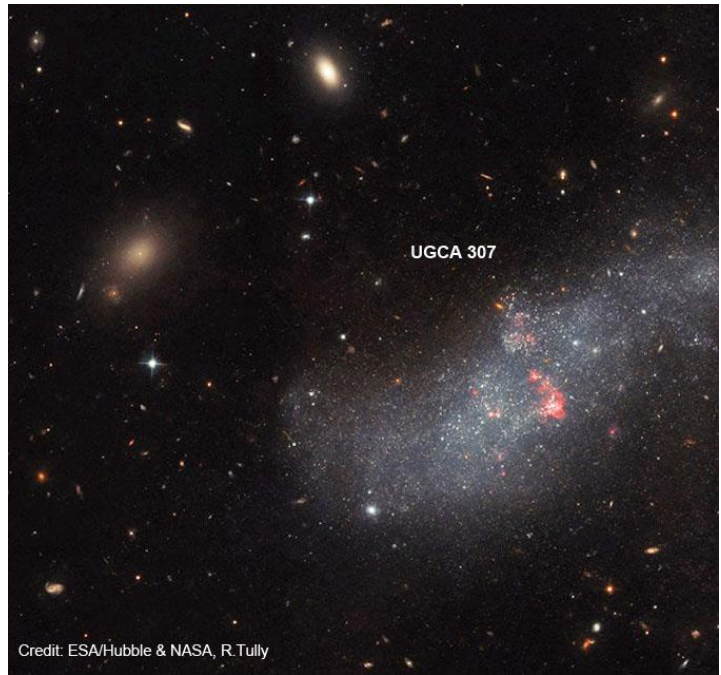
50 Mars Flights – The Mars helicopter Ingenuity has completed 50 flights since its landing on the Red Planet 2 years ago. This far exceeds the original plan for just 5 flights that were needed to prove the Mars helicopter concept. It has continued to scout the path ahead for the rover Perseverance, a feat not originally planned. On the 50th flight Ingenuity set a record of 59 feet for the highest it has ever flown. Its record for longest flight is 2310 feet horizontally, and for maximum speed is 22 mph, each set on flights months ago.

Pet Rock on Mars – In February 2022, images taken by a camera on the Mars rover Perseverance showed that a rock was sitting inside one of the rover's 6 wheels (left front). Images taken periodically showed that the rock remained there even though the rover rotated the wheel through several miles of driving. The rock didn't seem to be causing any damage, so no efforts were made to remove it. Someone suggested that Perseverance put its favorite rock in its wheel because it doesn't have a pocket. Some started calling it Perseverance's Pet Rock. About 438 days after the rock appeared, it went missing from the wheel. Maybe the rover will find an even better rock.



JUICE – The European Space Agency launched its JUICE spacecraft with an Ariane 5 rocket from French Guiana. After 4 gravity slingshot maneuvers with Earth and Venus, it will head for Jupiter where it will study Europa, Ganymede and Callisto, the large icy moons of the giant planet. The first slingshot will actually be the first ever double slingshot, using gravity of both the Earth and Moon to gain speed. JUICE will reach Jupiter in 2031. After about 3 dozen flybys of the 3 Jovian moons, JUICE will go into orbit about Ganymede, the first ever orbiting of any moon other than Earth's Moon. JUICE has huge and extremely efficient solar panels to power it in the dim sunlight levels found at Jupiter's distance. To protect from the strong radiation near Jupiter, most of the spacecraft's instruments are housed in a lead box. When maneuvering fuel runs out in several years, JUICE will crash into Ganymede. By the time JUICE reaches Jupiter, NASA's Europa Clipper spacecraft will already have arrived to study Europa. Because it uses only two gravity slingshots, it will take less time to reach Jupiter.

Tiny Galaxy Observed – The Hubble Space Telescope is carrying out an observing program of every known nearby galaxy, appropriately called The Every Known Nearby Galaxy Survey. Its latest target is the tiny obscure galaxy known as UGCA 307. It appears diffuse except for several bubbles of hot gas containing forming stars. It is located in Corvus at a distance of 26 million light-years and likely orbits the much larger Sombrero Galaxy.



Artemis II Crew – NASA has named the 4-person crew that will ride the 10-day Artemis II mission around the Moon. The mission will use the NASA SLS rocket, as did the recent uncrewed Artemis I test flight. People have not flown around the Moon since the Apollo 17 lunar landing in 1972. The newly announced crew is Christina Koch, Reid Wiseman, Victor Glover and Jeremy Hansen. This crew displays diversity by including a woman, an African American, and a Canadian. Three of them have spent more than 5 months each in space, and all are extremely qualified. In a recent interview Canadian Hansen was asked what it meant to him to be included in the crew. He answered that if anything goes wrong, NASA can blame Canada. I think he was kidding.

Thirty Meter Telescope – Construction of the Thirty Meter Telescope (TMT) atop Mauna Kea was halted a few years ago by Hawaiian protesters. Now a new board, known as MKSOA, has been formed that will in 2028 take over stewardship of the mountain top, including all observatories there. The mountain top has been overseen by the University of Hawaii. It is hoped that the wide representation on the new board will come to agreement on how TMT can be built. It will likely involve removing some existing telescopes on the mountain and may restrict tourism and recreation use.

Starship Test – The most powerful rocket ever, SpaceX's Starship with Super Heavy booster, took off on its first test flight. It has about twice the liftoff thrust of either the Saturn V or the SLS rockets. Unfortunately, the stage separation failed about 3 minutes into the flight, which caused it to tumble, and that apparently set off the self-destruct safety mechanism. So about 4 minutes into the flight it turned into a giant fireball. The flight was planned to make most of one orbit, landing in the Pacific near Hawaii. SpaceX spokespersons said that they considered the test a success insofar as it flew and provided data to correct the problems for the next test. Both stages of the rocket are designed to be recoverable and reusable, though the plan for this flight was not to test the recovery of either stage. NASA has contracted with SpaceX for a modified version of this rocket to be the landing craft for astronauts to set down on (and later leave) the Moon as part of the Artemis program. So, there is pressure to get the bugs out soon.



OWENS VALLEY RADIO OBSERVATORY TRIP

SCIENCE BEYOND THE BOOK

June 23-25, 2023

With Dr. Mark Hodges, Dr. Doug Millar, Cecilia Caballero, MA

Please join with us on the above dates for an extraordinary adventure in science education at the Owens Valley Radio Observatory outside of Big Pine, CA. Included are science activities at the 40m antenna and a tour, walking a scale model of the distances of the planets, solar astronomy, and nighttime astronomy. We will also make ice cream with liquid nitrogen.

This year we are emphasizing the DSA projects that are being built at OVRO. See the OVRO website for more info: <http://www.ovro.caltech.edu>.



Our main dish to explore is the middle one at 40m in diameter



Experimenting with liquid nitrogen. Dr. Mark Hodges from OVRO and Dr. Millar



Astronomers setting up



Ex CARMA Array dishes at the site

If you want to come on Friday, we will have an evening of astronomy to the south of Building #10 at the west end of the observatory. You can bring your own telescope and there will be a number of telescopes set up to share their views. 120V AC is available. We will also do astronomy on Saturday night. The main program will be on Saturday afternoon, starting in the dining area in Building #10. We will go to the Pizza Factory in Bishop for dinner.

All the above is free and courtesy of Dr. Mark Hodges, OVRO, and Caltech. This trip is open to teachers, students with their families, members of local astronomy clubs, and radio hams. You must RSVP to go on the trip to Dr. Millar so that we know how many to expect (contact information below). Please also forward your cell phone number.

This is not a school or OCA sponsored event. Everyone is on their own for transportation and lodging. You have many options. You can stay at a motel nearby, camp in a campground, bring a tent or trailer and stay at the OVRO site. If you decide to camp at OVRO, you must provide your own bathroom, as the buildings will be locked. There are places to eat in Big Pine and Bishop.

The weather will be warm and dry. Evenings will be a little cooler, so dress accordingly for the nighttime astronomy.

Please try to arrive at OVRO by 1:00 PM on Saturday for the program.

Schedule:

- Friday Setup outside the main office building for astronomy by sunset. 120v AC, bathroom, coffee and water will be available.

- Saturday 1pm Arrive at kitchen for start of program and tour.
 5pm Check in at your Motel (if needed) and go to dinner in Bishop.
 Evening Astronomy at the site

- Sunday A lot of us like to gather for breakfast about 9:30 at one of the local restaurants. More information will be available on Saturday. Leave whenever you like.

For any questions and RSVP's my contact information is

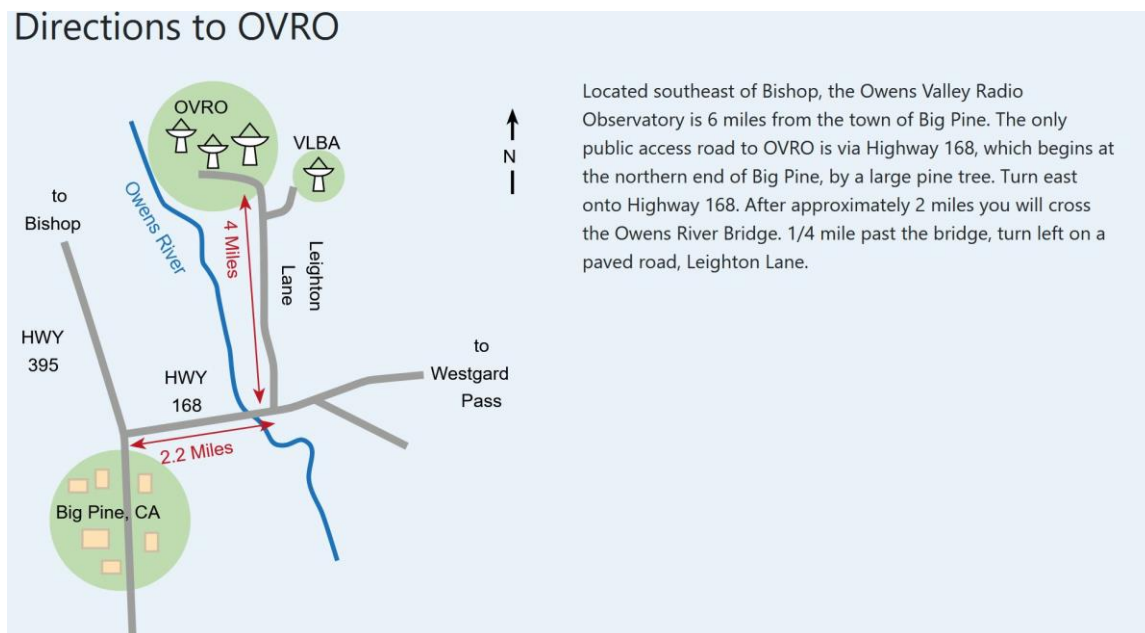
Dr. Doug Millar Cell- 562-810-3989 and email is drzarkof56@yahoo.com

Directions:

The directions from the LA area are: Drive north on the 5 and 14 through Palmdale and Mojave. Continue past Inyokern and join 395. Continue north through Little Lake, Lone Pine and Independence. Continue through Big Pine. Just as you get to the end of town turn right on Highway 168 towards Westgard Pass. Go about 2 miles and turn left onto Leighton Lane, the observatory road. You should be able to see the 40m dish in the distance, but it is 4 miles away! Continue through the gate onto the property and follow the blacktop road. Go past two 90-foot telescopes to the west end of the site and park. Below is a more detailed map. The observatory address is: 100 Leighton Lane, Big Pine, CA.

Local Directions to the observatory:

n.b. The large pine tree no longer exists.



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	
<ul style="list-style-type: none"> • Orion StarShoot AutoGuider further reduced price • Tele Vue 8mm plossl 1.25" eyepiece \$ 200 				\$ 80

For Sale	contact	Rick Hull	hull3hull3@yahoo.com	949-636-2920 cell
<ul style="list-style-type: none"> • QSI 6120C OSC CCD camera with Mechanical Shutter 				\$ 1625 +sh
<p>This unit was built before the ATIK acquisition, so you know it was built to QSI quality standards. Camera body is the "-s" version with mechanical shutter. The front end can be replaced to have an integrated OAG and/or filter wheel. Unlike more economical cameras using only desiccant, QSI 6xx series have a sealed chamber, purged and filled with a noble gas.</p> <p>Built around the Sony ICX834 with EXview HAD CCD II technology, this 12M sensor is perhaps the best CCD by Sony before ending CCD production - high in sensitivity, low in noise. Pixels are 3.1um for high resolution and image array is 8.8x13.2mm in size. The 3.1um pixels are nearly ideal for those using focal lengths of 600 - 1200mm desiring to achieve maximum resolution, as seeing permits. I believe the Bayer mask is superior to most found on CMOS sensors which are designed for consumer cameras, providing less overlap of the color channel band-passes.</p> <p>I can provide a few images taken at 770mm focal length out at Anza. Contact me by email.</p> <p>New, this camera is now \$4200, and the ATIK 4120C which is a basic lower-end cousin, is \$3K. On CN I am asking <u>\$1750</u>, any OCA member may purchase it for \$1625 plus shipping. Please feel free to contact me with any questions.</p>				

For Sale	contact	Michael Newman	mnewman2112@gmail.com	
<ul style="list-style-type: none"> • Pad lease for LP-12 in Lower Pads section and the pier upon it 				\$ 1000
<p>It includes a pier that is very nicely aligned and can support a C-8 up to a C-14 I believe although the new owner may need to drill new holes. For questions and to express your interest in the pad, please contact me via email.</p>				

For Sale	contact	Bill Prats	b.bill.p@gmail.com	
<ul style="list-style-type: none"> • QHYCCD PoleMaster Camera Adapter for Losmandy GM811xx Mount, IEQ30/IEQ45 # 020038 \$ 30 3 Pieces, Bright red finish, no scratches • Spotter Scope: Orion 6X30mm Correct Image Right Angle \$ 30 obo • ZWO OAG, Off Access Guider, new never used, full kit \$ 100 • 12VDC to 17VDC 3 amp Voltage booster with digital voltmeter used on a Losmandy G811GM \$ 50 • Losmandy Servo motor/Gemini 2 cables (pair) recent & hardly used Make offer • Losmandy Gemini 2 Hand Controller, recent & hardly used Make offer 				
<p>Contact Bill Prats b.bill.p@gmail.com Shipping is extra. All items can be picked up in Huntington Beach.</p>				

For Sale	contact	Sam Pitts	sam@samsastro.com	951-676-1345
<ul style="list-style-type: none"> • Sky-Watcher Star Adventurer 2i Pro Pack S20512 \$ 300 With 2 Vello Canon Camera connectors for Rebel series and D series cameras. These items have never been used (Like new in Box). I have not taken them out of the box. Retail prices \$ 520 - \$ 450 • 2 Losmandy DC-14 Dovetail Plate kits for Celestron C14 \$ 85 each Like new, used to mount C14 one time, bolts to existing holes. Wt. 3.75 lbs. Length 24" HS 23.00, height. top of tube to top of dovetail plate 1.20" Thickness 0.7" Retail \$ 140.00 ea. 				
<p>I can meet at Anza to deliver purchased items.</p>				

For Sale	contact	Eric Mjolsness	emj@uci.edu	
<ul style="list-style-type: none"> • Mars Hill Pad # MH-05 OCA license is up for sale. Includes solid equatorial pier. \$ 2300 obo Price in 2010 was \$2300. I am seeking that amount back or best offer. 				

For Sale	contact	Val Akins	akins7821@gmail.com	949-301-5956	
<ul style="list-style-type: none"> Telescope: Orion's Sirius 8" Go-To Reflector, Focal Length: F6, 1200 mm, Case: for 8 x 6 OTA 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 					\$ 1200
<ul style="list-style-type: none"> Telescope: Meade Lx200 8" SCT Cassegrain F10. The scope is like new. Tripod: Heavy duty Mount: Fork tine slow motion knobs, both axis Lenses: 1 1/4" 26mm super plossl; 16 mm - super plossl, Meade series 2 X apochromatic barlow Viewfinder: 8 x 50 mm Note: Hand controller missing, but available on internet as a classic scope. 					\$ 650

Carpooling OC to Anza	contact	Gene Kent	kenthouse@cox.net	714-604-8396
<p>I'm Gene Kent, a long time OCA member. I live in Tustin, CA. I'm looking to find someone to share the drive to and from Anza. I have a Chevy Trail Blazer. It will hold all the astronomy stuff for 2 people. I usually set up on the ball field below Anza House. If you have a pad or an observatory, I can drop you and your gear off there.</p>				

From the Editor

Sirius wants photograph submissions from club members

Sirius is getting short on pictures. We want more! Please send pictures to me along with a brief description of the subject, where the image was taken, and the equipment used.

Is our font too small ?

We've been using 9 point font recently to squeeze more content into the newsletter. Is it getting too small to read ? I need some feedback on this.

Is our content mix OK ? Boring ? Any comments about it ?

Send your opinion via email to newsletter@ocastronomers.org .

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
June	20 May
July	24 June
August	22 July

Another Look

Dave's column will return next month. His May article was very nice, trust me on this, but we ran out of room and couldn't run it. - The editor

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