



The Helix nebula (NGC7293) from Chuck Edmonds. This was shot in 2019 from a site near Portal Arizona using an 8" Newtonian and ASI1600 camera.

Because of the COVID-19 crisis and ongoing efforts to reduce exposure to the virus:

. Most but not all in-person club events are cancelled

Please read more about how OC Astronomers has modified its activities on page 2.

Upcoming Events - free and open to the public

Beginner's class	Friday, 3 June at 7:30 to 9:30 PM This is session 4 of the class. It covers visual perception and the science underlying it. Class materials can be downloaded from OCA website.	ONLINE
Club Meeting	Friday, 13 May at 7:30 to 9:30 PM "What's Up?": Chris Butler from OCA Main speaker: Dr. Steve Desch from Arizona State University whose talk will be "Oumuamua: The Nearest Exoplanet ?"	ONLINE
Open Spiral Bar	Saturday, 14 May at 10:00 to 11:30 PM Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.	ONLINE

Please consult the calendar on the OCA website to RSVP (required)

President's Message

By Barbara Toy

Now that things have been opening up more, I find that I'm doing more driving, going more places and, along the way, listening more to the radio. The other day, one of my favorites came on – "Fishin' in the Dark", by the Nitty Gritty Dirt Band. It's really as much an astronomy song as a fishing song if you go by the references, though neither is what the song is really about. Along with references to the moon and moonlight, it has these immortal lines in the chorus:

"You and me go fishin' in the dark
Lyn' on our backs and countin' the stars..."

Whether or not fishing comes into it, there's a lot to be said for lying on your back when you're looking up at the sky, particularly right overhead, enjoying the view naked-eye or with binoculars, even more so if there's a good meteor shower going on. In most of our viewing locations (and with advancing age), it's good to have something between your back and the ground if you're indulging in this – a portable chaise lounge does nicely for those who like a touch of luxury or at least a good bit of separation from the cold, hard ground, but a sleeping pad and pillow can shield you from the rocks and hold your head in comfort, too, and may be easier to pack.

The first time I realized the benefits of this approach was during a spectacular Leonid shower in the early 2000s, I think it was the 2001 shower. It had the good taste to peak on a Saturday night when a lot of folks could make it out to Anza – and did. Those who had the foresight to bring chairs and other devices that they could comfortably lean back in with support for their heads definitely had an advantage over the rest of us – it gets tiring to the neck for your head to be constantly tilted back as you ooh and ah over those bright flashes, streaks and fireballs.

I don't know what's forecast for the Leonids this year, but we've got a lot of 2022 to get through before they'll come into view in November. That includes the Perseids in August: a shower that's often on the showy side and is a summer favorite. The Lyrids in April will be passed by the time you see this but you may be able to see some of the Eta Aquariids (peaking May 4 through 6 and stretching beyond that), and the Delta Aquariids in late July to mid-August, overlapping the Perseids, which are expected to peak August 13. Following these are the Draconids in October (peaking October 8 for us), the Orionids (peaking October 21), the South and North Taurids (in late October and early November), and finally the Leonids (peaking around November 17). There should be some fun viewing in those showers...and hopefully more of us will be able to indulge in viewing them and other celestial delights this year than we have for the last two years.

Even though things seem to be improving overall, virus-wise, it's best not to let our guards down too much or too fast. Please keep aware of current conditions and safety recommendations and take appropriate precautions to keep safe and to help keep things moving in the right direction.

Club Updates:

It's nice to see familiar names among those attending our monthly general meetings, though there isn't an easy way to have the kind of visiting we'd have in our in-person meetings. For those who haven't tried coming to our Zoom meetings, you've been missing out on a lot of great talks, as I've mentioned before. Dr. Ethan Siegel's talk in April on changing theories on the Big Bang and the implications was another fascinating presentation by someone it would be difficult to get in person, and the May speaker, Dr. Steve Desch on 'Oumuamua promises to be another. Dr. Desch is from Arizona State University, not as distant as some of our speakers have been over the last two years, but far enough to make a personal appearance unlikely.

Our first Zoom meeting was April, 2020, so the April 2022 meeting was the 25th we've done in that format. Reza, in particular, had to do a lot of hard work to pull that first Zoom meeting together. In retrospect it's amazing they've generally gone as smoothly as they have. That's really a testament to what Reza and others do behind the scenes to avoid potential problems – the Zoom meetings in many ways are Reza's show, not just because he is the Zoom host and finds and makes all the arrangements with the speakers, but because of all of the other technical aspects he takes care of. That includes a session before we go "live" to check on everyone who has any speaking (or, in Kim's case, harp playing) role so we can be sure the sound and video are working for everyone. That care has really paid off, as we've had very few glitches during the meetings themselves.

One of these days we hope that we will again have access to our meeting location at Chapman University, but in the meantime please check out the Zoom meetings for interesting talks as well as a chance to have contact with at least some fellow club members. Many of our speakers have allowed us to post recordings of their talks, so you can look for links to those on the website as well.

Our first formal post-Covid shut-down star party will be at Anza on the Saturday of Memorial Day weekend, May 28, 2022. For those who haven't been to Anza Star Parties in the past, they are not generally as centralized as the Orange County Star Parties, as the site is bigger, and people set up at different levels. If you're new to the site and want to connect with someone to get oriented, it's usually easiest to find people in or around Anza House, as that's where the kitchen and most of the restrooms for the site are located (there's also one in the club observatory building). If all goes well, we should have the Kuhn telescope in operation for general viewing that night as well.

The Beginners Class is remaining online for now. The Astrophysics SIG has been meeting successfully in person at the Heritage Museum. The AstroImage SIG is still holding off on restarting its meetings though lively discussions continue on the AstroImage email group. And our Outreach program is continuing its careful scheduling of outreach events to balance the significant demand against risk to volunteers and those attending and the availability of volunteers. If you're interested in sharing interesting objects in the night sky with students and other members of the public, please consider volunteering some time for that program.

We've all been through difficult times these last two years and more. Hopefully any future surges in the virus will be much less severe than those we've gone through already. I hope you and your loved ones all stay safe, and that I'll be seeing some of you in person out at Anza and ultimately back at Chapman. But, in the meantime, isn't it great that we have the technology to continue with our most significant activities in spite of all of the challenges Covid-19 has given us?

Best wishes to you all!

© Barbara Toy, April 2022

Response to COVID-19 Crisis

COVID-19 continues to affect all our activities. Some in-person club events remain cancelled while others are beginning to occur or are in the process of being scheduled. Cancellation periods for specific events are detailed below. Please see the President's Message for additional information.

Any use of the club's Anza site by members is at their own risk as we have no way of cleaning or sanitizing the site to CDC standards. If you must go to the site, be sure to clean and sanitize surfaces you have contact with and make sure it is cleaner when you leave than it was when you arrived. You must bring cleaning supplies and sanitizer with you as it is not provided at the site. Be sure to take any trash that you generate or find on the site out with you and please maintain social distancing if anyone else is out there.

If you have any questions, feel free to contact board members or post them to the email groups or through social media. We will do our best to respond, but please bear with us if there is a delay as we all have other responsibilities as well.

We hope you and your families and friends all remain safe and healthy, and best wishes to all of you!

Summary of Cancellations of OCA In-Person Events

Due to the ongoing COVID-19 crisis, all in-person club events are cancelled through at least the following periods:

General Meetings	Cancelled until further notice; please try our virtual meetings instead.
Orange County Star Party	Cancelled until allowed by Orange County Parks.
Outreaches	Please check with our Outreach coordinator Cecilia Caballero
Beginners Astronomy Class	Held only as Zoom meetings. Please contact Dave Pearson to attend.
SIG Meetings	Astrophysics SIG has resumed meeting in person. AstroImaging remains cancelled indefinitely, depending in part on availability of facilities and when meetings could go forward safely.

Please check the website, email groups and social media for updates.

AstroSpace Update

May 2022

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

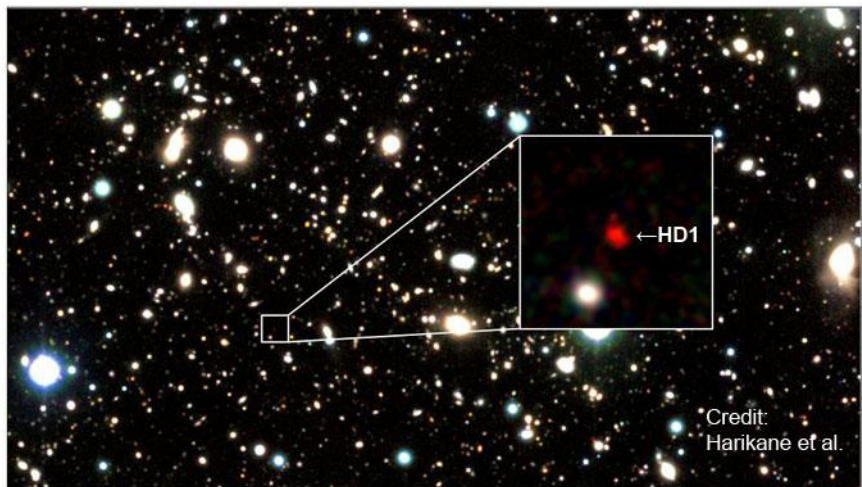
Milky Way Star Formation History – The sub giant phase of a star’s life occurs when it has stopped nuclear fusion in its core and is on the way to becoming a red giant star. A sub giant star’s age can be calculated fairly precisely from measurable properties, such as the elemental composition. A new study used data from the Gaia spacecraft and the LAMOST telescope in China to find and calculate the ages of about ¼ million sub giant stars in our Milky Way galaxy. Thus the study determined when star formation occurred in various parts of the Milky Way. The thick disk of the galaxy began forming stars a mere 0.8 billion years after the Big Bang and continued for 6 billion years until the gas to form stars was depleted. The inner halo of the galaxy saw much of its star formation 2 billion years after the beginning of the thick disk, apparently when the Milky Way collided with and absorbed a small galaxy. The Milky Way thin disk, the vertically center part of the thick disk, began forming stars later than the thick disk.

The distribution of elements heavier than helium, which are created within stars, was found to be generally uniform throughout the thick disk while showing correlation between heavy element content in individual stars with age of the Milky Way at the time those stars formed. This implies that gas was well mixed throughout the disk during the period of star formation, apparently by turbulence in the disk.

Milky Way Ring – Scientists have found an inner ring of heavy-element-rich stars just outside the central bar of our Milky Way galaxy. The ring stars formed about 7 billion years ago and are younger than the stars in the bar. The find was based on data from APOGEE, a large-scale spectroscopic survey of stars made in infrared. A computer model of the inner Milky Way with APOGEE and other data integrated showed patterns of orbits of stars indicating the central bar and the newly found ring.

Megamaser – Scientists using the MeerKAT radiotelescope array in South Africa discovered a megamaser, which is a powerful natural laser operating in radio frequencies. It is the most distant megamaser known, at roughly 5 billion light-years distant. The discoverers held a contest to nickname the object, and the winner was “Nkalakatha”, meaning “big boss”. Megamasers occur when galaxies collide, causing extremely dense pockets of gas. Dense pockets of hydroxyl gas have the property of amplifying a certain microwave radio frequency, and so can produce masers. The discoverers were actually looking for radio emission by hydrogen, but also picked up the hydroxyl frequency, which is not far different.

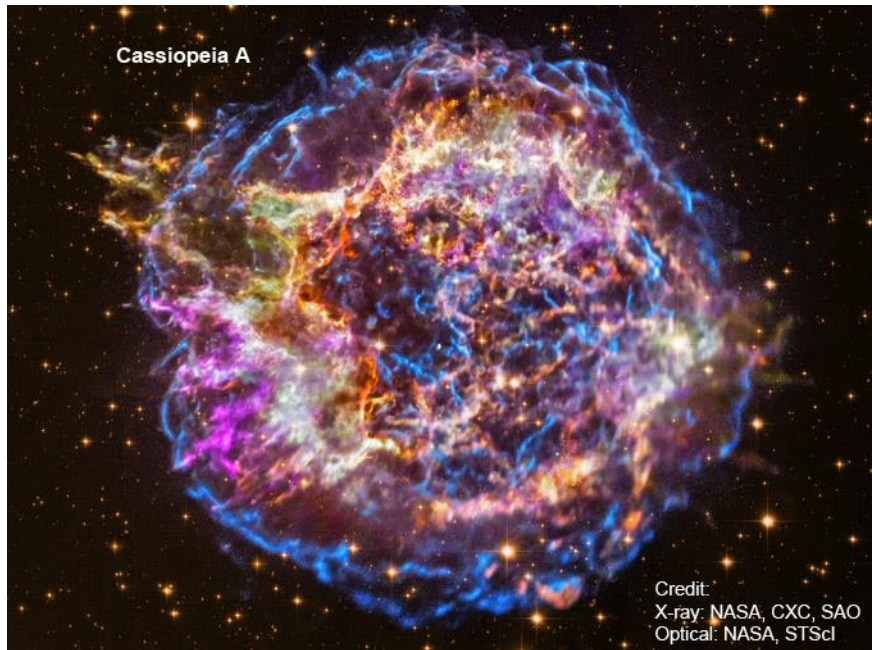
Farthest Galaxy – A team of astronomers discovered the (probably) most distant known galaxy, whose light left there only 0.3 billion years after the Big Bang. It was dubbed HD1. Astronomers hope to confirm its distance spectrographically with the James Webb Space Telescope. The record holder before is known as GN-z11, whose light left 0.4 billion years after the Big Bang. The new discovery was made by checking for Lyman spectral line shift of 700,000 objects imaged by the Spitzer Space Telescope and various ground-based telescopes. HD1 had the largest redshift among all these objects. A weak oxygen spectral line seen in radio seems to confirm the redshift of HD1, and therefore its distance. It is thought that the brilliant light of HD1 is caused by very active star-formation in the galaxy or possibly an active black hole. In either case, the brightness observed stretches our concepts of how bright star formation can be or of how big early black holes can be or how bright material falling into them can be. One possible explanation is that the first stars to form were much more massive than stars forming today, due to their lack of heavier elements, making star formation much brighter.



Star Expelling Rings – Scientists studying a red giant star called V Hydrae found that the star has thrown off 6 expanding rings and an hourglass-shaped formation perpendicular to the ring plane. The hourglass is being shaped by a fast stellar wind. The rings are emitted every few hundred years. The mechanism that expels the rings is not known. These features are in addition to the already-known eruptions of the star about every 8 years. All these appear to be part of the death of the star as it runs out of fuel. It has long been known that stars like this blow away a large fraction of their mass, but it had been thought this occurred in a steady wind, not in puffs that create rings. The study used ALMA, a radiotelescope array in Chile, and data from the Hubble Space Telescope.

Micronova – A team of astronomers examining data from the TESS planet-finding space telescope found 3 instances of a star brightening for several hours and has dubbed the phenomenon a micronova. Though they were found to be powerful hydrogen fusion explosions, they are much smaller and shorter lived than an ordinary nova. In an ordinary nova, hydrogen falling onto the surface of a white dwarf star from a nearby companion star collects until it reaches the temperature and concentration to nuclear fuse to helium in an explosion that occurs over the entire surface of the white dwarf. In a micronova, the same thing happens except a powerful magnetic field concentrates the hydrogen at the magnetic poles, and a smaller explosion takes place just at the poles. The team will continue to look for more micronovas.

Supernova Remnant Collision – The supernova remnant nebula known as Cassiopeia A is left from an exploding star that should have been seen from Earth about the year 1670. But the explosion was apparently blocked from view by gas and dust. A new study of X-ray images of Cassiopeia A over a period of 19 years shows that it is not expanding evenly, apparently because the expanding remnant has collided with material thrown off the star long before it exploded. Some of the remnant is actually moving back toward the explosion center probably because it bounced off the material it collided with. Much of the remnant is expanding at 2500-3700 miles per second.



Binary Supermassive Black Holes – A team of scientists announced the discovery of a pair of supermassive black holes orbiting each other in a galaxy so distant that its light took 8.8 billion years to reach us. The black holes likely have masses of about 100 million times that of the Sun. Only a few candidates to be such binary supermassive black holes are known, with varying degrees of confirmation. This newly announced binary seems well confirmed due to variations in the radio observation signals apparently caused by their orbital motion.

Planetary Bodies Collide – Astronomers monitoring a young star 388 light-years away, designated HD 166191, roughly the size of our Sun, found that for many months a cloud of dust obscured the star. The probable source of such a cloud is that two forming planets collided and pulverized. To produce the size of dust cloud seen, the colliding objects would have to be roughly the size of Vesta, one of the largest asteroids in our Solar System. The monitoring observations were made in infrared light over a period of 4 years by the Spitzer Space Telescope and in visible light using ground-based telescopes.

Enceladus Geysers – A new study based on computer simulations of Saturn's moon Enceladus concludes that the cracks in the icy surface are caused by the expansion of ice freezing thicker during long-duration temperature change cycles induced by orbital changes, but that the forcing of liquid water through those cracks into geysers has a different cause, namely boiling of liquid when exposed to the vacuum of space. A liquid ocean has been believed to lie beneath about 20-30 kilometers (12-19 miles) of Enceladus's icy shell since the observation of geysers erupting from cracks in 2006.

Jupiter Twin – A new study discovered an exoplanet nearly identical to Jupiter, in terms of its mass and its distance from its star. It is 17,000 light-years away and is known as K2-2016-BLG-0005Lb. It was found in archived data from the Kepler planet-finding space telescope. It is twice as distant as any other exoplanet found in Kepler data. It was found by microlensing, not by the transit method normally used for Kepler discoveries. In the microlensing technique, a massive planet passes in front of a distant star, bending the starlight, focusing and brightening it, according to General Relativity. The transit method shows instead the dimming by a planet blocking a little of the light of the star it orbits. The chances of a planet passing in front of a distant unrelated star are very small, but this event happened while Kepler was pointed toward the center of the Milky Way, where stars are dense, raising the chances of an alignment for microlensing. The event was also seen by a ground-based telescope that was also monitoring the galaxy center.

Ingenuity – The Mars helicopter Ingenuity completed its 21st flight several days after it reached its first Earth year on the Red Planet. NASA then approved continuing flights through September. The original plan was to declare the helicopter mission over after 5 flights, but there is so much potential science and engineering possible that its mission keeps getting extended. As of this writing, 26 flights have been completed, the latest setting a new record of 2324 feet for distance traveled. The last few flights have been to reach the base of the delta where an ancient river flowed into the lake in Jezero Crater, the area where the rover Perseverance will next explore. The rover is taking a much longer route to the delta that avoids areas that would be dangerous to roll over. Ingenuity will take pictures of the delta to help rover controllers plan Perseverance's route to reach the top of the delta. Helicopter controllers have loaded new software into the craft several times to add new capabilities, such as flying over rougher terrain, flying higher, more precise navigation, and changing speed during flight.

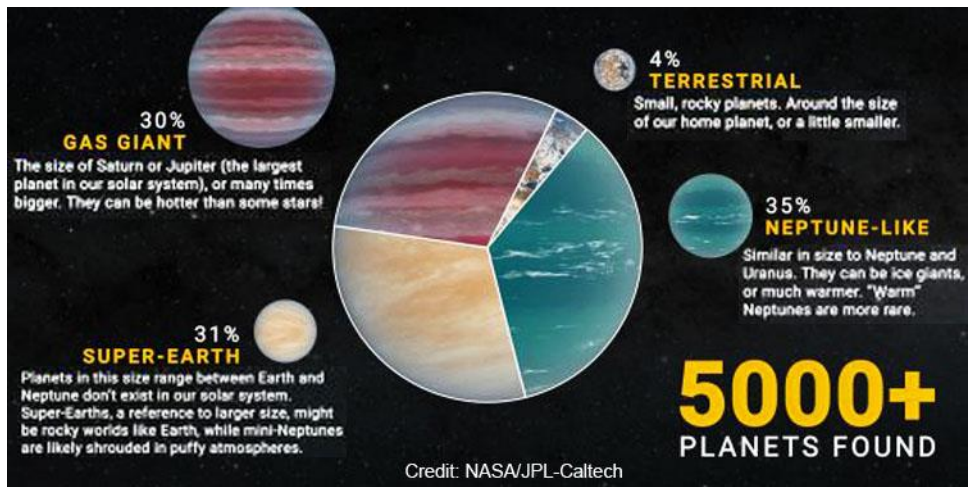
Marsquakes – A new study of marsquakes indicates that those occurring in the area called Cerberus Fossae are probably caused by movements of magma below the surface, not by tectonic movement or other causes. This may mean that volcanic activity is still happening in some areas of Mars. The new study used new techniques to find very weak marsquakes among the noise in data from the InSight seismograph.

Possible Shards of the Chicxulub Impactor – Scientists digging for fossils at a site named Tanis in North Dakota believe that they have found material splashed from the Chicxulub crater where a meteor hit the Earth 66 million years ago. That impact has been accused of killing off the dinosaurs. Among the new fossils there are glass spherules, a common product of material splashed out of an impact crater. Most of the unmelted rock bits found have high levels of calcium and strontium, as would be expected from splashed limestone, which is found at Chicxulub. Two spherules found contain high levels of iron, chromium and nickel. These would be shards of the meteorite, indicating that it was an asteroid, in fact a carbonaceous chondrite asteroid, not a comet. The thing that distinguishes this find from other finds of splash from Chicxulub is that some of this material landed in tree resin, sealing it in amber, which protected it from weathering. There are also some air bubbles preserved in some spherules. This raises the possibility of analyzing what the Earth’s air was like 66 million years ago. The Tanis dig also found the leg of a dinosaur, identified as a Thescelosaurus, raising the possibility that it was killed by the flooding that the Chicxulub impact likely caused.

Largest Comet Nucleus – Observations by the Hubble Space Telescope and a radiotelescope have yielded a size for the nucleus of Comet Bernardinelli-Bernstein and found it is the largest known comet nucleus, at about 80 miles across. The comet’s closest approach to the Sun will be near Saturn’s orbit in 2031. The comet nucleus is too far for Hubble to resolve it, so the size was calculated from brightness and reflectivity measurements and a computer simulation of comet coma. The reflectivity was found to be very low, about that of charcoal. The comet will take about 3 million years to orbit once, reaching the far point in its orbit (aphelion) of about a half light-year. The previous record holder for nucleus size was comet C/2002 VQ94, at 60 miles across.

CHIME Outriggers – CHIME, a radiotelescope array in Canada, is detecting more than 10 times as many fast radio bursts (FRBs) as all other radiotelescopes combined. It does this by looking at most of the sky simultaneously and using a supercomputer to sort out where each radio signal comes from. Its precision in locating, however, is only about as good as an area of the sky the size of the full Moon. The CHIME group is now constructing 3 outrigger antennas scattered across North America to pinpoint the locations of FRBs to a fraction of an arcsecond. This should help astronomers determine the sources of FRBs, which remain a mystery.

Exoplanet Milestone – The first planet orbiting another star, or exoplanet, was discovered in 1992. It took 10 years to find the next 90 exoplanets. Last month the number exceeded 5000, and those 5000 are confirmed. Another 3700 have been detected by just one instrument and await confirmation. Most have been discovered by the transit method, where a star is seen to dim slightly because its planet is passing in front. The transit method is terribly inefficient at finding planets because most planets’ orbits pass above or below their



star, not in front, from our point of view on Earth. But astronomers throw sheer numbers of stars at the problem and have great success. For example, the Kepler spacecraft primary mission stared at more than 150,000 stars for years (and over 300,000 stars in the extended K2 mission) and discovered more than 2600 planets. With the TESS spacecraft and other telescopes continuing the search, it probably won’t take long to find the next 5000 exoplanets.

Eugene Parker – The Parker Solar Probe, launched in 2018, was named after Dr. Eugene Parker, a pioneer in study of the Sun. He was the first person to predict the solar wind, before it had been observed. He did trailblazing work on the solar corona and magnetic field. The Parker Solar Probe was the first instance of a spacecraft named after a living person. Dr. Parker died in March at the age of 94, a great loss for solar astronomy.

SOAR @ Mount Wilson Observatory!

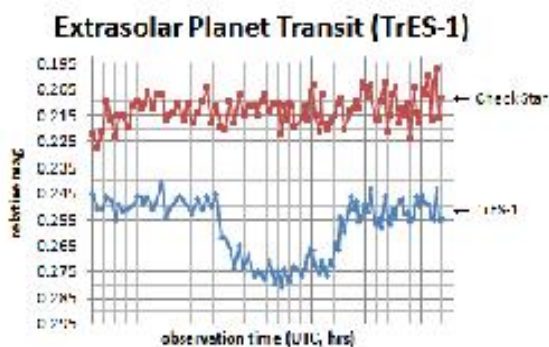


*Apply now to join our Summer Observational
Astrophysics Retreat, SOAR @ MWO
July 17-30, 2022*

Mount Wilson Observatory invites applications for a two-week observational astrophysics retreat (formerly known as the CUREA program). Here, participants can explore stellar astrophysics using historic telescopes where many seminal discoveries regarding the nature of our Sun, other stars, and galaxies were made. The retreat combines classroom instruction with hands-on solar and stellar observing to introduce participants to the physics of stars. Aimed at people considering careers in astronomy, astrophysics, or science teaching, the program is open to applicants 18 years or older who have completed an introductory physics course (AP or college), preferably including some modern physics or general astronomy.

Participants will engage in an intensive two-week course using historic and modern facilities at Mount Wilson Observatory, including:

- the Snow Solar Telescope and high-resolution spectrograph
- a 16-inch Schmidt-Cassegrain telescope and electronic detector
- the historic 60-inch reflector, used by early astrophysicists including Shapley and Hubble
- image processing for photometry and spectroscopy



During the second week, each participant will pursue a unique observing project, acquiring observations, analyzing data, and reporting results. Additionally, students will tour historic telescopes and other facilities at Mount Wilson Observatory, interact with observatory staff and volunteers, visit ongoing research projects at the observatory, and enjoy field trips to other astronomical sites in the Los Angeles area. Tour possibilities include Griffith Observatory, the offices of the Carnegie Observatories, and/or the Caltech astrophysics department.

Logistics and cost:

- Program cost is \$1500, covering all expenses including room and board. Participants will reside in Mount Wilson's famous "Monastery," home of visiting astronomers since the days of George Ellery Hale and Edwin Hubble.
- Airport pick up and drop off are included; participants are responsible for their own airfare or other travel to LA.

See <https://sites.google.com/a/kenyon.edu/mwss/home> for info/application.

Review of applications will begin April 15, continuing until spaces are filled.

OWENS VALLEY RADIO OBSERVATORY TRIP

SCIENCE BEYOND THE BOOK

June. 25, 2022

With Dr. Mark Hodges and Dr. Doug Millar

Please join with us on the above date 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. All the above is free and courtesy of Dr. Mark Hodges, OVRO and Cal Tech. This trip is open to teachers and 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. Please also forward your cell phone number.

The observatory asks that anyone who is not vaccinated against COVID-19 wear a mask while on site.

This is not a school sponsored field trip. Each participant is on their own to arrive at the observatory. Please try to arrive at OVRO about 1:00pm on Saturday. There are several motels in Big Pine to stay at. Some have multi-family rooms. Please make your own reservations. We usually eat at the Country Kitchen in Big Pine or the Pizza Factory pizza in Bishop. You can also camp out both at the dish or in Big Pine in either tents or campers. The weather will be warm and dry. If you would like to bring your own telescope, please do.

We should arrive in the early afternoon on Saturday, you may want to stay over and go back on Sunday afternoon. Some of us will arrive on Friday and enjoy some nighttime astronomy at the OVRO site. If you would like to bring your own telescope, please do. Anyone is welcome to join us on Friday night for visual astronomy. Let me know if you would like to come then as well. Please call Dr. Millar on the day of the trip and let him know when you are starting out and where you are about 1pm.

Schedule:

Friday-

Setup outside the main office building for astronomy by sunset. 110vac, bathroom and coffee and water available.

Saturday

1:00pm arrive at OVRO 40m dish

5pm check in at your Motel and go to dinner in Bishop.

Evening- Astronomy at the site

Sunday

Breakfast 9:30am at Country Kitchen

Leave whenever you like. Check websites about the area and the Highway 395 for sightseeing opportunities.

The directions from the LA area are: Drive north on the I5/14 through Palmdale and Mojave. Continue through Inyokern and join US395. Continue on 395 North through Little Lake and Lone Pine. Continue up to Big Pine. Just as you get to the end of town turn right towards the Westgard Pass. Go out about 2 miles and after Zurich, turn left onto the observatory road. You should be able to see the dish in the distance, but it is 4 miles away! Continue onto the property and go to the large dish. We will be at the base or inside of it.

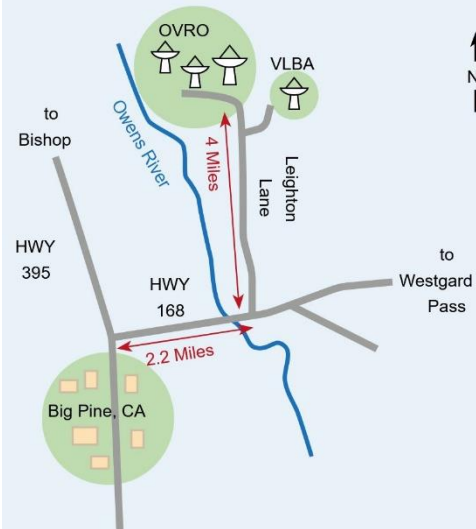
Owens Valley Radio Observatory: <http://www.ovro.caltech.edu/>

For any questions and RSVP's my contact information is: Dr. Doug Millar Cell- 562-810-3989 and email is drzarkof56@yahoo.com

Thank you and I hope to see you on the trip! --

Dr. Millar

Directions to OVRO



Located southeast of Bishop, the Owens Valley Radio Observatory is 6 miles from the town of Big Pine. The only public access road to OVRO is via Highway 168, which begins at the northern end of Big Pine, by a large pine tree. Turn east onto Highway 168. After approximately 2 miles you will cross the Owens River Bridge. 1/4 mile past the bridge, turn left on a paved road, Leighton Lane.

Here are some pictures from past visits.



Getting set up for nighttime astronomy - Lots of great telescopes.



Ex Carma Array dishes at the site.



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

From the Editor

Sirius wants photograph submissions from club members

Sirius is running low on pictures. Please send pictures to me along with a brief description of the subject, where the image was taken, and the equipment used.

Ideas for Future articles

The newsletter includes articles from members or about subjects suggested by our members. We seek ideas and writers to cover them. To contribute an article or work with the editor to produce one, please contact me at

newsletter@ocastronomers.org .

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
June	21 May
July	18 June
August	23 July

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	rongrace2@cox.net	
• Orion StarShoot AutoGuider			further reduced price	\$ 200

For Sale	contact	Rick Hull	hull3hull3@yahoo.com	949-636-2920 cell
• SBIG ST-i Mono; Guide/Planetary camera with mechanical shutter			reduced price	\$280
Price includes shipping and PP fees				

For Sale	contact	Rick Hull	hull3hull3@yahoo.com	949-636-2920 cell
• QSI 6120C OSC CCD camera with Mechanical Shutter			reduced price	\$ 1800 +sh

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.

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. I can provide a few images taken at 770mm focal length out at Anza. Contact me by email.

New, this camera is now \$4200, and the ATIK 4120C which is a basic lower-end cousin, is \$3K. On CN I am asking \$1900, any OCA member may purchase it for \$1800 plus shipping. Please feel free to contact me with any questions.

For Sale contact Jason Oxman jason@oxmans.com 714-519-1896
• Space Shuttle "Columbia" mockup We will consider donating it to a good cause.

10' long X 6'6" tall X 5' wide
Needs some TLC: some plywood repair and a new coat of paint

This Space shuttle stood outside of Oxman's Surplus in Santa Fe Springs marking the store entrance for over 20 years. It was originally from the BOEING AIRCRAFT CO. in Long Beach, CA. Oxman's Surplus is no longer in business and the Shuttle needs a good home.



For Sale contact Jerry Floyd jlfloyd720@gmail.com \$1200
• Losmandy G-11 mount with Gemini-1 controller

Originally purchased 7/12/1997, later updated with Gemini-1 controller, high precision brass worm and bearing block. Includes polar alignment borescope, new Michael Herman high-friction clutch pads, 2 18-pound counterweights, HGM clutch knob set. No tripod. Will deliver in Southern California.

Another Look

The column will return next month. There was not space enough in this issue to fit it.
-- the editor



ASTRONOMER

The Newsletter of the Orange County Astronomers

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

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

**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
Vice President
Treasurer
Secretary
Trustee
Trustee
Trustee
Trustee
Trustee
Trustee
Trustee

Barbara Toy
Reza AmirArjomand
Charlie Oostdyk
Alan Smallbone
David Searle
Cecilia Caballero
Doug Millar
Sam Saeed
Helen Mahoney
Gary Schones
John Hoot

board@ocastronomers.org
btoy@cox.net
reza@ocastronomers.org
charlie@ocastronomers.org
alan@ocastronomers.org
dwsearle@gmail.com
ceci@ocastronomers.org
doug@ocastronomers.org
sam@ocastronomers.org
helen@ocastronomers.org
gary378@pacbell.net
jhoot@ssccorp.com

COORDINATORS

Anza House Coordinator
Anza Site Maintenance
Beginner's Class
Orange County Star Parties
Explore the Stars
Librarian
Membership / Anza Pads
Observatory Custodian / Trainer / Member Liaison
Outreach
Sirius Astronomer Editor
Telescope Adoption Program
WAA Representative
Webmaster

Manuel Baeza
Don Lynn
David Pearson
Steve Mizera
Bob Nanz
Karen Schnable
Charlie Oostdyk
Barbara Toy
Cecilia Caballero
David Fischer
John Hoot
Cecilia Caballero
Reza AmirArjomand

manugb33@yahoo.com
dlynn@ieee.org
p.davidw@yahoo.com
mizeras@cox.net
bob@nanzscience.com
karen@schnabel.net
charlie@ocastronomers.org
btoy@cox.net
outreach@ocastronomers.org
newsletter@ocastronomers.org
scopes@ssccorp.com
ceci@ocastronomers.org
webmaster@ocastronomers.org

SPECIAL INTEREST GROUPS (SIGs)

AstroImagers SIG
Astrophysics SIG
Dark Sky SIG
Youth SIG

Alan Smallbone
Mark Price
Barbara Toy
Doug Millar

alan@ocastronomers.org
mark@ocastronomers.org
btoy@cox.net
doug@ocastronomers.org