



NGC6888 the Crescent (aka Dividing Cell) nebula from Ron Choi. The image was captured June 2020 at Echo Canyon State Park, Nevada using an EON 115mm refractor, ASI071MC Pro camera and Radian Triad Ultra Quad-Band narrowband filter

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

- **All in-person club events are cancelled**
- **Use of the Anza site is discouraged**

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, 7 August at 7:30 to 9:30 PM Kyle Coker will talk about how to get started in astrophotography.	ONLINE
Club Meeting	Friday, 14 August at 7:30 to 9:30 PM "What's Up?": John Garrett from TVA "Solar Eclipses: Math, Science, and Spectacle": Jay M. Pasachoff from Williams College	ONLINE
Open Spiral Bar	Saturday, 15 August 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)

Response to COVID-19 Crisis

COVID-19 continues to affect all of our activities. All in-person club events remain cancelled through at least August. 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
Anza Star Parties	Cancelled indefinitely
Orange County Star Party	Cancelled indefinitely, until allowed by Orange County Parks
Outreaches	Cancelled indefinitely
Beginners Astronomy Class	Cancelled indefinitely, please contact Dave Pearson to attend Zoom classes
SIG Meetings	Cancelled indefinitely, depending in part on availability of facilities and when meetings could go forward safely. Some may schedule Zoom events.

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

Magazine Subscriptions

Subscriptions to the Astronomy magazines through the club are now due for renewal, if you subscribed for one year or would like to subscribe at the club rate. You may also extend an existing subscription that does not end in December for one year at the club rate. Renewing on-line at the club rate can be done anytime during the year and for multiple years, but you still can renew for one year through the club by bringing your check made out to the OCA to the meeting or mailing it to:

Charlie Oostdyk, Orange County Astronomers, PO Box 1762, Costa Mesa, CA 92628.

Checks made out to the magazine publishers cannot be processed and will be returned to you. If you already subscribe, please provide the mailing label or the billing invoice with your check. One-year rates are as follows:

	Club Rate	Regular Rate
Sky & Telescope*	\$44.00	\$54.95
ASTRONOMY**	\$34.00	\$42.95

***You can now subscribe or renew Sky & Telescope on-line.**

E-mail Charlie@OCAstronomers.org for more information.

****Astronomy subscribers can now renew on-line for 1 to 3 years and get product discounts. E-mail Charlie@OCAstronomers.org for instructions.**

The **DEADLINE** for subscribing through the club will be the **October monthly meeting, October 9th**. The publishers will send expiration notices to all current club subscribers about November 1st even if you renew through the club. It takes the publishers a few weeks to process mailed renewals. **On-line renewals are processed MUCH more quickly.**

President's Message

By Barbara Toy

Neowise - A Bright Spot for 2020...

In case any of you missed the excitement in July, we actually had a bright comet come through! Bright enough to see naked eye in a dark-sky area – not a lot of detail, but definitely there. I saw it from Anza when I was there briefly on July 18. It was much better in binoculars or as captured by our many imagers.

Judging by the traffic on the email groups, I think pretty much everyone who had any interest in imaging was doing something to capture it and sharing their images, and there was a lot of discussion of locations where it could be seen better than in Orange County. It was in the northwest sky in the evening from mid-month on, and that, for most of Orange County, put it in the light dome from northern OC /LA County, so it lost a lot of contrast. But it could still be seen here and was the best comet of this century – so far. I'm really hoping for another one that splays out across most of the visible sky, preferably in the near, not distant, future!

Usually, finding food or restrooms on the way out to a dark (i.e. less inhabited) viewing area for an event like viewing a comet wouldn't be too much of a problem or require much planning, but that's not our current reality with all the Covid-19 restrictions. When Alan and I were thinking of going out to Joshua Tree to view the comet, one issue was just what in the park was closed right then – fortunately, the website said that "most of the restrooms" were open, along with the information desk during regular hours, which was helpful though ultimately we decided to go on a brief visit to Anza instead.

Even though Anza is more of a known quantity, we found in a prior trip that it is currently much harder to find open restrooms in Temecula than in pre-Covid times. Gas stations with mini stores seem to have them available, but often you have to have the attendant unlock them, even in locations where they were never locked in the past except when someone was using them (and the fact they were locked didn't necessarily correlate to cleanliness, sad to say). This time, on the way home from Anza, we found that most gas stations were closing their shops (and restrooms) by 11:00 pm, though the new Chevron closest to the I-15 was still open and we were told that they only close from 2:00am to 4:00am to do a deep cleaning; their pumps remain open for credit card use, though, just in case you need to know. Most fast food places, including the Pollo Loco, seemed to be doing take-out or drive-through only. We didn't do a thorough survey, but it seemed from what we saw that fast food restrooms generally weren't available for public use, or at least not as readily as in pre-Covid times.

OK, that may not be exactly an astronomical or comet-related topic per se, but I find I've gotten a lot more concerned about these issues as I've advanced in life...and, on occasion, we try to bring you practical information that you might be able to put to use...

Anza Rules

As another practical reminder, for those who go out to our Anza site, we do have a few rules in place for the safety of the site and those who are using it, and to help with astronomical activities of those who are out there. Some major rules are:

1. No smoking on the site other than in the cabin of your vehicle with the windows up (sitting in the bed of a pickup is not sufficient), and everything related to this activity stays inside the vehicle, particularly used matches, ashes and butts. The main reason for this is fire danger – the vegetation on our site is very flammable, especially as it dries out in summer, and anything that's wooden is flammable as well. We've had one fire come through the site and don't want another; we also don't want pollution from cigarette and other ashes and butts. A second reason comes from consideration for the health and enjoyment of other club members. Second-hand smoke is a health hazard, particularly to those of us who are allergic to it, and just the smell is unpleasant to many people. Another consideration - smoke and fine optics are not a good combination.

2. Use only red lights outside after dark, including when you're walking around the site. This is to protect the night vision of those who are using the site, even if you don't care about your own. Please also be careful when you're using a headlamp, which many people do because it frees up their hands – shining bright lights in someone's eyes, even if it's red light, causes glare and impairs their night vision.

3. Generally, if you aren't going to stay the full night, plan to leave during the "escape hour," which is midnight during the summer and about an hour earlier during the winter, and drive out using parking lights if at all possible. Please also park your vehicle so you don't have to back up to leave, as there's no way to shut off back-up lights. This limits damage from excess light for imagers and also helps visual observers preserve their night vision. Please remember, for most people it takes at least 20 minutes to get their night vision back fully once it's been lost due to exposure to excess light.

4. Be considerate of those around you, and don't encroach on them unduly. That includes not leaving equipment, chairs, etc., where they get in the way of other people, not playing music without making sure that those within earshot of it are ok with it, keeping your light levels as low as you can, and generally being a good neighbor. Right now, that includes wearing masks around other people and maintaining social distances. It should also include not making provocative statements, political or otherwise, unless you're talking to someone you know well who might enjoy that kind of thing – most people are out there to enjoy good nights of astronomical activities under dark skies, getting a rest from the outside world, and don't enjoy it when someone disturbs that.

5. This isn't a rule so much as practical advice – when you're walking around the site, particularly after dark, remember that we're in rattlesnake country and take reasonable precautions, such as using a (red) flashlight to make sure that your path is clear and making enough noise to give warning that you're coming through so any snakes in your vicinity have a chance to get out of the way. Having rattlesnakes on site isn't all bad, as they hunt rats and mice, but they do a lot of that hunting at night, and it would be unfortunate for all concerned if you unwarily crossed paths with one.

While the Covid-19 restrictions on gatherings remain in place, we'll continue with our policy of not having formal star parties and discouraging people from going out to the Anza site, certainly from going out there in large numbers. When Alan and I were out there on July 18 (which would in other times have been a star party night), there were several people set up on the football field, and it looked like they were spacing themselves out along that strip of pads, which was good. Another rule people can keep in mind is that, as to the member pads, if the pad holder for any of the pads isn't out there by sunset and hasn't left word that he/she is planning to come out that night, any member on site can use the pad – spreading out to some of the other pads on site can help relieve any congestion in the strip of pads in the Football Field.

While we were there, I was happy to see that people were keeping safe distances from each other, and generally were masked when around other people. We were up by the club observatory and, I'm sorry to say, had left our masks in the car while we had dinner and didn't retrieve them before some folks came by – we all kept more than 6 feet of distance and, of course, we were all outside, so I don't think any harm was done, but it was a reminder to keep my mask in my pocket any time I'm not using it next time I'm out there.

Back to Comets...

I wasn't following what was going on in the press or on social media about Neowise, but obviously people were getting the word that this was a cool object they really needed to see for themselves as I had quite a few people contact me about where in Orange County the viewing would be best. For some reason it all reminded me of the first comet I actually saw, Halley's Comet back in 1986, though the people who contacted me about Neowise were doing much better prep work than we did.

The closest we got to social media in those days was newspapers and magazines, but there was a lot of hype about Halley's Comet, and we knew something of its history, so we got a group of about 8 friends and relatives together to go see it. I think we all had the expectation that all we had to do was go out into an area with dark skies and there it would be – a bright, obvious comet in the sky. One member of the group convinced us that the best location to see it would be the Antelope Valley, based on his recollection from (it turned out) many years earlier that the sky was really dark out there.

The first shock was that the Antelope Valley had seen a lot of development since our friend had last been out there at night – there's been a lot more since then, but definitely there was a lot more light pollution than we expected. Then, it turned out, we really didn't have even a vague idea of where to look for the comet. I think we had a news article about it that may have had some kind of rudimentary chart, but we didn't know any landmarks that would help locate it in the sky and there was nothing we could see that looked at all the way we had envisioned the comet.

Well, somehow we stumbled into an area in a darker section of the Valley where, it turned out, a group of local astronomers, I think from the Antelope Valley Astronomy Club, were set up looking at the comet – that was pure luck. And they were a gracious and generous group that refrained from indicating in any way that our approach to seeing the comet was totally idiotic. They kindly explained that the comet was much further away than on its previous visit, so it actually looked very tiny and quite dim, and they let us look at it through their telescopes. It was pretty cool to see it – but it looked very tiny and dim, even in the telescopes.

Now, I can't say that seeing Halley's Comet fired me with an enthusiasm that led me to OCA – that, I'm afraid, came much later. It did show me what great people amateur astronomers generally are, and how many of them are willing to share their knowledge and views through their equipment with even totally clueless members of the public, something our Outreach volunteers do regularly. I've been on the astronomer side of the equation many times since becoming an OCA member, and I hope that this early experience has helped give me patience when dealing with people who are as clueless as we were back then.

Club Updates

Just to confirm what you've probably already figured out – we're not having our annual Starbecue this year due to Covid-19. Usually that would be the night of our July Star Party, but though we've had it in August when weather was bad or there were other problems with having it in July. We're looking forward to a really incredible party next year!

Our Orange County Star Parties are also cancelled indefinitely. Along with our own safety considerations, we don't know when OC Parks will allow us to have access to the viewing site again.

Chapman University is being very careful in how it reopens for the fall semester, and we don't know when group meetings the size of our club meetings will be allowed there again. It looks like we probably will not be able to have in-person meetings for the rest of the year, but even if Chapman would let us use the Irvine Auditorium again before that, we have our own safety concerns due to our club's demographics.

The general meetings that are now going forward on Zoom have been going very well, and we actually maxed out on the number of attendees at the July meeting. The Board decided to upgrade our Zoom account as a result. We can now have up to 500 attendees (it was 100 before), so feel free to invite friends and anyone else you think might be interested to attend our general meetings. Reza posts the link about a half hour before the meeting, to make it harder for trolls to interfere; it's posted on the meeting page of the website (the page you get to if you click on the meeting information on the Home Page. Reza monitors what is going on with all of that, so please email him if you run into problems (Reza@ocastronomers.org).

Reza has also been hosting a new club social session, the Open Spiral Bar, which is separate from the general meetings and hopefully will give people a chance to enjoy the kinds of conversations and informal exchanges of information that often happens at the meetings. We've had two sessions so far, both a lot of fun, and it was nice having a more informal setting than we have for the general meetings. The next one is set on August 15 at 10:00 p.m.; this is the day after the general meeting. These are open to all members, so please give them a try if you haven't already.

The Heritage Museum, where we have the Beginners Class and the Astrophysics meetings, was in the process of reopening when they got shut down again due to the spike in Covid-19 cases. Dave Pearson is doing the Beginners Class on line, and Astrophysics may start to do that, as well, when Bob Sharshan has figured out some technical issues.

Members of the AstroImagers group have been active on the AstroImagers email group (particularly in response to Neowise), but so far are not planning to have virtual meetings. If you have questions about the group, please email Dave Kodama.

I hope all of you and your families and friends are remaining safe and healthy – best wishes to all of you!

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AstroSpace Update

August 2020

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

Mass Gap Breached – The most massive neutron star with a reliably known mass is about 2.2 times the Sun’s mass. This agrees well with theoretical work that shows that a neutron star should collapse into a black hole at very nearly this mass. The smallest black hole with a reliably known mass is about 5 solar masses, though there are some controversial measurements somewhat smaller. This agrees well with theories of how massive stars at the ends of their lives explode as supernovas, leaving behind a black hole. The space between neutron star and black hole masses, in which no objects were known, is called the “mass gap”. The LIGO-Virgo teams, which run the 3 operational gravitational-wave detectors, have announced that an event in August of last year was the merging of a black hole of 23 solar masses with an unidentified object of 2.6 solar masses, right in the mass gap. Though astronomers disagree whether this was a heavy neutron star or a light black hole, many believe the light-weight black hole is more believable. Since a supernova should not have produced this small of a black hole, theories are being proposed for rarer events that might produce black holes with smaller masses, such as a 3-star interaction. This event set the gravitational-wave record for the most extremely different masses merging, at almost 9:1 mass ratio. Astronomers were surprised by this mass difference, since most theories of how double stars form and age will never result in such a mass difference. One theory put forth is that young dense star clusters might rarely result in gravitational interactions that pair extremely different mass stars. Also unusual about this event is that the 23-solar-mass black hole was barely spinning. Many black holes are spinning about 70% as fast as relativity allows, particularly if they have ever merged with any massive objects, which spin up black holes.

Black Hole Merger Seen Optically – When 2 black holes merge, they don’t normally give off light in any form, they just emit gravitational waves. However observations soon after a gravitational wave event in May of last year apparently saw a burst of light in the same place, which then faded over the next month. The visible-light observations were found in archived data from the Zwicky Transient Facility, a project that uses the large Schmidt telescope at Palomar to image large portions of the sky every night. Unfortunately the observations were found after fading, so no new observations, such as spectra, were possible. The gravitational wave event, seen by LIGO, showed that 2 stellar-mass black holes merged. If that occurred near a supermassive black hole, then theoretically the merged black hole should shoot off in a new direction and likely plow through the accretion disk around the supermassive black hole, and that would definitely make a burst of light for a few weeks. So that is the most likely explanation for the observations of light. There are some other explanations that have not been completely ruled out. But if the likely explanation is true, then the merged black hole should hit the accretion disk again in a few years, and observations of that would go far in confirming it.

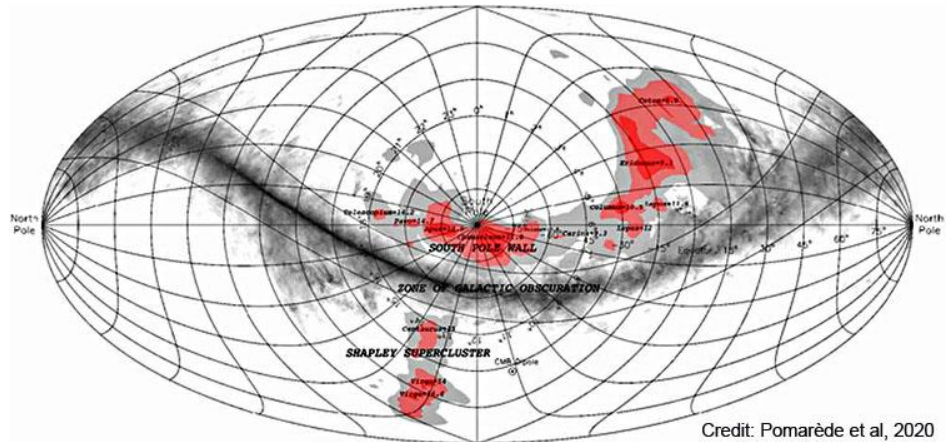
Star Disappeared – For about 20 years some astronomers have been observing the Kinman Dwarf Galaxy because it has interestingly low content of heavier elements. The spectra of the galaxy as a whole contained the distinctive pattern of a Luminous Blue Variable (LBV) star mixed in with spectra of all its other stars. The LBV was never resolved in images because the galaxy is too far away (75 million light-years). But the spectra showed unmistakably that an LBV was there ... until recently. The LBV spectral lines are gone. An LBV should end its life as a supernova, but none was seen in Kinman. The most likely explanation seems to be that the LBV collapsed directly to a black hole without bothering to explode. Some theorists have been proposing that such a collapse can happen, but more evidence is needed to firmly conclude that this happened in Kinman.

Black Hole Corona Disappeared – Supermassive black holes are surrounded by what is called a corona, a ring of super hot (billion degree) particles. Astronomers have watched such a corona disappear and then rebuild itself, for the first time ever. The best guess at what caused the disappearance is that a closely passing star got torn apart by tidal forces fell in, pulling the corona with it. The brightness of the black hole first flashed brilliantly, then dropped to 1/10,000 of its normal value as the corona disappeared. Over a few months the brightness climbed almost to normal. The event was first seen by an automated survey for supernovas called ASSASN. This prompted monitoring in many wavelengths over the months of the event.

Gas Giant Core – The core of a gas giant planet has been discovered by TESS (planet-finding space telescope). Known as TOI 849 b, it orbits a Sun-like star about 730 light-years away. The TESS observations showed that it is about the size of Neptune, and follow-up Doppler observations made at the La Silla observatory in Chile determined that its mass is 2-3 times that of Neptune. This results in a high density that could only be explained by a gas giant planet without its gas, that is, just the core. Astronomers have come up with only 2 explanations: 1) when the gas giant formed, something prevented the accumulation of hydrogen and other gas, or 2) a gas giant formed normally but then something (perhaps heat) removed the planet’s gas. It orbits quite close to its star, and therefore is hot (about 2800°F), so this could be what ripped away its gas. However calculations show the current heat is not enough to fully explain the gas loss. Very few Neptune-like planets are found orbiting very close to their stars, so finding this one is surprising. Astronomers who want to know what is in the core of a gas giant need to study this object.

Cosmic Magnetic Fields – 20 years ago astronomers first discovered magnetic fields in galaxy clusters. Last year magnetic fields were detected in a piece of the cosmic web that connects galaxy clusters. Some astronomers now believe that magnetic fields could be everywhere, even in cosmic voids, and recent observations of blazar light passing through voids tends to support this. That would pose the question, how did magnetic fields form everywhere? Some theories propose that various steps in inflation or the Big Bang would have created such. Other theories show how the fields could grow later. An interesting aspect of magnetic fields everywhere would be that they would distort the sizes of the blobs seen in the cosmic microwave background (CMB), which in turn would alter the calculations of the expansion rate of the Universe (the Hubble constant). A recent paper suggests that magnetic fields could explain why calculating the Hubble constant from the CMB results in a different number from calculating it from distant supernova brightnesses. A lot more work needs to be done, both in determining the effects of magnetic fields and in measuring magnetic fields.

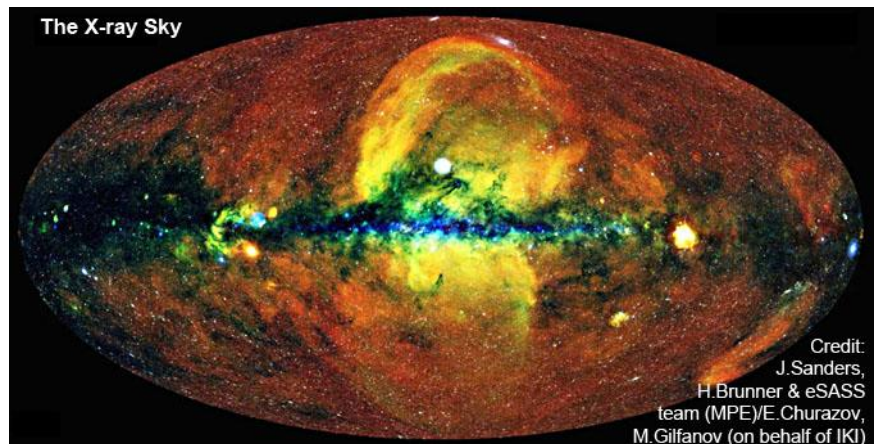
Cosmic Wall – A team of astronomers have discovered a wall made of clusters of clusters of galaxies that ranges at least from 300 to 500 million light-years away. It has been dubbed the South Pole Wall. It was found by its gravitational effects on the velocities of galaxies. It is comparable to the Laniakea structure announced in 2014. The team has spent the past decade mapping this wall and they just released their results.



Credit: Pomarède et al, 2020

New Map of the Universe – The Sloan Digital Sky Survey (SDSS) made its latest release of data, basically a map and spectral data of a large part of the sky. This included the eBOSS phase of the survey which studied the large scale structure of the Universe by analyzing the location and spectra of millions of galaxies and quasars. The data contains substantial numbers of quasars out to distances from which light took about 11 billion years to reach us. A value of the Hubble constant was calculated from this structure, and the value agreed with the values derived from the CMB. Also the strength of dark energy at various distances, and therefore look-back times, was calculated, and it appears not to have changed over time. The flatness of the Universe was confirmed to quite close tolerance; that is, the total mass and energy (including dark energy) is exactly at the critical level so that, ignoring local concentrations of mass, space-time allows parallel light beams to remain parallel forever.

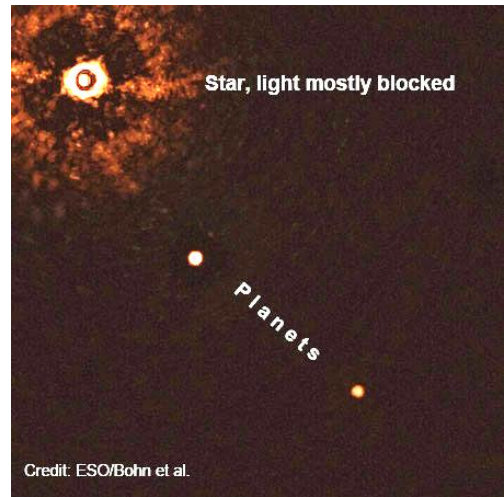
X-ray Map – eRosita is an X-ray telescope on board the SRG (Spektrum-Röntgen-Gamma) German-Russian spacecraft and it has been surveying the entire sky since shortly after its launch about a year ago. The eRosita team just released its first all-sky X-ray map. It shows more than a million X-ray sources, roughly doubling the number known of such sources. This is the first update in such a map in 30 years because it has been that long since a wide-field X-ray telescope was in service. A goal of the mission is to map galaxy clusters and track the growth of structure of the Universe over much of its life. Galaxy clusters are visible in X-rays because of the very hot gas between galaxies in those clusters. More than 20,000 galaxy clusters are in this map, but scientists expect over 100,000 will be found by the time eRosita completes several more sweeps of the entire sky and stacks the images. Also found in the map are loads of stars with magnetic activity and black holes actively swallowing matter. SRG is in a halo orbit about the Earth-Sun L_2 Lagrange point, about 900,000 miles anti-sunward from Earth.



Credit: J. Sanders, H. Brunner & eSASS team (MPE)/E. Churazov, M. Gilfanov (on behalf of IKI)

Webb Telescope Delayed – NASA announced that the James Webb Space Telescope launch has been delayed 7 months to October 2021. About 3 months of the delay was due to the Covid pandemic. At least it won't cost more, as the current budget will support work until the new launch date.

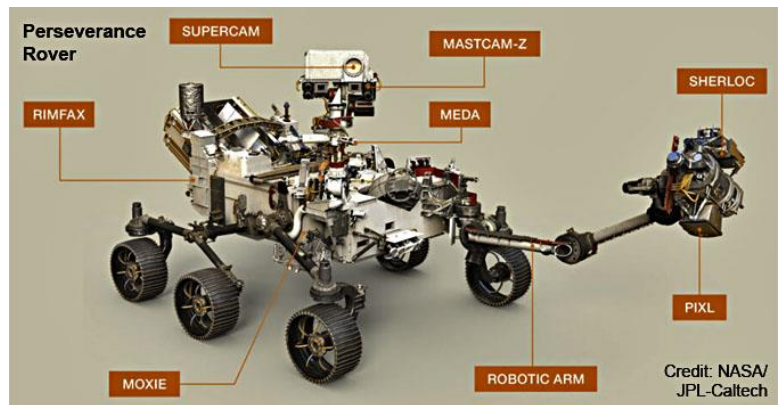
Exoplanets Imaged – The Very Large Telescope (VLT) in Chile has made images of 2 exoplanets orbiting their star. Only about 1% of all known exoplanets have been imaged because they are generally too faint and too close to their stars to be resolved. The newly imaged planets are unusually far from their planet, are unusually bright in infrared because of their temperatures, and an instrument on the VLT was used to block the star’s light. These factors were necessary to make these images. This is only the second time 2 exoplanets in one system have been imaged, and the first time 2 planets were imaged orbiting a Sun-like star. The star is known as TYC 8998-760-1 and is about 300 light-years away in the constellation Musca. It is estimated to be only 17 million years old. The planets orbit at about 5 and 10 times the distances from their star compared to Neptune’s distance from our Sun. The planets are each several times the mass of our largest planet Jupiter.



Earth Invades Mars – Mars and Earth align in their orbits every 26 months such that rockets can reasonably get to the Red Planet. Now is the alignment. 2 Mars missions have been launched and a 3rd is scheduled for next week as I write this. The first launch was the Hope mission, built by the United Arab Emirates. This is that country’s first interplanetary mission. It will study the Martian atmosphere and weather from orbit.

Next launched was China’s Huoxing 1 mission that includes an orbiter, lander, and rover. The orbiter has cameras, a spectrometer, and a radar to search for ice below the surface. The rover is solar powered and has weather, magnetic-field and radar instruments.

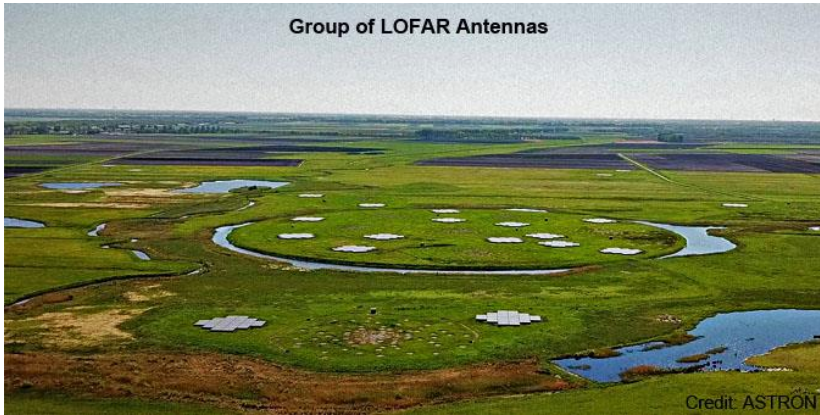
Lastly is NASA’s rover Perseverance. It resembles the currently operating Curiosity, but with new and different instruments. The landing area is Jezero Crater, which was long ago a lake with a geologically interesting river delta. Besides analyzing rocks and soil with onboard instruments, the rover will collect samples to be returned to Earth by a separate mission in future years.



A drone helicopter named Ingenuity is fastened to the rover, and will be let loose after landing to perform several flights, taking aerial images of the surrounding terrain. It takes a few days of solar battery charging to ready the copter for a flight. The extremely thin Martian air (140 times thinner than Earth’s) dictates that the helicopter has to spin its blades really fast and can lift little weight (like substantial batteries or solar panels), so it is limited to only 1.5 minutes per flight.

Unfortunately the ExoMars (European-Russian mission) lander and rover ran into delays and will launch in 2022 instead of this year. Almost had 4 invaders go to Mars this time.





Solar Radio Emission – Observations using the LOFAR radiotelescope array have shown faint bursts of radio being emitted all over the Sun. Some astronomers propose that this is from nanoflares, but more work is needed to establish this. LOFAR works at lower radio frequencies than other radiotelescopes, and these faint bursts have not been seen at higher frequencies. Some theorists believe that nanoflares, too small to be observed individually, may be the means by which million-degree heat is carried into the Sun's corona, or outer atmosphere.

Venus Volcanoes – A new simulation of how coronae form on Venus has produced simulated land forms that strongly resemble those seen on the planet. Coronae are ring-shaped structures that were formed by lava erupting through the planet's crust. 37 coronae on the planet matched well with the simulated objects that were quite young or even still forming. This led scientists to believe that those 37 represent volcanic activity still evolving. In other words, Venus appears to have currently active volcanoes.

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	Jeff Gortatowsky	jeff.gortatowsky@gmail.com	
•		Jupiter Ridge pad 5 lease privilege – for sale to any OCA member		\$1200
		This is a pad with no pier on it.	Price is negotiable	

For Sale	contact	Bill Prats	b.bill.p@gmail.com	
•		Meade LX-70 Tripod & Mount 20lb capacity, Meade Polar Scope (#670010),		\$300 OBO
		Dual axis motor drive with Controller (#670011), original accessories, fresh 6 volt battery.		
		Very clean, Used 1 year.		

For Sale	contact	John Derks	derksjm@yahoo.com	
•		Meade 14" LX200 GPS UHTC w/ complete original accessories package:		\$2700
		2" diagonal, 8x50 finderscope, zero image shift focuser, Autostar II handpaddle,		^ reduced ^
		Series 4000 26mm Super Plossl 1.25 eyepiece, vibration iso pads		
•		Meade Giant Field Tripod		
•		Meade Superwedge		
•		14" SCT Dewshield		

OTA is in like new condition in original Meade foam lined box . Located in So. Orange County

For Sale	contact	David Hobbs	david_hobbs714@yahoo.com	
•		20" F5 Research grade early Coulter mirror and secondary mirror		\$2800
•		Primary mirror is 2 3/4" thick, Secondary is 4" x 5 5/8"		

Advertisements

For Sale	contact	Ron Choi	rongrace2@cox.net	
• Orion StarShoot AutoGuider				\$240
• Orion Mini 50mm Guide Scope				\$ 60
• Baader Planetarium Classic Ortho 6mm eyepiece				\$ 50
• Orion SkyView Pro 8" f/4.9 reflector telescope with EQ mount Tripod with 25mm Orion Sirius Plossl telescope eyepiece 10mm Orion Sirius Plossl telescope eyepiece Padded Telescope Case, Finder Scope, Polar Alignment Scope, Orion Dual Axis TrueTrack Telescope Drive installed				\$300

For Sale	contact	David Fischer	Leyes-Fischer@cox.net	
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- ATS Portable Pier, 8 inch diameter \$1,800
- 52 inch height
- Excellent condition
- Detachable aluminum shelf and eye-piece holder
- No pier adapter (top plate) is included – these are specific to the user's mount



From the Editor

Sirius wants photograph submissions from club members

We need submissions for this year. I will also pull some from the OCA members images section on our website but those will be at my discretion. If you would like your picture on the cover, please send it 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 and / 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>
September	22 August
October	26 September
November	24 October
December	21 November

OCA Loaner Scope Program

From John E. Hoot, Program Director

Due to the CoVid-19 pandemic, the OCA Telescope Loan Program is on hold. Those of you who have telescopes checked out are encouraged to continue to enjoy them rent free until such time as it is deemed safe to resume the scope exchanges.

I am still accepting reservations for scope checkouts when the program resumes but no firm date has yet to be set. Please see the current inventory list below. If you have questions I can be reached at scopes@ssccorp.com.

INV#	Type	Size	Mfg	Model	Accessories/Notes	Status
Active Inventory						
1	Mac	3.5"	Meade	ETX90	Alt/Az Goto	Available
2	Newtonian	4.5"	Meade	DS2114ATS	Alt/Az Goto	Available
5	SCT	8"	Meade	LT8	Alt/Az Goto	Available
6	Newtonian	4.5"	Celestron	1114EQ	Wt Bars In Storage	Available
10	SCT	8"	Celestron	Orange Tube	w/Encoders,Wedge,Tripod & SlowMo. Ctl	Available
16	SCT	10"	Meade	LX200 Classic	Alt/Az Goto	Available
17	Newtonian	8"	Celestron	????	electronics not working	Available
19	Mac	2.25"	Meade	ETX60	Alt/Az Goto	Available
20	Reflector	8"	Orion	SkyView	German Mount wTracking & SloMo 2 axis	Available
22	Reflector	4.5"	Celestron	NexStar	Alt/Az Goto	Available
24	Reflector	4.5"	Meade	4504	German Mount Goto	Available
26	Dobsonian	8"	Celestron	Starhopper	Alt/Az Manual	Available
29	Schmidt-Cas	8"	Celestron	NexStar 8	Alt/Az Goto	Reserved
31	MAK-Cas	5"	Meade	ETX-125	Alt/Az Goto	Available
32	Newtonian	4.5"	Meade	DS-114AT	Alt/Az Goto	Available
33	Schmidt-Cas	10"	Meade	LX90-AFCF	Alt/Az Goto	Reserved
34	Dobsonian	12"	Meade	Light Bridge	Alt/Az Manual	Available
35	Newtonian	4.5"	Meade	DS-2114	Alt/Az Goto	Available
36	Schmidt-Cas	8"	Celestron	Ultima 8	Fork Mount w/Wege, Tripod Motorized	Available
37	SCT	8"	Meade	LX200GPS	Needs Spreader & Handbox	Available
45	Refractor	4"	Tashihaki	106FSQ	Motorized German Mount AstroImaging	Available
49	Dobsonian	4"	Orion	Dobsonian	Table Top Dob - Easy to use	Available
Available For Purchase						
39	Black C8 OTA	8"	Celestron		OTA Only	\$250
41	SCT	14"	Celestron	C14 Classic	w/Wedge, and Tripod	\$1,200
48	SCT	12"	Meade	LX200 Classic	Az/EI Goto w/Tripod (no wedge)	\$1,200
50	Dobsonian	10"	Orion	Classic Dob		\$200
51	Dobsonian	12"	Oddessey	Red Tube Dob		\$250

Email: scopes@ssccorp.com with question or for details

Scope Pickups are on hold

SIRIUS
www.ocastronomers.org



ASTRONOMER
The Newsletter of the Orange County Astronomers

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