

SIRIUS ASTRONOMER

www.ocastronomers.org The Newsletter of the Orange County Astronomers

August 2021

Free to members, subscriptions \$12 for 12 issues

Volume 48, Number 8



Ian Grove framed the Milky Way behind the Star Chaser observatory at the OCA Anza site. The image was taken with a Canon EOS T6 camera and 50mm lens.

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, 6 August at 7:30 to 9:30 PM The topic this month will be the basics of astrophotography, presented by Kyle Coker	ONLINE
Club Meeting	Friday, 13 August at 7:30 to 9:30 PM "What's Up?": Chris Butler from OCA Main speaker: Dr. Shami Chatterjee from Cornell University who's talk will be "Into the Void with Voyager, Pulsars, and Fast Radio Bursts"	ONLINE
Open Spiral Bar	Saturday, 14 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 our activities. All in-person club events remain cancelled through at least the summer of this year. 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.

From the Editor

Sirius wants photograph submissions from club members

Sirius needs more picture and home-made project submissions from the club. The editor is running low !

Please send pictures to me along with a brief description of the subject, where the image was taken, and the equipment used. For projects made, send an email with a brief description and the editor will work with you to produce an article.

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>
September	21 August
October	18 September
November	23 October
December	20 November

President's Message

By Barbara Toy

One of the nice things about our club is the human element. Being around fellow astronomers makes viewing, attending talks, and all the other activities we indulge in for our hobby more interesting and fun - even dealing with equipment issues can be less frustrating when others are helping you find a good solution. Some of that sense of community comes through in our remote events, and I for one have been very grateful that we've had that option since the pandemic closed us down almost a year and a half ago, but it's not quite the same as sharing events in person.

During the sessions we've had getting the Kuhn telescope's new control system up and running, I've realized how much I miss those pre-Covid viewing parties we used to have at it. Actually seeing the telescope go to objects pretty accurately has been reassuring and fun, and having a chance to do some viewing as part of the process has been great. The whole experience was enhanced by the company of the crew who have dedicated themselves to getting the system going and making it reliable.

John Hoot, of course, was instrumental in getting the system installed and running, and was an important part of our initial sessions with the Kuhn after the installation. There were some significant computer problems, however, and Alan Smallbone has done a lot of work to resolve them and to come up with a checklist to make starting the system up and shutting it down easier. Trey McGriff has been part of the process with us, helping deal with equipment problems, install new monitors, install red screens on the new monitors and test things out along the way. We've had help from others, but these have been the central members of the crew that has gotten the Kuhn to the point that we can train Star Members on the new system and see the telescope back in regular use.

I'm happy to report that we had our first training session on July 17, which was slightly marred by the fact that the sky was mostly overcast and only the moon was visible through the clouds. We had started well before dark, which turned out to be good, as the clouds only got thicker as time went on. As a result, an unusual feature of this training was that it all happened before dark - by necessity. As we confirmed, you can get great views of the first quarter moon long before dark, particularly around the terminator. In spite of thunderstorms in the area and monsoonal weather moving in, we had steady enough skies that we were able to see a lot of detail in craters and other features in addition to going through the training with both of the night's trainees.

The human element came in with the fun of putting the telescope through its paces and testing the seeing under higher and higher magnification, with all of us enjoying the views in the eyepiece and comments from everyone there. Along with our regular crew, the "party" included Rick Wasson, who has regularly used the Kuhn for research for several years, and Dave Phelps, a returning member who was an active in the club years ago before he moved out of state and has now returned, rejoined the club, and is renewing his acquaintance with the Anza site and the Kuhn (for any members who remember him from the old days - I think he'd be delighted to hear from you). It was a fun party, even though all we could observe was the moon (the sunset was nice as well), and even though it ended in twilight as heavier clouds moved in and blotted out even the moon.

Given that we were all vaccinated and working in open air (a benefit of observatories with roll-off roofs), masks weren't needed, which was convenient. It's sad, this far into the pandemic, that we still have to worry about spreading the disease, but, with the current increase in cases with the Delta variant, it looks like it'll be a while before we can put these pandemic concerns fully behind us.

Getting the Sirius Astronomer Out...

There is a different type of human element involved in getting the Sirius Astronomer out each month, starting with the writing of the content and Dave Fischer's work as editor putting it all together and updating notices, etc., to produce the finished issue, which he then sends to the printer. Dave Kodama posts an electronic version to the website, and the printed copies are delivered to Charlie Oostdyk, who beside being designated as our Treasurer and Membership Coordinator, has assumed many other duties over his long years with the club. I would note that if he ever decides to pass the baton, I think it'll take at least three people to handle everything he's been doing for the club.

My understanding of his monthly process for the printed copies of the newsletter that are sent out as bulk mail was that he updated the membership list to be sure his mailing list was current, printed address labels, sealed each newsletter with three tabs per post office specifications (he has a device to help with that), put on the address labels, and then delivered them to the post office to be mailed out. It turns out that this last step is more involved than I suspected.

Well, it isn't enough that you just drop off bundles of addressed newsletters at the post office with instructions that they go out by bulk mail. Among other things, they have to be put in Post Office trays in order and not bundled. The trays then are slid into cardboard sleeves to keep the contents in place, with the information about the contents noted on the front.

The way I found out about this is that Charlie was moving these trays with the July issue downstairs to take them to the post office, missed the last step and, very unfortunately, broke his ankle. It was several days before he was able to let us know about it. Our first concern was for his health, yet his main concern at the time was finishing the job of getting the newsletters into the mail.

Fortunately, his fracture wasn't displaced, and will heal over time, but in the meantime he's on crutches. Although, being Charlie, he's resourceful and has worked out a way to carry some things via bags attached to his crutches, there is no way he can carry the long trays of newsletters while on crutches. He therefore ultimately had to rely on my inexperienced assistance to get the trays to the post office and properly processed.

As I learned, you don't go to the regular customer area of the post office when you have a bulk mailing, you drive through gates that I had thought were just for post office employees and deliver them to a very industrial looking back part of the post office that was previously unknown to me. The particular post office used for the club's mailings is the large facility on Susan St. in Santa Ana, and the back area gets a lot of truck traffic, which makes driving there more challenging.

The first step in delivering the bulk mailing was to get one of their special carts and load all of the trays properly oriented so they would be processed correctly. The cart was then pushed up a long ramp and left temporarily while we took a sample into the office for the next step in the procedure. On this visit, Charlie was also delivering a check to replenish our account; from the discussion, all the folks there seemed to know him. After they issued the documents for the current mailing, we went back out to the cart, had it weighed, were given a different label to put on the cart, and then pushed it to another location where it would be picked up later. Charlie had to accompany me through all the steps, which was a lot of tough walking on crutches for him.

Before this excursion, I had no idea what was involved in delivering one of our mailings to the post office. I know that, over the years he has handled the mailings, Charlie has refined the process to minimize problems in processing the newsletters, and if I had taken them in without his assistance, it wouldn't have gone nearly as smoothly.

Well, we all hope that Charlie will recover quickly and without complications, as crutches are no fun at any time, and neither is a broken bone. In the meantime, I appreciate the education on an area of club activity I knew little about. It has certainly given me more appreciation for what goes into seemingly simple processes, like mailing the newsletters. I won't say that it gives me any more appreciation of junk mail, but at least I know that those who send it have to go through a more complicated process to get it mailed out to me than simply putting them through a mail slot.

So, enjoy your newsletters as well as any stargazing you can get in, and I hope you all stay safe and healthy!

© Barbara Toy, July 2021

AstroSpace Update

August 2021

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

Hubble Space Telescope shut down all observations on June 13 because its payload computer stopped functioning. That computer controls all the instruments on board. Spacecraft controllers switched the telescope to use the backup payload computer, but that didn't work. Troubleshooting showed that the failure had to be in one of the other components that interfaces with the payload computer. After several trials, controllers switched to the backup command and data unit, and that fixed the problem. The failure was in the power unit within the command and data unit. Hubble was out of service for just over a month. The observations that were scheduled during that time are being rebooked for later times. Hubble has been operating for 31 years and has made 1.5 million observations. It was last serviced by astronauts in 2009, but such servicing is no longer possible since the Space Shuttles were retired.

Hubble Tension – Analysis to measure the expansion rate of the Universe, termed the Hubble Constant, by its effects on the Cosmic Microwave Background (CMB) has settled in on a value of 67 (km/sec/megaparsec). Measuring the expansion rate by determining the distances of Type Ia supernovas, and then measuring their expansion speeds by spectra has resulted in values around 74. Neither method should have measurement errors large enough to explain the difference. This disagreement has been termed the Hubble tension. A new paper by a team headed by Wendy Freedman recalculated the Hubble Constant using the supernova method and came up with 69.8. Previous supernova measurements have calibrated the supernovas with Cepheid variables, but this new paper calibrated them using the peak brightness of red giant stars. Maybe the new result is within measurement errors of the CMB result. That is, maybe the Hubble tension will go away. Interestingly, the Freedman team's previous work was some of the most convincing evidence for the higher Hubble value.

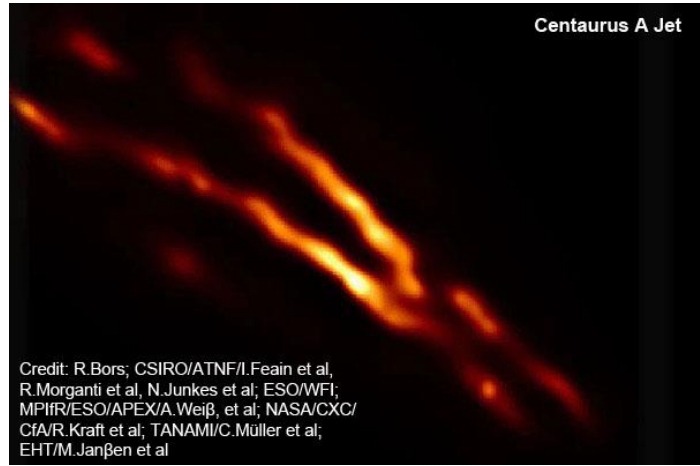
Cosmic Web – Astronomers have found that filaments in the cosmic web are spinning slowly about their long axes. This was measured by taking spectra of galaxies on both sides of 17,000 cosmic filaments and finding slightly more redshift on one side than on the other. The Millennium Simulation, a computer program that simulates evolving of the cosmos over time, had predicted that the filaments in the cosmic web should spin. The cosmic web is composed of huge filaments that connect clusters of galaxies.

Zodiacal Light – It has long been known that the Zodiacal Light, a faint wedge of light seen at dusk or dawn, is caused by sunlight reflecting off dust particles residing in a disk in the plane of the planets. Further, it was generally believed that such dust came from bumping of objects in the asteroid belt. The spacecraft Juno flew through the zone of the Zodiacal Light disk twice between launch and arrival at Jupiter. It recorded every time a dust particle collided with its solar panels. A new analysis of this data shows that very little dust was encountered in the asteroid belt, but much was found orbiting near Mars. So the source of Zodiacal Light dust appears to be Mars. Dust has long been observed lifting quite high in the Martian atmosphere during storms, but how the dust achieves enough speed to escape the planet's gravity is still a mystery.

Gravitational Waves – In January the gravitational wave detectors recorded 2 incidences, 10 days apart, of the kind of wave predicted to be emitted by the collision of a black hole and a neutron star. All previous gravitational wave detections have been of 2 like objects colliding, either 2 black holes or 2 neutrons stars, with one possible exception that is still being debated. The new detections were certainly from a black hole and neutron star, as their masses were firmly determined. Both collisions occurred somewhat under a billion light-years away. The first collision was a black hole with 9 times the Sun's mass consuming a neutron star with 1.9 solar masses. The second consisted of a black hole with 6 solar masses and a neutron star with 1.5 solar masses. Collisions between these unlike objects are predicted to be commonly detected with the level of sensitivity of the gravitational wave detectors on their next observing run, scheduled for summer of 2022. No light (of any type) counterpart was seen for either of these collisions, possibly due to their distance.

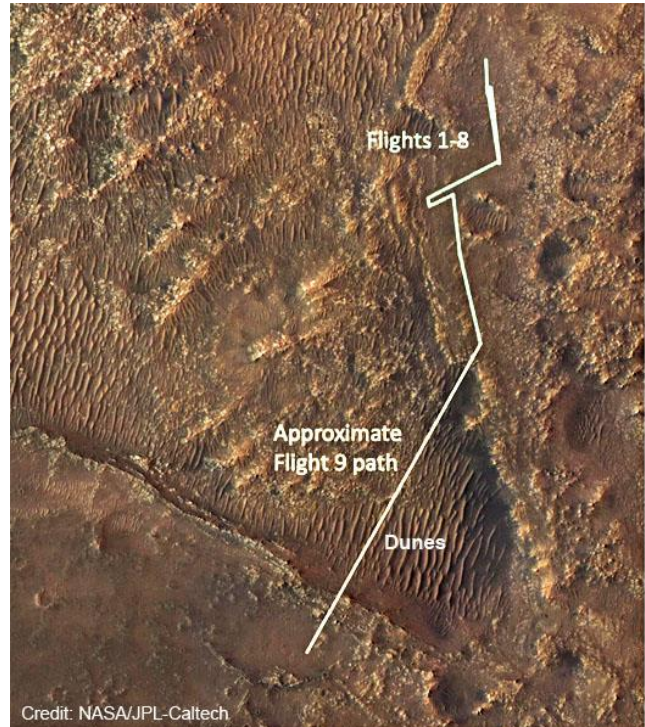
Planet Formation – A team of scientists used ALMA, a radiotelescope array in Chile, to study the young star named Elias 2-27. They found evidence of gravitational instabilities in the disk of material about the star, showing that instability plays a role in planet formation. The instabilities formed spirals within the disk. The gas in the disk was found to be asymmetric, which was unexpected. There is also a gap in the disk, which has yet to be explained. The star is under 400 light-years away in Ophiuchus.

Black Hole Jets – The Event Horizon Telescope (EHT), an array of 8 radiotelescopes scattered across the world, which produced the first image of a black hole 2 years ago, was used to image the center of the galaxy Centaurus A. Because of the size of the black hole in Centaurus A and its distance, the EHT did not achieve enough resolution to see detail of the black hole, but did resolve the bases of the jets being thrown out from near the black hole. The jets appeared hollow with brightly glowing edges. The image has 16 times better resolution than any previous ones of Centaurus A.



Martian Aurora – The Hope spacecraft, sent to Mars by the United Arab Emirates, has observed in ultraviolet light scattered areas of aurora on the Red Planet. The aurora does not concentrate at the magnetic poles like it does on other planets, because Mars long ago lost its planet-wide magnetic field.

Ingenuity – The Mars helicopter Ingenuity made 2 more flights in the past month. One of these set new records for the fastest flight (11 mph) and the longest in both time (166 seconds) and distance (2050 ft). It also for the first time scouted locations that the Perseverance rover might want to visit (fractures and boundaries between rock layers), and a location that the rover should not visit (a huge sand trap). It was the first time that the helicopter navigation system had to deal with undulating ground beneath it.

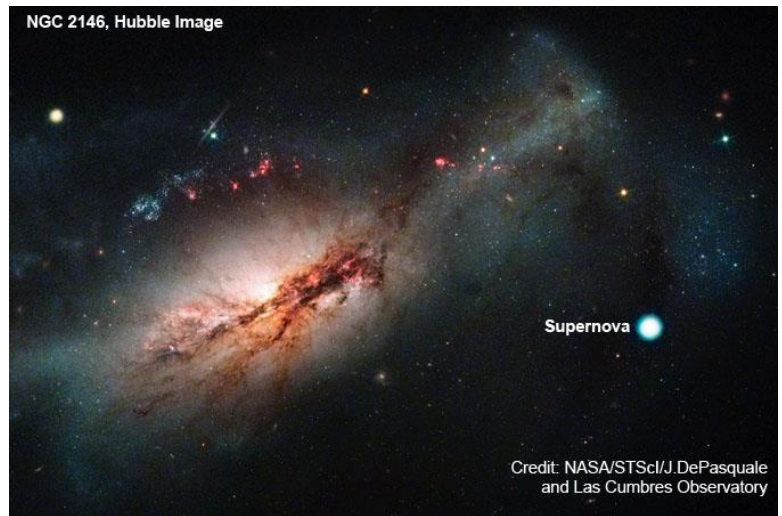


Martian Methane – For many years, various spacecraft have reported that they did or did not detect small concentrations of methane in the atmosphere of Mars. Measurements by rover Curiosity may have solved the issue. The rover sniffed for methane at various times of day and night and found that the methane was present only at night. It usually peaks near a part per billion. Indeed the best past detections had been made at night, and the most sensitive non-detections had been made in daytime. Additionally rover Perseverance was unable to detect methane, while rover Curiosity found it, so it appears to be location dependent, as well as time dependent. Now scientists not only have to explain what is emitting methane, but also how it is destroyed or dissipated in mere hours. More data is needed.

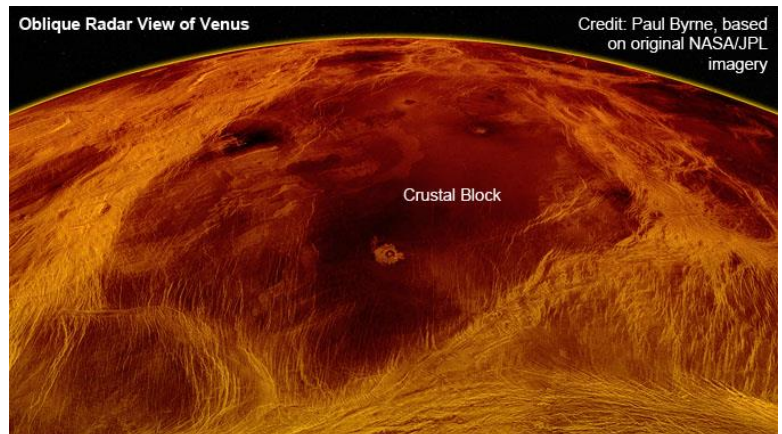
Most Massive White Dwarf – Surprisingly, the more massive a white dwarf star is, the smaller its diameter. A newly found white dwarf set the record for the largest known mass and for the smallest known diameter. It is 1.35 solar masses, and only about 1.2 times the diameter of our Moon. Most white dwarfs are roughly the size of the Earth, far larger than Moon-sized. The discoverers believe that this white dwarf reached this large mass when 2 smaller white dwarfs merged. If the result had been very much more massive, it would not have remained a white dwarf, but instead would have collapsed into a neutron star. When 2 white dwarfs merge, they get a boost in magnetic field intensity and in spin rate. This particular white dwarf has a magnetic field nearly a billion times as strong as our Sun and spins once every 7 minutes. This is near the white dwarf spin record of 5.3 minutes.

Inevitable Supernova – A team of astronomers monitored the light variations from a star known as HD265435 and concluded that it must be tear-drop shaped, pulled that way by a dimmer but massive companion star. Further observations showed that the companion is a white dwarf star with about the mass of our Sun, and the pair are so close together that they orbit each other in about 100 minutes. Eventually (about 70 million years) they will spiral together, and their combined mass is enough to cause a Type Ia supernova explosion. That is long enough in the future that the star will reach the end of its life and also become a white dwarf.

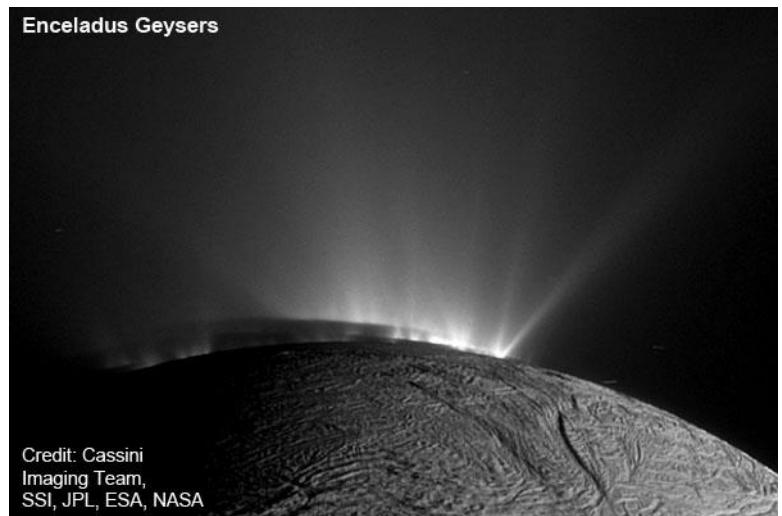
Unusual Supernova – Theorists have long proposed that stars about 8 to 10 times the mass of the Sun should, at the ends of their lives, collapse and explode as supernovas by a different mechanism than more massive stars. This has been termed an electron-capture supernova. Magnesium and neon atoms in the core capture electrons, thereby reducing the electron pressure in the core, resulting in the core collapsing into a neutron star, but exploding away the outer layers. New analysis of a supernova seen in galaxy NGC 2146 in 2018 shows that it had many properties predicted for an electron-capture supernova: the star was a super-asymptotic giant branch star, a particular type of red giant, before it exploded; it was between 8 and 10 solar masses; it had shed much mass before exploding; the shed mass was abundant in helium, carbon, and nitrogen, but with little oxygen; the explosion was weaker than normal; the light of the explosion lingered longer than typical; the remnant contained stable nickel but not radioactive nickel. Archived space telescope observations allowed astronomers to identify the star that later exploded, an unusual situation. The Crab Nebula, the remnant of a supernova seen in the year 1054, is likely an electron-capture supernova, but without nearly as much observational evidence, this is nowhere as certain as the 2018 supernova.



Venus Crustal Blocks – A new study of radar images of Venus found that parts of the lowlands consist of broken blocks of the planet's crust that have moved in a manner similar to pack ice on Earth. They are not like Earth's tectonic plates because they don't dive under (subduct) one another when they collide, nor do they build large mountains. However, there are places on Earth interior to continents where crustal blocks have been seen with motions that resemble these Venesian ones. The Venesian blocks are geologically very young, and their motion may have continued until the present. Scientists believe that Earth's crust during its early history may have broken and moved like these new observations of Venus, because the Earth's crust was thinner in the distant past.

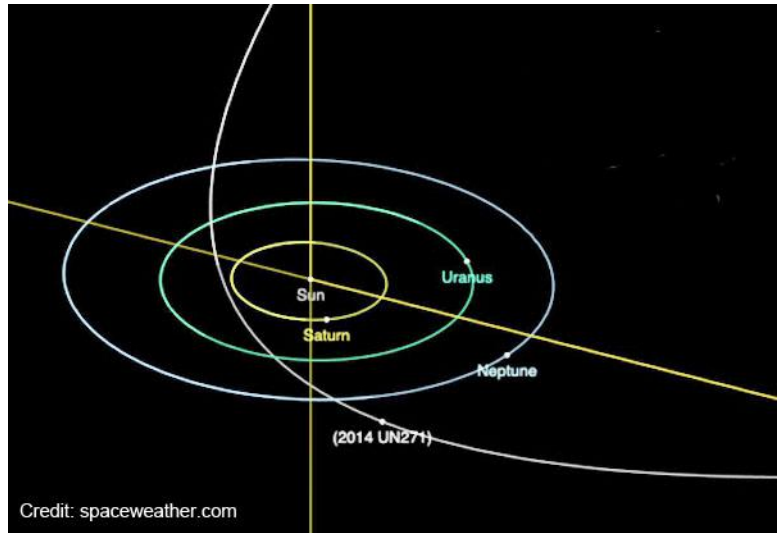


Enceladus Methane – New analysis of old Cassini spacecraft data detected methane in the geysers of material being thrown off by Saturn's moon Enceladus. Methane on Earth is generated by, among other methods, tiny organisms feeding off material spewing out of hydrothermal vents at the bottom of oceans. Enceladus is believed to have hydrothermal vents at the bottom of its ocean, but the scientists in this analysis are not ready to conclude that life is involved in the Enceladus ocean. More data is needed.



Jovian Moons – An amateur astronomer named Kai Ly has discovered a new moon of Jupiter, provisionally named S/2003 J 24. This is the same person who recovered some lost moons of Jupiter last year. The recoveries and discovery were made by searching publicly available images made by the 3.6-meter Canada-France-Hawaii telescope around 2003 by professional astronomers who discovered 23 moons of Jupiter. The amateur also used images made by a few other telescopes to find the object as late as 2018. There are probably a lot more moons of Jupiter to be found. Some really deep images taken last year of an area near Jupiter found dozens of new objects, but didn't follow up to determine their orbits. From this it was estimated that there are about 600 Jovian moons of at least a half mile size.

Large Comet – Astronomers have discovered what may be the largest known comet. It was at first given an asteroid designation, 2014 UN₂₇₁, but was declared a comet, designated C/2014 UN₂₇₁ (Bernardinelli-Bernstein), when a faint comet coma was found about it. Its orbit shows it came from the Oort Cloud, and will make its closest approach to the Sun (perihelion), near Saturn’s orbit, in 2031. Its orbital period is roughly 5 million years, and its farthest point from the Sun (aphelion) is about a light-year. Unfortunately the large perihelion will likely prevent it from getting very bright as seen from Earth. It is expected to reach only magnitude 17, unless it happens to outburst. From its brightness, it is estimated to be roughly 60 miles across, though different estimates vary considerably, both smaller and larger. It was discovered in archived images from the Dark Energy Survey, which maps galaxies over a large portion of the sky using a very wide-field camera on the 4-meter Victor Blanco Telescope in Chile. When found, the comet was somewhat inside the orbit of Neptune, the farthest distance at which a comet has been discovered.



New Solar Panels – Astronauts have begun replacing the solar panels on the International Space Station (ISS) in a series of spacewalks. The new panels are much more efficient in that they generate a little more power even though they are much smaller in area. The new design delivers the panels rolled up so that the astronauts unroll them during installation, while the old design unfolded accordion-like when they were deployed. The new panels are part of the plan to increase total ISS power in order to support the Artemis program to return to the Moon.

New Station Module – Russia launched a module called Nauka, which translates to “science”, to the ISS. At 22 tons and 42 feet long, it becomes the largest ISS module. It is to replace, in location, the Pirs module, which is being discarded into the Pacific Ocean. Nauka chiefly houses research facilities, but also adds a bedroom and toilet. It has its own oxygen and water recycling systems, and sports an external mechanical arm supplied by Europe.

Squid in Space – 128 baby bobtail squid were launched to the ISS as an experiment to determine how immune systems change during spaceflight. It is hoped that what is found will also apply to astronaut immune systems, which are known to change in space. Also 5000 tardigrades, microscope animals, were launched to understand how they adapt to extreme conditions of space.

New Lunar Missions – NASA has selected 3 new science packages to land on the Moon about 2024:

- Lunar Vertex, which includes a rover, that will investigate the magnetic fields in a lunar swirl;
- Farside Seismic Suite, which will measure moonquakes from the Schrödinger basin, near the lunar south pole;
- LITMS, also landing in the Schrödinger basin, to measure heat flow from within the Moon, and electrical conductivity.

Space Tourism – Richard Branson, founder of the Virgin Galactic spaceflight company, on July 11 rode along with 5 other crew members on the first flight with passengers of the rocket plane VSS Unity to a bit beyond the edge of space, which according to NASA is 50 miles altitude. The crew experienced a couple minutes of weightlessness, but the plane is not capable of anywhere near the speed required to achieve orbit. Not to be outdone, Jeff Bezos, founder of the Blue Origin spaceflight company, on July 20 rode his rocket New Shepard to above 62 miles altitude, which is the International definition of the edge of space. Along for the ride were Bezos’s brother, an 18-year old student from the Netherlands (the youngest person to ever fly to space), and Mary Wallace “Wally” Funk (the oldest person to fly to space). Wally was a member of the corps of women who trained as astronauts in the 1960s, but who never were given the opportunity to fly to space. Both companies plan to take paying passengers to space on a regular basis soon.

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	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"		

For Sale	contact	Ron Choi	rongrace2@cox.net	
•		Orion StarShoot AutoGuider	further reduced price	\$ 200

For Sale	contact	Jerry L Floyd	jlfloyd720@gmail.com	562-252-5666	
•		ZWO Electronic Filter Wheel, 7x36mm			\$ 850
•		Includes set of ZWO brand 36mm LRGB, S2, H-Alpha, O3 narrowband (7 nm) filters			

This item was originally purchased in May 2020. It has been used a few times (with a ZWO ASI1600MM camera) but is in virtually new condition. I am selling it because I replaced it with a filter wheel that accommodates my 7 1.25" Astrodon filters.

The cost of the items as purchased new from a vendor such as OPT would be \$299 for the filter wheel, \$199 for the LRGB filter set, and \$479 for the SHO filter set, a total of \$977.

I am willing to deliver in person to the OCA Anza site or other Southern California locations.

Magazine Subscriptions

Effective this year, the OCA will no longer be accepting renewals or new subscriptions to either Astronomy or Sky and Telescope. During the last few years the publishers have lost or been unable to provide timely processing of member subscriptions mailed to them. Both Astronomy and Sky and Telescope allow members to subscribe or renew on-line at the club rate anytime during the year and for multiple years. Astronomy also gives product discounts to club members.

Any subscriptions or renewals sent to the club will be returned to you.

E-mail Charlie@OCAstronomers.org for current on-line subscription or renewal information and instructions.

We Made It Ourselves – Pier Top Plate for AP-900 Mount

Made by David Fischer

Written by David Fischer

The project was to make an adapter plate to attach an Astro-Physics AP-900 mount to my pier at Anza.

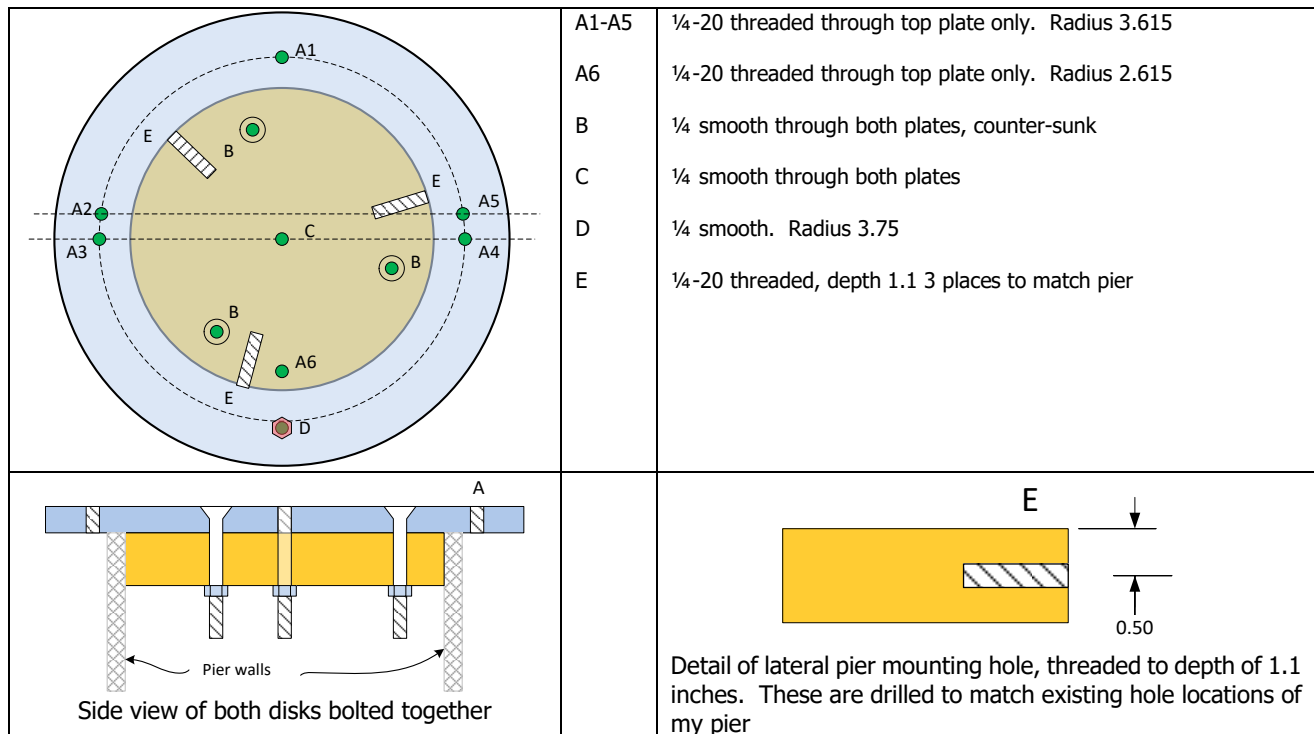
My pier is home-made from 6 inch schedule 40 steel pipe and there isn't any off-the-shelf commercial pier top plate available for it so a custom plate was needed from the start. I don't have direct access to a lathe and have not been able to find machine shops locally that were willing to fabricate parts for me so my design was constrained to what I could do with readily available raw materials, a drill press and hand tools.

The AP-900 mount has a 9 inch diameter base so the top of the pier plate needed to match that diameter and the pier has a 6 inch inner diameter so the bottom of the plate needed to have that dimension. At a machine shop, the usual solution is to take a thick metal disk and trim it on a lathe to have a 9 inch diameter top section and a 6 inch diameter lower section.

Lack of a lathe led to a 2 piece design using separate disks for these two sections made from pre-cut aluminum disks of selected diameters and thicknesses available locally at Industrial Metal Supply in Irvine. These bolt together to form the pier plate.

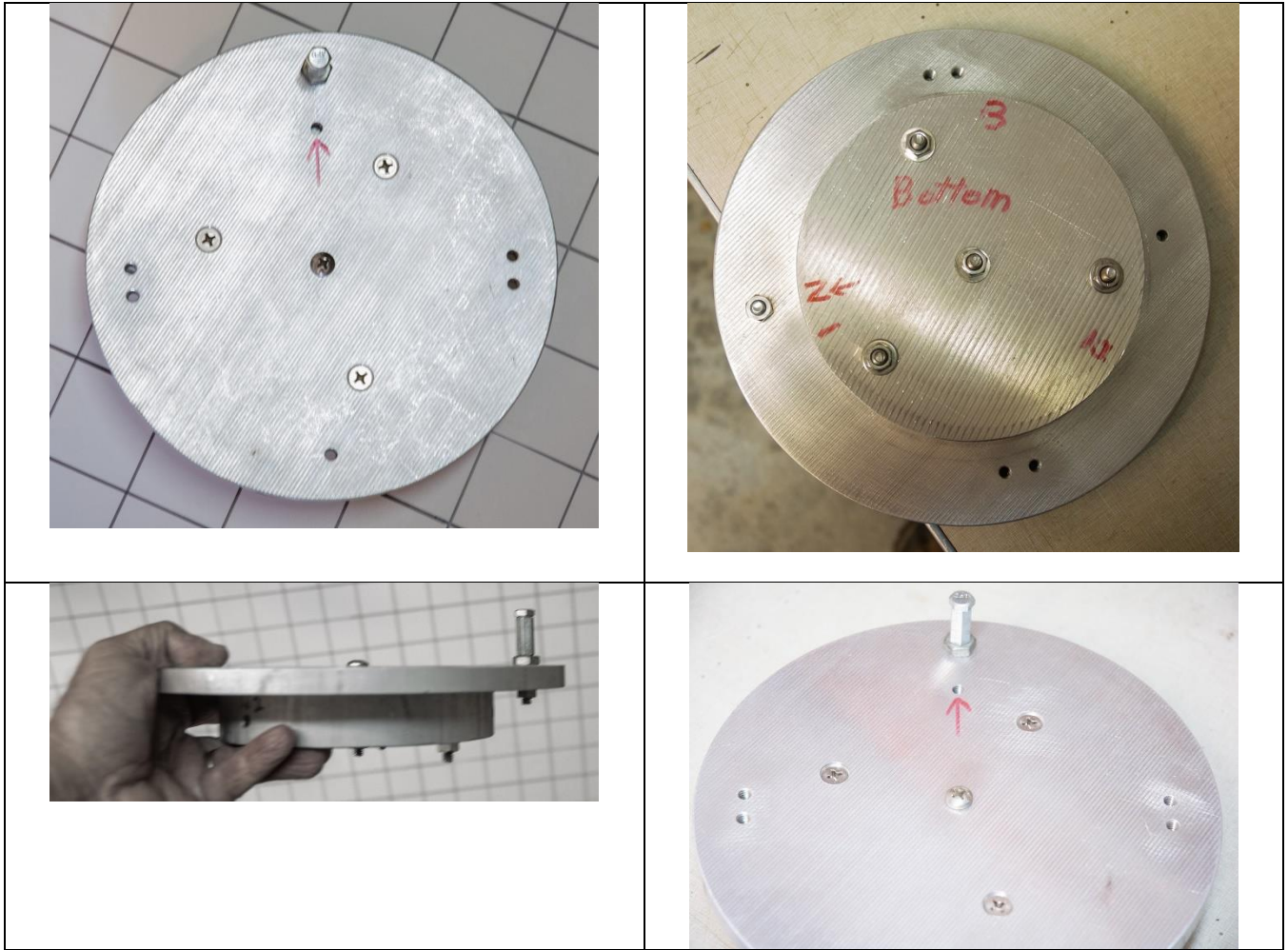
The bottom disk secures the adapter within the pier laterally and vertically by way of 3 horizontal screws through the pier. The pre-cut disk was just a little smaller than the inside of the pier so a little duct tape was wrapped around the bottom disk to snug the fit.

Top disk was drilled to match the needs of the mount's base and provides a central pivot point and an azimuth post for aligning the mount. To keep things simple, 1/4-20 screws are used throughout and threaded holes were employed only where required.



A sanding disk on a hand drill was used to flatten out the top side surface of the top plate so that the mount would not see any high points on which it could rock. The little corrugations seen in the images are residual from when the original disks were cut off a larger piece of bar stock at the metal shop. It turns out that they make a nice slippery surface for the mount to rotate on while still providing sturdy positioning when the mount retention knobs are tightened down.

The plate fit both the pier and the mount correctly when installed and my mount has been happy ever since.



Newsletter Delivery Preferences (Save A Tree)

The OCA Board of Trustees has always considered the mailed paper copy of the current Sirius Astronomer newsletter to be the most tangible asset of membership in the OCA. However, in our recent poll, 2/3 of members indicated they would prefer to receive the newsletter electronically. Electronic delivery will help the club cut down on expenses for printing and postage, as well as manpower and time. And the pictures are in color!

If you want to continue to receive the mailed paper copy, you do not need to respond to this notice. However, if you are annoyed that the newsletter arrives after the meeting, or too late for some of the time-critical events, you can pay for First Class delivery along with your next membership renewal.

If you are **already** receiving the newsletter via an electronic format, you will continue to do so, and do not need to respond to this notice.

If you are interested in receiving an electronic copy of the newsletter, below are the available options. Remember, if you do not respond, you will still receive the paper copy of the newsletter, delivered by USPS bulk mail.

1. Paper copy and E-mail with a link to the newsletter in PDF format
2. Only electronic delivery by E-mail with a link to the newsletter in PDF format

Please send an E-Mail to: Charlie@OCAstronomers.org stating your delivery preference. Please allow at least 2 months for your preferences to be updated.



ASTRONOMER

The Newsletter of the Orange County Astronomers

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

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

**DATED MATERIAL
DELIVER PROMPTLY**

RETURN SERVICE REQUESTED

CONTACT LIST

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

BOARD OF DIRECTORS

President
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
Mount Wilson Star Parties
Librarian
Membership / Anza Pads
Mount Wilson Trips
Observatory Custodian / Trainer / Member Liaison
Outreach
Sirius Astronomer Editor
Telescope Loaner Program
WAA Representative
Webmaster

Manuel Baeza
Don Lynn
David Pearson
Steve Mizera
Bob Nanz
Karen Schnable
Charlie Oostdyk
Michele Dadighat
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
mmpkb8@gmail.com
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
Bob Sharshan
Barbara Toy
Doug Millar

alan@ocastronomers.org
rsharshan@aol.com
btoy@cox.net
doug@ocastronomers.org