



M33 – the Triangulum galaxy imaged by Sam Pitts in September 2016. The picture was captured using ST10XME camera and 80mm TBM refractor.

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, 2 October at 7:30 to 9:30 PM The speaker this month will be David Pearson.	ONLINE
Club Meeting	Friday, 9 October at 7:30 to 9:30 PM "What's Up?": Alex McConahay from RAS Main speaker will be Marcel Pawlowski from Leibniz-Institute for Astrophysics "Dark Matter and the Dance of Dwarf Galaxies"	ONLINE
Open Spiral Bar	Saturday, 10 October 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 October. 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

As I write this, we are at the Autumnal Equinox, with just three months to go before we reach the Winter Solstice. It always amazes me how fast the sun seems to move to the south through this period, after its slow movement while it hung around at the northern end of its path and before it starts slowing as it reaches the southern end in December. Besides its progress against landmarks along the horizon, in our house we also tend to mark it by which windows it hits first in the afternoons – a practical effect of an astronomical phenomenon. Of course, seasons are practical effects of the same phenomenon as well...

Fire and Smoke

Speaking of seasons, it seems likely that the fire season will run longer than usual this year, as La Nina has been confirmed in the Pacific, which usually means dry conditions in Southern California into at least December. This news came after we had an early start to the fire season with an appalling array of fires in Northern California, Oregon and Washington, then two major fires closer to home, the Bobcat fire in the San Gabriel Mountains that has been threatening the observatories and adjacent antenna farm on Mt. Wilson and the El Dorado fire in the San Bernardino Mountains. Sadly, many homes and other buildings have been lost already, the death toll keeps climbing, and smoke from all of these fires has blanketed all of California and beyond.

While most of the reporting I've seen has concentrated on the fires in the coastal states, we're not the only states with fire problems. In fact, most states in the western United States have been having a bad fire season. As I write this, Utah, Idaho, Montana, Wyoming and Colorado all have multiple active fires, and Nevada, Arizona, South Dakota and Texas each have at least one significant fire, so fire-fighting resources are spread pretty thin. Besides the immediate impact of the fires themselves on the areas that are burning, these all affect air quality for hundreds of miles around them and all that smoke affects viewing conditions. So, in addition to checking on the usual forecasts for clouds and seeing, we in the astronomical community have learned to pay close attention to smoke maps in planning any viewing or imaging activities.

I hope none of you or your families or friends have been directly affected by any of the fires. And I hope that we will somehow get through the next couple months without more major fires, particularly in Southern California, but the chance of a major fire will be even higher as we get into Santa Ana season. This is a tough year all round – please stay safe, from fire as well as the coronavirus...

An Update on COVID-19 and the Club...

At this point, Chapman University is still closed and holding its classes remotely. The forecast right now is that we won't be able to resume having our general meetings on campus for the rest of 2020, and possibly for the rest of this academic year. Fortunately, Reza has been able to get us excellent speakers who are willing to give their talks via Zoom, and the remote version of our general meetings continues to be very successful.

If you haven't tried them out yet, please do – there's a link on the website that will get you into the meetings, and if you have any problems, help is available! Reza is the formal Zoom "host" for these meetings and Alan Smallbone handles the pre-meeting slide show so he can be available to help anyone who is having problems connecting – email him at reza@ocastronomers.org if you can't get on, or if you get on but have problems you should be able to send him a comment asking for assistance within the Zoom app. And I understand that Helen Mahoney has written a more complete article on our Zoom meetings that you should find in this issue of the Sirius Astronomer as well as on our website, and which should also give you more insight into how these meetings are working.

As I write this, the Heritage Museum of Orange County, where we generally hold our Beginners Class and Astrophysics meetings, remains closed, though they are hopeful that they will be able to reopen soon. The Beginners Class will probably continue online through the rest of the year even if the museum reopens.

We are hoping that the Astrophysics meetings will be able to start again at the museum once it reopens, as they have not yet been able to work things out to do them remotely. Please check the website periodically for updates, and information should also be posted to the email groups. If you have questions about the Astrophysics group and aren't on his email list yet, please contact Bob Sharshan, the coordinator, rsharshan@aol.com.

The star parties remain on hold, and Steve Mizera has advised me that OC Parks is unlikely to allow us to meet for a star party at our Orange County location through the rest of 2020. However, with that as with all of our events, even if we can get access to facilities, whether and when we go forward with in-person events will ultimately depend on our assessment what is best for the safety of our members and guests.

Our regular Outreach program, where volunteers go out to different schools for viewing sessions, is also on hold, probably through this entire school year. Cecilia Caballero, our new Outreach Coordinator, is working on some approaches for remote events in addition to the new Cosmic Adventures program – if you're interested in volunteering for this, please contact her at ceci@ocastronomers.org.

Board Election

This is the time of year when we get into our own election cycle for the Board for the upcoming year. We take nominations in October and November – please email Alan Smallbone if you want to run for a position (alan@ocastronomers.org). The deadline for the nominations is the end of the day of the November general meeting (November 13, 2020).

Ballots will be sent out with the December Sirius Astronomer and will be available online, voting by mail can be done any time from when the ballot is available through the day of the general meeting in January; actually, they will be accepted if they are postmarked the day of the January meeting or before, i.e. on or before January 11, 2021.

In a usual year, we have a ballot box where you can deposit your ballot at the January meeting, but it looks like casting paper ballots for this election will be entirely by mail. The Board is looking into possible electronic alternatives that might make it easier for members to vote and also allow us to verify that the ballot is from a member in good standing, not duplicative, and also maintain the anonymity of the ballot itself. If we find something that seems likely to work for us that we can get set up before the election, we will certainly be letting you know about it via the website, email groups, Sirius Astronomer and social media, and possibly by individual emails.

Whether electronically or by snail mail, please don't let the Coronavirus get in the way of voting. If you vote by snail mail, please mail your ballot in early, if you can. Instructions, including where to mail it, will be on the ballot.

The Board:

The Board is the governing body for the club and is elected annually. We have a total of eleven members, four officers (President, Vice President, Secretary and Treasurer) and seven general Trustees. To run for President or Vice President, you need to have served on the Board for a year, any year, not just the year before you decide to run, and you need to be a current member in good standing. For any of the other positions, you need to have been a club member for at least a year and to be a member in good standing at the time of the election.

Our regular meetings are every other month, starting in January of each year with the newly elected Board. Over most of this last year we've been having our meetings on Zoom, and that has been working so well that we will probably continue that way even after the virus is no longer a threat. They are set on Sundays, currently at 10:30 a.m., and we generally get through them within a couple of hours. All members are welcome to attend, which is also easier to do remotely – if you would like to attend any of these meetings (the next is set on November 15), please send Alan Smallbone an email and he'll send you the link when he gets it set up.

The issues we deal with are pretty much anything that affects the club – some that come to mind are repairs, new construction and other concerns for the Anza site, concerns with Chapman University, the Heritage Museum and OC Parks (for the general meetings, other meetings and the OC Star Parties, respectively), the website, our newsletter, member issues of different types, outreach, proposals for new ventures (such as the recently launched Cosmic Adventures program), club finances and insurance, and anything that could affect our operations or membership, such as the current pandemic. While some issues come up every year, such as weed clearance and road repair at the Anza site, every year it seems we have new challenges as well that keep things interesting.

While our main formal functions as Board members are to attend the Board meetings and take part in discussions of various club-related issues via the Board's dedicated email group between meetings, in general most Board members wind up volunteering for other activities as well. I think this is mainly because we find out about them through Board discussions, know something needs to be done, and are in a position to contribute. At the September meeting, for instance, Reza AmirArjomand, John Hoot and Cecilia Caballero volunteered to research possible approaches to electronic voting that would work for us, and Gary Schones volunteered to deal with an electrical problem on Jupiter Ridge (conditions at our Anza site would be nowhere near as good as they are without the work Gary has done there over the years); it should be noted that John previously volunteered to put in the new control system for the Kuhn, which he is working on currently, and we are very grateful for his efforts and the expertise he brings to this project.

I am happy to report that all of the members of the current Board have agreed to run again for the 2021 Board, but we would be delighted to have additional candidates on the ballot and hope you'll consider putting your name in.

Thank you to all of our members, who've continued to hang in there through this very difficult year, and I hope you're finding the modified versions of our regular activities interesting and maybe even something of a relief from the stresses of our current daily lives. I hope you all stay safe and healthy, and that we'll be seeing you regularly online until it's safe for us to meet again in person.

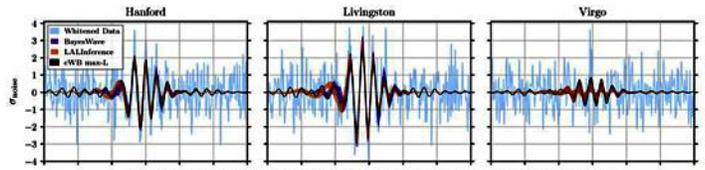
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AstroSpace Update

October 2020

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

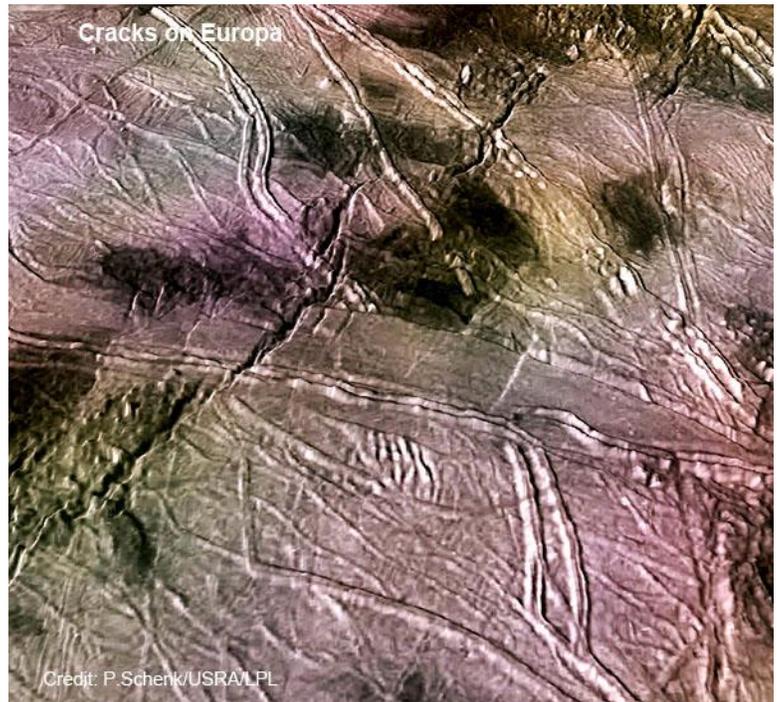
Most Massive Black Hole Merger – The largest black holes ever seen to merge were detected by the LIGO and Virgo gravitational wave detectors. The black holes were 85 and 66 times the Sun’s mass, and merged to form one of 142 Sun masses. The excess of about 8 Sun masses turned into the energy contained in the gravitational waves. The event occurred at a distance with a light-time travel of 10 billion years. The distance to it now is considerably more at about 17 billion light-years due to the expansion of the Universe that occurred while the gravitational waves were traveling to us. The amazing thing is not that this set records, but that astronomers don’t know how black holes can form with masses of 85 and 66. Based on the black holes LIGO and VIRGO have seen merging, it was thought that essentially all stellar-mass black holes are below mass 43. Theory supports this, as more massive stars than this, at the end of their lives are believed to turn into electron-positron pairs (called pair instability), which blows the star apart rather than collapsing to a black hole. As a result of seeing this new pair merge, the theorists are feverishly working on how black holes can form or grow to masses above 43.



Gravitational Waves, Largest Black Hole Merger
Credit: R.Abbott et al. (LIGO Scientific Collaboration and Virgo Collaboration)

Lunar Hematite – During much of every orbit of the Moon about the Earth, our satellite is outside the Earth’s protective magnetic field, and so is bombarded with hydrogen ions thrown off the Sun. This bombardment prevents metals on the Moon’s surface, such as iron, from forming oxides, including common iron rust. So it was a surprise when data from the Indian lunar orbiter Chandrayaan-1 showed hematite, a form of iron oxide, in several places on the Moon. New study shows that this has occurred because oxygen is being thrown off the top of Earth’s atmosphere and is hitting the Moon, particularly when the Moon passes through our planet’s magnetic tail. The water ice known to be found in certain areas of the Moon probably also takes part in the formation of the hematite. The places where the hematite was found support this explanation.

Europa’s Surface Moved – A study of the cracks in the icy surface of Jupiter’s moon Europa shows that the surface moved more than 70 degrees in latitude in relation to the rotation poles, sometime in the last several million years. The study used archived images from the Voyager and Galileo spacecraft. The cracks are formed in certain shapes and locations by tidal forces. The movement of the surface should cause other features that would be visible in higher resolution images, and so this theory can be checked by observations by the Europa Clipper mission, planned for 2024 launch.



Jupiter Moons – A couple of years ago, a search around Jupiter brought the total of its known moons up to 79. A new search, using a more sensitive technique, found 45 tiny objects near Jupiter that are likely moons. The technique used was to stack multiple exposures, offset by every amount a moon was likely to orbit in the interval between exposures. The stacking brings out even dimmer objects. The technique was applied to a series of 60 archived images taken years ago by

the CFHT telescope in Hawaii. Extrapolating from the area searched to the total region occupied by Jupiter moon orbits estimates that there are about 600 moons, most still to be discovered. The objects found range down to about ½ mile across. There could be far more moons smaller than could be detected. The astronomers involved do not plan to spend the observation time necessary to track these objects and verify that they are indeed previously unknown moons of Jupiter. However routine operation of the Vera Rubin Observatory will make observations that are likely to verify these and additionally cover the rest of the orbital zone. That observatory is scheduled to begin next year imaging the entire visible sky every few nights.

Andromeda's Gaseous Halo – A study was made of the hot gaseous halo surrounding the Andromeda Galaxy by means of spectroscopic observations of 43 quasars whose light shines through that halo on the way to us. These observations were made using the ultraviolet spectrograph on the Hubble Space Telescope. The gas is of such low density that there is no means to “see” that gas other than its effects on light passing through. The halo was found to have 2 nested shells. The outer shell is smoother and hotter than the inner. The halo stretches 1.3 million light-years toward us and as much as 2 million light-years in other directions. If the Milky Way's gas halo is of similar size, then the halos are bumping into each other already even though the collision of the galaxies themselves is about 4 billion years in the future. If we could see the Andromeda gaseous halo, it would appear to be by far the largest object in the sky, stretching about a dozen times as long as the star-filled part of the Andromeda galaxy. Studying this halo will help astronomers understand how such gas contributes to star formation and how it contains outflows from violent events in the galaxy.

Phosphine – Astronomers using 2 different radiotelescopes have found the spectral lines of the chemical phosphine in Venus's atmosphere in very small concentration. This would not be a discovery of much significance if not for the fact that most phosphine in Earth's atmosphere is emitted by living things. There are non-life processes that produce phosphine, but the astronomers involved stated that they did not know of a non-life process that would be likely to occur on Venus and would produce the amount of phosphine measured. There have been theories proposed that Venus in the distant past may have had oceans and climate that might allow microbial life to develop. Now the surface of Venus is far too hot, dry and acidic for life as we know it. There are theories that microbes could still live in the conditions found high in Venus's atmosphere where the temperature is reasonable. But there is little evidence to support either of these explanations. As is often stated, extraordinary claims (such as “life on Venus” would be) require extraordinary evidence, and that is not what this discovery is. There is probably little that scientists can do to find the source of the phosphine until we send new spacecraft to Venus with different instruments.

Dark Matter Halos – It is known that there exist halos of dark matter surrounding clusters of galaxies, and denser pockets of dark matter occur as smaller halos (subhalos) about individual galaxies. These have been detected by their gravity. They agree fairly well with computer simulations of how dark matter should clump over the life of the Universe. A new study examined dark matter in 11 very large galaxy clusters and found that there are many more or much denser subhalos than previously thought. The study analyzed the gravitational distortions of more distant objects (behind the galaxy clusters) seen in images taken by the Hubble Space Telescope. Also spectroscopic measurements of star velocities were made, which can be related to the strength of gravity there. Astronomers are trying to understand if they need to fix something in their computer simulations of dark matter clumping, or if they do not understand the properties of cold (slow moving particles of) dark matter.

Magellanic Stream Explained – The Magellanic Stream has long been known as a huge stream of gas ripped off from the small galaxies the Large and Small Magellanic Clouds. Gravitational forces from our Milky Way galaxy did the ripping. But computer simulations failed to explain the Stream's mass, about a billion Sun's masses, until now. Astronomers recently discovered that the Magellanic Clouds have a huge halo of warm gas surrounding them, and that halo supplies the quantity of gas seen in the Stream in simulation that includes that halo.

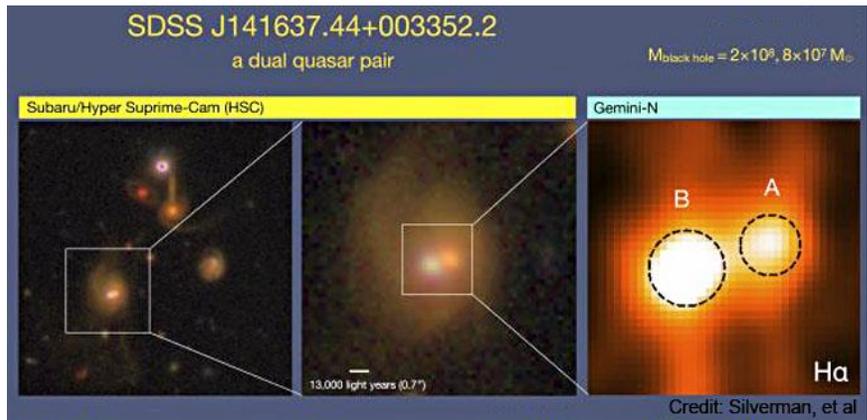
Nearby Supernovas – Scientists have found radioactive iron-60 in small amounts in sediments sampled from the bottom of 3 oceans. That iron was found only in layers that were deposited 8 million years ago and 3.2-1.7 million years ago. They are believed to have been caused by the Earth passing through the remnants of supernovas that exploded nearby. It was estimated that such supernovas would have occurred within 300 light-years of Earth, but not so close as to cause significant biological damage. The layer that lasted 1.5 million years would have required a series of supernovas, which could likely occur in a single aging star cluster. Both those time periods correspond to times when the Earth's climate cooled, so that cooling could also be an effect of supernovas.

Nearby Plasma Cloud – A few quasars are known that twinkle or flicker over periods of minutes. A few of those have been investigated and found to be caused by a plasma (charged particle) cloud in front of the quasar, far closer, at a few tens of light-years away. Recent investigation of another flickering quasar, known as J1402+5347, indicated a plasma cloud at 0.8 light-years away. That would put it in the Oort Cloud, the outermost part of our Solar System. Some of the flickering plasma clouds have been near hot stars that may have thrown off plasma. Clearly plasma in the Oort Cloud was not thrown off by a hot star. But other astronomers have disputed the distance to the newly found plasma cloud. More observations of more flickering quasars are needed to fully explain them.

Strongest Magnetic Field – Observations using Insight-HXMT (Chinese X-ray space telescope) of a pulsar known as GRO J1008-57 show that the magnetic field strength at its surface is roughly 1 billion teslas, the strongest ever magnetic field accurately measured. Accreting matter follows the magnetic field lines down to collide with the surface of the pulsar. The observations were made during an X-ray outburst in August 2017, but the magnetic field strength was just calculated.

Binary Supermassive Black Holes –

Quasars are powered by large amounts of matter falling into the supermassive black hole at the center of a galaxy. Because galaxies occasionally collide, there should be some quasars that have 2 black holes instead of one. Two black holes from 2 galaxies colliding will likely eventually merge, but for a time 2 should remain, particularly if a single accretion disk forms about the both of them. A new search found such a pair of black holes in a quasar. The search looked at 35,000 known quasars using the wide angle camera on the Subaru telescope in Hawaii. More than 400 of these merited closer examination, and only one of those was found to have a double black hole. Its components are of masses 80 million Suns and 200 million Suns. Making an approximation of how many may have been missed in this study, it was estimated that about 3/10 of 1 percent of quasars have a double black hole.

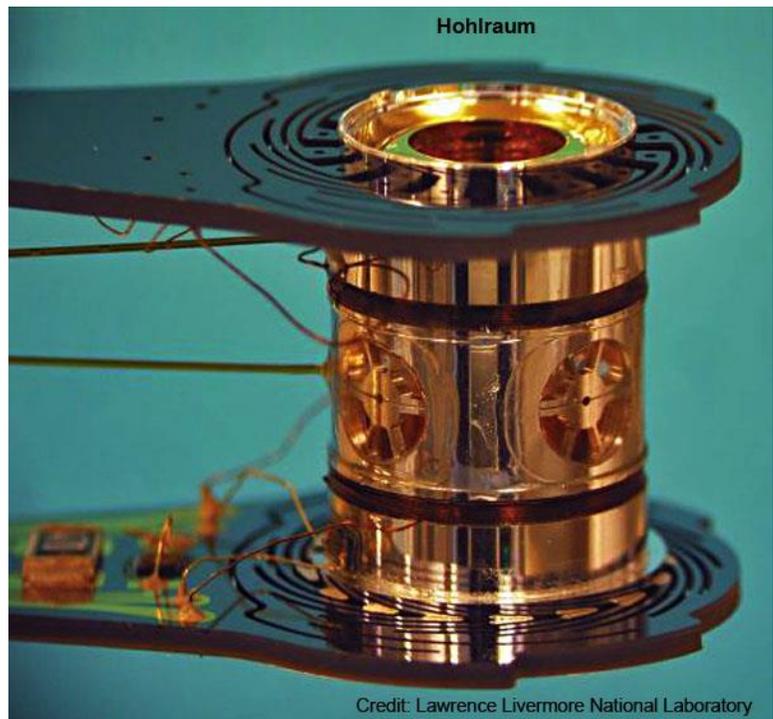


White Dwarf's Planet –

A Jupiter-sized exoplanet has been found closely orbiting a white dwarf star known as WD 1856, located about 80 light-years away. In order to get to white dwarf stage a star must pass through the red giant phase, where the star swells up and wipes out any closely orbiting planets. Hence the newly found planet must have been orbiting farther away during the red giant phase, then moved its orbit closer afterward. Because it is in a triple star system, it would be reasonable for the companion stars to disturb the planet's orbit closer to its star. What is harder to explain is how it moved closer to its star, but not too close, as that would tear it apart from tidal forces. The planet was found by TESS (planet finding space telescope), but has not been verified, so is technically still a planet candidate. It is about 7 times the diameter of its white dwarf star, though of far less mass.

White Dwarf Density Achieved –

A white dwarf is a star of roughly the mass of our Sun that has collapsed at the end of its life to about the size of Earth. This results in extremely high density. So high that scientists have been unable to reproduce such density in labs, until now. A device known as a hohlraum was made that squeezes a pellet of a carbon- and hydrogen-containing substance to 450 million times the pressure of our atmosphere and to 3.5 million degrees, while pummeling it with X-rays, creating a shock wave. So briefly it attains the conditions of a white dwarf. Prior to achieving this density, scientists had only been extrapolating what the behavior might be in this condition.



Stellar Elements Versus Planets –

Previous studies have shown that stars with very low amounts of heavier elements (heavier than helium) are unlikely to have exoplanets orbiting them. This makes sense, because planet cores form from those heavier elements that are left over from star formation in the form of a disk about the newborn star. A new study attempted to see if there is further correlation between elements found in a star and the presence of planets. The idea was that maybe a spectrum of a star would indicate if it was worth spending a lot of observation time looking for planets. No further correlation was found; stars with known planets did not have any significant difference in composition of elements. 16 stars with known planets and 68 stars without had their spectra taken with the Keck Telescope in Hawaii in this study. The scientists involved admitted however that this may not be the final word because many exoplanets are beyond current technology to find, so the sample of stars without planets may not have been accurately chosen.

OCA IN THE AGE OF COVID

By Helen Mahoney

We were only a couple of days away from our March OCA meeting when Chapman University (where we have held our OCA meetings for decades) announced that it was closing down due to the COVID-19 virus emergency. We did not have enough time to make other plans, so the Board sent out emails and posted a notice on our club webpage informing as many people as possible that the March meeting was cancelled.

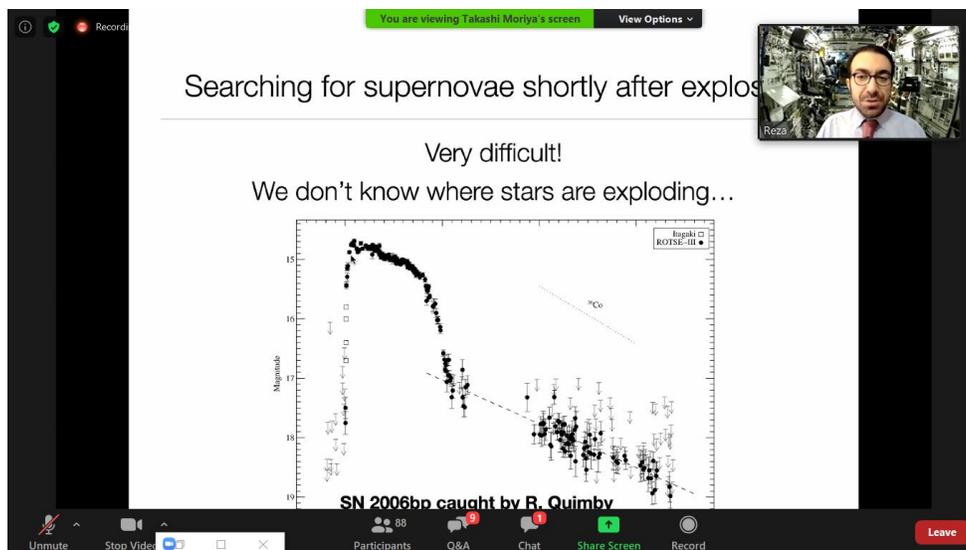
The next week, we had a scheduled Board meeting. Our Secretary Alan Smallbone looked into a platform we could use to do it virtually. He decided that Zoom was the one that would accommodate our needs best, and we had the Board meeting on Zoom. At that meeting, we decided we would try to do our next General Meeting on Zoom as well.

Our Vice President and Webmaster Reza AmirArjomand swung into action. He usually has speakers scheduled 6 months in advance. Some of them did not have the capacity to do lectures with the new conditions, and some were not comfortable yet with the virtual milieu. He had to do some creative scheduling shifts within a short period of time. There were also the technical aspects to work out in order to have all of the parts of a usual OCA meeting possible. It had to flow from the Announcements, to the What's Up, to the speaker, and to post-lecture questions seamlessly. We have a large club so we needed to accommodate a hundred or more meeting viewers. With the technical talents of Reza and Alan, we were able to pull it off!

By our April meeting, the virtual set-up was in place. Dr. Laura Danly of Griffith Observatory agreed to be our first on-line speaker. It went quite well. After the meeting, Dr. Danly supplied feedback to us. One thing she missed, she said, was seeing the reactions of the audience. So, we decided to have some of the Board members as "Panelists," who could be seen by the speaker during the presentation, and who could interact with the speaker before and after it. Attendees are muted for both video and audio; however, they can communicate through Chat, and ask questions with Q&A features.

May was a month in which some of the benefits of Zoom were realized. Reza had hoped for several years to get Dr. Carlton Pennypacker of UC Berkeley to be a speaker; however, for speakers not living in the Orange County area, we usually had to wait until they came to town on other business. But with Zoom, Dr. Pennypacker was able to give his presentation from Berkeley! The Panelist feature allowed us to interact with Dr. Pennypacker, and that sharing of ideas culminated in the new Cosmic Adventures program for OCA members.

Each month, the meetings have been improved upon. The pre-meeting slide show begins at 7:00 pm, with beautiful astrophotos and important information, as usual. It has been accompanied by music, including Holst's *Jupiter* and live music by Doug Millar on guitar and Kim Kanahale on harp. And, as usual, the Announcements and What's Up presentations precede the main speaker. Our speakers and attendees have commented on how professional our Zoom format is (a reflection of Reza's hard work and expertise).



September's meeting really showed what we can do with Zoom meetings. Our main speaker, Dr. Takashi Moriya spoke to us from Tokyo Japan! It was Saturday morning for him. Not only was our speaker from out of the country, but through the Chat feature, some of our 124 attendees told us they were viewing the meeting from countries like India and Australia. Some of them had heard of OCA through Global Hands On Universe, one of the Cosmic Adventures connections.

In addition to our international participants, joining us were several OCA members who had moved out of the Orange County area. They commented on how nice it was to partake in an OCA meeting again.

The Zoom meetings have been such a success, that the Board is considering having an on-line option for participating, even when we are able to get back to holding our meetings at Chapman University. That way, those who are able to show up to Irvine Hall can do so, and those who are out of state, or out of the country, can check in with Zoom. It's a great way to keep our OCA family connected.

* * *

If you haven't attended one of our virtual meetings yet, it is very easy to do so. Go to the OCA website, click on "View Meeting Info". You will see a link to register for the next meeting, and then you will receive an email with the link to join.



Friends,

If you have ever asked yourself, "could my observations have scientific value?", then you should consider participating in the upcoming Annual Meeting and Workshops of the American Association of Variable Star Observers. These will be online meetings, so no travel is required. AAVSO is committed to delivering quality events, celebrating AAVSO science, discussing observing techniques, and sharing exciting news on variable stars. Mark your calendars, online registration is now open at: <https://www.aavso.org/aavso-109th-annual-meeting>.

1. [109th AAVSO Annual Meeting](https://www.aavso.org/aavso-109th-annual-meeting): November 13, 14 & 15

Two additional special events this year are:

2. [AAVSO Spectroscopy Workshop](https://www.aavso.org/asw2020) : October 31, November 6, 7, & 8
(separate registration required: <https://www.aavso.org/asw2020>).
3. [AAVSO Data Mining Workshop](https://www.aavso.org/2020-data-mining-workshop): November 1
(separate registration required: <https://www.aavso.org/2020-data-mining-workshop>).

If you wish to give an oral or poster presentation at the Annual Meeting, AAVSO is now accepting abstracts; please go to <https://www.aavso.org/2020-abstract-submission> to submit your abstract by September 30.

Best wishes--clear skies,

Bob Buchheim

AAVSO Board Member

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	
<ul style="list-style-type: none"> • 20" F5 Research grade early Coulter mirror and secondary mirror • Primary mirror is 2 3/4" thick, Secondary is 4" x 5 5/8" 				\$2800

For Sale	contact	Ron Choi	rongrace2@cox.net	
<ul style="list-style-type: none"> • Orion StarShoot AutoGuider • Orion Mini 50mm Guide Scope • Baader Planetarium Classic Ortho 6mm eyepiece • 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 				\$240 \$ 60 \$ 50 \$300

For Sale	contact	David Fischer	Leyes-Fischer@cox.net	
<ul style="list-style-type: none"> • ATS Portable Pier, 8 inch diameter • 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 				reduced price \$1,500



OCA Youth Group

New Opportunity- International Astronomy Club

From Doug Millar

By the time you read this we will have a new opportunity for our OCA younger members and friends.

Along with Cosmic Adventures we have also been invited to participate in an international youth astronomy club for 10 to 18 year-olds. This club is a joint sponsorship of clubs from USA (our club), Chile, Uganda, Kenya, and Iran and is just now getting organized. That is the list so far. Participating clubs will be doing remote imaging as well as local eyepiece astronomy and sharing their ideas and images with the other clubs. The group will meet on Zoom about once a month. Other clubs from all over are also welcome and we have heard that groups in Nepal and Australia may join. We will also meet by ourselves to see what we would like to do.

If you would like to participate and meet other astronomers who are your age, or even if you just have questions, please contact Dr. Millar at doug@ocastronomers.org. Once you email me, I will keep you up-to-date via group email. Doug

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.

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

Scope Pickups are on hold

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>
November	24 October
December	21 November
January 2021	19 December
February	23 January

SIRIUS

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