SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

September 2020 Free to members, subscriptions $12 for 12 issues **Volume 47, Number 9**

NEOWISE C/2020 F3 taken by Bill Warden from the Mojave desert on 21 July 2020

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, 4 September at 7:30 to 9:30 PM ONLINE The speaker this month will be David Pearson.
Club Meeting	Friday, 11 September at 7:30 to 9:30 PM ONLINE "What's Up?": John Garrett from TVA Main speaker will be Takashi Moriya from National Astronomical Observatory of Japan: "Uncovering the Death Throes of Massive Stars Through Supernovae"
Open Spiral Bar	Saturday, 12 September at 10:00 to 11:30 PM ONLINE Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face.

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 September. 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

Continuing to cope with COVID-19…

As I write this in August, Orange County is hoping that it has brought the rate of new coronavirus infections and hospitalizations down enough that it will be taken off the state's "watch" list. That would be a nice sign that things are moving in the right direction here, pandemic-wise, but doesn't mean that we can relax our vigilance. Unfortunately, it doesn't look like that will be possible until we have an effective vaccine, so masks, sanitizers, social distancing and regular hand washing will be a continuing part of our daily lives, probably well into 2021. On the brighter side – those measures should also reduce transmission of whatever influenza viruses circulate this year, so maybe most of us will escape getting the flu this year. That would be nice, but I'll be getting my flu shot anyway as a bit of insurance.

As to club activities, Chapman University recently informed us that they don't expect that any groups, including ours, will be allowed to meet on the Chapman campus through at least the end of the year due to the pandemic. Their first priority, of course, is their students, faculty and others that work at the campus, and their website has reflected their ongoing efforts to meet their educational goals safely in the current pandemic, with changes as needed to meet changing circumstances. Per their website, they ultimately decided to start their fall semester entirely remotely and the campus is closed while they continue working on ways to resume at least some activities on campus safely. We'll continue to monitor what is going on there and will let you know when we can resume our in-person meetings, though, of course, that would be with our own assessment of what we can do safely.

Zoom Meetings

Our monthly meetings via Zoom have been going very well, mostly due to Reza's ongoing efforts to get us good speakers as well as everything he's been doing as host of these meetings (a lot of it behind the scenes) to have them go forward smoothly (for those who may not be aware, Reza is our current and very capable vice president as well as webmaster). Our first Zoom meeting was in April, and every meeting since then has had more people attending. By July we had more than the 100 attendees we were allowed; the excess was transferred to YouTube, where the meeting was also being broadcast live, so they weren't lost, but it was harder for them to submit questions for the speaker or anyone else, so that wasn't an ideal solution. To avoid this, the Board decided to upgrade our Zoom plan so we can now have up to 500 attendees.

This means that we should have plenty of space for all of you who want to attend and anyone you want to invite – and, if we go over 500, there still is YouTube to catch any who can't get into Zoom (we don't anticipate going over 500, though). Our meetings have always been free and open to the public as part of our activities as an educational non-profit, and that continues with our Zoom meetings.

If you haven't attended any of these yet, please give them a try – you'll find the link on the club's website (click on the button for "View Meeting Info" on the home page, and then click on the "website" link that's the last entry in the column under "Details"). You should be able to attend by smartphone or tablet, if those are better options for you than by computer. The meetings are on the same days and at the same time as our regular meetings – second Friday of the month, with the meeting formally starting at 7:30 p.m. Pacific, and with the slideshow of announcements and pictures starting at 7:00 (courtesy of Kyle Coker, who has been putting these together for at least the last couple years).

I'm not sure what people who sign in before 7:30 actually see (for these meetings, those of us who have any kind of speaking part sign in as "panelists" and I'm told our screens are different), but it seems attendees can ask written questions of the panelists, individually or as a group. If all goes well, we'll have a sound track running with the slideshow, but sometimes that hasn't worked out, so if you don't hear any sound with it, that's probably something at our end and not a problem with your equipment.

Credit should also be given to a number of people who help make these meetings a success: Sam Saeed, who puts the slideshow for the club announcements together, Doug Millar and Helen Mahoney, who always seem to be stepping in when things are needed or with additional ideas, Cecilia Caballero and crew, who help with the announcements, Kyle, who has been very capably handling most of the announcements at the meetings, and Alan Smallbone, who helps on some of the technical aspects and runs the pre-meeting slideshow so Reza can deal with

any issues people have signing in, etc. It's quite a collaborative effort, and they all make my job at these meetings really easy – all I have to do is show up, make some introductory comments at the start of the meeting, and then sit back and enjoy it!

While in the Zoom meetings we don't have a way for Charlie Oostdyk to have a digital equivalent of his usual table at the in-person meetings, where he takes care of all kinds of club business with members. He's still there, though, taking care of business and lending a hand where needed – another important part of the collaborative effort. If you have some business you would normally transact with him at one of the regular meetings, please contact him by phone or email (his information is on the Contacts page of the website or the back of any issue of the Sirius Astronomer).

Open Spiral Bar

For astronomy enthusiasts who miss the socializing that is an important part of our in-person meetings, Reza came up with a new event, the "Open Spiral Bar," generally on the Saturday after the General Meeting at 10:00 p.m. Pacific (I'm putting the zone in because we've been having people attend our Zoom meetings from other time zones, which is really great).

These are generally pretty unstructured gatherings, but often there seems to be a theme – for the August Spiral Bar, it was Comet Neowise, and we got to see a lot of different pictures people took of the comet from different locations, with different types of equipment and different ways of processing them, so there was a lot of astronomical eye-candy as well as good information and interesting stories of challenges people had getting their pictures. Not that the conversation was limited to the comet – it went in a lot of different directions the way conversation does during a good social event.

All are welcome at the Open Spiral Bar (bring your own beverage and snacks), and you can get to the link through the calendar on the club website or through the link at the bottom of the General Meeting information page (click on "Open Spiral Bar" and that will get you to the page with the link).

Beginners' Astronomy Class

Dave Pearson is continuing to hold the Beginners' Class via Zoom as well, and if you or anyone you know would like to join him for it, the link is on the calendar or through the link at the bottom of the General Meeting information page. These are scheduled on the first Fridays of the month at 7:30 p.m., so the next one will be September 4, 2020.

September marks the first session of the new cycle of classes. There are six sessions per cycle, but they are independent of each other, so you could start with any of the sessions, or attend sessions on the topics that most interest you. The first is a general overview of astronomy – a lot to cover in two hours, but Dave manages to do it. The second session is on basic information on equipment, including binoculars and telescopes, the third is on how to find what's up in the sky, the fourth is on the science behind telescopes, the fifth is usually the "Bring Your Telescope" class for assistance in setting up and using a telescope, and the sixth is an introduction to astrophotography (usually given by Kyle Coker).

We usually hold the Beginners' Class at the Heritage Museum, but unfortunately it is still closed to the public and we don't know yet when it will reopen. The Zoom classes are going well, though, and Dave may decide to continue with them even if we can get access to the facilities again. Please check the website for updates – and this would be a good time for anyone you know who would like to get some systematic training on the basics of different aspects of our hobby but who would have a problem attending it as an in-person class to tune in to the class.

In General

2020 has given us some major challenges, and it has been good to see creative ways people have used technology to allow significant aspects of our lives to continue in spite of the limitations from the pandemic. Those of us in professions that can do things by conference calls or video links, such as law or teaching, have seen a lot of experiments and changes in approaches since March, and there seems to be steady improvement over time as people figure out how best to work with what's available and as different platforms change to deal with different problems. Those innovations can give us new options for the future, and I expect we'll see many of them continue in use even when things are closer to normal, particularly where they are more efficient or allow more options than the old way of doing things.

Within the club, we've already been talking about how we can keep the benefits we see from our Zoom meetings even after we're able to resume them as in-person events, such as having access to interesting speakers who would generally not be able to attend our meetings in person and having club members attend who couldn't be there in person. There will be a number of technical details to work out when we're able to use Chapman Auditorium again, but we're hoping we'll find a way to use Zoom to essentially livestream meetings for those who can't be there, and – my own hope – to allow Reza to continue to participate directly and to see the incredible speakers he's able to line up for our meetings himself.

We've now had three Board meetings by Zoom, and that has been working so well that everyone on the Board agrees that we should continue holding these meetings by Zoom indefinitely. Aside from saving the more remote board members a lot of travel time, it saves us from the hassles of finding places where we can hold the meetings in person, makes it easier for club members to attend, and allows Board members who are out of the area to attend. We haven't really seen any down side to meeting remotely, and we're still able to get in a bit of socializing… If you'd like to attend any of these meetings, please contact our club secretary, Alan Smallbone.

Although there may be some long-term benefits from these different activities, their main purpose right now is to reduce the spread of the virus and keep as many people as possible safe from getting it. We're definitely in favor of that, and we're particularly concerned about the safety of our club members and their loved ones. Unless we're told, we don't have any way of knowing if any of you or anyone close to you has become infected so for any of you out there who are dealing with the illness, I'd like you to know that I'm really sorry, and hope you get through it quickly and without long-term problems.

I see the sad numbers of ongoing deaths and know every one of the people making up those statistics was a vital individual who left a grieving network of family and friends. If any of you are among the family or friends of one of those the virus has taken – I'm so very sorry for your loss. Unfortunately, there isn't much more I can say that would be meaningful in times of such grief, but I am sorry, and I wish you and your loved ones brighter days ahead.

May you all continue to stay safe and healthy in these difficult times.

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

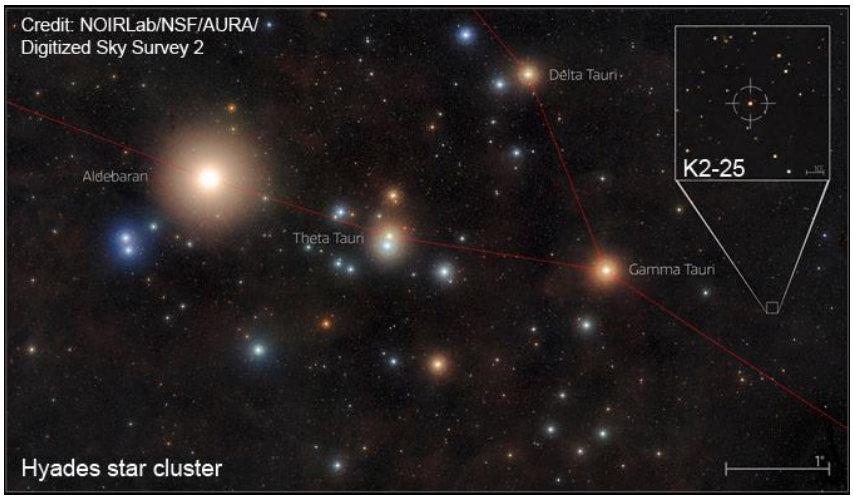
Scope Pickups are on hold

AstroSpace Update

September 2020
Astronomy and space news summarized by Don Lynn from NASA and other sources

Amateurs Find Exoplanet – A team of amateur astronomers searching to discover exoplanets has announced finding a Saturn-sized planet (actually planet candidate until confirmed) orbiting the red dwarf star Gliese 3470, about 100 light-years away in the constellation Cancer. Its year is 66 Earth days. This puts it in the star's habitable zone, that area where temperatures may allow liquid water to exist on the planet. This will be the first exoplanet found by an entirely amateur astronomer team if confirmed. It was found by observing its transits in front of its star. Other probable transits were observed, but no pattern to them has yet been found, but this likely means there are more planets in this system to be found. There is already one previously known planet, which is Neptune-sized, orbiting much closer to that star.

Dense Exoplanet – Observations have found an unusually dense exoplanet orbiting a star in the Hyades open star cluster. It is known as K2-25b, and is slightly smaller than Neptune, but about 1.5 times as massive. This is reminiscent of a planet announced about a month ago named TOI 849 b, also of unusually high density. In both cases, astronomers have to figure out how a gas giant can form without much of its gas, or else how a gas giant can later lose much of its gas. K2-25b orbits a red dwarf star every 3.5 Earth days. The star and planet are young, only about 600 million years, and are located about 150 light-years away.



Exoplanet Found By Radio – An exoplanet, dubbed TVLM 513b, has been found using radio observations for the first time. Those observations were made using the VLBA, an arraying of radiotelescopes spread across the North American continent. This huge telescope size allows extremely precise resolution, which enabled tracking the host star's movement in the plane of the sky. The gravitational tug of the planet causes the star to trace a tiny ellipse in the sky. This method of finding planets is known as the astrometric method, and has rarely been used successfully due to the extreme precision required. Previously it was used with visible light, not radio. The planet is about the mass of Saturn, but its orbit is about the tiny size of Mercury's. It orbits a tiny red dwarf star about 35 light-years away, taking 221 Earth days per orbit. Giant planets at tiny stars are somewhat rare.

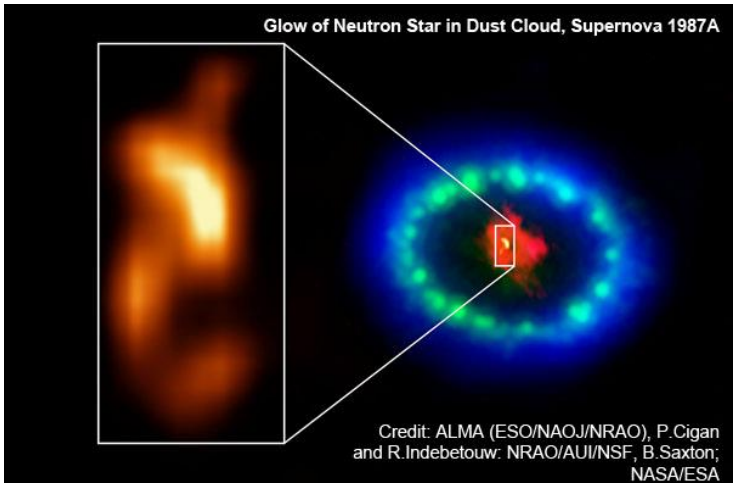
Unusual Magnetar – A star has been found to be emitting a unique variety of radiation, including X-rays and short, powerful radio bursts. It is a known magnetar, that is, a neutron star with an extremely powerful magnetic field. The radio bursts observed resemble the mysterious Fast Radio Bursts (FRBs). All prior FRBs ever seen originated outside our galaxy, while this magnetar is inside our Milky Way. Further observation of this object may prove that the as yet unknown source of FRBs are actually magnetars. However, no X-rays have ever been observed from the same source as an FRB, so the situation may not be that simple.

Misclassified Black Holes – Black holes found in the X-ray version of the Deep Field South image were studied by multiple telescopes using multiple types of light. This study found that many black holes have been misclassified. In particular many black holes thought to be showing little activity, that is, little material is falling into them currently, were actually quite active, but heavily obscured by dust and gas about them. The black holes chosen for study were all more than 5 billion light-years away. There were already 67 known active but obscured black holes, and the new study found 28 more that had been misclassified. This implies that several fields of study related to black holes need to adjust their numbers, such as growth rates of black holes in the early history of the Universe, amounts of gas and dust around such black holes, and the contribution of black hole X-rays to the cosmic X-ray background.

Unusual Pulsar Found – Pulsars have been placed in 3 classes according to what powers their pulses:

1. Rotation-powered: usually pulse in radio
2. Accretion-powered: pulse in X-rays emitted by the spots where material pulled from their companion star (accreted) hit the pulsar
3. Magnetically-powered: magnetars that pulse in X-rays and gamma rays

Observations of a recently discovered very young pulsar known as Swift J18180-1607 don't fit these classes. It is a magnetar, yet also emits in radio. Its quiescent brightness (between pulses) is unusually low. It may differ from previous pulsars because it rotates faster than any other known magnetar, at 1.36 seconds per rotation.



Neutron Star Found – Ever since the supernova was seen to explode in the nearby galaxy the Large Magellanic Cloud in 1987, astronomers have been looking for a neutron star expected to be left by this explosion. The detection of neutrinos from the explosion back in 1987 indicated that this supernova should have produced a neutron star, not a black hole. Two teams of astronomers using the ALMA radiotelescope array have just announced that they have found a hot object there that fits what is expected for such a neutron star, at least if there is a cloud of dust blocking a clear view. Astronomers hope that the dust will dissipate in future years, eventually allowing a direct view of the neutron star. It is likely not a pulsar, that is, a neutron star with a rotating beam. This would be the youngest known neutron star, as the last supernova close enough to produce a neutron star that could be seen occurred about 330 years ago.

Globular Cluster Torn Apart – A team of astronomers has identified a stream of stars near our Milky Way galaxy in the constellation Phoenix and determined that it was a globular cluster before a close pass by our galaxy about 2 billion years ago tore it apart gravitationally. The concentration of heavier elements (everything heavier than hydrogen and helium) in the stream was found to be lower than any other globular cluster that orbits our galaxy. It will take adjustment of globular cluster formation theory to explain this low concentration.

Aluminum-26 – Many years ago it was shown that calcium-aluminum-rich inclusions (known as CAIs) found in many meteorites had originally formed with substantial amounts of aluminum-26, a radioactive isotope of aluminum. This was believed to indicate that a supernova or the stellar wind of a massive star had blown aluminum-26 into the nebula about the forming Sun. No other source of substantial amounts of aluminum-26 was known. New research shows that cosmic rays striking a protostellar disk also create aluminum-26 and that forming stars create cosmic rays. Does that mean that a supernova or massive star with strong stellar wind did *not* occur just before the Sun and its planets formed? No, there is other evidence for a supernova at that time, such as iron-60 found in meteorites. Astronomers still believe a supernova happened nearby just before the Sun formed, but the Sun itself added to the aluminum-26 from the supernova. This may change the time scale for newly formed planets and moons to cool, since aluminum-26 radioactively decaying was a substantial source of heat when those bodies formed.

Ocean at Ceres – Astronomers working with archived data from the Dawn mission have concluded that an ocean, or at least fragments of an ocean, exists beneath the icy surface of Ceres. That asteroid has more water than any other body in the inner Solar System except Earth. But before the observations up close by Dawn, everyone thought that all that water had frozen eons ago. The new conclusion was based on surface features that appeared to be formed by leaking water and on variations in Ceres's gravitational field. The astronomers believe that the ocean must be very salty and that hydrate chemical compounds must have formed that conduct heat poorly in order to have postponed the asteroid from freezing throughout. The best estimates are that liquid water stretches for hundreds of miles parallel to the surface and roughly 25 miles in depth.

Waves on Titan – It has long been known that sunlight glares can be seen in images taken of the methane/ethane lakes found on Saturn's moon Titan. A new study looked for glitters, that is, glares reflected off lake surfaces that are not smooth, but wavy, diminishing the brilliance of the glare. The study used archived observations from the Cassini Saturn orbiter mission. It has been previously calculated that waves in Titan's lakes and seas likely do not exceed 8 inches in height. The small size is due to Titan's huge distance from the Sun, which produces rather mild sunlight-induced winds. The new study found several glitter instances, especially near 2 straits in Kraken Mare, the largest Titanic sea. The study team suggested the glitters were caused by some combination of tides, winds, and flows over shallows.

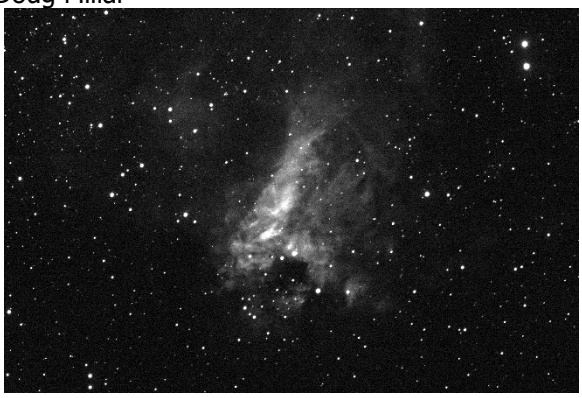
Cold and Wet Mars – Researchers made a computer analysis of 66 networks of valleys on Mars, composed of 10,000 individual valleys, comparing their patterns and shapes to those of valleys on Earth, of known origin. Only 14 of the networks matched earthly valley networks formed by flowing rivers, while 31 of them matched networks formed by meltwater flowing beneath glaciers. Three of the networks matched sapping valleys, a process where seeping groundwater erodes the ground. The researchers came to the conclusion that much of Mars 3.8 billion years ago, when many of the valleys formed, was experiencing rather cold times, such that more erosion occurred under ice sheets than by flowing rivers. So it might be more accurate to describe ancient Mars as cold and wet, not warm and wet. This may actually increase the chances that simple life forms evolved on Mars during that time, since massive glaciers would protect the watery regions beneath from hazardous radiation.

Warm and Wet Mars – And yet another new study showed that significant amounts of water flowed on ancient Mars (3.5 - 4 billion years ago), beyond the glacier action implied by the previous item. This new study examined 96 Martian basins that in ancient times were filled with water (became lakes). Some of them had filled to overflowing (termed open lakes) and others did not overflow (called closed lakes). The volume of open lakes was used to determine the minimum amount of water that flowed into such lakes, and the volume of closed lakes was used as a maximum. Such flows would be at one episode, where episode is defined as water flowing without breaks significant enough to allow water to substantially evaporate from the lake. The water flowing could be either from rainfall or snowmelt, or a combination. Then the study calculated how much water would have to precipitate over the watershed feeding the lake inlet. The result obtained was that 13 to 520 feet of water would have had to precipitate in an episode to create the lakes studied. If the precipitation fell in multiple episodes, then the total water would be even greater in order to replace evaporation.

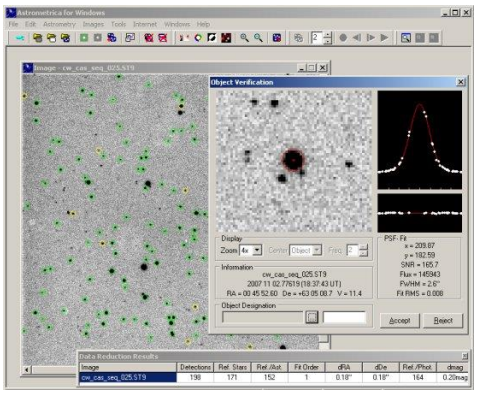
Arecibo Damaged – A cable helping to support the receiving platform above the dish of the Arecibo radiotelescope broke and damaged a portion of the dish. The telescope will be out of service for some time while repairs are made. Arecibo is the second largest radio dish in the world and has long been active in observing objects throughout the Universe and in radaring and observing Solar System objects. Cause of the cable break is under investigation.

Cosmic Adventures for Orange County Astronomers

By Doug Millar



Recent image M17



The search is on for new asteroids

As a result of meeting Dr. Carl Pennypacker at the May meeting Reza and I and several others are developing a portal for the OCA website that allow members to do remote imaging and to become involved in citizen science projects across the world at no expense to members or the club. We call this an "inreach" program. It provides educational experiences for students and adults. Participants must have their OCA membership confirmed and receive a password from Reza in order to participate. Once you have registered, you will receive more detailed information as well as access to the programs.

You can access Cosmic Adventures on the OCA website under Special Interest Groups (SIGs). The web portal is divided into two entry areas: Imaging Portal and Citizen Science Portal.

The first is for remote imaging and is aimed at members of all ages. We suggest parents supervise elementary and junior high students. The Cosmic Adventures program was granted remote telescope observing time through the Las Cumbres Observatory (LCO) in Santa Barbara. OCA members are now allotted a specific amount of time to use for acquiring images. LCO has 0.4 meter telescopes with an SBIG 6Mp cameras located all over the world. Members sign up and receive a password to receive telescope time.

Images can be downloaded and processed by member's own programs and there is also an image processing program for beginners called SalsaJ which has instructions and tutorials included. Participants should sign up onto a mailing list we have set up to contact other participants and to ask questions.

The has a link to a web-based sharing site called Padlet. Hands-On Universe and Cosmic Adventures participants are currently sharing their images there. We invite OCA members to do the same, as well as to share their images on the OCA website. You can see some of the images we took at https://padlet.com/ocastronomers/cosmicadventures

The citizen science side of the portal lists several programs that we have been granted access to as a club, and as members, to participate in.

The first is The International Astronomical Search Collaboration (IASC) program. Using Panstars data and the program Astrometrica we are able to do asteroid searches for new asteroids. This is a worldwide project involving hundreds of participants organized into campaign groups. We will start one in September with the help of our coordinator Emma Garrett. More information is available.

The second research program we are part of is InSTAR. This is a research group that is quite large and does, among other things, double star astrometry. They have extensive resources and experience with many papers published over the years. Some of our OCA members have been working with them for some time. This is serious research for the advanced amateur astronomer, and thanks to Dr. Carl Pennypacker and Rachel Freed, we are welcomed to join their group. There is more information, again when you sign up. InSTAR's main website is here: https://www.in4star.org/

The portal is open and the options and choices are many. We hope you will have many happy Cosmic Adventures.

Doug Millar, Reza AmirArjomand, and the OCA committee

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 Bill Prats b.bill.p@gmail.com

- Meade LX-70 Tripod & Mount 20lb capacity, Meade Polar Scope (#670010), Dual axis motor drive with Controller (#670011), original accessories, fresh 6 volt battery. Very clean, Used 1 year. — $300 OBO

For Sale contact John Derks derksjm@yahoo.com

- Meade 14" LX200 GPS UHTC w/ complete original accessories package: 2" diagonal, 8x50 finderscope, zero image shift focuser, Autostar II handpaddle, Series 4000 26mm Super Plossl 1.25 eyepiece, vibration iso pads — $2700 ^ reduced ^
- 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 ¾" thick, Secondary is 4" x 5 5/8"

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 — $300
  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

Advertisements

For Sale contact David Fischer Leyes-Fischer@cox.net

- 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

Issue	Due date
October	26 September
November	24 October
December	21 November

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