SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

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NGC3190, taken by club member Arnie Rosner at Sonoran Skies Observatory in Arizona on 12 January 2003. It was captured with the Finger Lakes Instruments Dream Machine camera on a Mewlon 300 Cassegrain telescope and SBIG ST8xE camera on a 150 FCT refractor

OCA CLUB MEETING

The free and open club meeting will be held on May 10 at 7:30 pm in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange.

This month, speaker is Christine Corbett from JPL, topic is ***TBA.***

NEXT MEETINGS:
June 14 (speakers TBA)

STAR PARTIES

Both the Irvine Lake and Anza sites will be open on May 4. Members are encouraged to check the website calendar for updates on star parties.

Please check the website calendar for the outreach events this month. Volunteers are always welcome.

You are reminded to check the club web site for updates to the calendar of events and other club news.

COMING UP

The next sessions of the Beginner's class are on 3 May and 7 June at Heritage Museum of Orange County at 3101 West Harvard Street in Santa Ana.

Youth SIG:
contact Doug Millar
Astro Imagers SIG: 1 May, 5 June
Astrophysics SIG: 17 May, 21 June
Dark Sky Group:
contact Barbara Toy

President's Message

By Barbara Toy

While, as I write this, the skies haven't been all that great for our usual viewing or imaging activities, the wildflowers this spring have been great! I hope you've all had a chance to see some of the display – the area around Elsinore visible from the I-15 freeway was totally overrun with people in late March and early April, and there were areas beyond that with lots of blooms where only a few hardy souls ventured. By the time we were supposed to be having our April star party at Anza the bloom had reached that area as well, as documented by Dave Kodama, who I think was actually hoping more for clear skies at night than a local flower show. Unfortunately, by all accounts the forecasts of clouds and poor seeing were more accurate than we would have liked but, while it may not have been a great night for astronomical viewing, it's good to know there were some compensating views at the terrestrial level.

Messier Marathon That Wasn't:

Technically, we had our Messier Marathon scheduled for the second March Anza star party (there were two in March as new moon was on Wednesday) – those that might want to try the Messier Marathon at the Orange County star party would only be able to do about a half Marathon, as we don't have access to the site all night. Just in case you were wondering, the Messier Marathon at Anza pretty much didn't happen, as the star party itself pretty much didn't happen due to weather. There are certainly serious downsides to drought, but a drought-busting winter and spring of regular rain has some downsides, too – such as getting in the way of astronomical activities and, this March, the Messier Marathon.

As a type of silver lining, the second March star party was actually too early for an optimal Messier Marathon and the April star party was too late – these events work best closer to the equinox, but this year's equinox (March 20) was at full moon, so the period around it was pretty moony and not good for looking for dim fuzzy objects. So at least we weren't weathered out of a really superbly placed Messier Marathon this year, and hopefully next year will be better. That said – if anyone out there decided to try to do the Marathon on nights in March that were clearer, please let us know how it went.

'Tis the Season of Weeds and Pests…

Wild flowers aren't the only plants that enjoy a good winter of rain – grasses, mustard and all kinds of other weedy vegetation really grow well after a wet winter like we had this year. Most of these are easier to control if they are attacked while they are still young and their stems haven't toughened. Mustard in particular gets really tough and woody as it matures, before it dries out and becomes brittle. If you can get it out while it's still young, not only is it easier than even a week or two later, but keeping it from going to flower reduces the seed out there waiting to grow more invasive mustard bushes next year.

Besides keeping new growth from blocking our on-site roads and paths, making sure that the weeds are kept well away from any of the structures on the site will seriously reduce the danger of fire. In dry years we worry about the build-up of years-old, very dry plant material in areas that haven't burned for a long time. After a wet winter, we worry about new fuel from all of the weed and other plant growth, which will become very dry as we get into summer, particularly if this summer is as hot as last summer. Whether it's old or new, all that dry fuel can burn easily, meaning that fire is a constant danger, and we all need to do what we can whenever we're out at the Anza site to minimize the fire risk.

And, of course all that new growth, if it's left in place, can provide shelter and food for a number of pests. I expect that the rodent population is skyrocketing this year, as food is plentiful. That means that rattlesnakes will be out hunting them for dinner, and they could attract more attention from coyotes, though the coyotes tend to stay away from the site when there are people there. As to the rattlesnakes, this is the time of year when the young hatch – they can be more of a problem than the mature snakes, as they are often harder to spot and, if

they bite, they haven't learned to regulate how much venom to use so they tend to deliver more poison than an adult snake would.

Clearing away the weeds and cutting back shrubs that are too close to buildings are good ways to reduce the chance you'll run into one of these types of local wild life, and while you're at it, make sure there aren't any places around the site where water can pool, as that could become a mosquito haven. And, particularly if you're going into sheds or other areas on site that have been closed up a while, keep an eye out for black widow spiders, which really thrive out there. If you're roaming around the Anza site after dark, as many of us do, sticking to established paths and roads and using your red flashlight to check for local wildlife should minimize the chance of any unfortunate encounters.

Fortunately, just a bit of vigilance is generally enough to avoid problems, and we've never had anyone bitten at any of our viewing sites – and that's a record we'd like to keep going.

Beyond issues of personal safety, several regulars at Anza have reported problems with mice moving into their engine compartments. This wouldn't be such a problem if it weren't that mice and rats for some reason love to chomp on rubber and plastics, such as radiator hoses and insulation on wires.

People have adopted different strategies to avoid these problems; probably the easiest is raising the hood while parked so the engine heat dissipates faster (one theory is that heat attracts them) and so the engine area is a less protected space and therefore less attractive to any inquiring mouse or rat. Parking away from bushes and weeds so they have to cross an open area instead of having a sheltered path to the vehicle also helps. Since the most likely route into the engine compartment is via the wheels, I know one member who puts mouse traps on top of the front tires as an additional precaution – I don't know if he's actually caught anything with them, but he seems to be successfully keeping them out of his vehicle using the traps as part of his overall strategy.

And, while mostly I've been talking in terms of Anza, our Orange County site is out close to the wild even though it's much closer to urban areas than our Anza site, and it doesn't hurt to keep a weather eye out there, too. All of the potentially problematic critters that we deal with at Anza are in Orange County, too – so be mindful of where you are and what's around you while you are at those star parties as well, so you can avoid any potential wild life problems.

Just don't go so overboard with the vigilance that it spoils your time at either star party – just a bit of care should be sufficient.

Other Critters

After all that attention to local wildlife we really don't want to run into, it's worth remembering that we have a lot of other wildlife out there that's much more fun as well. That includes kangaroo rats (rare and protected, so please don't interfere with any you see), owls and other birds, rabbits, butterflies and moths, lizards, toads, and beetles of different types. I'm not sure if stink bugs qualify as fun, but they can be interesting to watch. And, of course, we have a lot of ants…

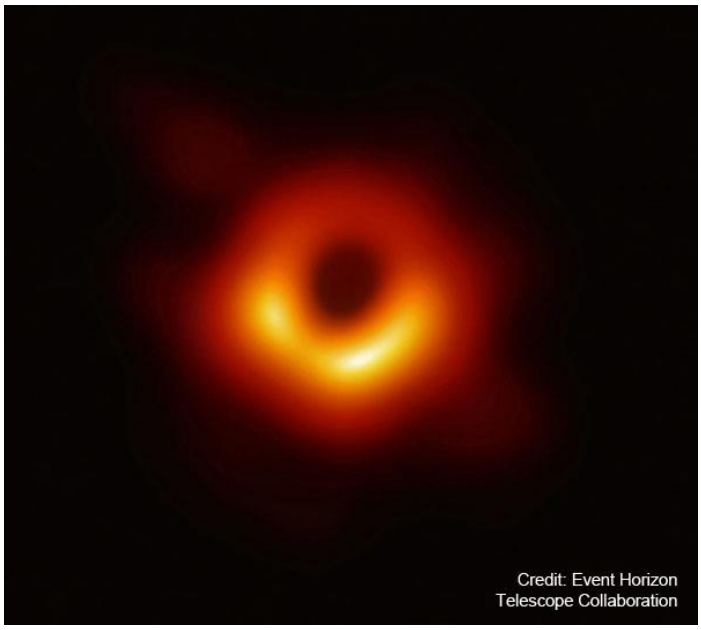
If you have a bit of time, it can be fun to roam the site and do some nature-watching, and also check out our local wildflowers – those on the site (other than the mustard) are generally pretty small, but still pretty, and they often last well into summer. And then, assuming we manage to get some dark, clear skies, you can enjoy the night views, as well.

© Barbara Toy, April 2019

AstroSpace Update

May 2019
Gathered by Don Lynn from NASA and other sources

Black Hole Image – The Event Horizon Telescope team released the first ever image of a black hole. Technically it is an image of the material swirling into the black hole, since the hole itself gives off no light. The image matches pretty closely what computer simulations of black holes have predicted. It shows a ring with one side brighter than the other. Material swirling toward the black hole creates the ring, and relativistic effects brighten the material moving toward us. Also, light from behind the black hole is bent around toward us, changing the ring shape somewhat.



The Event Horizon team is working on imaging the 2 largest (in apparent size) supermassive black holes, Sagittarius A* (at the center of our Milky Way) and M87* (at the center of the giant elliptical galaxy M87). Because the faster apparent motion of material falling into Sagittarius A* requires more complicated types of supercomputer processing, the team finished the M87 image first and that was the one released.

The team gathered the data 2 years ago from 8 radiotelescopes located around the world operating at millimeter wavelengths. The signals were combined using a method called Very Long Baseline Interferometry which used precise phase relationships for each signal measured by synchronized atomic clocks to create a virtual antenna having the same width as the spacing between the farthest individual radiotelescopes. This method gave the image the same resolution as if it were captured with a single antenna having the same width as the distance between the most widely separated of the individual radiotelescopes. The picture is the highest resolution radio image ever made. But it is still fuzzy due to the great distance to M87 (about 53 million light-years). One scientist compared it to taking a picture of an orange sitting on the Moon. Another compared it to a doughnut on fire.

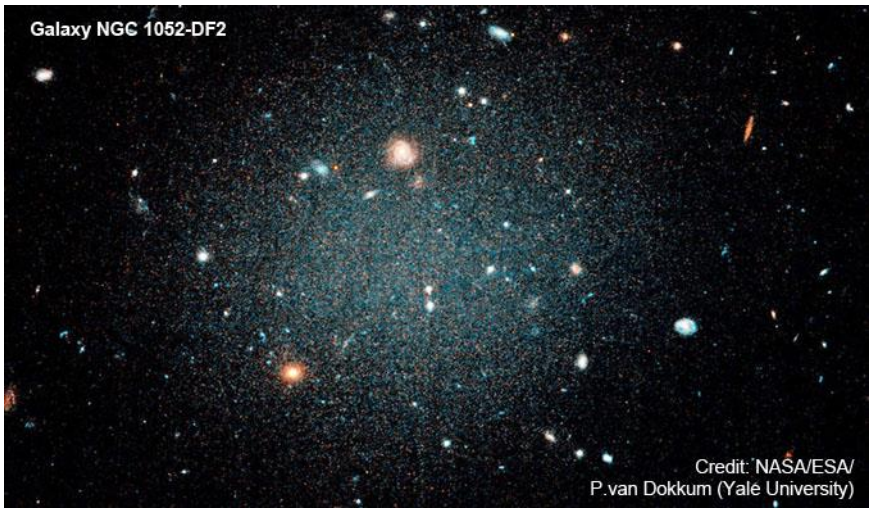
Observational data totaled 5 peta-bytes which filled a half ton of very high capacity hard drives. It took this long to combine the huge volume of observations in supercomputers and process them into an image, then double check every step (actually they quadruple checked) and write their papers describing what the image shows. Since the data was collected in radio waves which we can't see, the image was rendered in artificial color. Orange seemed nice for something so hot.

Black holes were first proposed by John Michell in 1784, using Newton's equations. After Einstein's theories, the properties of black holes were calculated again using General Relativity. It took another century to develop the technology to take a picture of one. The size of the dark circle in the image (which is the shadow cast by the black hole, somewhat larger than the black hole itself) shows that M87* has a mass of 6.5 billion solar masses. That is within the range of previous mass measurements, and probably more precise than any others. Future work planned includes: finishing the Sagittarius A* image, repeating the observations at higher radio frequency (which improves the resolution), and studying the magnetic fields at the 2 black holes.

Hyper-Velocity Star Origin – Only about 2 dozen hyper-velocity stars are known – ones whose speed is so great that they will escape the gravity of the Milky Way. The best theory of how they reached these speeds is in a 3-body encounter with a supermassive black hole (that is, a pair of orbiting stars wanders too close to the black hole). Just the black hole and star (2-body) encounter won't fling a star with enough speed, and 3-body encounters with an ordinary (not supermassive) black hole won't do it either. The only supermassive black hole in the Milky Way is in the center of the galaxy. So when a recent study of the motions in 3-dimensions of one of these hyper-velocity stars showed it was not coming from the center of the galaxy, astronomers were surprised. Its origin was a place in the disc of the Milky Way, far from the center. So theorists had to come up with ideas to explain this star: 1) 3-body encounter with a very massive dense star cluster, 2) 3-body encounter with a mid-sized black hole. Neither very massive star clusters nor any mid-sized black holes are known anywhere back along the path of this hyper-velocity star, but astronomers are looking.

Mercury Dust Ring Found – Analysis of images taken by the Stereo solar-observing spacecraft has found a ring of dust that orbits the Sun along Mercury's orbit. The ring is about 9.3 million miles wide. The discoverers were actually looking for a dust-free zone theoretically predicted by some astronomers (because the intense sunlight near the Sun might clear such a zone), but instead found only this region with increased dust.

Venus Dust Ring Source – It has been known for about a decade that there is a dust ring located along Venus's orbit. The ring is about 16 million miles top-to-bottom, and about 6 million miles wide. The particles range in size up to that of sandpaper grit. A new study based on computer simulations may have found how that ring formed. The best fit of the dust observations to the simulations is that there are numerous asteroids sharing Venus's orbit, like the Trojan asteroids that share Jupiter's orbit. Such asteroids would be found in 2 gravitationally stable areas, one ahead of Venus, the other behind. Occasional collisions between these bodies would produce the kind of dust ring that is observed. No asteroids are known at these locations, but it is possible they could have escaped detection so far because they would always be lost in the Sun's glare as seen from Earth. Astronomers will be looking for such bodies, perhaps needing new methods of observation.

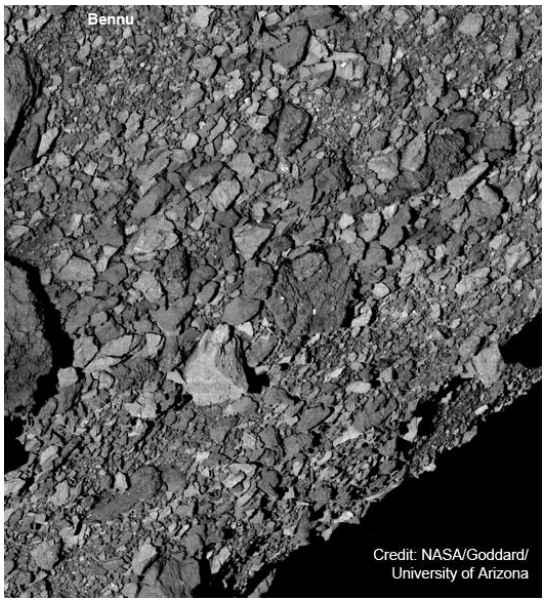


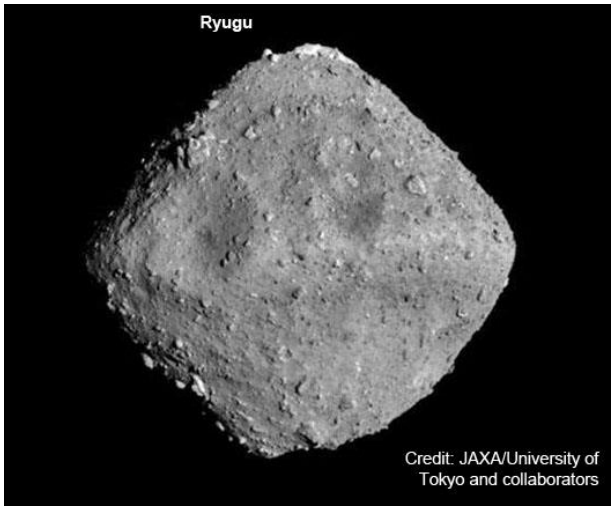
Galaxies Lacking Dark Matter – A year ago astronomers announced that they had found a galaxy whose total mass (including dark matter) was all accounted for by its stars alone. This was the first known galaxy without substantial dark matter. The mass was calculated from the speed of the globular clusters orbiting it. It was designated NGC 1052-DF2 (DF2 for short), since it appears to be a companion to galaxy NGC 1052. Faced with skepticism that such could exist, those astronomers have now found another galaxy like it (called DF4), and measured both of their masses by a second method. These galaxies pretty much rule out all modified gravity theories, since such theories cannot show deviations from relativistic gravity for other galaxies near DF2 and yet show no deviation from relativistic gravity for DF2 itself. Similarities between DF2 and DF4: both have so little stars and dust that you can see background objects through them, many very bright globular clusters, similar size, similar shape, similar surface brightness, and, of course, negligible amounts of dark matter. How such galaxies could form is still a mystery.

Source of Hot Gas Found – In 2010 observations with the Fermi gamma-ray space telescope discovered a pair of huge bubbles of hot material giving off gamma rays, one above the center of the Milky Way galaxy, the other below. New observations with the XMM-Newton X-ray space telescope have found channels of hot material streaming out from the supermassive black hole at the center of the Milky Way, feeding hot gas into those 2 bubbles. Now we know how the bubbles formed.

Long Gamma-Ray Bursts Explained – After decades of investigation most astronomers agreed that the longer form of gamma-ray bursts came from massive stars collapsing as supernovas, but the mechanism that produced the gamma rays remained a mystery. New research based on computer simulations shows that such gamma rays originate in the visible surface of jets shot out from the supernova. Such jets expand, and as they do so, the surface from which light can escape travels down the jet. The simulations showed this produces the shape of gamma-ray bursts observed. Now if astronomers can show the mechanism that forms the jets …

Discoveries At Bennu – The OSIRIS-Rex spacecraft, in orbit about the asteroid Bennu, has made more discoveries. Theory had predicted that Bennu would be fairly smooth, covered with fine powdery material. After all, the Moon is covered with powder, due to billions of years of meteoroid bombardment grinding up the surface. Bennu isn't. It is littered with boulders, many of them up to 10 yards across. The range of darker and lighter material is larger than expected. Bennu has been caught in pictures (11 times) throwing rocks and dust off into space. Most of the particles are moving too slowly to escape, so fall back onto Bennu. It is thought that maybe heating from the Sun as the asteroid approaches closer might be causing the rock throwing. These surprises will make it more difficult to take a sample of the surface material, but spacecraft operators think they can succeed anyway. The surface has a few large old craters, but not many smaller craters.





Discoveries At Ryugu – The Hayabusa 2 spacecraft, orbiting the asteroid Ryugu, has made more discoveries. The surface is rougher than expected, similar to Bennu. A small bomb was thrown at Ryugu, which produced a crater, as planned. The spacecraft is scheduled to examine the crater close-up and retrieve a sample from well below the original surface in late April. Like Bennu, Ryugu appears to be a rubble pile, with much void space inside. Ryugu's rotation period is 7.6 hours, but the current shape implies it was spinning faster in the past. This differs from Bennu, which has been measured to be slowly increasing in rotation speed, not decreasing. Hydrated minerals, which usually form in water, have been found on Ryugu, but not as much as on Bennu.

Exocomet Found – TESS (planet-finding space telescope) has discovered an exocomet, that is, a comet orbiting another star. TESS finds planets by the dip in brightness of stars when planets pass in front (transit). But the shape of the dip in brightness for an object passing in front of the star Beta Pictoris was wrong for a planet, but just what was expected for a comet. Previous evidence, such as spectroscopic data, had led astronomers to believe this star and others possessed comets, but this was the first comet seen by TESS.

Exoplanet Atmosphere Measured – Using the Very Large Telescopes in Chile ganged together as an interferometer, scientists have obtained the spectrum of the atmosphere of the exoplanet HR8799e. They found that carbon monoxide and methane are not in chemical equilibrium, probably indicating continuous storming on the planet. Clouds of iron and silicates were detected, perhaps raining iron and sand, not surprising considering the temperature of nearly 1800° F. This is not a pleasant place to visit, even with a titanium umbrella. The planet is several times the mass of Jupiter and lies 129 light-years from us. It is only about 30 million years old and has an orbit somewhat larger than Saturn's.

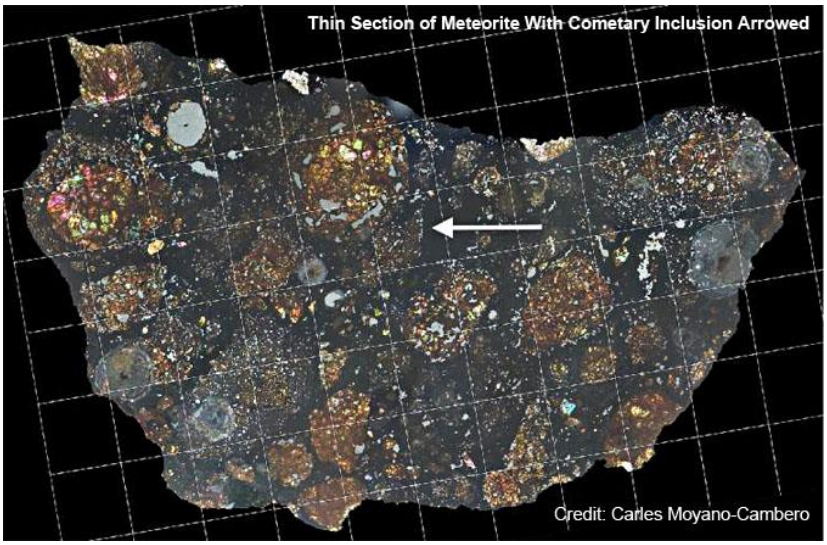
Rare Exoplanet Found – A third planet has been found orbiting the star Kepler 47, the only known binary star with a system of more than one planet orbiting the pair. Like the 2 previously known planets, this one, dubbed Kepler 47d, is a gas giant, even larger than those other 2. The outer of the previously known planets is in the habitable zone (where temperatures should allow liquid water to exist), but the newly found one is closer to its stars than this zone. Kepler 47d orbits its pair of stars once every 187 Earth days. This system has been compared to Tatooine, the fictional planet with 2 stars in Star Wars.

LIGOs Resume Operation – On April 1 (not a joke) the 2 LIGO gravitational wave detectors were started up again after a long period of hardware upgrades. These changes should make the LIGOs much more sensitive to the waves, resulting in more frequent discoveries and more precise measurements of the wave properties. The similar Virgo instrument in Italy is also installing these upgrades. The upgrades include increasing the laser power and reducing the electronic noise that interferes with measurements. Japan is building a similar instrument and should begin operations this year. Look for a lot of discoveries involving gravitational waves in coming months. In addition to looking for the waves from colliding black holes and colliding neutron stars, as have been seen before, the LIGOs may also see a collision of a black hole with a neutron star, or a supernova, or even a rapidly spinning neutron star, all of which should produce gravitational waves.

Neutron Stars Merging – A burst of X-rays over a 7 hour period was found in data taken in 2015 by the Chandra X-ray Space Telescope. The source has been named XT2, and it is located in a galaxy so distant that its (X-ray) light took 6.6 billion years to reach us. The characteristics of the X-rays were compared to theoretical predictions for various events, and the best match is that it was caused by 2 neutron stars merging and producing a magnetar (neutron star with extremely powerful magnetic field), but without the gamma-ray burst that may accompany neutron star mergers. It would have required a jet from the event to have been aimed at Earth to have also produced a gamma-ray burst. A pair of neutron stars merging is what caused one of the detections of gravitational waves, but this X-ray event was not seen in gravitational waves because the advanced LIGOs were not operating at the time, and besides the event was probably too far away to have been detected gravitationally. The source object of the X-ray event has not been found in visible light. But this detection in X-rays now gives astronomers another method to find neutron star mergers.

Moon Landing Failure – The Beresheet spacecraft, the first privately sponsored space mission to attempt a Moon landing, crashed April 11 instead of soft landing. A failure, perhaps of a sensor, shut off the retro rocket during the final minutes of descent. Though spacecraft controllers restarted the engine, it was too late, and the spacecraft hit the surface at an estimated 300 mph. Though they (and all other entrants) had missed the deadline to win the $30 million X-prize for a privately sponsored Moon landing (and of course didn't exactly land), the X Prize Foundation is giving the Beresheet team $1 million to begin work on a replacement spacecraft. NASA's Lunar Reconnaissance Orbiter will try to image the crash site.

Rare Space Molecule Found – Theoretically, the conditions shortly after the Big Bang should have produced helium hydride ion as the first molecule ever. Forget what you were taught in chemistry class about helium not forming any compounds. Under certain circumstances, it does. Helium hydride was first produced in a lab in 1925. But it had never been found in space until now. Recent observations using SOFIA (airborne infrared observatory) showed it exists in the planetary nebula NGC 7027. However the discoverers believe that this helium hydride was formed by conditions in the nebula, not by the similar conditions just after the Big Bang.



Comet Material in Meteorite – Scientists have found a tiny inclusion of cometary material embedded in a meteorite. Comets are believed to have formed beyond Neptune's orbit. Meteorites are fragments of asteroids, and this type of meteorite (carbonaceous) is believed to have formed near where Jupiter's orbit is today. This implies that material from the comet-forming region sometimes migrated in to where the asteroids were forming during the time period when both comets and asteroids were forming, early in the Solar System's history. The migration was likely due to drag force from gas in the planet-forming disk. The meteorite is known as LaPaz Icefield 02342 and was found in that icefield in Antarctica. Because the cometary material was embedded inside the meteorite, it was well preserved, rather than being burned up or at least heat-altered as is most cometary material falling to Earth. The inclusion was shown to be cometary by analysis with an electron microscope.

Instant AstroSpace Updates

New research shows that the amount of water vapor in the extremely thin atmosphere of our Moon peaks during meteor showers. Analysis showed that there must be ample water **ice buried in the lunar soil** over much of the Moon, beginning about 3 inches below the surface, in order to splatter the observed water vapor.

TESS space telescope has found its first **Earth-sized exoplanet** orbiting the star HD21749, 52 light-years away, once every 8 Earth days. The star also has a Neptune-sized planet orbiting it farther out.

Further analysis of Cassini (former Saturn orbiter) data has found **phantom ponds**, bodies of liquid methane that disappeared. It is believed the ponds simply dried up with the change in seasons.

OWENS VALLEY RADIO OBSERVATORY TRIP

SCIENCE BEYOND THE BOOK

Special Focus- Equipment used in the Event Horizon Project
June 15th 2019 With Dr. Millar and Cecilia Caballero

Please join with us on the above date for an extraordinary adventure in science education at the Owens Valley Radio Observatory outside of Big Pine, CA. This year we have the good fortune of seeing and learning about the equipment that participated in the M87 Event Horizon project. We will have equipment demonstrations and information as well as a talk about it by one of the people involved in the project.

Included are science activities at the 40m antenna and tour, walking a scale model of the distances of the planets, and night time astronomy on both Friday and Saturday nights. All the above is free and courtesy of Dr. Mark Hodges, OVRO and Cal Tech. This trip is open to teachers and their families, members of local astronomy clubs and radio hams. You must RSVP to Dr. Millar to go on the trip to so that we know how many to expect. Please include your cell phone number with the RSVP.

This is not a school or OCA sponsored field trip. Each participant is on their own to arrive at the observatory. Please try to arrive at OVRO about 1:00pm on Saturday. There are several motels in Big Pine to stay at. Please make your own reservations. We usually eat at the Country Kitchen in Big Pine or "We Toss 'em, They're Awesome" pizza in Bishop. You can also camp out both at the dish or in Big Pine in either tents or campers.

The weather will be warm and dry. If you would like to bring your own telescope along, please do.

We should arrive in the early afternoon on Friday or Saturday, you may want to stay over and go back on Sunday afternoon. Some of us will arrive on Friday and enjoy some night-time astronomy at the OVRO site as well as Saturday night. Please call Dr. Millar on the day of the trip and let him know when you are starting out.

Schedule:		
Friday	Night	Visual astronomy
Saturday-		
	1:30pm	Arrive at OVRO 30m dish
	5pm	Check in at your Motel and go to dinner in Bishop.
	Evening	Astronomy at the site
Sunday-		
	8:30am	Breakfast at Country Kitchen
Leave whenever you like. Check websites about the area and the Highway 395 for sightseeing opportunities.		

The directions from the LA area are: Drive north on Interstate 5 to CA 14 and follow it through Palmdale, Mojave, and Inyokern to join US 395 North. Continue North through Little Lake, Lone Pine, up to the far end of Big Pine. Just as you get to the North end of town, turn right (East) on CA 168 towards the Westgard Pass. Go out about 2 miles and after Zurich, turn left onto the observatory road which is Leighton lane. This website has a page showing the route from Big Pine to OVRO. You should be able to see the dish in the distance, but it is 4 miles away! Continue onto the property and go to the large dish. We will be at the base or inside of it.

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

For any questions and RSVP's my contact information is

Dr. Doug Millar Cell = **562-810-3989** and email is **drzarkof56@yahoo.com**

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

Dr. Millar

Western Amateur Astronomers
Board Meeting Update

by Tim Hogle, WAA Vice President & Cecilia Caballero, OCA Representative

Western Amateur Astronomers (WAA), an umbrella organization of astronomy clubs, of which OCA is a long standing member, had its regular winter board meeting this year on February 16th. It was held at Royer Oaks Observatory at the home of Monseigneur Ron Royer in Springville, CA. Gigantic thanks to Msgr. Royer for hosting the club meeting in his beautiful hillside home and sharing his home made cranberry sauce. Clubs represented at the meeting included OCA, Los Angeles Astronomical Society, China Lake Astronomical Society, Eastbay Astronomical Society, Astronomical Association of Northern California, Chabot Telescope Makers Workshop, Mount Diablo Astronomical Society, and Mount Diablo Observatory Association.

2019 is an election year for the WAA board. On this winter meeting, a new board was established bringing with it invigoration and growth as well as expansion of bestowing an array of awards to clubs and individuals west of the Mississippi. Timothy Thompson is the newly elected President with Tim Hogle as Vice President, Richard Ozer as Secretary, and Earl Wilson as Treasurer. We look forward to great innovation and collaboration from board, club representatives, and member clubs to enrich all of our involvement in our beloved sky viewing experience.

One of WAA's most well-known functions is to select and award the very prestigious G. Bruce Blair medal to a living individual who has made truly outstanding contributions to amateur astronomy over a significant period of time. The Blair Award has a history going back to 1954; the list of recipients is posted on the WAA web site.

This year the Blair award is going to Conrad Jung, Staff Astronomer at Chabot Space and Science Center in Oakland. He has played a leading and central role in the operation, maintenance, and preservation of the three large telescopes at Chabot. He has led, trained, and supervised hundreds of volunteers in the operation of those telescopes for over 30 years. He has enabled over 300,000 visitors to observe the beauty of the night sky via Chabot's telescopes. He has also led over 1,000 programs for schools, scouts, and adult clubs in his time at Chabot. He is also a well-known Astro-photographer, being one of the few "amateur" astronomers to have his images exhibited at the Smithsonian Air and Space Museum in Washington DC. Well done, Conrad. Congratulations!

Publication of WAA's newsletter, the New Pacific Stargazer, is continuing. We invite OCA club members who have something they would like to publish that would be of interest to other amateurs within and outside OCA such as astronomical projects, great ideas, and subjects of astronomically-sensitive environmental concern. Those interested in getting material published, contact Ms. Caballero at caballerocecilia21@gmail.com.

WAA's web site, http://www.waastro.org, is now official. Check it out! For more info about WAA, visit the new web site and take a peek at the New Pacific Stargazer. Until next time, keep your head up and both eyes on the sky!

From the Editor

Sirius needs photograph submissions from club members

Ideas for Future articles

The newsletter would like to include articles from members and articles about subjects suggested by our members. We are looking for both ideas and writers to cover them. Anybody who would like to contribute an article or work with the editor to produce one may contact me at newsletter@ocastronomers.org .

To get this started, I will post some examples here and then add in ideas submitted to me from club members.

- The Making of a Personal Observatory
- Borrowing a Club Telescope – the process, the results – real life experiences by club members
- Articles about early history of the club
- "Your idea goes here"

New Location For an 18 Inch Dobsonian

For over 13 years, OCA members have been going up to Cal Tech's Owens Valley Radio Observatory (OVRO) in the Owens Valley for a science program, tour of the 130 foot radio telescope dish, and star party. These programs have been organized by OCA board members Doug Millar and Cecilia Caballero and expertly hosted by OVRO scientist Dr. Mark Hodges.

Recently, an opportunity arose to further strengthen the association of OCA and OVRO. Chris Buchen was an OCA member who observed with his 18 inch Dobsonian telescope. When he passed away, his wife Shelley wanted his beloved telescope to continue to be used and appreciated.

With the help of Alan Lang, another OCA member, she decided to donate Chris's scope to OCA. Alan helped Shelley to contact the OCA Board about the donation and prepare it for transport. The lovely scope was deemed not to be practical for our loner scope program, so a good home needed to be found.

In addition to the star parties that OCA holds at OVRO, Dr. Hodges holds star parties for his Northern Owens Valley Astronomy Society (NOVAS). He currently is using an 8 inch Celestron, and Doug had the idea that an 18 inch Dobsonian would provide exceptional views in the dark skies of the Owens Valley.

A plan was proposed for the scope to be placed on a long-term loan from OCA to Dr. Hodges. The Board agreed, and Shelley Buchen was delighted with the idea.

Doug and Board member (and wife) Helen Mahoney transported the scope up to OVRO, where they and Mark assembled it. It looked lovely against the backdrop of the giant radio telescopes. The next trip to OVRO will be June 14-15. OCA members, and others who are interested, can join us there to see the scope in action in its new home.

Steve Condrey Needs Our Help

Steve Condrey is a long-time member of OCA. Steve and his family recently relocated to Nebraska. Unfortunately, their home was lost in the recent floods that have devastated that state. They have lost just about everything: all their furniture, clothes, their two children's toys, school supplies, bicycles, and countless other things that can never be replaced like family mementos. What wasn't destroyed by the flood itself, has been contaminated with mold.

But they are determined to make a new life for themselves. They have found a new place to rent — well out of the flood zone area. They are shopping at thrift stores for replacements for beds, tables, chairs, clothing, and kitchen tools. But all of this expense is out of their own pockets. Renter's insurance does not cover flood damage.

Steve was one of the federal workers caught up in the furloughs and missed his paychecks for 36 days. While he did eventually receive his backpay, much of that money had to be used to repair their car that broke down during the time he was furloughed.

Let's help the Condreys get back on their feet. As of 11 April, $5,585 has been raised. The goal is to get to $10,000. He has given so much to our club over the years through his active participation. He continues to give to his family, community, and to the hard work needed to keep our medications safe and effective.

Go to GoFundMe.com, search for "Steve Condrey," and donate generously. Thank you.

May's Guest Speaker: Christine Corbett from JPL

Title To Be Announced

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 get more information.

For Sale contact Val Akins vlakins@comline.com

Advanced CG-5 celestron mount	$200
Celestron 4" F14 Maksutov tube assembly	$75
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For Sale contact Ron Choi rongrace2@cox.net 949 – 463 - 2191

Telescope and accessories as a set. The condition of the gear is almost like new.

The asking price is $2000 (45% off from retail value)

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