

SIRIUS ASTRONOMER

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

September 2019

Free to members, subscriptions \$12 for 12 issues

Volume 46, Number 9



M1 the Crab Nebula imaged by Bill Patterson 27 Nov 2005 from OCA Anza site. The image was captured with an SBIG STL11000 camera through RCOS 12.5 inch Ritchey-Cretien telescope

OCA CLUB MEETING

The free and open club meeting will be held on Sept 13 at 7:30 pm in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange.

This month, the speaker is Riccardo DeSalvo from CSULA talking on the subject LIGO Findings and what they tell us about the universe.

NEXT MEETINGS:
Oct 11 (speakers TBA)

STAR PARTIES

Anza and OC star parties are on 7 Sept. 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 session of the Beginner's class is on 2 August at Heritage Museum of Orange County at 3101 West Harvard Street in Santa Ana.

Youth SIG:

contact Doug Millar

Astro Imagers SIG: 4 Sept, 2 Oct

Astrophysics SIG: 20 Sept, 18 Oct

Dark Sky Group:

contact Barbara Toy

President's Message

By Barbara Toy

As we head toward the Equinox (September 23 this year), summer is waning fast. I hope you've all had fun with the summer objects, and that not too many of the nights you intended to spend under the stars were clouded out. One nice aspect of this time of year is that the nights are getting longer but are still generally warm enough for comfortable observing.

Fall is often a time of change, and it seems to be unusually so for us this year.

Farewell, Many Thanks and Best Wishes to Andy Lowry!

Those of you in the Outreach Program know Andy Lowry (formerly Andy David) as the dynamic coordinator who took on the program when Jim Benet decided he needed to turn it over to someone else about two years ago. She has had great ideas to enhance the program and the enthusiasm and energy to implement them. She has been as committed to bringing telescopes to different schools around Orange County as Jim was (and is), and has spent a lot of time and energy keeping that part of our Outreach Program healthy.

She's also been interested in developing other types of outreach. One direction that interest took was her involvement with the NASA@mylibrary project, which in Orange County has been centered at the Anaheim Library. The goal of this program is to improve general science literacy through an alliance between NASA and local libraries, and Andy has been part of the founding group setting up different activities that would be fun and interesting in line with that goal.

She joined the Board as a Trustee in 2017 as one of our younger members, which has been really helpful as she's been able to give us perspectives from a younger generation and also as one who is social media savvy in ways that most of the rest of us on the Board are not.

Well, unfortunately for us though not for them, Andy's husband accepted a new position in the Bay Area, so they will be moving in late September. We hope that she won't lose touch with us entirely, but she'll be too far away to continue with her club activities. At this point, she expects the September Board meeting to be her last as a Trustee, and will be attending her last outreach events in September, as well. We're exploring some options for the new leadership of the Outreach Program, and fortunately Jim Benet can keep things going if there's a hiatus before we have a new person in place.

Andy is planning to be at the September General Meeting, so if you're there, or if you see her anywhere else, please let her know how much we appreciate her efforts during this all-too-brief time she's been with our club!

A Final Farewell to Jay Glowacki...

Jay Glowacki was a long-time club member who was Vice President of the club in 2000 (and retired from the Board at the end of that year) but remained active in astronomical pursuits. Some of you may recall his account of viewing (and photographing) the 2017 solar eclipse from the bottom of a canyon in Silver Falls State Park, Oregon, in the October 2017 Sirius Astronomer, with his image showing the sun in total eclipse over South Falls (you can find a copy of that image in our website image gallery).

Jay's wife, Effie, told us that Jay died due to a tractor accident in Oregon on Saturday, July 6, 2019. For those who knew him and may want to attend, his memorial mass will be on Saturday, November 9 at 10:30 am at Holy Trinity Catholic Church in San Pedro, CA.

She said that his love for Astronomy never disappeared, and that the memories he wrote about for his class reunion booklet two years ago were of visiting the 200-inch telescope at Palomar, the 100-inch at Mt. Wilson, and spending a night looking through the 60-inch at Mt. Wilson. He also mentioned using a telescope at Lake Titicaca in Bolivia, and relished the idea that his own eyes had seen light from galaxies that had taken a billion years to reach him.

...And to John Gallie

This summer has not been kind to some of our long-time members – shortly after we were advised of Jay Glowacki's death, John Gallie's wife advised us that he died on August 12, 2019. John has been a member of our club for 22 years and had a deep interest in astronomy, evidenced by the astronomy books he left behind him as well as his many years of membership.

While he didn't leave much record of his astronomical activities, some of you may recall him as the member who made an announcement several years ago at one of our general meetings encouraging people to apply for duty on the Grand Jury. He served on the 2009-2010 Orange County Grand Jury, and found the experience interesting and rewarding as well as good public service, and hoped others would as well.

It's always sad to say goodbye, and it must be even sadder for their families. We send them our best wishes in this difficult time.

On a Happier Note – RTMC's New Dates: September 19-22, 2019

For decades, the event that started as the Riverside Telescope Makers' Conference and became the RTMC Astronomy Expo has been held at Camp Oaks near Big Bear City over Memorial Day weekend. This year, as RTMC President Martin Carey told us at our August general meeting, the Powers that Be at Camp Oaks insisted on changing that, and the best alternative dates the RTMC folks could negotiate were Thursday, September 19 through Sunday, September 22. To make things even more challenging, the Camp Oaks folks apparently want everyone out by around noon on Sunday; traditionally, RTMC had a star party Sunday night as well as Saturday, and then Monday was clean-up day.

Even though this change has made organizing RTMC a lot more challenging than usual this year, from lining up vendors and speakers for a very different timeframe than in the past to getting word out to everyone who might be interested in attending, the RTMC crew has gamely been doing all it can to make this new timeframe a success. On the positive side, the weather should be less chancy than in May, when almost any kind of weather that can hit the mountain has occurred at one RTMC or another (snow, rain, wind storms, hail, blazing heat...). Also, the September dates are near the 3rd quarter moon, so it should be pretty dark during the most active parts of the star parties on Friday and Saturday nights. Since this is just before the Equinox, the nights will be longer than in May, as well.

So, for those who haven't been to RTMC: What is it and why should you go? It started with the Riverside Astronomical Society (RAS) and maintains strong ties with that club, while having become much broader, drawing people from a lot of different clubs, including some outside of California, so it gives you a chance to get to meet people from the broader astronomy world. Although other activities are available, it is mainly a celebration of different aspects of amateur astronomy, including telescope making for those who still want to make their own instruments.

There's a vendor area, and one traditional benefit of RTMC is trying out different telescopes from different vendors. There are also vendors of other equipment, including T-shirts and other items that may only be peripherally related to astronomy (such as a vendor of interesting rocks and minerals). There's also usually a booth specializing in used parts and equipment, and a swap meet where you can find used equipment – or try to sell something you no longer use.

And there are a lot of talks, on all kinds of astronomical topics, including the Keynote talk on Saturday night; this year's Keynote Speaker is Jerry Blackburn, whose career spanned the entire manned space program, which is certainly of interest in this anniversary year of the first moon walk. And they will be continuing with the traditional RTMC raffle – always fun, and with some great prizes. For more information, see the RTMC website: <http://rtmcastronomyexpo.org/> .

If you haven't been to RTMC yet, this would be a good time to try it out. If you have, it would be a great time to go again, meet up with old friends, and enjoy a fine astronomical event.

© Barbara Toy, August 2019

AstroSpace Update

September 2019

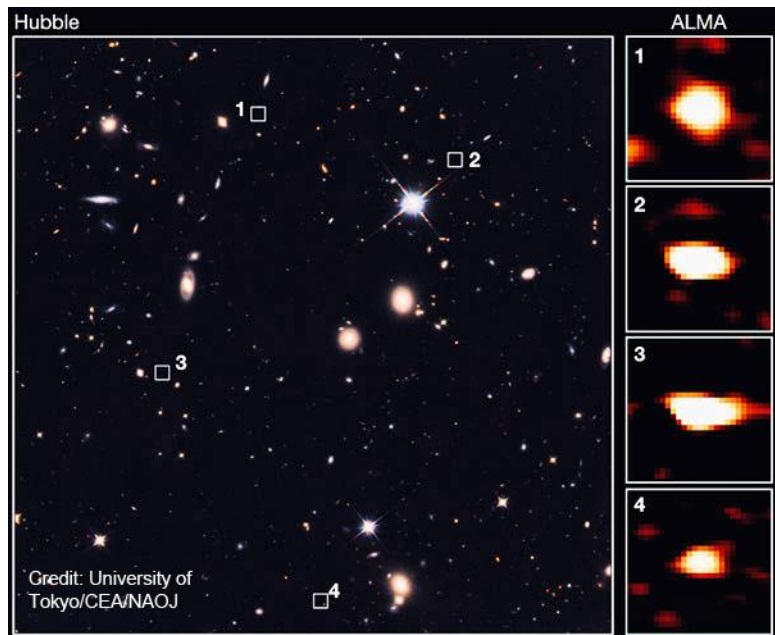
Gathered by Don Lynn from NASA and other sources

Extremely Massive Black Hole – Using spectra taken by the Very Large Telescope in Chile, astronomers have measured the speeds of stars orbiting a supermassive black hole in galaxy Holmberg 15A. From this they calculated the mass of the black hole and found it to be 40 billion solar masses. This is unexpectedly huge. The only more massive black holes ever found were measured by indirect and less precise means. The mass is larger than would be estimated from the size of the galaxy's central bulge. However, it does fit theory for the result of a collision of 2 galaxies with depleted cores, indicating Holmberg 15A is probably such a result.

Eclipsing White Dwarfs – A pair of white dwarf stars orbiting each other extremely closely was discovered by the Zwicky Transient Factory, which repeatedly scans the sky for changes, using the Palomar 48-inch telescope. Follow-up observations were made with the Kitt Peak 2.1-meter telescope. The pair is known as J1539 (ok, it's really ZTF J1539+5027, but the abbreviation is good enough), and it is the fastest known orbiting pair of stars that eclipse each other, and the 2nd fastest pair of orbiting white dwarfs. Their orbital period is 6.91 minutes. They are emitting gravitational waves, which lose orbital energy, resulting in their drawing closer by about 10 inches every day. The gravitational waves are not of the frequency that LIGO can detect, but when the gravitational wave spacecraft LISA is launched in 2034, it should be able to detect this pair. The stars' orbit is smaller than Saturn (the planet itself, not Saturn's orbit).

Fast Radio Bursts – Only a few dozen fast radio bursts (FRBs) have ever been observed, and only 2 of those have been caught repeating. New observations made by a radiotelescope array in Canada, known as CHIME, have now found 8 more of the repeating FRBs. It is thought that FRBs are happening all the time, but they only last for a fraction of a second, and so radiotelescopes are rarely pointed the right places when they so briefly occur. The precise source locations have been determined for only 3 FRBs, all being distant galaxies. But the types of source galaxies differed substantially between repeaters and non-repeaters, suggesting they are different phenomena. So it is important to find more examples of both types. The mechanisms for generating powerful radio bursts remain unknown, though there is some evidence that one type of FRB may be caused by magnetars (pulsars with extreme magnetic fields).

Dusty Galaxies – One of the areas imaged with a deep-field picture by the Hubble Space Telescope has since been imaged in many other forms of light, including in infrared by the Spitzer Space Telescope. A surprise in the infrared images were many galaxies that were not seen in visible light by Hubble. A team of astronomers selected 63 such galaxies that were bright in infrared and imaged them in submillimeter radio waves, using the ALMA radiotelescope array in Chile. 39 of them showed up. They are so distant that we are seeing them as they were more than 10 billion years ago, when the light left there. They were found to be forming new stars at huge rates, about 200 times the output of our Milky Way galaxy today. The reason that they are not seen in visible light is that they are surrounded by dense dust. Computer simulations of the early formation of galaxies don't produce this much dust this early in the history of the Universe. Such dust is thought to be mostly made by supernovas. Theorists are going to have to work to explain this much dust.



Unusual White Dwarf – The Kepler planet-finding space telescope has ended its mission, but new discoveries continue to be made with its data. One such finding is a pair of stars (dubbed KIC 8145411) orbiting each other that not only eclipse each other every orbit, but one of the stars gravitationally lenses the other during the eclipse. These are quite rare; only 5 lensing pairs of stars have ever been found. From the eclipse and lensing data, the masses, sizes and orbit of the stars have been determined. They are a Sun-like star and a white dwarf star. The white dwarf has an unusual (for a white dwarf) mass of only 1/5 the Sun's mass. White dwarfs are produced when a roughly Sun-like-mass star has consumed all its hydrogen fuel. The lower the starting mass of a star, the longer it takes to run out of fuel (because lower mass stars nuclearly burn fuel much more slowly). The Universe has not been around long enough to produce a white dwarf with this low of a mass. A few similarly low mass white dwarfs are known, but all have extremely close companion stars that gravitationally stole much of the original mass. The new discovery has a companion of course, but it is not close enough to steal any material. Theorists are scrambling to explain how this white dwarf formed.

Unusual Variable Star – The AAVSO (organization to observe variable stars) has records of the variations of the star T UMi for more than a century. These have shown a puzzling change in period (from about 300 days to 200 days) and amount of brightness change (amplitude) (from roughly 5 magnitudes to under 2) over the years. A new analysis shows that the star is undergoing the transition from fusing helium to ceasing fusion and becoming a white dwarf star. Theory predicts that such a star would go through a period of shrinking, which would have exactly the observed effects on the variability. The analysis also showed an overtone of 111 days impressed on the main variability that matches theory. Such theory predicts that the star will go through various cycles of change in variability for a few hundred thousand years before shrinking to a white dwarf.

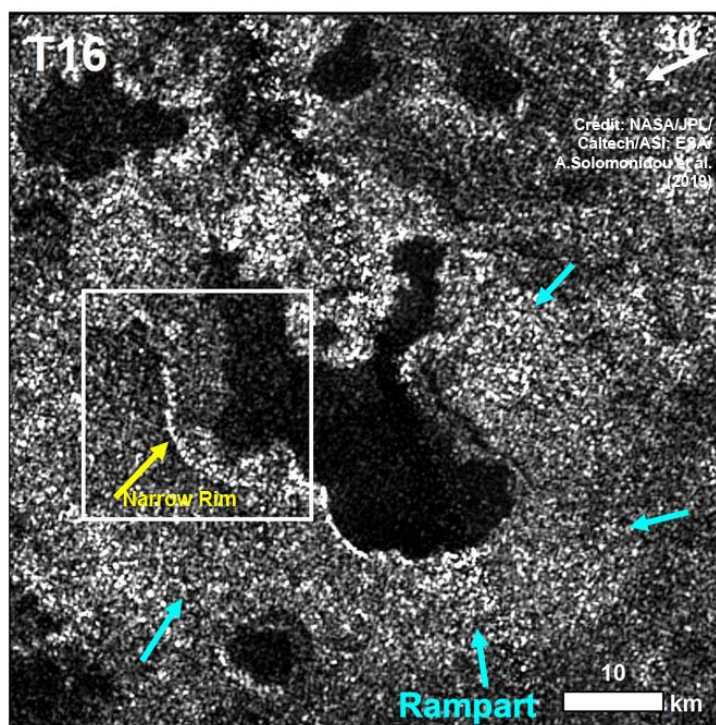
Pulsar Glitch – Spinning neutron stars that have a spot that emits radio waves are known as pulsars. Our radiotelescopes see a pulse every time the spot spins by. These pulses occur at extremely regular intervals because the pulsars spin extremely consistently, except every once in a while a pulsar changes its pulse period just slightly. This change is known as a glitch. Only 5% of known pulsars have been observed to glitch. It is believed that a shift in the structure of neutrons or other particles within the star causes the glitch, something like an earthquake within the star. The Vela Pulsar is observed almost continuously because it glitches so often: roughly once every 3 years. Data taken of the glitch of 2016 has been analyzed, and it was found that the star first slowed down a touch, then returned to normal, followed by a speed up and a slow settling to its post-glitch speed. The speed up then settling exactly matched theory that neutron stars have 3 layers of differing content of subatomic particles, and how computer simulations show glitches would work with those layers. The previous slowing is a mystery.

Second-Generation Star – A star (named SMSS J160540.18-144323) has been discovered in the halo of our Milky Way with the lowest abundance of heavier elements (heavier than helium) ever seen. It has 1.5 million times less iron than does our Sun. The Big Bang produced hydrogen and helium and almost nothing else, so the first-generation stars after the Big Bang had no heavier elements. Stars produced increasing amounts of the heavier elements and spread them principally by supernovas, so that those elements would be incorporated into future generations of stars. The newly discovered star has so little iron that it likely formed from a cloud of gas enriched by a single supernova of a first-generation star. In fact it couldn't have been a very powerful supernova, or the iron abundance would have been even higher. No first-generation stars have ever been found (they probably all ended their lives by now), so studying second-generation stars such as this is our best way of learning about the first-generation ones.

Lunar Formation Date – A new study of radioactive elements (uranium, hafnium and tungsten) in rocks brought back from the Moon by Apollo astronauts shows that the lunar surface solidified within 50 million years after the formation of the Solar System. Previous estimates of when the Moon formed were about 150 million years after the formation of the Solar System. It is generally agreed that the Moon formed as a result of the collision of a Mars-sized planet with the Earth. The new study puts this at 4.51 billion years ago.

Titan Ramparts – Though Cassini ended its mission exploring Saturn in 2017, new discoveries continue to be made from its data. A new study sheds some light on Titan lake ramparts. These are raised zones completely surrounding some of the methane/ethane lakes found on Saturn's largest moon Titan. The ramparts are a few miles wide and 200-300 yards high. Spectral data examined in the new study shows that the material of which the ramparts are made is the same as the residue found in the bottoms of dry lake beds in the vicinity. There are a few theories how the ramparts formed, but it will take more study to determine this. Interestingly there are narrower (than the ramparts) raised rims about some of the lakes, but they appear fragmented, not completely surrounding the lakes.

Europa Occultation – Precise positions of stars from Gaia (spacecraft that measures star positions and motions with extreme precision) data allowed astronomers at 3 observatories in South America to observe Jupiter's moon Europa pass in front of (occult) a star. This allowed that most accurate measurement of Europa's size and shape. It's not quite round. The longer diameter is 2.0 miles larger than the smaller. The data also improved our knowledge of Europa's orbit. The Gaia data shows that in the next 2 years, all 4 of Jupiter's large moons and some of the small ones will occult stars, so astronomers will be watching. After 2 years, Jupiter moves out of a region of dense stars, so such opportunities will diminish.



Martian Methane – Methane has been briefly observed in small concentrations on Mars. What produces it, as well as how it dissipates so quickly, are mysteries. A new study probably rules out one proposed source. It had been suggested that methane trapped within rocks was being released when wind eroded those rocks. This study showed that the conditions on Mars would not produce enough methane as quickly as observed, if this erosion were the source. Scientists would very much like to know the source of the methane, since one possibility is that bacteria can produce methane (at least they do on Earth).

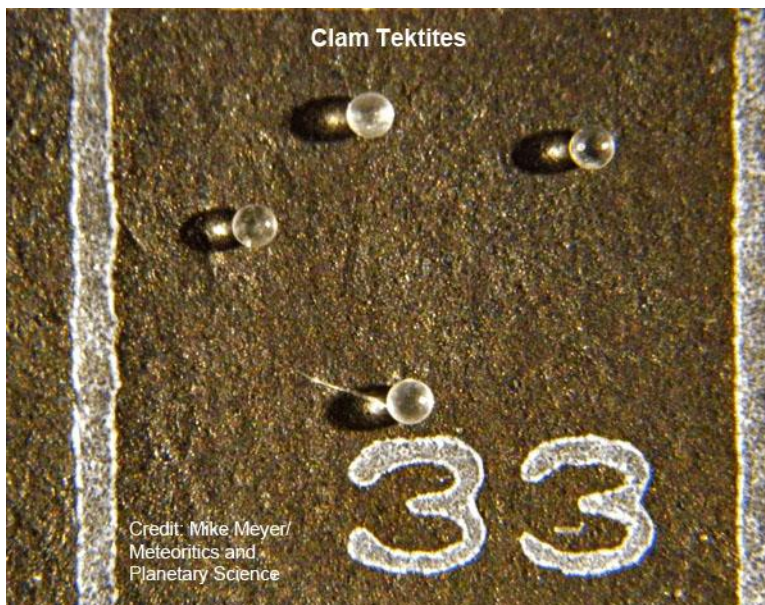
Oxygen Detection Mission – A project named SISTINE is being occasionally launched by sounding rocket to spend short times in space to try to find if stars can create oxygen that would end up on exoplanets. SISTINE does this using an ultraviolet telescope and spectrograph. It is looking for evidence of breakdown of water or carbon dioxide into oxygen. If this process is found not to occur, then future detection of oxygen at exoplanets may be a good indicator of life. The 1st launch was scheduled for early August.

Clam Tektites – A student doing field work in 2006 collected a number of clam fossils from a quarry in Florida. He found dozens of tiny glass-like beads in the clams, but didn't investigate them until recently. He now found that they are tektites, melted sand thrown out by a meteorite impact. The quarry is gone (housing development), so he can't follow up. The implication is that there was a meteorite impact in the distant past somewhere near present-day Florida. No such impact sites have been found yet.

Extremely Energetic Gamma Rays – You can't detect gamma rays from the Earth's surface, because they always hit molecules in our atmosphere, and transform into a shower of particles. But scientists have learned how to build detectors for the showers, then calculate the energy and direction of the original gamma ray. The hard part is distinguishing gamma rays from cosmic rays (which are atomic particles, not waves like the gamma rays). A double detector system does a fairly good job of distinguishing (only misidentifies occasionally). Such a gamma-ray detection system was built a few years ago at high elevation in Tibet. Observations there have recently detected some extremely energetic gamma rays (100-450 trillion electron volts) coming from the Crab Nebula, a remnant of a supernova seen in the year 1054, that now has a neutron star in it. These are the highest energy photons of any form of light ever recorded from an astronomical source. It is more energy in one photon than the largest particle collider (the LHC) can create in a single particle collision. Theorists will be kept busy explaining how such energetic photons can be created by the Crab. Meanwhile the detector in Tibet will keep looking and possibly find even more energetic photons.

Lunar Mission – The India space agency (ISRO) in late July launched their 2nd mission to the Moon, named Chandrayaan-2. It consists of a lander, rover named Pragyan, and orbiter named Vikram. September 7 is the scheduled landing date. Destination is near the lunar south pole, where no previous spacecraft has landed. Plans call for the rover to operate for 14 Earth days, and the orbiter for a year. Pragyan will study moonquakes, the surface composition and thermal properties, the properties of the extremely rarified atmosphere, and of course, look for lunar water ice.

Hot Rocky Exoplanet – The Spitzer infrared space telescope observed the exoplanet LHS 3844b and found the data best matched a rocky (probably basaltic) planet with no detectable atmosphere. The planet is 1.3 times the diameter of Earth. It orbits quite close to a red dwarf star in just 11 hours. Because it is so close to its star, it is quite hot (several hundred degrees). The planet was discovered by TESS (exoplanet-finding space telescope).



Massive Exoplanet – A 2nd huge planet (about 9 times the mass of Jupiter) has been found orbiting the young star Beta Pictoris, just 63 light-years away. The 1st was found in 2008 by imaging it; the new find was discovered by the radial velocity method (spectrograph detects its star wobbling). This is the 1st time the radial velocity method has discovered a planet orbiting as massive a star as Beta Pictoris. The gravitational pull of this newly found planet probably explains the tilt of the other planet's orbit. Astronomers hope to measure and compare the atmospheres of the 2 planets.

Hottest Jupiter Exoplanet – Hubble Space Telescope observations of an exoplanet known as WASP-121b have found that it is so hot (because it is extremely close to its star) that it is blowing off heavy metal vapors, including iron and magnesium, and has distorted into more of a football shape than a sphere. The temperature of its upper atmosphere is hotter than that measured at any other planet. This observation is believed to support that the hot Jupiter class of planets forms farther from their stars and later migrate inward. If WASP-121b had formed close to its present position, it would have evaporated by now.

Unusual Supernova – After 3 years of continued observation of the supernova known as SN2016iet, astronomers have concluded that the star that blew up was the most massive one ever seen to explode. The star began life with 200 times the mass of our Sun (but lost some of that before exploding). A number of characteristics distinguished it from ordinary-sized stars exploding: brighter, longer lasting, different spectrum, lack of heavy elements (essentially all hydrogen and helium), the type of galaxy in which it is located (a dwarf galaxy), and the location (far in the outskirts of its galaxy). Theorists think this was a pair-instability supernova. Such has been predicted, but only a few possible candidates have been observed. Some astronomers are claiming this supernova fits the theory better than any previous supernovas. Pair instability is a different way for the subatomic particles to fail to support the star, involving electrons and anti-electrons, and so results in a different mode of collapse and explosion.

Supernova Evidence – Scientists gathered more than 1000 pounds of snow from Antarctica that had fallen in the last 20 years and analyzed the trace materials contained. A surprise find was radioactive iron and manganese isotopes in a ratio that has only been seen in supernova remnants. Conclusion: the Solar System is passing through a thin cloud of material thrown off by a supernova. More research is needed to find where and when a supernova exploded that produced the cloud.

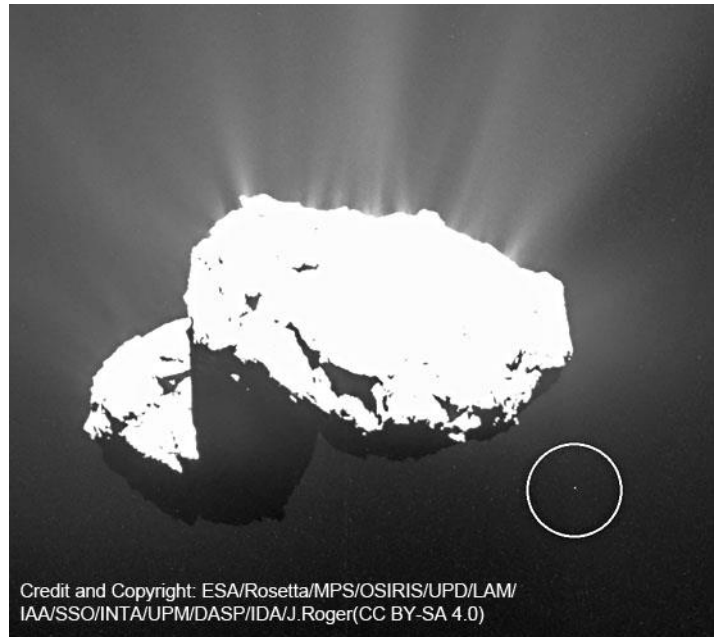
Instant AstroSpace Updates

Comet Moon – An amateur perusing images released by the Rosetta spacecraft team has found a rock orbiting the nucleus of comet 67P/Churyumov-Gerasimenko. It appears to have been ejected from the nucleus by solar heating, and is estimated to be about 4 yards across.

Observations in infrared of the **black hole** at the center of our Milky Way galaxy being made last May by the Keck Telescope in Hawaii showed a temporary **brightening** of the material falling in, by a factor of 75 times. In the 20 years that this black hole has been closely observed, no fluctuation has been seen anywhere near this bright.

A bill has passed the US House of Representatives to name the LSST (huge wide-field survey telescope now under construction) after the late **Vera Rubin**, who is famous for showing that essentially all galaxies need a huge amount of dark matter to explain the orbits of stars within. She is also known for encouraging women in science.

TESS (exoplanet-finding space telescope) has discovered an Earth-sized planet and 2 mini-Neptunes closely orbiting a star known as TOI 270, 73 light-years away. It is hoped that observations by the Webb Space Telescope (launching in 2021) can study their atmospheres and help the theorists understand how planets of these types could have formed there.



OCA Loaner Scope Program

Telescopes are checked in and out only on one designated weekend every 3 months. The loan period is 6 months. Available scopes are listed on the club website and in the club newsletter. Reservations will be accepted until 7 days prior to the next pickup day. To reserve one, send the program director an email at scopes@ssccorp.com
The request should contain the desired scope's inventory number, the member's name, address, telephone number and email contact address. Pick up time and location will be sent to the borrower via email. Please bring proper identification and sign the club's loan agreement at the time of scope pickup.

NEXT SCOPE EXCHANGE DATES

October 26th, 2019 – Returns

October 27th, 2019 – Pickups

Inventory of OCA Scopes For Rent As Of 7/20/2019

INV#	Type	Size	Mfg	Model	Accessories/Notes	Available On	Rent
1	Mac	3.5"	Meade	ETX90	Alt/Az Goto	10/27/2019	\$5/Mo
2	Newtonian	4.5"	Meade	DS2114ATS	Alt/Az Goto	8/4/2019	\$5/Mo
4	Newtonian	4.5"	Gallileo	FL-700mm	Alt/Az Manual	8/4/2019	Free
5	Newtonian	8"	Meade	LT8	Alt/Az Goto	8/4/2019	\$5/Mo
6	Newtonian	4.5"	Celestron	1114EQ	Wt Bars In Storage	8/4/2019	Free
9	Newtonian	5"	Celestron	Cometron/GEM	Motorized Dec Drive	8/4/2019	Free
10	SCT	8"	Celestron	Orange Tube	w/Encoders,Wedge,Tripod & SlowMo. Ctl	8/4/2019	Free
13	Mac	3.5"	Meade	ETX90	Alt/Az Goto	10/27/2019	\$5/Mo
16	SCT	10"	Meade	LX200 Classic	Alt/Az Goto	8/4/2019	\$5/mo
17	Newtonian	8"	Celestron	????	electronics not working	8/4/2019	\$5/mo
19	Mac	2.25"	Meade	ETX60	Alt/Az Goto	8/4/2019	\$5/mo
20	Reflector	8"	Orion	SkyView	German Mount	8/4/2019	Free
22	Reflector	4.5"	Celestron	NexStar	Alt/Az Goto	8/4/2019	\$5/Mo
24	Reflector	4.5"	Meade	4504	German Mount Goto	8/4/2019	Free
26	Dobsonian	8"	Celestron	Starhopper	Alt/Az Manual	10/27/2019	\$5/Mo
27	Schmidt-Cas	8"	Celestron	NexStar 8	Alt/Az Goto	8/4/2019	\$5/Mo
28	Schmidt-Cas	8"	Celestron	Ultima 8	Fork Mount w/Wege, Tripod Motorized	8/4/2019	\$5/Mo
31	MAK-Cas	5"	Meade	ETX-125	Alt/Az Goto	8/4/2019	\$5/Mo
32	Newtonian	4.5"	Meade	DS-114AT	Alt/Az Goto	8/4/2019	\$5/Mo
34	Dobsonian	12"	Meade	Light Bridge	Alt/Az Manual	8/4/2019	\$5/Mo
35	Newtonian	4.5"	Meade	DS-2114	Alt/Az Goto	8/4/2019	\$5/Mo
43	SCT	8"	Celestron	Orange Tube	With Dec Motor, Guider, Wedge	1/27/2020	\$5/Mo

Fabulous OCA Scope Inventory Reduction Sale!!! No Reasonable Offer Refused

INV#	Type	Size	Mfg	Model	Accessories/Notes	Price OBO
11	Dobsonian	13"	Hand made		Alt/Az Manual	\$300
23	Reflector	4.5"	Meade	4501	German Mount, Motorized	\$50
37	SCT	12"	Meade	LX200GPS 12"	Az/El Goto Wheely Bars	\$2,000
39	Black C8 OTA	8"	Celestron	C8	OTA Only	\$300
41	SCT	14"	Celestron	C14 Classic	w/Wedge, and Tripod	\$2,000
42	Dobsonian	16"		Truss Tube DSS	Wheely Bars, Truss Tub	\$1,200
44	Refractor	90mm	Orion	Manual GEM	Eyepieces Tripod	\$50

Email: scopes@ocastronomers.org

Magazine Subscriptions

Subscriptions to the Astronomy magazines 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. Bring your check made out to the OCA to the meeting or mail 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*	\$33.00	\$42.95
ASTRONOMY	\$34.00	\$42.95

***Sky & Telescope subscribers please note: You CANNOT renew at the club rate on-line due to the sale of Sky & Telescope to the American Astronomical Society. To get the club rate, you can renew either by phoning them directly at 800-253-0245 or by paying through the club.**

Astronomy subscribers can now renew on-line with a credit card. E-mail Charlie@CCCD.EDU for special instructions and the renewal code.

The **DEADLINE** for subscribing at the club rates will be the **October monthly meeting, October 13th**. 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 renewals.

From the Editor

Sirius needs photograph submissions from club members

We are down to our last unused submission. Please continue to send in more !

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@ocaastronomers.org .

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
October	21-Sep
November	19-Oct
December	23-Nov



**September's Guest Speaker: Riccardo DeSalvo
from CSU Los Angeles**

Topic is: LIGO Findings and what they tell us about
the universe



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 advertisements in the newsletter.

For Sale	contact	Charles Goral (714)488-5451	
		Celestron 11" XLT OTA. Excellent condition/optics-rarely used.	\$1000
		Includes Feathertouch focuser, dew strap/sensor cable assy, Telrad finder, Losmandy-style dovetail. It comes w/a roller case (gratis) if desired.	

For Sale	contact	Val Akins	vlakins@comline.com	
		Celestron 2 inch light pollution reduction filter for SCT's		\$30
		Lumicon oxygen III 1.25 inch filter		\$40
		Celestron piggyback mount for 35mm DSL cameras or finderscopes		\$20
		Telegizmos 365 telescope covers for Dobs and SCT's all weather		\$30 each
		Hardwood adjustable height folding observing chair		\$30
		Padded foam-lined locker for 4 or 5 inch scopes (Maksutov's or SCT's)		\$20
		assorted plossl and Kellner eyepieces, See me for focal lengths		\$10 each
		Celestron 102mm (4") f9.8 Refractor tube assembly		\$100
		with dove tail attachment. Like new condition		
		Orion Astro View 120ST f/5.0 Richfield refractor OTA with rings and dove trail attached		\$200
		Celestron Nexstar 4" f9 refractor complete with computer mount, tripod, eyepieces, star diagonal with 6x30 finderscope and case		\$120

If you buy any of the Refractors I will take \$50 off the mount.

UPCOMING TOTAL SOLAR ECLIPSE TRIPS

- **December 2020 – Patagonia/Argentina***
 - 6 Day/5 Night Tour
 - "Glamping" at the observation site night before the eclipse
 - 2 Nights in Buenos Aires
 - 2 Nights in San Carlos de Bariloche
 - Best weather prospects along eclipse path
 - Price includes hotels, ~ 1/2 meals, ground and air transportation, technical support
 - Nearly 2 minutes of totality
 - Nighttime sky observing before eclipse day
 - Optional extension to the Patagonian ice field, Glacier National Park, Moreno Glacier
 - **April 2024 – San Antonio, TX***
 - 4 Day/3 Night Tour
 - 5 Star hotel accommodation in the famous Riverwalk tourist area (Alamo, etc.)
 - Daily breakfast, transportation to reserved site 20 km from centerline (4 min 15 sec totality)
 - Celebration banquet following the eclipse
 - Optional added days in San Antonio available
 - Transportation to/from eclipse site, daily breakfast, early equipment setup on site with security
- * Led by 30 year OCA Member Joel Harris
Veteran of 21 Total Eclipses/Tours
90%+ Success Rate Seeing Totality**



For more information, go to: www.twilighttours.net



ASTRONOMER

The Newsletter of the Orange County Astronomers

NEWSLETTER OF THE
ORANGE COUNTY ASTRONOMERS
P.O. BOX 1762
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HANDY CONTACT LIST

OCA WEBSITE: <http://www.ocastronomers.org> STARLINE 24-HR. Recording: 714-751-6867 ANZA OBSERVATORY: 951-763-5152

CLUB OFFICERS (to contact the entire board at once, send an email to board@ocastronomers.org)

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