



Jet of high energy particles emitted from black hole within galaxy M87, taken on 28 August 2009 by club member Pat Knoll from the Anza site using SBIG ST-8XME camera with adaptive optics on the Kuhn telescope. This is a stack of Luminance, Red, Green, and Blue images.

OCA CLUB MEETING

The free and open club meeting will be held on Aug 9 at 7:30 pm in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange.

This month, the speaker is Anthony Piro from Carnegie Observatories talking on the subject "Investigating the Mysteries of Exploding Stars"

NEXT MEETINGS:
Sept 13 (speakers TBA)

STAR PARTIES

Anza site Starbeque 27 July
Anza Star parties on 3 Aug & 31 Aug.

OC star party and Potluck will be on 3 August, next OC party 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: 7 Aug. 4 Sept
Astrophysics SIG: 16 Aug, 20 Sept
Dark Sky Group:
contact Barbara Toy

President's Message

By Barbara Toy

We're now well into summer, and I hope you're all enjoying the summer sky! Although June Gloom should be behind us, some years the marine layer continues to interfere with views of the night sky – though there are also times when it's low enough that it blots out light domes that interfere with the viewing, resulting in darker skies – at least for sites that are high enough to be above the clouds. It can work that way for our Anza site, a phenomenon we particularly enjoy when it happens near new moon, but it's less likely to help at the location of our Orange County Star Parties near Irvine Lake.

It happened this way unexpectedly when I was out at Anza recently with a small group putting the Kuhn telescope through its paces. There were a lot of clouds moving through in the afternoon and evening, the moon was a blazing crescent that was getting close to first quarter, and the forecast was for the cloud cover to increase to complete coverage by midnight and for fairly average seeing, so our expectations weren't high. However, the sky overhead turned out to be amazingly steady, the clouds largely cleared after about 10:30, and the marine layer moved into the Temecula area and dimmed that great light dome to our west along with the setting moon, so it got nice and dark even before the moon actually set.

It turned out to be a superb night for viewing nebulae, in particular, with summer favorites like the Trifid, the Eagle, the Swan and the Veil looking almost three dimensional with an O3 filter. As an added bonus to the evening, we were joined for a while by long-time member Jimmy Nguyen, who's been away at school but now is back after earning his degree. He brought some friends with him who were new to astronomy. It's always fun to connect with old friends under the stars and to introduce new folks to the pleasures of seeing what's up there. If there's any moral to that story, I guess it's that the forecasts sometimes are too pessimistic, and that it can be worth taking a chance even when it doesn't look like the conditions are going to be all that great. Of course, we've got more flexibility with viewing than with imaging, as we can follow the clear spots in a partially cloudy sky and don't need to stay on an object for significant chunks of time to capture the photons we need. And, when the moon is out, sometimes the clouds blot it out and improve the viewing in other parts of the sky – an astronomer's version of a cloud's silver lining.

Before leaving the topic of that night – it was a great night for globulars, too, even before the sky cleared, though not so much for detail on planets. And the forecasts weren't entirely wrong – the clouds did move back in later on, just a bit later than expected. But we all had a great time under the stars, and I hope all of you have equally good summer viewing!

Our New Website...

Hopefully, by the time you see this, the last steps needed before the Members section of our new website can go live will be completed and the site will be fully functional. When that's done, members will be able to get new passwords and log in. Until then, the most recent issues of the Sirius Astronomer will be made available on the main website with all the other issues – there was a delay on that for the July issue due to a glitch, but if the Members section still isn't operational by August you should be able to access the August issue from the main website.

If you have any problems using the new site or questions about it, please contact Reza AmirArjomand, our Webmaster (and Vice President), or Alan Smallbone, our Secretary, who has been working with the developers of the new site and continues to work with Reza on it. That would include any articles, announcements or other information you would like to submit for the website.

Update on Anza Weeds:

I'm happy to report that Gary Schones, one of our Trustees and an observatory holder at Anza who has done a lot over the years to maintain and improve the Anza site, decided to take on the job of dealing with the weed and overgrowth problem at Anza. He arranged to have a tractor delivered to the site to help clear the areas with the worst problems and repair damage to the roads and other areas on the site, and was taking a crew out with him to deal with weeds in the general use areas that the tractor couldn't reach.

We're very grateful to him for taking this on, which should help a lot in reducing the fire danger out there as well as making the roads on site more passable. However, we still need the folks who use the Anza site to be vigilant about clearing weeds and grasses that he may not be able to get to or that pop up after summer thunderstorms – we're getting into monsoon season and those rains can trigger more growth. The need for maintenance out there is ongoing, not just once a year. And many thanks to those of you who have been putting in a lot of hard work already to help get the weeds under control!

Sad Event at the Heritage Museum:

Our club has had a long-standing relationship with the Heritage Museum of Orange County, which is where our Beginners Astronomy Class and our Astrophysics SIG currently meet each month, and we periodically have outreach events there, as well. The museum has been expanding its activities in recent years, and is a great place to visit if you've never been there (you can find out more about it on their website: <http://heritagemuseumoc.org/>).

Another organization with an even stronger relationship with the museum is the Orange County Blacksmith Guild, which has had a blacksmith's shop there for years, and provides demonstrations and information about their craft for many events at the museum as well as classes in blacksmithing techniques. Their building really looked the part and has always added a lot to the ambiance of the museum property.

Somehow a fire started there early on July 4, and even though the fire fighters arrived quickly, the building was burned pretty much to the ground. Fortunately, they were able to contain it to just that building, and none of the other museum buildings were damaged and nobody was hurt.

Our "Bring Your Telescope" session of the Beginners Astronomy class was on July 5, the day after this happened. Because none of the other buildings was damaged, we were able to go forward with the class, being careful to stay away from the area of the blacksmith shop. It was pretty sobering to see how much damage was done. The cause is still under investigation as I write this.

I don't know if the Blacksmith Guild has been able to salvage any of their tools or how much damage there was to their forge. If any of you have any tools that might be used in blacksmithing work that you've been thinking could use a new home, please consider them contacting them (their website is <http://www.ocblacksmith.org/>). Of course, money donations to help rebuild their shop would be very welcome, and can be made through the Heritage Museum website.

Although what they do isn't really astronomy, blacksmiths developed the metal working techniques that later provided components for telescopes and other equipment we rely on in our hobby, so there is some connection if you need to find one. Or you could help them out simply because they're good people doing their best to preserve and pass on an important part of our collective history.

Happy summer to all of you, and may your skies be clear whenever you plan to be out under the stars!

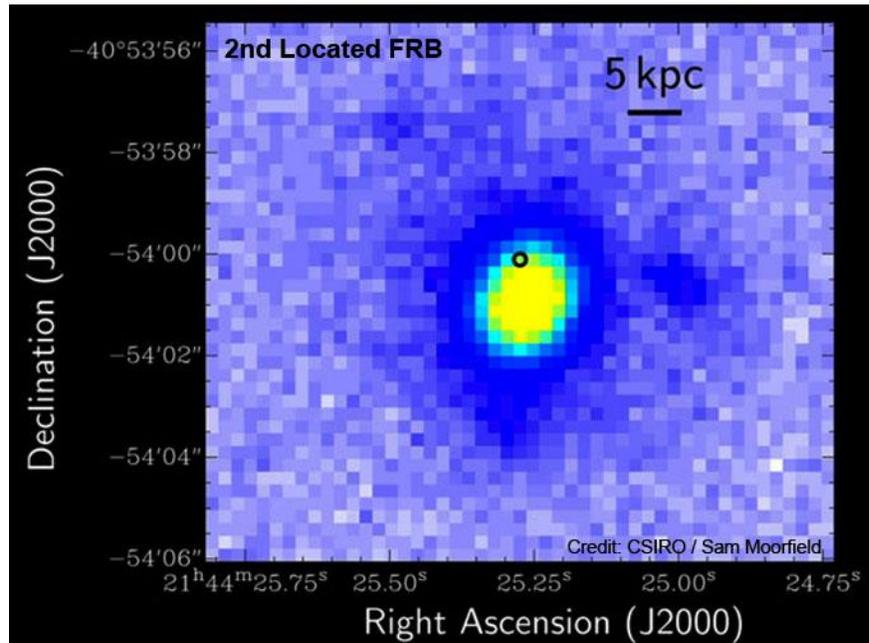
© Barbara Toy, July 2019

AstroSpace Update

August 2019

Gathered by Don Lynn from NASA and other sources

FRBs – It was announced June 27 that the 2nd fast radio burst (FRB) had its source located. The only other time this has happened was for an FRB that repeated, giving astronomers lots of chances to find its source. This time an array of radiotelescopes in Australia was able to locate a non-repeater in the fraction of a second that the burst lasted. The repeater had been found to originate in a dwarf galaxy with high star formation, and originated in a strong magnetic field, likely a magnetar. The new discovery had a completely different source. It is a large galaxy, appearing to be a combination of elliptical and spiral, with little or no star formation activity, and no evidence of a magnetic field. This supports the astronomers who have been saying repeater FRBs and non-repeaters are different phenomena. The light from the newly discovered source took 3.6 billion years to reach us.



5 days later, the source of a 3rd FRB was announced. It was located by an array of radiotelescopes in California. The source is in a Milky-Way-sized galaxy, with a similar star-formation rate of about 1 solar mass per year (not anywhere near as high as the source of the 1st located FRB). Light took 6 billion years to reach us from this new source. Again, this supports repeaters and non-repeaters being different beasts.

Hubble Constant – Cosmologists have been frustrated by the fact that the 2 most precise means of measuring the expansion rate of the Universe, known as the Hubble Constant, produce results that do not agree. Analysis of the Cosmic Microwave Background gave 67.7, but measurements using Type Ia supernovas gave 74.0 (in units of kilometers/second/megaparsec). This July two new precise means of measuring the Hubble Constant were announced. Calculating distance to red giant stars by their brightness yielded 69.8. Observing the timing differences in multiple images of distant quasars seen through gravitational lenses yielded 73.3. Analysis of all known error sources in each of these methods says that the differences in the methods' results remain unexplained.

Binary Black Hole – Using the Hubble Space Telescope, a pair of supermassive black holes have been found orbiting each other tightly, about 2.5 billion light-years away. It is expected that they will eventually lose orbital energy and collide. That should produce gravitational waves far stronger than those that have been detected by LIGO, caused by much smaller black holes colliding. Those gravitational waves would be at a wavelength that LIGO is not sensitive to. Astronomers are monitoring a number of pulsars because such wavelengths of gravitational waves should produce detectable changes in the pulses from the pulsars. However, nothing has shown up yet. Astronomers would like to know how common collisions are of supermassive black holes in order to estimate how likely it is that the pulsar monitoring will detect something. So astronomers will look for more pairs of supermassive black holes. There is a further wrinkle though. Some simulations of supermassive black holes in orbit about each other have shown that the approach of the black holes stalls, so possibly they never collide. More theoretical work needs to be done.

Exoplanet Atmosphere – Using the Hubble and Spitzer space telescopes, astronomers have analyzed the atmosphere of a sub-Neptune exoplanet. It appears to be mostly hydrogen and helium, but without the heavier elements (like oxygen and carbon) found in Neptune's atmosphere. The planet is known as Gliese 3470 b. Light penetrated very deeply because the atmosphere is quite clear. The planet appears to have a rocky core. Just how it formed with heavier elements in its core, but not its atmosphere, is a subject of debate. There is not sufficient resolution in the observations to separate the light from its star from that passing through the atmosphere, but the changes in the combined light during transits and eclipses of the planet allowed this separation.

Unexpectedly Close Disk – Using the Hubble Space Telescope to observe spiral galaxy NGC 3147, astronomers have found a gas disk very close to the supermassive black hole at the galaxy’s center. This was unexpected because such disks close to the black hole are found only in active galaxies (that is, ones with black holes eating a great deal of material), and NGC 3147 is not active. It does give astronomers a chance to test Relativity though, since the disk being so close to the black hole subjects it to huge gravitation. The light from the disk was found to be redshifted by the strong gravity, as Relativity predicts.

Missing Iron Found – Iron is common in planets and stars, but has not been found in comparable amounts in interstellar material. A new study explained why. It showed that iron will commonly form molecules with carbon and the results have spectra essentially identical to carbon molecules without iron. So the iron is masquerading as carbon molecules without iron. This also solves another mystery. Carbon chains longer than about 9 atoms should not be stable in space, yet much bigger molecules have been seen there. The new study found that long carbon chains with iron in them are stable.

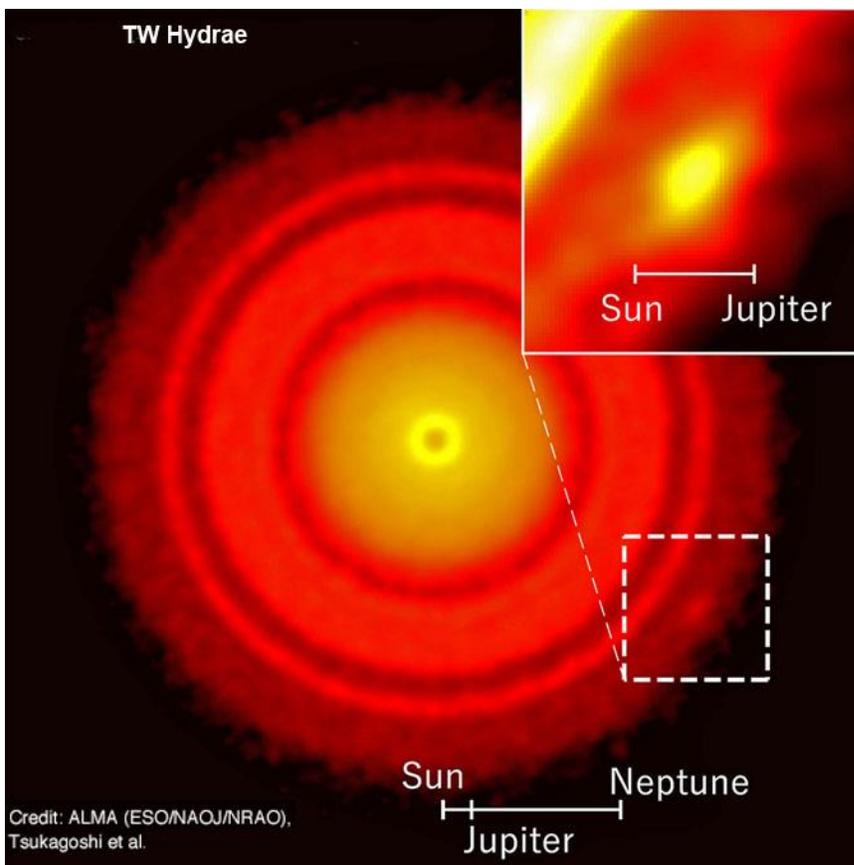
Planet Formation – CI Tau b is an exoplanet of probably 12 Jupiter masses that is so close to its star that it takes only 9 Earth days to orbit. This puts it in the class of hot Jupiters (hot because they are so close to their star). Many astronomers have been explaining hot Jupiters by positing that they form farther out, but migrate inward. But since the star CI Tau is only about 2 million years old, its planet hasn’t had time to migrate. 2 theories have been proposed regarding how any giant planet forms (not just ones close to their stars):

- Core accretion, where the core forms 1st, then attracts a huge gas atmosphere, and
- Gravitational instability, where a chunk of protoplanetary disk suddenly collapses to a giant planet.

New observations of CI Tau b best fit the gravitational instability predictions. But it is still under debate how a giant planet can form so close to its star.

Possible Forming Planet – Using ALMA (radiotelescope array in Chile), scientists have observed the nearest very young star, TW Hydrae, and found a concentration of material in the disk about it that may be a forming planet. Previous less sensitive observations had seen rings that formed in the disk, but not this concentration. This clump is elongated in the direction of disk rotation. It is about as wide as the distance between the Earth and Sun. The clump was not exactly what theoretical astronomers had predicted, so more observations and/or theoretical work need to be done.

Possible Exomoon Formation – Using ALMA (radiotelescope array in Chile) and VLT (large optical telescope array in Chile) observations, astronomers have found a disk about the exoplanet PDS 70 c. This likely means that (exo)moons are forming around the planet. This is the 1st observation of a circumplanetary disk. The system is 370 light-years away. The planet is about the same distance from its star as Neptune is from our Sun. These observations also showed a tail of dust trailing behind the other planet in this system, PDS 70 b. This will take some explaining.



Curiosity (Mars rover) has detected levels of methane about twice what has ever been seen on the red planet. It dissipated entirely in a few days. Curiosity has seen temporary rises in methane before, some of which were confirmed by orbiting spacecraft and some that were undetectable by the orbiters. Scientists would love to know what the source is and how it dissipates so fast. On Earth, most methane comes from life, though a little comes from non-living geological processes.

Uranus Rings – Astronomers have been observing the rings of Uranus using ALMA and the VLT. For the 1st time, the temperature of the rings has been measured (minus 320°F). The epsilon ring, the brightest one, was confirmed to have no small particles: nothing smaller than golf-ball sized. Voyager data from 1986 had implied this. And yet there is some dust (tiny particles) between the rings.

The InSight Mars lander last February stopped trying to pound its heat-sensing probe down into Martian soil in order to assess why it was making no progress. Spacecraft controllers came up with a theory that the soil is allowing the probe to bounce rather than progress. They then commanded InSight's arm to remove the support device from over the probe. What they saw confirmed the theory. They are developing a plan to use the arm to compact the soil or push on the heat probe and then try pounding the probe in again. If the probe reaches a depth of 3-5 yards, it will be able to measure heat escaping from the core of the planet, and will be able to measure heat conductivity of the soil, which will reveal much about the interior of Mars. The probe stuck at a depth of only about a foot.

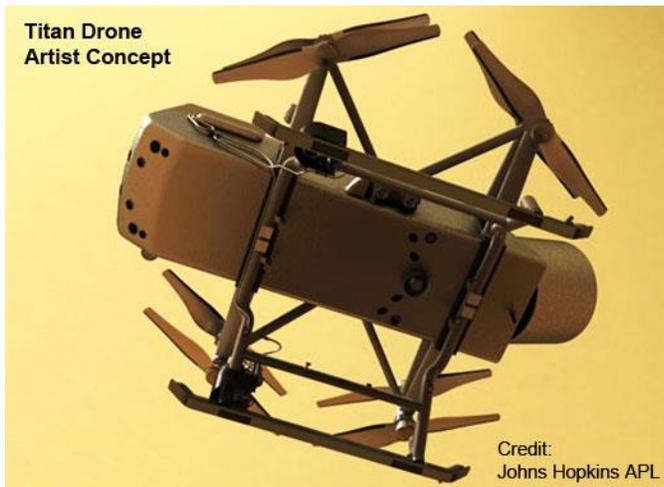
Near-Earth Asteroids – There are several telescope survey projects (ATLAS & Zwicky Transient Facility, to name just 2) that sweep large parts of the sky almost every night searching for asteroids (and other objects), particularly near-Earth asteroids that might pose a danger of collision. Interesting recent discoveries include:

2019 LF6, which has an orbital period (year) of only 151 Earth days, the shortest known. It is one of only 20 known asteroids whose orbits lie inside Earth's orbit. This class is known as Atira asteroids. They are difficult to discover because they are always in the Sun's glare. Its unusual inclination puts it at quite a tilt to the plane of most asteroids (and planets).

2019 MO, a 4-yard diameter rock, which was quickly found to have an orbit that would intersect the Earth. About 12 hours later it burned up over the Atlantic Ocean. A Puerto Rico weather radar picked up the sound of it hitting our atmosphere.

Hayabusa2 (Japanese asteroid sample mission) has completed collecting its 2nd sample of asteroid Ryugu, this time from within the crater it blasted in the surface in order to get a subsurface sample. Its 1st sample was collected last February. The mission is a little behind schedule, since planning the sample-collecting landings took longer due to the rough nature of Ryugu's surface. However, mission controllers expect to complete the remaining pictures and measurements so the spacecraft can leave the asteroid on schedule this December and return to Earth a year later.

Dragonfly – NASA has announced approval of a mission to Saturn's moon Titan, called Dragonfly, which will use an 8-propellor drone to fly about. Titan is the only moon in our Solar System with a substantial atmosphere. There is not enough light there to allow solar power, so the drone will have a radioisotope generator that recharges its battery nightly. It should get up to 5 miles of flight out of each battery charge. Landing at Titan is scheduled 2034. Landing will take 2 parachutes, followed by flying the drone down to the surface. The drone will transmit its data directly to Earth. Instruments will include cameras, a mass spectrometer, a gamma-ray spectrometer, a seismometer, and a weather station.



The Falcon Heavy, currently the most powerful rocket in operation, made its 3rd launch. 2 of its 3 boosters landed successfully (the other crashed) so that they can be reused. Half the payload fairing (a \$6 million dollar item) landed in a net, so it can be reused. There were 24 payloads launched on 3 upper stages, requiring 3 different deployments.

The 30-Meter Telescope project has announced that they will resume construction atop Mauna Kea in Hawaii, now that all legal hurdles have been settled. The design phase was completed about a decade ago. A number of concessions were made to protesters, including protecting religious sites and removing 5 other telescopes from the summit by 2033. As of this writing, protesters continue to block the road to the summit, not allowing construction equipment, materials or persons to pass. A state of emergency has been declared that may allow means of resuming construction.



Comet Interceptor – The European Space Agency has approved a program, called Comet Interceptor, to fly triplicate spacecraft in formation about a pristine comet (first trip near the Sun). Observing from 3 viewpoints will allow 3-D mapping of the material cast off by the comet. It is believed that such comets will differ in constituents and behavior from old comets. An interesting aspect is that the target comet has not been discovered yet. The spacecraft will park at the L2 Earth-Sun Lagrange point until a suitable target is discovered, then fly at its path. Planners believe that it can complete its mission within 5 years of launch. Comets are being discovered at such a rate by various sky surveys that this should be possible. Launch is planned for 2028.

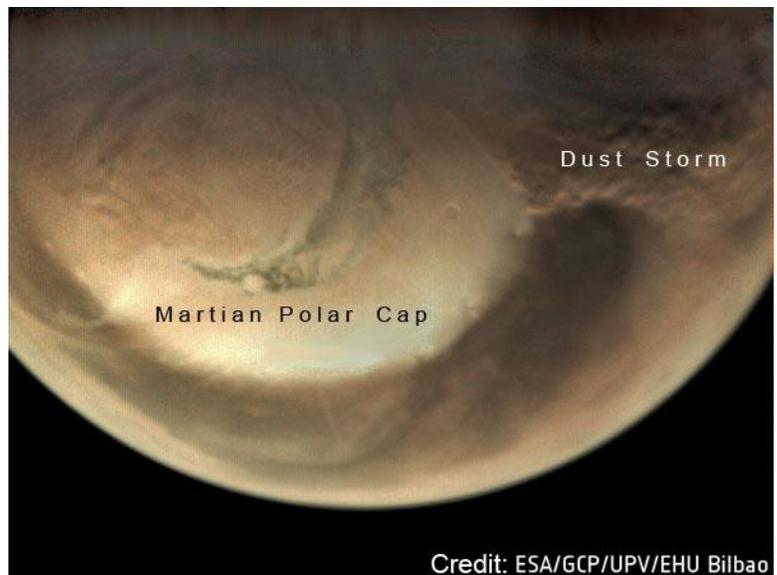
X-ray Space Telescope – A dual X-ray space telescope was launched on July 13 by a Russian Proton rocket. One of the telescopes is known as EROSITA, and was built by the German space agency. It is sensitive to lower-energy X-ray photons (300-10,000 electron volts). The other, named ART-XC is a Russian product, though NASA supplied the mirrors for it. It is sensitive to higher-energy X-ray photons (5,000-30,000 electron volts). Both have somewhat lower resolution than previous X-ray space telescopes, but that is a trade-off to make them extremely wide-field instruments. That wide field will allow EROSITA to image the entire sky 8 times over in the next 4 years. The next 3 years after that will be dedicated to possibly longer observations of the most interesting objects seen. The combination of both telescopes is known as Spektr-RG. It is on its way to the Earth-Sun L2 Lagrange point, about 1 million miles from Earth, where it will operate. By analyzing the distribution of X-ray emitting galaxy clusters, scientists hope to better understand dark energy, the unexplained force that seems to be pushing the Universe apart.

Instant AstroSpace Updates

Mars Express has been monitoring the red planet's north polar area for the last few months and has seen 8 dust storms flare up, but each dissipated in a few days, without becoming global.

NASA has approved 9 proposals to **study the solar corona** and the Sun's impact on Earth's atmosphere, including an X-ray solar telescope, a radiotelescope to study solar particles, and a coronal spectrographic imager.

NASA also approved 12 proposals **to explore aspects of the Moon**, in preparation for the return to the Moon with crew, now planned for 2024. The proposals include a fast lunar rover, radiation-tolerant computers, determining how lunar soil (regolith) sticks to things, studying the Moon's mantle, a radiometer to measure surface composition, and the Planet Vac (that sucks up soil samples).



The solar sail spacecraft developed by the Planetary Society, named **LightSail 2**, was launched June 25, but as of this writing had not deployed the sail. It will control its movements by reflecting sunlight off the sail, so the momentum of photons powers those movements.

Voyager 2 controllers shut off the heater in its cosmic ray instrument in order to prolong the spacecraft life, and so far the instrument is still functioning, though quite cold. Also, they are switching back to using the original thrusters, rather than the backup ones that have been in use for 30 years and are starting to degrade.

Tentative **launch dates** for sending people into space on privately developed rockets have been set for November this year, for both the SpaceX Crew Dragon and the Boeing Starliner.

Our Memories of the First Lunar Landing

These are a few memories from club members of that first landing on the moon.

= = = =

From John Robertson:

Here is my recollection of the Apollo 11 mission:

As a young child, I remember setting my wind-up alarm clock for very early in the morning so I could get up and watch the launch of most of the Project Mercury launches live on our small black and white television in our small living room. Through the following many years, I continued to watch every launch that I could on live t.v., viewing almost all of the Gemini and Apollo launches too. I was very interested in science and marveled at the fact that people were riding rockets and returning to Earth. I also became aware of the Space Race with the U.S.S.R. and how we had set our sights on the Moon.

Nobody in my family of six shared my interest in space flight, so most of the launches I watched alone. Some were right on time, but many were late. I patiently waited and watched and was sometimes disappointed when a launch was delayed or scrubbed. I lost a lot of sleep but it was worth it to me to witness the amazing show of power and skill.

On July 20, 1969, I was watching our new television in our new den that my dad had recently constructed. Our new television was a portable RCA - the only brand my dad would buy - and it was in color! It sat on a metal, wire-framed stand that rolled on plastic wheels and was connected by a flat, double wire to the rooftop antenna. My dad was home at the time and joined me on the couch. As just the two of us sat together, we watched as Neil Armstrong descended the lunar lander and stepped onto the moon. The picture quality wasn't very good and the audio had static, but we both knew that we had just witnessed one of the greatest adventures of all time: the first step on the Moon and a new era in space exploration.

It was a special moment for me because I had been following our nation's journeys into space for many years, and this was a culmination of the commitment, effort and sacrifice by an amazingly skilled and dedicated team. What made it more special was that I was able to share that moment with my dad who was just as amazed and impressed as I was.

My dad is ninety-seven years old now, in relatively good health and likes to reminisce occasionally about times past. One of his favorite times is when he was able to join his son - me - and watch man step for the first time on the Moon.

I will always cherish that day because I was able to share it with my dad.

= = = =

From Jorge Rubino:

I was a 12 year old kid living in my home country of Uruguay following the Apollo Program through the news. The night of the landing, at around midnight, my brother and I were sleeping for school next day when my father woke us up to watch the first steps of Neil Armstrong since some TV channel picked up the transmission and carried it live. We were not aware of that before going to bed so imagine our surprise and excitement to watch live from the moon the astronauts we were following through magazines and newspapers.

I still remember vividly the hour or so we spent glued to the TV set trying to discern through the grainy images what Neil and Buzz were doing.

= = = =

From Dave Kodama:

For the touchdown on the moon, I happen to remember exactly what I was doing, but don't have info on exactly where I was. I was somewhere over the Pacific, on a flight back to Honolulu from my family's very first visit to the "Mainland." The pilot was able to tap into the live NASA broadcast and pipe it over the airplane's intercom. I listened as the lander's altitude was called out. I was really puzzled by the pause in the altitude call-outs as Armstrong maneuvered sideways to avoid a field of rough terrain. That certainly added drama to the landing for me!

= = = =

From Paul Densmore:

When Apollo 11 landed I was watching a small screen B&W TV in the "Day Room" of a basic training barracks at Fort Dix, N.J. The room was packed with dog tired, emotionally strained trainees, the lowest scum on earth.

I had received a then-worthless Bachelors degree and a draft notice in June. Eventually I served my year in Vietnam as a Combat Engineer, Infantry with shovel. My area of operations was the same area as My Lai is located, called "Pinkville" (Google "Pinkville Vietnam"). It was a difficult year, I/we did the dirt and had the dirt done to me/us.

Consequently the moon landing is tainted memory for me, a casualty of the war.

= = = =

From David Fischer:

I watched the landing on a little 12 inch B&W TV, in my bedroom by myself while the rest of the family was watching in our living room. Once the LEM was safely on the surface, I ran over to the living room to watch the lunar walk and the rest of the coverage from the moon. I don't recall ever worrying about anything going wrong.

= = = =

From Rick Hull:

It was summer of 1969, I was 13 yrs old, having finished 7th grade, and days were mostly made up of swim team workouts in the mornings, and hanging at the local community pool in the afternoons.

I had already been an amateur astronomer for several years, receiving my first telescope 4 years earlier, and having just completed my first ATM project of an 8 inch f/8 Newtonian where I ground, polished and figured the primary. So, of course I was emotionally vested in the space program, and to say I was excited and anxious to witness the Moon landing would be an understatement.

There was no hanging at the pool that day. After workout, the rest of the afternoon was spent in front of the TV in my parents' living room. My father worked for GE and we had the largest color console made at that time, a whopping 25 incher. Although the telecast from the Apollo was B&W, it did not matter, most of the family was glued to the TV.

Of course when the Eagle landed, there was excitement, awe, wonder, satisfaction, all the emotions that go along with success. After the landing and the announcement that it would be several hours before stepping out onto the Moon, we ate a quick dinner, of what, that I cannot remember, and it was back watching the TV and just listening to the commentary until Neal and Buzz would walk on the Moon. No matter how late at night this would be, I would be up watching, and I did.

After the astronauts returned to the LEM, then I too went to bed. I then remember being up late again the following night, when the ascent module of the LEM left the Moon and met up with Columbia. Then again I went to bed very late.

= = = =

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.

2019 Owens Valley Radio Observatory Trip

By Doug Millar

The weekend of June 14 we had our yearly trip to the Owens Valley Radio Observatory near Big Pine, CA. This trip was special because we not only had participants from Oregon and The Bay Area, but we were going to be able to see and learn about some of the millimeter wave radio equipment that was used in the Event Horizon Project (Picture of the Black Hole).

We had about 37 participants at the event led by Dr. Mark Hodges and Doug Millar. Most came for both nights. The first night, Friday, was spent mostly on astronomy. Even though the moon was up, there was lots to see. Thankfully, Bill Hall brought along a CCD camera/telescope and we were able to see good detail in objects that were only fuzzy visually.

On Saturday we had a general introduction to the Observatory. We made ice cream with liquid nitrogen and we had a five station round robin exploration of Hydrogen alpha solar observing, a solar radiometer, introduction to millimeter wave dishes, the design of the digital end of radio astronomy, and an introduction to superconductor receivers.

Everyone then drove up to the 40m dish and we continued with experiments with liquid nitrogen and a detailed tour of the 40m dish. In the evening we went to Bishop for dinner and returned to the Observatory for more astronomy.

We all had a great time. If you missed this year's trip, watch for our announcement next year, and plan to join us!



OCA Loaner Scope Program Overview

By John E. Hoot OCA Scope Loan Program Director

The Orange County Astronomers Telescope Loan Program is designed to allow members to try out telescopes before buying one of their own. All too often someone becomes interested in astronomy and without prior telescope experience buys one that is difficult to use or poorly made. The resulting difficulties dampen their enthusiasm and they lose interest in the astronomy. Our program seeks to prevent this problem by allowing you to find out what type of scope suits your interests before you buy one.

We try to maintain an inventory that includes good introductory level scopes and some more advanced scopes for those looking to move up to advanced viewing or astro-imaging.

Since taking over the program I have restructured the program to allow me to manage the program without having the inventory overwhelm me or the limited space I have available to store things. As a result we have changed the way the program is administered in several key ways. Firstly, the club's scopes that are not on loan are now stored in a self-storage facility.

Secondly, scopes are now checked in and out only on one designated weekend every 3 months. This arrangement offers members more selection as the inventory turns at specific intervals.

I am looking forward to helping members find the type of scope that will give them many hours of pleasure under the stars and planets, in their yards, at outreach events, and star parties far afield.

Procedures and Rules

- 1) Scopes are lent out for a periods of 6 months.
- 2) Scopes may be return after only 3 months if you want to try something else, have purchased your own scope, or no longer want to use it.
- 3) At the end of the 6 months loan, you can request a 3 month extension so long as no one else has requested the scope.
- 4) Some very large scopes may be borrowed for periods longer than 6 months by prior arrangement with the program director.
- 5) Scopes in inventory (not on loan) and those whose loans are expiring will be advertised on the club web page, the pre-meeting slides, and in the Sirius Astronomer Newsletter.
- 6) Scopes on the inventory list are reserved by sending the 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.
- 7) To request a scope you must be a member in good standing whose dues are paid up to date.
- 8) To reserve certain advanced telescopes it is required that you have been a member in good standing for one full year.
- 9) You may only borrow one scope at a time.
- 10) Scope reservations will be accepted until 7 days prior to the next pickup day. This gives us time to collect scopes from storage and check them prior to pickup.
- 11) Scopes are reserved on a first come, first served basis. The timestamp on emails will be used to resolve all conflicts.
- 12) Reservation request confirmations will be via email.
- 13) If you request a scope that is already reserved, you will receive an email with a list of all the currently available scopes.
- 14) Scopes whose loans are expiring should be returned with all accessories between 12:00PM and 5:00PM the Saturday of Scope Return Weekend at a location that will be sent to you via email. If you cannot return the scope in that time window, contact the program director prior to that time to make alternate arrangements to return your scope.
- 15) Reserved scopes can be picked up on Scope Checkout Sunday between 12:00PM and 5:00PM at a location that will be emailed to you at the time your reservation is confirmed.
- 16) If your reserved scope has not been returned and is past due, we will make our best effort to email or phone you to let you know before 12:00PM exchange weekend Sunday.
- 17) Members with scopes that are past due will be charged a \$10/month overdue fee for every month they are delinquent. This charge will need to be paid and the scope must be returned before your membership in the club may be renewed.
- 18) Some scopes in the program are rent free, others have a \$5/month rental fee. All rental fees must be paid in advance via check or cash, or at time of scope pickup.
- 19) All scope borrowers must provide proper identification and sign the club's loan agreement at the time of scope pickup.

NEXT SCOPE EXCHANGE DATES

July 29, 2019 – Returns

October 26th, 2019 – Returns

August 4, 2019 – Pickups

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

From the Editor

Erratum:

Front page of July issue, Dave Kodama's name was misspelled in the caption to his photograph.

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@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"

Due dates for submission of articles, pictures and advertisements

<u>Issue</u>	<u>Due date</u>
September	24-Aug
October	21-Sep
November	19-Oct
December	23-Nov



August's Guest Speaker: Anthony Piro from Carnegie Observatories

"Investigating the Mysteries of Exploding Stars"

Advertisements

Buy, Sell or Trade some of your gear ? This is where club members can place advertisements. Please contact the editor at newsletter@castronomers.org to place an advertisement or get more information.

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 with dove tail attachment. Like new condition			\$100
Orion Astro View 120ST f/5.0 Richfield refractor OTA with rings and dove trail attached			\$200
Twilight I Alt-Azimuth mount with slo-motion cables, weight 15 lbs			\$100
If you buy any of the Refractors I will take \$50 off the mount.			

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)			
<ul style="list-style-type: none"> Orion SkyQuest xx14g GoTo Truss Tube Dobsonian Telescope Orion Light Shroud for SkyQuest xx14g Truss Tube Dobsonian Set of Orion SkyQuest xx14g Padded Telescope Cases JMI Wheeley Bars for Orion SkyQuest xx14g Scope Cloak Cover for Orion SkyQuest xx14g 			
			



ASTRONOMER

The Newsletter of the Orange County Astronomers

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

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

**DATED MATERIAL
DELIVER PROMPTLY**

RETURN SERVICE REQUESTED

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)

President	Barbara Toy	btoy@cox.net	714-606-1825
Vice-President	Reza AmirArjomand	reza@ocastronomers.org	949-791-7072
Treasurer	Charlie Oostdyk	charlie@ccd.edu	714-751-5381
Secretary	Alan Smallbone	asmallbone@earthlink.net	818-237-6293
Trustee	Andy Lowry	andy@ocastronomers.org	410-615-2210
Trustee	Cecilia Caballero	caballerocecilia21@gmail.com	949-333-3283
Trustee	Doug Millar	drzarkof56@yahoo.com	562-810-3989
Trustee	Sam Saeed	samsaeed4241@yahoo.com	714-310-5001
Trustee	Helen Mahoney	drhelenmahoney@yahoo.com	562-424-3737
Trustee	Gary Schones	gary378@pacbell.net	951-687-7905
Trustee	John Hoot	jhoot@ssccorp.com	949-498-5784

COMMITTEES, SUBGROUPS, AND OTHER CLUB VOLUNTEERS

Anza House Coordinator	Manuel Baeza	manugb33@yahoo.com	323-394-3042
Anza Site Maintenance	Don Lynn	dlynn@ieee.org	303-719-7490
Beginner's Astronomy Class	David Pearson	p.davidw@yahoo.com	949-492-5342
OC Star Parties	Steve Mizera	mizeras@cox.net	714-649-0602
MTW Star Parties	Bob Nanz	bob@nanzscience.com	760-751-3992
Librarian	Karen Schnable	karen@schnabel.net	949-887-9517
Membership, Pad Coordinator	Charlie Oostdyk	charlie@ccd.edu	714-751-5381
Mt. Wilson Trips	Michele Dadighat	mmpkb8@gmail.com	573-569-3304
Observatory Custodian / Trainer / Member Liason	Barbara Toy	btoy@cox.net	714-606-1825
OCA Outreach Coordinator	Andy Lowry	outreach@ocastronomers.org	410-615-2210
Sirius Astronomy Editor	David Fischer	newsletter@ocastronomers.org	949-831-1163
Telescope Loaner Program	John Hoot	jhoot@ssccorp.com	949-498-5784
WAA Representative	Cecilia Caballero	caballerocecilia21@gmail.com	949-333-3283
Webmaster	Reza AmirArjomand	webmaster@ocastronomers.org	949-791-7072

SPECIAL INTEREST GROUPS (SIGS)

AstroImagers SIG	Alan Smallbone	asmallbone@earthlink.net	818-237-6293
Astrophysics SIG	Bob Sharshan	rsharshan@aol.com	714-845-6573
Dark Sky SIG	Barbara Toy	btoy@cox.net	714-606-1825
Youth SIG	Doug Millar	drzarkof56@yahoo.com	562-810-3989