SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

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Wide field view of the Lagoon and Triffid nebulas with star-dense regions of the Milky Way in the background. Made by club member Craig Bobkin at the Anza StarBeQue (August 2019) using Pentax K-1 camera and William Optics White Cat 51 refractor.

OCA CLUB MEETING

The free and open club meeting will be held on 11 October at 7:30 pm in the Irvine Lecture Hall of the Hashinger Science Center at Chapman University in Orange.

This month, the speaker is Gary Bostrup from Rockwell International talking on the subject "The Universe in Infrared Light (There is no Red in Infrared)".

NEXT MEETINGS:
8 Nov (speakers TBA)

STAR PARTIES

Anza and OC star parties are on 26 October. 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 1 November at Heritage Museum of Orange County at 3101 West Harvard Street in Santa Ana.

Youth SIG:
contact Doug Millar
Astro Imagers SIG: 2 Oct, 6 Nov
Astrophysics SIG: 18 Oct, 15 Nov
Dark Sky Group:
contact Barbara Toy

President's Message

By Barbara Toy

OCA Election for 2020!

October marks the beginning of the OCA election season – which we generally manage to get through without candidate debates, primaries or other major drama. Still, our annual election is important for governing the club and is an opportunity for all of our members to weigh in on who should be the officers and trustees for the coming year.

Our election schedule starts with collecting nominations, which we do in October and November, ending generally at the end of the November meeting, which is November 8 this year. If you are interested in running for a position on the Board, the easiest way to get on the ballot is to email our club Secretary, Alan Smallbone, at asmallbone@earthlink.net. You can also give him your information at the October or November general meetings, you can give notice by US mail to the club's P.O. Box, or you can give the information to one of the other Board members to relay to him – the danger with that, of course, is it could be delayed in getting to him. Since Alan puts the ballot together, notifying him directly is the best way to be sure he gets the information promptly and accurately.

We have seven Trustees on the Board, plus four officers, the President, Vice President, Secretary and Treasurer, so the Board has a total of eleven members. Any adult who has been a member in good standing of the club for at least a year and is so at the time of the nomination (and election) is eligible to run for a position as Trustee, Secretary or Treasurer. Any member who has these qualifications and has also served on the Board for a year (any year, not just the year prior to running) is eligible to run for President or Vice President.

After the ballot is finalized following the November meeting, it will be posted on the website and sent out with the December issue of the Sirius Astronomer, and copies will be available at the December and January general meetings. To vote, you need to submit a paper ballot – we don't have any way to vote electronically. Each member can submit a ballot, so if you have more than one member in your household, each one can submit a ballot, but each ballot needs to be submitted separately. After indicating your votes on the ballot, you need to put it in an envelope, and write your name on the outside of the envelope (so the ballot can be verified as from a member in good standing and that each member has only voted once) and either put it in the ballot box at the general meeting in December or January, or mail it to the address on the ballot (there will be full instructions on the ballot, too, and if those directions are different from what I've put here, please follow what's on the ballot).

The election ends at the end of the January general meeting (January 10, 2020), though any ballots that are postmarked before or on that day are counted even if they arrive later.

At this point, all of the members of the 2019 Board have agreed to run again for their same positions, except Andy Lowry, who is leaving us to move to Northern California. As a result, we have an open Trustee position. As of the time I'm writing this, I'm told we have at least one person interested in running for it, but it would be nice to have some additional candidates for the Board as well, so please do consider running if you have any interest in how the club functions.

What Do the Board Members Do?

So, if you decide to run for the Board, what would you be getting yourself into? Excellent question – when Jim Benet convinced me to run for a Trustee position many years ago he characterized it as just attending six Board meetings a year, which is accurate as a bare bones description but the actuality is a much richer experience than just attending six meetings.

Board meetings are in the odd-numbered months, January, March, May, July, September and November. We start each meeting by setting the date for the next meeting, as we plan around holidays, other club events and the schedules of the Board members. Our meetings are on Sundays, and are currently set to start at 11:00 a.m. Perhaps there were times in the past when some meetings unfortunately became marathon sessions, in recent years we've been pretty successful at keeping them around two hours or less. Although we have an agenda and work to get through it expeditiously, our meetings are far from rigidly formal and there's a social aspect -- it's a chance to get caught up with other Board members we may not have a chance to see very often (I'm happy to report that our Board members generally like as well as respect each other). So, while we're there mainly for club business, we have some fun as well.

The President sets the agenda, and generally sends it out prior to the meeting. Topics include anything related to running the club. Besides budget updates, these often include maintenance or infrastructure issues at our Anza site and concerns about various club programs. As one example, this last year has seen some major changes in how the Loaner Scope program is organized and administered, including where telescopes in the program are stored when not out on loan. John Hoot as the current coordinator of the program has brought a number of issues related to that before the Board for input as well as keeping us advised of the status of the program as he has modified it. Other major recurring concerns over the last year include the development and implementation of the new website, newly installed fiber as an alternative to the satellite Internet service we've had at Anza, weed clearance at Anza, and developments related to the Outreach Program.

In truth, very few members of the Board just show up for the meetings and don't do anything beyond that, which would be pretty boring. Folks who run for the Board care enough about the club to want to become involved where there's a need; and when you're on the Board, it's easier to see where help is needed – so most Board members wind up volunteering for particular projects that interest them. John Hoot taking on the Loaner Program is one example; others from the last year or so include Cecilia Caballero becoming our new representative to Western Amateur Astronomers and Alan Smallbone getting the new website designed and implemented (we still have the last bits to implement but those should be on line soon).

During the meetings, we generally have a discussion of the different topics on the agenda, those that require a Board decision are put to a vote, and for those issues that require further action or more information before a decision can be made, generally one or more members volunteer to obtain the information or take the action. Some items are on the agenda just as informational updates without need of Board action.

The Board also has a dedicated email group, where topics can be discussed between meetings and, if immediate action is needed on something before the next Board meeting, this gives us a way of making those decisions in the necessary timeframe. Fortunately, we rarely need to do so and the more usual use of the email group is for exchanging information and reminders.

Each of the officers has specific duties. The major job for the Treasurer is handling the club's finances, which encompasses a lot. At this point, it includes keeping membership information current along with pad and observatory information for licensees at our Anza site, sending out notices when fees are due, getting our tax returns filed, handling insurance issues (with input from the President – Charlie Oostdyk and I have had numerous conversations on our policies over the years, particularly when we needed to find alternative coverage, but Charlie is the primary contact for our broker), and innumerable other related tasks, including mailing out the Sirius Astronomer each month and sending out any other mailings going to groups of members. Needless to say, it is not a sinecure, and we are very grateful that Charlie has been willing to continue handling all of those necessary functions that keep us going as a club.

The other officers have more limited responsibilities. The major formal duties for the Secretary are providing Minutes for Board meetings, maintaining the official copy of the past Minutes and other club documents, and taking care of club correspondence (mainly acknowledgment letters for donations). The most important duty for the Vice President is finding speakers for our general meetings and any other events where speakers might be needed, such as club banquets – Reza AmirArjomand has been doing a really great job of finding excellent speakers for us and we're grateful he's been willing to continue doing that.

The President presides at the general meetings and Board meetings, drafts the agendas for Board meetings, writes the President's Message (though some past presidents haven't and the club continued to function anyway), and generally whatever else might be needed to keep things running smoothly. I've been finding being the President interesting, with a lot that makes it a fun position – one person shouldn't have all the fun, though, so if one of you who has served on the Board in the past is interested in running for President, please do (none of the current Board members wanted to).

If you want to run for any of these positions and meet the requirements, please send Alan an email specifying which position you want to run for, and, if you want to run for President or Vice President, please also state what year(s) you served on the Board in the past.

Please do consider running in our very own OCA election! We look forward to hearing from you.

AstroSpace Update

October 2019
Astronomy and space news summarized by Don Lynn from NASA and other sources

Probable Neutron Star/Black Hole Collision – LIGO and Virgo (gravitational wave detectors) on August 14 detected waves that were made by the collision of 2 objects of about 5 and under 3 times the mass of our Sun. Quite likely this was a black hole swallowing a neutron star. This is based on the fact that no black hole has ever been seen with a mass this small (under 3 solar masses). Also, no neutron stars have ever been seen with mass over about 2.5 solar masses. If confirmed this would be the 1st ever detection of these types of bodies colliding. Previous gravitational wave detections have been from collisions of 2 black holes or 2 neutron stars, never a mixture. The collision occurred about 900 million light-years away.

Exoplanet Water Vapor – Astronomers have for the 1st time discovered water vapor in the atmosphere of a rocky exoplanet that is at a temperature where liquid water could exist on the surface (the so-called habitable zone). The planet's density shows it is a rocky planet. It could be a water world, one where the entire surface is ocean, but there is no way to tell with current observations. The planet is known as K2-18 b and is 110 light-years away in Leo. It orbits a small dim red dwarf star every 33 Earth days. There are some differences from Earth, in that it is about twice our diameter, and therefore much more massive. Although red dwarf stars are known for their sporadic emissions of radiation that might be damaging to life, this particular star is very quiet. Astronomers hope to find out more about this planet with the James Webb Space Telescope after it is launched in a couple of years.

Unusual Exoplanet Orbit – After monitoring a star (HR 5183) for about 20 years to see if an orbiting exoplanet was wobbling the star, and finding nothing, astronomers were surprised to find indications of a planet. The movement of the star matched what is expected if a planet is in a very elongated orbit, and only measurably wobbles the star when close to its near-point with the star (periastron). The planet has 3 times the mass of Jupiter. If its orbit were placed in our Solar System, it would stretch from the asteroid belt to beyond Neptune. Planets should form in roughly circular orbits, so something has disturbed this planet's orbit to a very elongated shape. The most likely explanation is that there was another large planet in the past, which passed too close and distorted this planet's orbit. The other planet would have been thrown out of the system.

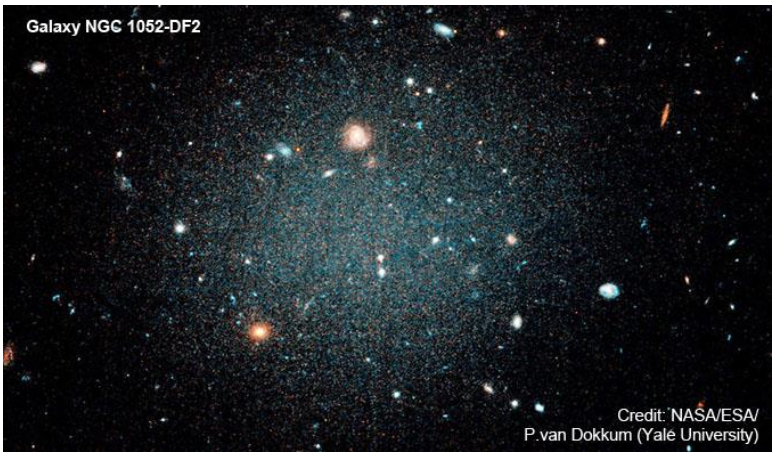
Exomoons, Maybe – Data from the Very Large Telescope in Chile shows the presence of 2 gigantic exomoons, maybe. It depends on the definition of a moon. Some astronomers are calling these double planets rather than planet and moon. Also the "planets" are so large that they may be brown dwarf stars. Can brown dwarfs have moons? That hasn't been defined. Both of the new objects were actually imaged, which is an unusual way to find planets (unprecedented for exomoons). The 1st "moon" has almost Jupiter's mass and orbits a "planet" with 10-11 times Jupiter's mass. The 2nd "moon" is 4.6 times Jupiter's mass and orbits a "planet" of 13-14 times Jupiter's mass. Both orbit at roughly 300 AU (1 AU is Earth's distance from the Sun) from their star, which is why astronomers were able to separate their images from their stars' images.

Decaying Orbit – WASP-12b is a hot Jupiter. That is, it is a giant exoplanet that orbits very close to its star, which heats it. Theoretically planets very close to their star should slowly spiral in to the star. 2 years ago, astronomers reported that WASP-12b's orbit appeared to be decaying. A new study showed that its orbit is 0.3 seconds shorter than it was 11 years ago. At that rate, it should fall into its star in about 3 million years. Further work is being done to prove that the change in orbital period is not due to some other cause. If hot Jupiter orbital decay is confirmed, it will be the 1st time observed.

Asteroid Color Change – Last December astronomers noticed that asteroid 6478 Gault had grown a couple of tails. The longer tail is ½ million miles long. Further work showed the tails were dust thrown off, lacking the gases that comets throw into their tails. So it was declared an active asteroid, not a comet. Of course astronomers kept watching Gault to see what it would do, and it changed color! The infrared portion of its spectrum changed to show more energy coming from shorter wavelengths. Such a color change has never before been seen. The best explanation is that it threw off enough surface dust to uncover rocks that were somewhat different color. And the best explanation for how it threw off much of its dust is that the YORP effect is increasing its rotation speed, and centrifugal force is throwing off the dust. The YORP effect (named after 4 astronomers; guess what their initials are) has been observed to spin up small Solar System bodies. It happens because sunlight is absorbed, then re-radiated as infrared light in a different direction, adding a little momentum to the spin. When Gault moves from behind the Sun, the astronomers will make more observations, hoping to prove that the spin matches the theory.

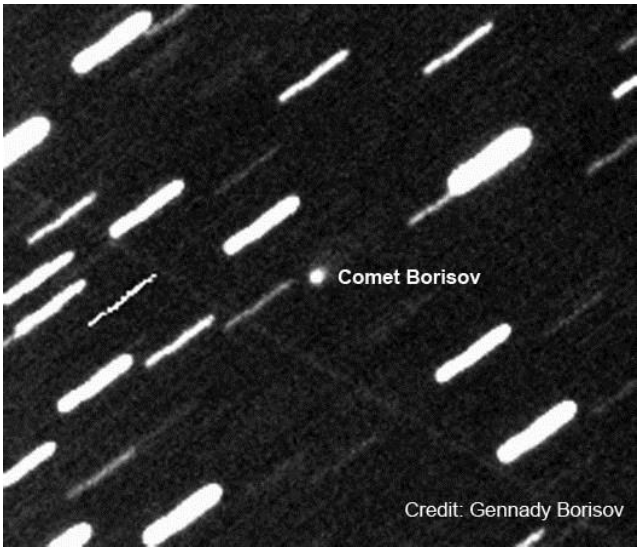
Star Strings – A new study of 20 million stars selected from Gaia (star position/motion space telescope) data showed that only 1.5% of stars are in groups, and roughly half of those are in strings, not clusters. The youngest strings are aligned perpendicular to the arm of our galaxy. Astronomers had expected strings of stars to form parallel to the arms. Typical strings are 650 light-years long and 30 light-years wide. The strings seem to hold their shape longer than clusters do. Older strings did not align with respect to galaxy arms, but may be showing us where arms used to be.

Lack of Dark Matter Disputed – It was reported here in past months that 2 galaxies had been discovered that appeared to have essentially no dark matter, based on the fact that the total masses (ordinary matter plus dark matter) calculated from globular orbital speeds were the same as the ordinary masses calculated for all their stars. These galaxies are known as NGC1052-DF2 and NGC1052-DF4 because they appear to be neighbors of the galaxy NGC1052. In fact, the discoverers of the lack of dark matter had measured the distances of DF2 and DF4 and found them to be about the same as NGC1052. Now another team of astronomers has measured their distances by other methods, and found them to be only about 2/3 as far away. This greatly changes the calculated mass of the stars in them and the mass implied by the globular speeds. The result is that DF2 and DF4 would have substantial dark matter at the closer distance. The original discoverers dispute the new distance measurements and have secured observation time on the Hubble Space Telescope to make highly precise distance measurements. Everyone is breathlessly awaiting the result.



Periodic Black Hole – Astronomers have discovered a supermassive black hole that flares up in X-rays (becomes 20 times as bright) every 9 hours. It is the only one known to do so with a regular period (2 small black holes are known to periodically flare, but no other supermassive ones). Calculations show that each flare up is caused by consuming a mass of about 4 times that of our Moon. This black hole is located in the center of galaxy GSN 069, about 250 million light-years away. As supermassive black holes go, this is a fairly small one, at about 400,000 times the mass of our Sun. That may be why such behavior has never been seen before. Periodic behavior may increase period with increasing mass, so the inactive periods may be far longer for black holes with millions or billions of solar masses. The temperature of the material falling in has been measured at 1 million degrees F., increasing sharply during the flare ups. This is hotter than an accretion disk of this size should be: another mystery. Two theories have been proposed to explain the periodic behavior: 1) material builds up in an accretion disk until it becomes unstable and falls in; 2) another orbiting body disturbs the accretion disk periodically. During the last couple of months the intensity and duration of flare ups have decreased slightly, and the periods between flare ups has increased slightly. Astronomers will continue to monitor this object to get more clues to explain the behavior.

Interstellar Object – Remember 'Oumuamua, the asteroid (or possibly comet) that cruised through the Solar System at such a speed that it had to have come from interstellar space? It appears we have found another interstellar invader. This one, however, displays a head and tail, so is definitely a comet. It is preliminarily designated C/2019 Q4 (Borisov). It was discovered by a Ukrainian amateur astronomer, Gennady Borisov, using a 26-inch telescope that he built. He has discovered 7 comets. Initial observations show that it is a similar color to any typical comet nucleus that originated in our Solar System. It is still on its way into the Solar System, so astronomers will have months to study it. It is approaching from within the plane of the Milky Way, from the direction of Cassiopeia. Although the object is large for a comet (estimated 6+ miles across) it is not expected to get even as bright as 14th magnitude, because it will not approach the Sun very closely. When the orbit is better established, the designation may be changed to an "I" (Interstellar) number rather than a "C" (comet) number.

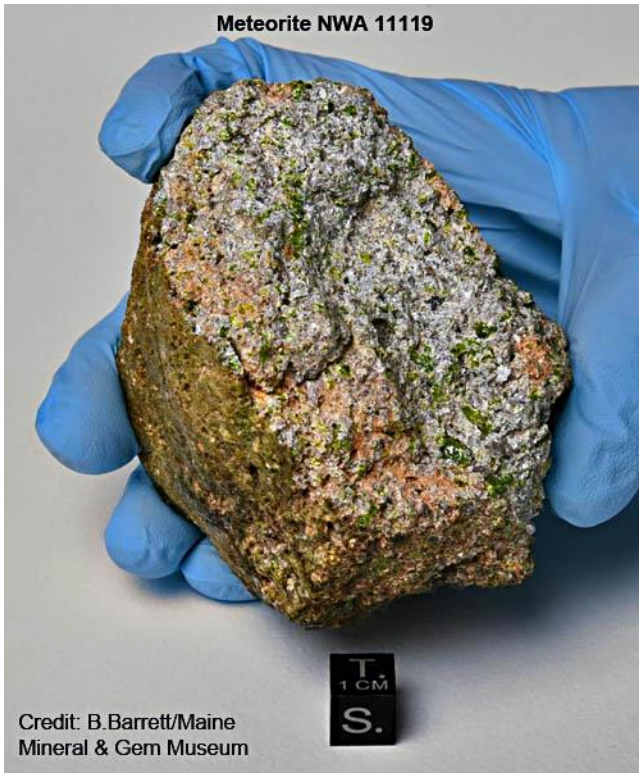


Hayabusa-2 (Japanese asteroid sample mission) – New science results from Hayabusa-2: The asteroid Ryugu is a fragile pile of rubble, which must include substantial void space in it. Overall density is only 1.2 times that of water. Surface rocks are of 2 types, both quite dark. Though space weathering should have reduced some of the rocks to dust, there isn't any dust; it must have dropped into the voids or escaped. The bright inclusions in surface rocks resemble the structure of the Tagish Lake meteorites that fell to Earth in 2000. Hayabusa-2 has collected samples, scheduled to return to Earth next year, when we should learn more.

Mars Isotope Measurements Explained – Astronomers for some time have been measuring the ratios of isotopes in Mars' atmosphere, because that can be used to calculate how much atmosphere has been lost during the life of the planet (different isotopes dissipate into space at different rates). Unexpectedly, the measurements of oxygen isotopes have been quite inconsistent. A new study found out why. The oxygen measurements vary widely depending on the time of day, apparently due to ground temperature changes. This was discovered from observations made by an infrared telescope in Hawaii.

Titan Ramparts – It was reported here that wide ramparts and narrow raised rims have been found to surround many of the lakes on Saturn's moon Titan, though how they formed has not been satisfactorily explained. The ramparts are a few miles wide and 200-300 yards high, and the rims are much narrower, higher and fragmented. A new theory says that cryovolcanic explosions created the depressions that are now lakes. The explosion cause is proposed to be warming of frozen buried nitrogen until it suddenly turned to gas. The promoters of this theory say that could have formed the ramparts and rims. Afterward, methane rained, which would then fill the explosion craters to form the lakes.

Pre-Earth Volcano – A meteorite named NWA 11119 has been found to be a little older than the Earth. This has happened before. But this is the 1st older meteorite that had volcanic rocks in it (andesite and pyroxene). This implies that a Solar System planetesimal had formed a mantle and crust and began volcanic activity earlier than thought.



Neutrino Masses – Theorists have shown that the masses of the 3 types of neutrinos affected the formation of galaxies and how they are distributed about the Universe. So of course a team of scientists studied the distribution of more than a million galaxies, and for the 1st time applied the known interactions of neutrinos from particles experiments, and calculated masses for the neutrinos. Previous work had established that at least 2 of the 3 neutrino types have non-zero masses, and that no 2 types have the same mass. But those 3 masses have not been measured with any precision; only wide limits on the masses have been established. The new study was able to find a new limit on the sum of the 3 type masses, and establish an upper limit on the least massive of the 3 types. They plan to analyze 10 times as many galaxies in order to get better limits on neutrino masses. If they can calculate a lower limit for the lightest neutrino that is clearly above zero, that would be a new discovery.

Most Massive Neutron Star – The Green Bank radiotelescope has discovered a neutron star that happens to have a companion (a white dwarf star) in close orbit, and that has allowed astronomers to determine the masses of the 2 stars. The mass of the neutron star turned out to be the largest ever measured for that type of star. Theorists have long been calculating the maximum mass that a neutron star can have before it collapses into a black hole, but there is some disagreement among such numbers because they depend on the behavior of neutrons and other subatomic particles at pressures higher than we can produce. The newly measured neutron star is 2.17 times the mass of the Sun, and this is close to the best estimates of the theoretical maximum. That measured mass is believed to be quite accurate because the eclipsing of the neutron star by its white dwarf companion showed "Shapiro Delay", the effect where extreme gravity of the companion delays the transmission of pulses from the neutron star. The measured delay put quite close limits on the accuracy of the star mass calculations. The neutron star is known as J0740+6620 and is about 4600 light-years away.

Instant AstroSpace Updates

The Indian lunar lander, part of the **Chandrayaan-2** mission, lost contact shortly before its scheduled landing on September 7. As of this writing, efforts to contact it, now seen (from orbit) on the surface, have been unsuccessful.

The MeerKAT radiotelescope has discovered 2 **bubbles** of material emitting radio waves, above and below the center of the Milky Way galaxy. These are much smaller than the bubbles emitting gamma rays discovered similarly placed, in 2010. Both pairs are likely remnants of past activity of our galaxy's central black hole.

It may be too much of a coincidence that **gravitational waves were detected twice** in 21 minutes on August 28. Other possibilities include both parts of a binary black hole merging with something else or double imaging of the event by gravitational lensing.

NASA announced plans to launch late next year a tiny spacecraft named **CAPSTONE** to test the lunar orbit planned for the future crewed Gateway space station.

The Solar Eclipse of July 2nd – A Return to Elqui Valley

By Joel K. Harris – OCA Member

As many OCA members were acutely aware, a total solar eclipse occurred on Tuesday, July 2nd this year. For most club members, the only view of this occultation was a vicarious one, made through via the Internet, or various news reporting agencies.

For myself, along with 59 other diehard "eclipse chasers", it was an entirely different event. This eclipse took place in a venue all-too-familiar to me, having traveled to the Elqui Valley of North-Central Chile numerous times over the past 33 years.

My first experience in Elqui was in leading a small band of amateur astronomers in March of 1987, to observe Comet Halley. For 4 days and 3 nights, we stayed in the coastal town of La Serena, making the long, 4 hour round-trip observing commute to the flat terrain leading to the world famous La Silla Observatory, operated under the auspices of the European Southern Observatory (ESO).

A second visit to that region came in mid-1988, accompanied by the late OCA President John Sanford, long-serving Treasurer Charlie Oostdyk, and former club members Verryl Fosnight and Liz Johannson. Our visit was prompted by John's need to capture wide field images of the southern sky asterisms, for John's watershed book "Observing the Constellations" (Fireside Publications – 1989).

Another visit, in mid-1990, coincided with a feature article I penned for Astronomy magazine ("An [Optical] Revolution in Chile" – November 1990), regarding the newly completed New Technology Telescope (NTT) at La Silla Observatory --- the NTT being one of the first telescopes employing active optics and a multi-mirror design (in lieu of a traditional monolithic mirror). During that visit, I was privileged to stay overnight at the La Silla facility (a courtesy rarely granted to non-ESO astronomers), and to carry out an observing run with Richard West – the discoverer of the brilliant sun-grazing comet he discovered in 1975.

Our group of eclipse observers originated from all over the U.S.: Northern California, Florida, New Hampshire, Massachusetts, and places in between. OCA was represented as well, with Don Lynn, his wife, and his sister among the tour participants. Many tour members elected to arrive in Santiago (our starting point for the tour) several days prior to the actual tour. This was aimed to preclude arriving after our scheduled departure July 1st, to transfer to the town of Tongoy --- situated just outside the eclipse track, and the site of our hotel – the Playa Blanca Beach Resort.

Unfortunately, 2 members of our tour were thwarted in their attempt to get to Santiago, due to airplane mechanical issues or severe weather conditions that kept them from connecting to their international flights. Two other tour members, also faced with failed connections, took drastic measures to ensure they joined the group successfully. One of them, Josette Seitz of the Bay Area, ended up flying from DFW Airport, to JFK Airport, and then down to Santiago. Greg Dunn and his wife Cynthia arrived in Santiago the day after the group transferred to Tongoy (some 260+ miles away). In order to meet up with our group, they hired a private car and driver for $450 to take them up to our observing site.

Eclipse day, our group departed our hotel at 05:30 for our viewing site, hard by the public Mammaluca Observatory, located just outside the town of Vicuña, some 35 miles inland from La Serena. The early departure was planned to avoid predictions of massive traffic jams on the two lane road up the Elqui Valley leading to Vicuña. Our early departure resulted in a commute of only 90 minutes, rather than the forecasted 3 to 4 hours.

The viewing site was set in the Andean foothills, with copious space for our group to comfortably set up their various observing hardware and viewing spots. We had a buffet lunch of BBQ'd meats and vegetables, in addition to some local wine and beer (for those not particularly concerned about eclipse event keenness).

The weather that day was ideal. A cloudless sky, and temperatures hovering in the low 70s (despite it being the start of the Austral Winter). On cue, the partial phases of the eclipse started at 15:23 local time. During the ensuing 75 minutes, the moon steadily made its way across the solar disk, occulting more and more of the sun's diameter. At 16:38, as predicted, totality overtook our viewing site. Poised just 9° above the western Andean foothills, we were treated to an awe inspiring view of the solar corona. Numerous "brushes" were visible at both the north and south poles, while the overall coronal shape resembled a hybrid of both maximum and minimum solar activity --- exhibiting equatorial extensions, while maintaining a roughly symmetric geometry.

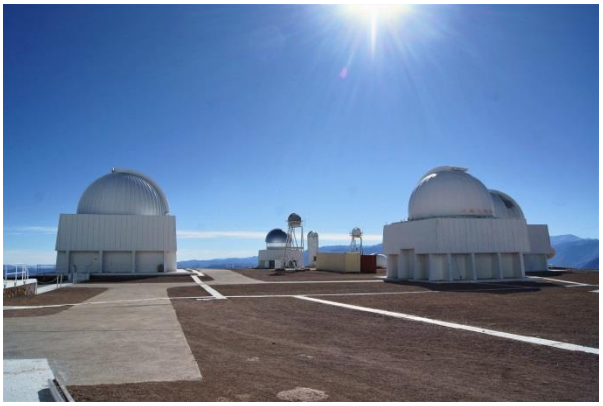
Totality close-up by Greg Dunn

Totality wide angle by Dr. Donald Edberg

Sunset occurred while the final partial phases of the eclipse were still ongoing. Again, seeking to avoid massive traffic heading back to La Serena, we had dinner at our observing site. By the time dinner was through and we were packed up, it was 22:00. Sadly, despite our plans to outwit traffic, the ride back to our hotel took well over 3 hours, making it a 20+ hour day from start to finish.

The remainder of the tour included a visit to one of the distilleries in the Elqui Valley, where the national alcoholic drink - Pisco - is manufactured. Naturally, everyone was treated to free samples of that very potent "adult beverage".

The final day of our trip, we were treated to an excellent tour of Cerro Tololo Inter-American Observatory (CTIO) --- my having arranged the visit several years in advance of the eclipse. We saw two of the largest telescopic facilities on the mountain, highlighted by the 4 meter "Victor Blanco telescope", currently used in concert with its DECam (Dark Energy Camera) ---- an imaging device containing 62 individual CCDs totaling 520 megapixels, imaging 3 square degrees (2.2° wide field), at a 0.263 arcsecond/pixel resolution.



Cerro Tololo observatory by Joel Harris

The group, photo courtesy of LADATCO Tours

We returned to Santiago on Friday, July 5th, whereupon most of the group disbursed – either heading back home, or extending their South American adventure by visiting Easter Island, Brazil, or Machu Picchu/Cusco.

Where to next? Perhaps Patagonia in southern Argentina next December, or southwest Texas in 2024…
Lunar Umbra anyone??

OCA Observatory Gets A New Scope

By John E. Hoot

In 2017 OCA received the generous donation of a Meade LX200 GPS 14 Inch Telescope with a collection of fine Televue eyepieces and other accessories. The telescope was donated by the family of the late Alvin Closter. He purchased the scope to pursue his love of the night sky. Unfortunately, he passed away before he had the opportunity to fully appreciate and utilize the telescope.

In donating the telescope to our club, his family requested that the scope be used by those who shared his love of the night sky and grandeur of the universe. Additionally that asked scope be affixed with a plaque in memory of their father. The board debated how best to fulfill the family wishes. We attempted placing it with a school system to help foster an appreciation for the sky in young students. But after month of effort, the school administrators were never able to get the funds required to provide the accessibility and security for an instrument of this size.

With that option closed off, the board concluded that we could meet the family's wishes by putting the telescope in the club's Anza observatory, replacing one of the older 12" Lx200s that was mounted on the south wall of the observatory. That effort was completed prior to the Starbaque on July 27th this year.

With the help of several willing club volunteers the old 12" was removed and the shiny new 14" was mounted in its place. With its fine collection of Televue eyepieces the scope will offer yet another way to enjoy the Anza Observatory. The scope is also available for astrophotography. Bring your DSLR, CMOS or CCD camera and a 2" adapter and have at it.

We will be adding an off axis guider for the scope so that you can guide long exposure images. So next time you visit the observatory, don't miss the chance to use this wonderful gift.

Able club volunteers installing the scope

Telescope Dedication

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**

Email: scopes@sscorp.com

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 wants photograph submissions from club members
We have sufficient submissions for remainder of this year. New submissions will be queued up for inclusion starting in January.

Ideas for Future articles
The newsletter includes articles from members and about subjects suggested by our members. We seek ideas and writers to cover them. To contribute an article or work with the editor to produce one, please contact me at newsletter@ocastronomers.org .

Due dates for submission of articles, pictures and advertisements

Issue	Due date
November	19 Oct
December	23 Nov
January	19 Dec
February	25 Jan

October's Guest Speaker: Gary Bostrup from Rockwell International

Topic is: The Universe In Infrared Light (There Is No Red In Infrared)

Advertisements

Buy, Sell or Trade some of your gear ? This is where club members can place advertisements. Please contact the editor at newsletter@ocastronomers.org to place an advertisement or to learn more about placing one. There is no cost to club members for non-commercial advertisements in the newsletter.

For Sale contact 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 piggyback mount for 35mm DSL cameras or finderscopes $20
Orion Astro View 120ST f/5.0 Richfield refractor OTA with rings and dove trail attached $175

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 Baraloche
  - Best weather prospects along eclipse path
  - Price includes hotels, ~ ½ 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

TWILIGHT TOURS

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

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The Newsletter of the Orange County Astronomers

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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)

President	Barbara Toy	btoy@cox.net	714-606-1825
Vice-President	Reza AmirArjomand	reza@ocastronomers.org	949-791-7072
Treasurer	Charlie Oostdyk	charlie@cccd.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	doug@ocastronomers.org	562-810-3989
Trustee	Sam Saeed	sam@ocastronomers.org	714-310-5001
Trustee	Helen Mahoney	helen@ocastronomers.org	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@cccd.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, scopes@sscorp.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	doug@ocastronomers.org	562-810-3989