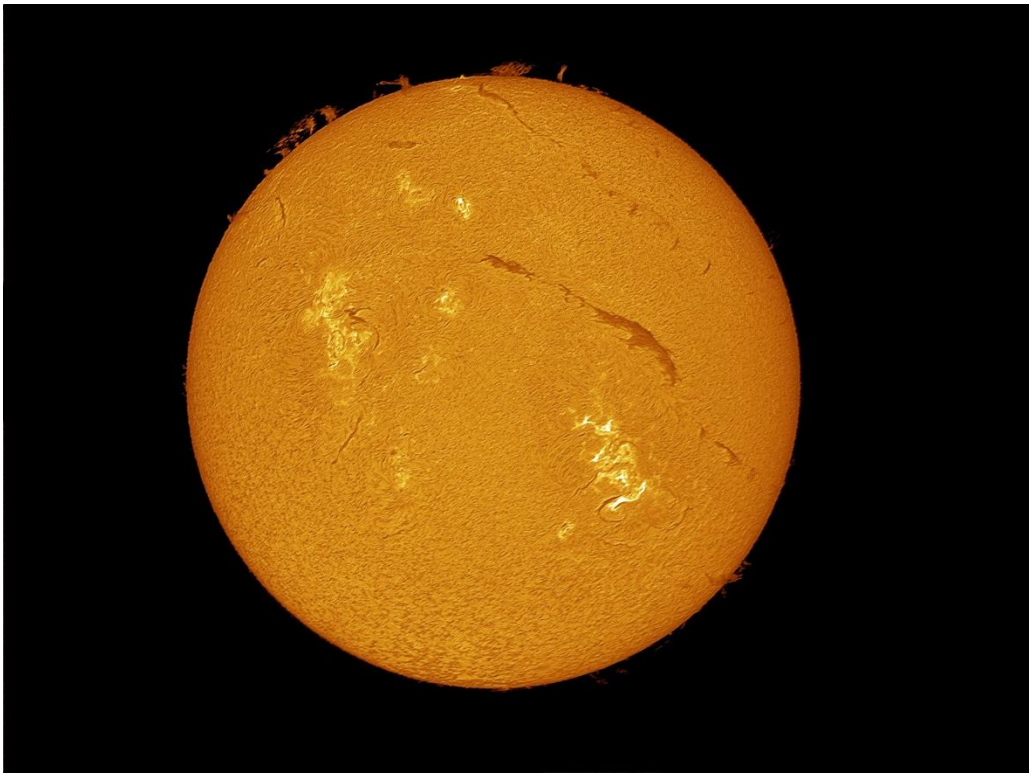
# SIRIUS ASTRONOMER

www.ocastronomers.org

The Newsletter of the Orange County Astronomers

**August 2024** Free to members, subscriptions $12 for 12 issues **Volume 51, Number 8**

This image of the sun with many prominences comes courtesy of Tom Bash.
It was taken in May of this year with a Stellarvue SV70 ED refractor using a double stacking etalon filter and Luminera Infinity2-1 M camera.

## Upcoming Events - free and open to the public

| | |
|---|---|
| **Beginner's class** | Friday, 6 September at 7:30 to 9:30 PM **ONLINE**<br>This is session 1 of the class: Overview of celestial objects, current scientific understanding of the Universe's beginning, present and future. |
| **Club Meeting** | Friday, 9 August at 7:30 to 9:30 PM **IN PERSON** at Chapman University and **ONLINE**<br>"What's Up?": John Garrett from TVA<br>Main speaker: Dr. Matt Penn presenting "The Dynamic Eclipse Broadcast Initiative and follow up projects!" |
| **Open Spiral Bar** | Saturday, 10 August at 10:00 to 11:30 PM **ONLINE**<br>Want to socialize? Grab your images, experiences, questions, or none and see your fellow Orange County Astronomers face-to-face. |
| **Star Parties** | Saturday, 3 August at the OCA Anza site.<br>??? Irvine site dates are yet to be determined |

The monthly club meeting is viewable in progress on Zoom and our social media platforms. The recording is available on these platforms after the meeting is over.

https://twitter.com/OCAstronomers
https://www.facebook.com/OrangeCountyAstronomers
https://www.youtube.com/@ocastronomers

**Please consult the calendar on the OCA website to RSVP online meetings (required)**

# President's Message

By Barbara Toy

**Not Too Early to Think About Our Election…**

…and by that, I mean the annual OCA election, which can have a direct impact on your life by affecting how your club is run. Fortunately, our elections lack the drama (and vitriol) of national elections, and it's easier for ordinary people (i.e. regular club members) to get on the ballot with a good chance of being elected. If there's only one person running for each position on the Board, which has often been the case recently, that chance pretty much becomes a certainty.

As you may recall, October and November are when we actively seek nominees for the ballot, which is finalized after the November General Meeting. Members vote in December and early January, ending at the end of the January General Meeting. Although Fall can seem far away, we'll likely be less than two months away from starting formal nominations by the time you see this. So, now is a good time to start thinking about becoming a nominee in this election.

We have eleven Board members total, seven Trustees and four Officers (President, Vice President, Secretary and Treasurer). To run for President or Vice President, you must have served on the Board for at least a year at some point during your membership. For all other positions, you must have been a member of the club for at least a year, and, for all positions, you must be a current member in good standing (which must continue through your time in office if you are elected). Whatever background you have, your perspective would be helpful - one of the strengths of our Board through the years has been the wide range in experience different members have brought to bear on its problems and projects, helping us find the best solutions for the club.

When Jim Benet was convincing me to run for the Board years back, he said that I would just need to show up for six meetings a year, which is technically true (the meetings are every other month, in odd-numbered months). But, by being on the Board, its members learn more about problems we face than most members, and because Board members generally care deeply about solving club problems or they wouldn't have run, they are more likely to volunteer to help on issues that come up. So, there are at least seven current Board members (the number fluctuates), including all current officers, who regularly help run the club's general meetings. Others regularly deal with problems at our Anza site (a recent example - we can thank Gary Schones for getting a work crew out to Anza to clear out weeds on the site, making it much safer). For most of us, involvement in these additional projects gives us a lot of the satisfaction we get from being on the Board.

The time I have spent in different capacities on the OCA Board over the time I've been a member has generally been the most satisfying and (often) fun aspect of being in the club. Do think seriously about running for a Board position this year – if you get on the Board, I think you'll find it a truly rewarding experience. To get on the ballot, come October, please send notice of the position you want to run for and your contact information to our Secretary, Alan Smallbone (Alan@ocastronomers.org).



# From the Editor

Pictures from the August Starbeque would be appreciated.

The newsletter is open to suggestions for new content to replace the column "Another Look".

Due dates for submission of articles, pictures and advertisements

| **Issue** | **Due date** |
|---|---|
| September | 24 August |
| October | 21 September |
| November | 19 October |

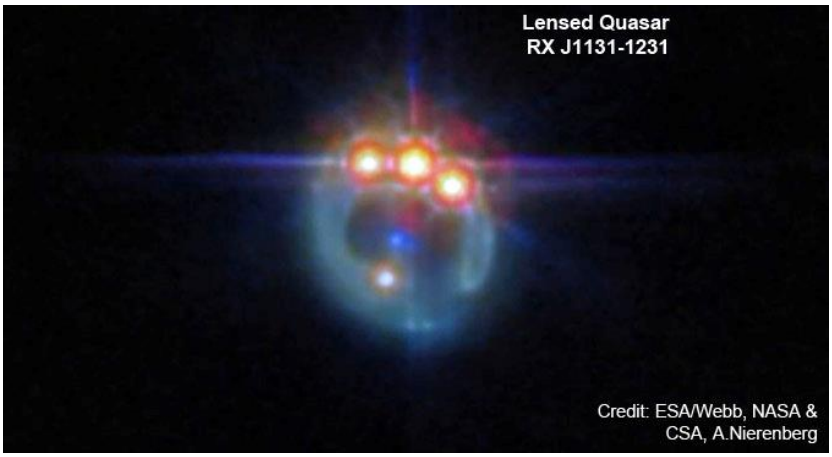
# AstroSpace Update

August 2024
Astronomy and space news summarized by Don Lynn from NASA and other sources

**Intermediate Black Hole** – Lots of black holes are known with about the mass of a large star and lots are known in the supermassive range (millions or billions of times our Sun's mass). But extremely few black holes are believed to have intermediate masses, say hundreds or thousands of Solar masses. A new study of star velocities in the globular cluster Omega Centauri using years of Hubble Space Telescope (HST) data shows there is an object with at least 8,200 Solar masses, which could only be an intermediate black hole. Previous work had shown there to be something massive there, but it wasn't so clearly a black hole as the new study shows.

**Black Hole Growth** – There are two theories to explain how supermassive black holes came to have their masses equivalent to millions or billions of Suns: 1) Early in the history of the Universe, such black holes must have accreted matter much faster than black holes seen at later times, or 2) supermassive clouds collapsed directly to supermassive black holes early in the history of the Universe. New spectral observations by the James Webb Space Telescope (JWST) of a really distant quasar (actively feeding black hole) known as ULAS J1120+0641, showed that it was accreting matter at about the same rate as quasars seen at later times. This tends to support theory 2.

**Lensed Quasar** – JWST and X-ray space telescopes observed a very distant quasar that is seen through a gravitational lens formed by a foreground galaxy. It is one of the best lensed quasars known. It produces 3 separate images of the quasar, much brightened and magnified. The quasar is known as RX J1131-1231 and is about 6 billion light-years distant. Evidence was found that the black hole in the quasar is spinning very fast. Theoretically a black hole should spin fast if it grew from one merger or collision but should spin slowly if it grew from many feedings from random directions.




**Pulsar Measured** – A pulsar is a neutron star that is seen to emit a pulse every rotation when an emitting spot on it moves past our direction. A pulsar known as PSR J0437-4725 lies 510 light-years away, which is close for a pulsar. It spins 174 times per second, which is fairly fast for a pulsar. An X-ray space telescope known as NICER, which is mounted on the International Space Station (ISS), was used to study this pulsar. Then a supercomputer was used to simulate the object and find what values of its properties best fit the observations. This resulted in these pulsar's properties: diameter 7.08 miles, mass 1.4 times the Sun's mass, that there are hot spots at the magnetic poles, and that those poles are not exactly opposite each other. The diameter result is very precise for a pulsar measurement.

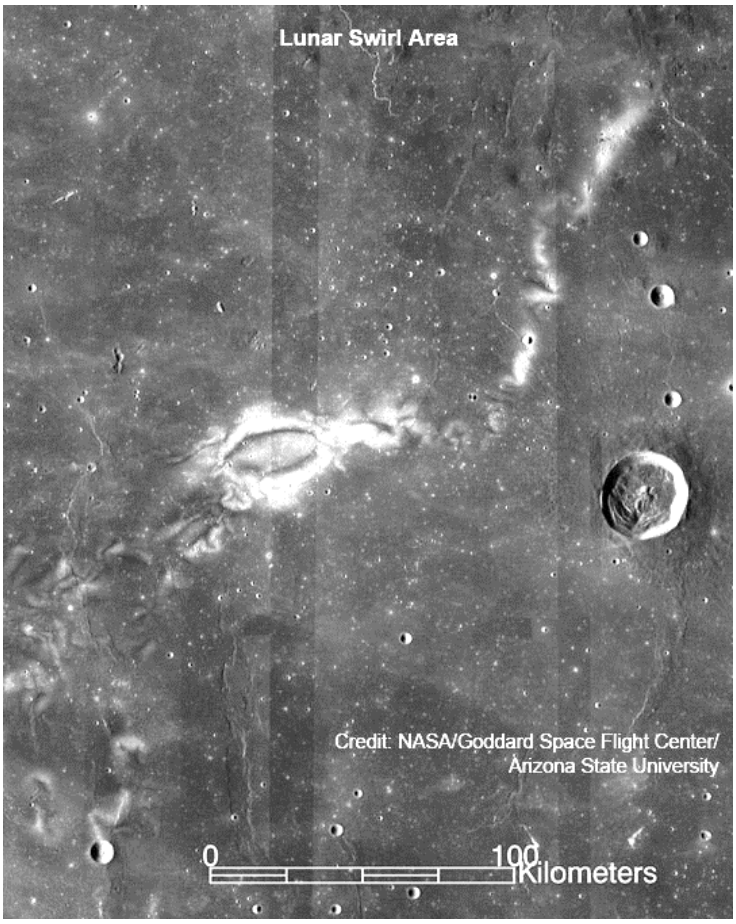
**Dark Matter Mapped** – A team of astronomers used HST data taken over 18 years to precisely measure motions of stars in the Draco dwarf spheroidal galaxy, a satellite of our Milky Way. From this, scientists calculated the gravitational force acting on these stars, including dark matter gravity. They created a 3-dimensional map of the dark matter. It agreed with theories of dark matter that produce sharp concentrations of dark matter at the centers of galaxies, often referred to as "cusp structure". The same astronomers are now similarly studying the Sculptor and Ursa Minor dwarf galaxies.

**Milky Way Warp** – A team of astronomers observed 2600 Cepheid variable stars of various ages in the disk of the Milky Way to measure how that disk is warped and how the warp has changed with time. Their conclusion is that the warp is precessing, or wobbling, in the retrograde direction about a degree every 8 million years. They also calculated that the dark matter halo of our galaxy had to be a slightly flattened sphere to support this precession.

**Neutron Star Companions** – Data from the Gaia space telescope was searched for Sun-like stars that were found to wobble, indicating they are orbiting another body too dim to observe. Astronomers found 21 stars that were orbiting bodies which follow-up observations with other telescopes showed to be likely neutron stars. This was surprising because neutron stars are produced by supernova explosions, which were thought to either eject or destroy any companion stars. These findings prove that at least some companion stars survive supernova explosions. This will give theorists a lot to explain. Some Sun-like stars were already known to orbit neutron stars, but unlike the new discoveries, the previously known pairs were involved in mass transferring between the members of the pairs, which muddies the picture of how they formed. The same team of astronomers is also looking for Sun-like stars that orbit black holes.

**Brown Dwarf Weather** – Brown dwarfs are objects bigger than a planet, but too small to maintain the nuclear fusion that powers ordinary stars. JWST was used to observe a couple of brown dwarfs that are orbiting each other, known as WISE 1049AB. This is the closest known binary brown dwarf. Observations were made in various infrared wavelengths for complete rotations. That allowed a sort of weather map of each brown dwarf to be made. Clouds of hot (1740°F) sand (small silicate particles) were detected.

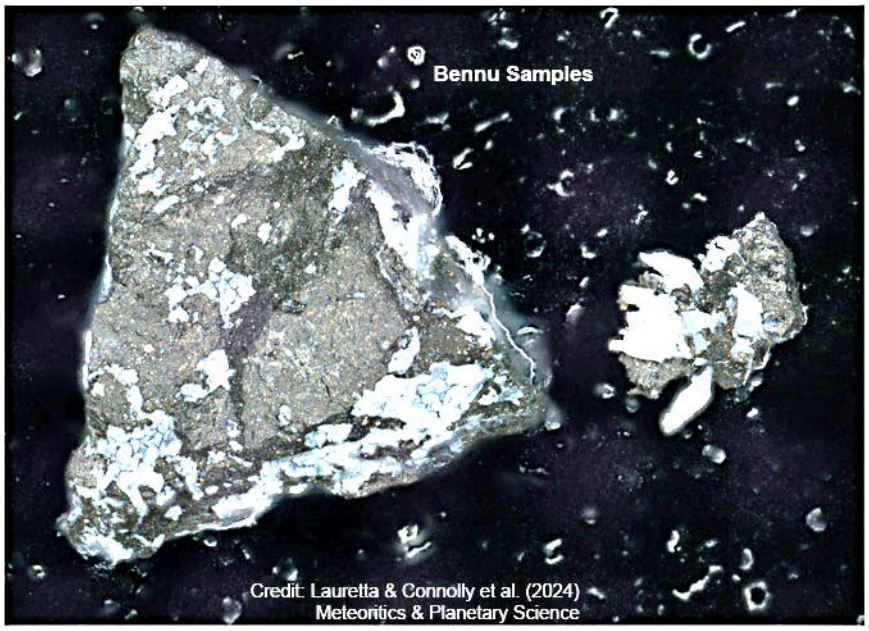
**Lunar Swirls** – There are light-colored features on our Moon known as lunar swirls. They are known to be magnetized, which deflects solar wind particles that over time darken the lunar surface. How they got magnetized has long been debated. A leading theory is that impacts could magnetize areas, but the shapes and sizes of some of the swirls do not match what an impact should create. A new theory has been proposed: magma welling up under the Moon's surface could have magnetized areas on the surface. More observations are needed. A lunar rover to a swirl area is planned by NASA for 2025.




**Mars Meteorite Rate** – A new analysis of data from the InSight Mars Lander seismometer, which operated for 4 years, showed that meteorites strike the Red Planet about 5 times more frequently than previous estimates yielded. It is difficult to determine from the seismic data which events are crust movement, and which are impacts. However, the new result is likely much more accurate than previous impact frequency estimates. The new analysis says that nearly one impact of a basketball-sized or larger meteorite occurs every day. This sized object will create a crater at least 26 feet across. An object that creates a 98-foot crater happens about once a month. The meteorite impact rate is used to determine age of various surfaces in the solar system (by counting craters of certain sizes) and this rate is known to have varied over time and place. This new data for Mars will help with age dating.

**The Kuiper Belt** is a doughnut shaped region beyond Neptune that is populated by small icy bodies. More than 2,000 objects in that belt are known, but it is estimated that there are 100,000 more to be discovered. The outer limit of the Kuiper Belt is usually quoted as being 50 or 55 AU from the Sun (where an AU is the radius of the Earth's orbit), because extremely few objects have been found beyond this. The Subaru Telescope in Hawaii has been searching the area of the sky where the New Horizons spacecraft is hurtling away from us (after visiting Pluto and Arrokoth) to find possible further flyby targets. The search has found several objects beyond that 50 AU, leading some astronomers to believe that the Kuiper Belt is actually larger.

**Asteroid Sample** – The first results have been released from examining the sample of asteroid Bennu that was retrieved by the OSIRIS-REx spacecraft. Some of the material is carbon-containing, similar to what is seen in certain types of meteorites. However, there is also substantial serpentine, smectite, carbonates, magnetite, sulfides and phosphates, materials that usually form in wet environments, particularly in alkaline water. This suggests that Bennu was once part of a wetter body. This could have happened if Bennu broke off from a larger body by collision (a frequent happening), and that larger body formed where water ice was available, and that ice then melted. More research is needed to confirm this. Also found were phyllosilicate streaks that indicated the material had flowed as a fluid into cracks. The Bennu sample has been described as the most pristine sample of material from the time the planets were forming more than 4 billion years ago, because the other samples from this time are meteorites that were subjected to heat and force when they hit Earth's atmosphere.




**Ancient Supernova Explained** – Historical records show that in the year 1181 a supernova, then known as a "guest star", was seen in the Far East. In 2021 a supernova remnant was found in Cassiopeia that matched the historical records. A new study of observations of the remnant and using computer simulations of supernovas found that it was a Type Iax supernova, a type that leaves a white dwarf star instead of the usual complete demolition. It was triggered by the collision of a carbon-oxygen white dwarf and an oxygen-neon white dwarf. Also, the resultant star had to have begun blowing a strong stellar wind less than 30 years ago, not immediately after the explosion. All these conditions had to hold in order for the supernova to produce the remaining white dwarf and the unusual double shock remnant that are observed.

**Boeing's Starliner** spacecraft, as reported here last month, made its first trip with crew to the ISS, arriving on June 6. Some problems arose with helium (used to pressurized fuel tanks) leaking and with thruster operation. These are located on the service module, which burns up in the atmosphere upon returning to Earth. Engineers decided to keep the Starliner at ISS until all possible tests on helium and thrusters could be made in order to correct these problems before the next flight. Officials stressed that Starliner is fit to return the two astronauts now, so they are not stranded. As of my writing this, return to Earth is tentatively expected in late July, depending on completing tests. The astronauts involved are happy to have the opportunity to stay in space longer. NASA wants to have two methods of transporting astronauts to and from ISS, but so far only SpaceX vehicles have been certified for this. So, it is important to NASA for Starliner to finish certification. It is important to Boeing also, as they have overspent the payments for development of Starliner and won't get paid again until they begin regular trips to ISS.

# Another Look

August 2024

Dave Phelps has been writing a regular column for astronomy club newsletters highlighting things to see in the sky each month. Sadly, we share that he passed away recently.  He will be missed by many of us.

# Bonus Pictures from OCA Club Members

M42 taken by Rob MacKenzie in the city of Orange using Stellarvue 80mm refractor and ZWO 294MC procolor camera with light pollution filter.
It was captured in November 2023.

M33 from Sam Saeed, takin in 2017 with Tak152 refractor and QSI683 mono camera

# 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.

Each advertisement may be run for 3 consecutive issues, after which it will be removed. The advertiser may resubmit it for inclusion after a one-month hiatus.

For Sale contact James Greer jamesgreer237@gmail.com

- DWARF II smart telescope (deluxe) with case, tripod (small) $ 225 obo
  2 Batteries, charging cable, deep sky light pollution filter, 2 solar filters, memory card
  Heavy Duty Slik tripod capable of enabling polar alignment of scope < < < < new item added and price reduction

See July 2024 Sky and Telescope for an excellent review. It will plate solve 1 mile from Ontario Airport and find Messier objects. iPhone and Android apps can control the scope (no eyepieces). A stunning introduction to astrophotography and only lacks image processing software.

This item is pickup only – one mile from Ontario international Airport. Email me if you have any questions.

For Sale contact James Greer jamesgreer237@gmail.com

- Vixen80Sf refractor extra low dispersion optics telescope with factory foam fitted metal case $ 500 obo
  80 mm aperture, focal length 600 mm. Focuser has 2 inch tube with a 1.25 inch converter.
  8 x 50 finder. Orion 1.25 inch Dielectric Mirror diagonal.
- Alt-Az mount with slow motion controls
- Cannon IS Binoculars
- Kasai 2x40 ultrawide binoculars < < < < new item added and price reduction

- Accessory case 1: 13 x 18 x 6 Orion case with pick & pluck foam. Contents: solar filter for this scope, flip diagonal, spectroscope that fits over an eyepiece, zoom eyepiece (8-24 mm), many filters. including skyglow, ultrablock, and 5 color filters.
- Accessory case 2 same size and type with same foam. Contents: 15 Plossl eyepieces, mix of Meade and Astrola and range from 4 mm to 40 mm.
- Bag: T adapter, Binoculars and spare parts.
- Also available are astronomy books. These include Burnhams manuals and books on urban astronomy. Everything is in good condition, especially the scope.

Price is for entire lot. These items are pickup only – one mile from Ontario international Airport. Email me if you have any questions.

For Sale contact Arnie Richards (562) 644-9775 wannawalk52@gmail.com

- Meade 7" LX200 Maksutov-Cassegrain telescope with tripod. $ 900
- Includes tripod, 9 Plossl eyepieces ranging in focal length from 6 mm to 40 mm; and a full aperture solar filter.

  Originally purchased in 2003 for $3500; Excellent optics; Alt-Azimuth fork mount in excellent condition but GPS tracking program is slow and cranky. My understanding is that there are local (SoCal) experts who can fix this.

Photos, including sample images, are available upon request. Will deliver to any location within 100 miles of Downey, CA.

For Sale contact Jerry Floyd jlfloyd720@gmail.com

- Celestron AVX mount, no tripod $ 450
  Excellent condition - includes SkySync GPS accessory and 11-pound counterweight

The buyer can either pick it up at my house in Hemet at their convenience, or I can deliver it in Southern California at my convenience.

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## CONTACT LIST

WEBSITE: https://ocastronomers.org Phone 949-266-9777 Starline 24-Hr. Recording: 714-751-6867 Anza Observatory: 951-763-5152

## BOARD OF DIRECTORS

| | | |
|---|---|---|
| | | board@ocastronomers.org |
| President | Barbara Toy | btoy@cox.net |
| Vice President | Reza AmirArjomand | reza@ocastronomers.org |
| Treasurer | Charlie Oostdyk | charlie@ocastronomers.org |
| Secretary | Alan Smallbone | alan@ocastronomers.org |
| Trustee | David Searle | dwsearle@gmail.com |
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| Trustee | Doug Millar | doug@ocastronomers.org |
| Trustee | Sam Saeed | sam@ocastronomers.org |
| Trustee | Brett Nordby | brett@ocastronomers.org |
| Trustee | Gary Schones | gary378@pacbell.net |
| Trustee | John Hoot | jhoot@ssccorp.com |

## COORDINATORS

| | | |
|---|---|---|
| Anza House Coordinator | Manuel Baeza | manugb33@yahoo.com |
| Anza Site Maintenance | Don Lynn | dlynn@ieee.org |
| Beginner's Class | David Pearson | p.davidw@yahoo.com |
| Orange County Star Parties | Steve Mizera | mizeras@cox.net |
| Explore the Stars | Bob Nanz | bob@nanzscience.com |
| Librarian | Karen Schnable | karen@schnabel.net |
| Membership / Anza Pads | Charlie Oostdyk | charlie@ocastronomers.org |
| Observatory Custodian / Trainer / Member Liaison | Barbara Toy | btoy@cox.net |
| Outreach | Martin Christensen | outreach@ocastronomers.org |
| Sirius Astronomer Editor | David Fischer | newsletter@ocastronomers.org |
| Social Media Coordinator | Rich Cormier | social@ocastronomers.org |
| Telescope Adoption Program | Jake Brown | scopes@ocastronomers.org |
| WAA Representative | Jon Montgomery | 56scooter@gmail.com |
| Webmaster | Reza AmirArjomand | webmaster@ocastronomers.org |

## SPECIAL INTEREST GROUPS (SIGs)

| | | |
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| Astrophysics SIG | Mark Price | mark@ocastronomers.org |
| Dark Sky SIG | Barbara Toy | btoy@cox.net |
| Youth SIG | Doug Millar | doug@ocastronomers.org |