



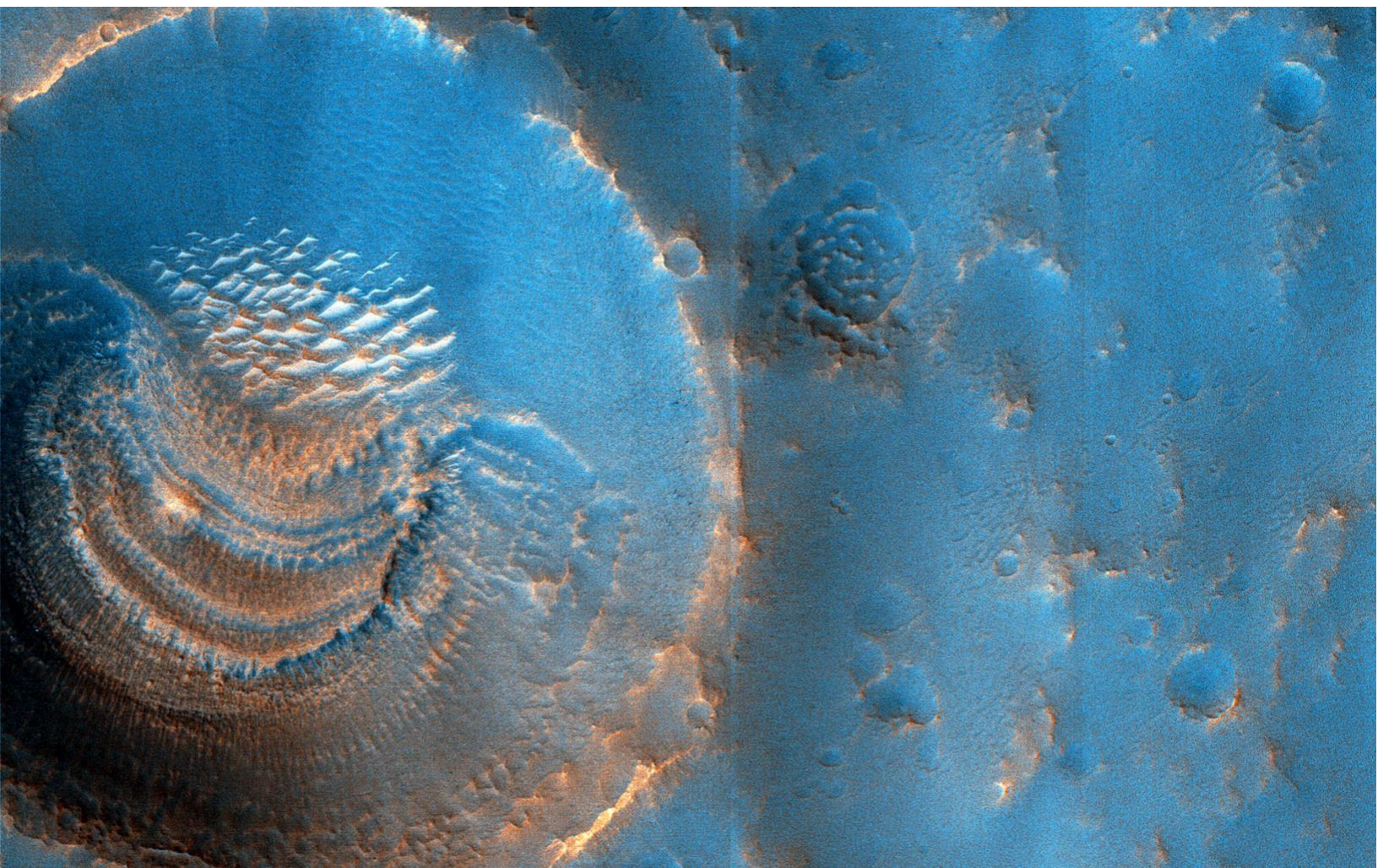
EVENT HORIZON

The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

January – March • 2023 Issue

792nd General Meeting: Feb. 3

793rd General Meeting: March 3



**March 3, Lecture 8pm at CSM:
Exploration of Mars for Habitable
Environments and Life**

See page 6

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Cover: This image taken by the Mars Reconnaissance Orbiter (MRO) spacecraft's HIRISE instrument on Oct. 23, 2022, of the northern plains of Arabia Terra shows craters that contain curious deposits with mysterious shapes and distribution. *Image Credit: NASA/JPL-Caltech/University of Arizona.*



SMCAS Board Member Kevin Simpson sets up his Dobsonian 10-inch Orion GoTo. He usually sets it up with a Baader MaxBrite II binoviewer, with a pair of matching eyepieces. This allows people to use both eyes to view, which gives a slight 3D effect. The binoviewer has an attachment that boosts magnification of any pair of eyepieces by 1.7 times.

Upcoming Events

The Society and the City of San Carlos Parks Department host public Star Parties at Crestview Park, 1000 Crestview Drive, San Carlos. [Click here to see the schedule for the entire year.](#) See page 17 for directions and guidelines.

Saturday, Jan. 7: SMCAS Holiday Potluck, 6 p.m., Crystal Springs United Methodist Church, 2145 Bunker Hill Drive, San Mateo. See page 5 for additional details.

Saturday, Jan. 14: Star Party – At sunset (5:14 p.m.) – Crestview Park

Saturday, Jan. 21: Star Party – At sunset (5:22 p.m.) – Crestview Park

Friday, Feb. 3: SMCAS General meeting, 7 p.m., College of San Mateo, ISC Room (#110) and lecture by a SMCAS member, 8 p.m. in the Planetarium. See page 18 for directions to CSM.

Saturday, Feb. 11: Star Party – At sunset (5:44 p.m.) – Crestview Park

Saturday, Feb. 18: Star Party – At sunset (5:51 p.m.) – Crestview Park

Friday, March 3: SMCAS General meeting, 7 p.m., College of San Mateo, ISC Room (#110) and lecture by Dr. David Des Marais, 8 p.m. in the Planetarium. See page 6 for more details about the presentation. See page 18 for directions to CSM.

Saturday, March 18: Star Party – At sunset (7:20 p.m.) – Crestview Park

Saturday, March 25: Star Party – At sunset (7:26 p.m.) – Crestview Park

Founded in 1960, the San Mateo County Astronomical Society is a 501(c)(3) non-profit organization for amateur astronomers and interested members of the public. In non-pandemic times, visitors may attend Society meetings and lectures on the first Friday of each month, September to June, and Star Parties two Saturdays a month. All events are free for visitors and guests. Family memberships are offered at a nominal annual cost. Detailed membership information is found at www.smcasastro.com/membership.html where those who want can join via PayPal. Membership also includes access to our Event Horizon newsletter, discounted costs and subscriptions to calendars and magazines, monthly star parties of the Society and the College of San Mateo, field trips, social occasions and general meetings presenting guest speakers and programs. For additional information, please email us at SMCAS@live.com or call (650) 678-2762.

Membership forms are available at the end of this newsletter. The Membership Application form is on the back page.

Prez's Corner

Greetings to the Society,

2022 seemed to go by so fast and it was certainly an exciting year for astronomy and space news. The big capper being Artemis I successful 25 day trip around the moon. Certainly the club had a big year as well, growing to over 70 members and having some great in person lectures at the College of San Mateo, CSM. While we are not allowed to simulcast them on Zoom, we do record them and posted up on our YouTube channel in case you missed one (<https://www.youtube.com/@smcasastro>).

We will be kicking off 2023 with a big bang! January 7, 6 p.m. to 9 p.m. will be the SMCAS annual holiday party at Crystal Springs United Methodist Church, 2145 Bunker Hill Drive, San Mateo. I hope to see you there for some good food, conversation and white elephant gift exchange.

As exciting 2022 was for space news 2023 will not disappoint, James Web Space Telescope, JWST, will continue returning lots of fascinating information. But 2023 might be the year of the moon. There are plans for several lunar landers in 2023 on the books with landings from the space agencies of India, Japan and Russia. Hakuto-R could become the first private mission to land on the moon in March. I say "could" because two private landers from the US — one from the firm Astrobotic and the other from Intuitive Machines, called Peregrine and Nova-C, are also set to reach the moon around the same time. The European Space Agency (ESA) has a mission called JUICE, for "Jupiter Icy Moons Explorer" scheduled to

launch April, though we will have to wait until 2031 for it to get there. ESA is scheduled to see another major mission launch: its Euclid telescope. The Euclid mission is to better understand dark energy and dark matter by accurately measuring the acceleration of the universe. NASA's OSIRIS-REx mission is scheduled to return to Earth in September with pieces of an asteroid called Bennu, which could offer new insight into the structure and formation of the solar system. SpaceX's massive and reusable Starship rocket should have its first orbital test flight in 2023. There is an annular solar eclipse on October 14 to look for and much, much more. It could not be a better time to be in the Society.

I mentioned this before but we want to learn what it is you all would like the Society to do so we can better serve you as a Board. So be on the lookout for a survey we just finished up to get some feedback from you all and feel free to reach out to any of the board members with ideas or things you would like the Society to do. We really want to hear from you. Hope you all have a Happy and prosperous New Year!

Clear Skies,

Michael Cooke
SMCAS
President
[tfbsaxman@
hotmail.com](mailto:tfbsaxman@hotmail.com)



SMCAS Annual Holiday Party – Jan. 7, 6pm to 9pm



SMCAS annual holiday party: January 7, 2023

6:00 p.m. to 9:00 p.m.

Crystal Springs United Methodist Church, 2145 Bunker Hill Dr, San Mateo, CA 94402

Our party is a potluck and white elephant gift exchange (optional). Our board members will provide entrees, and you can bring any dish to share. If you can attend, please RSVP [here](#).

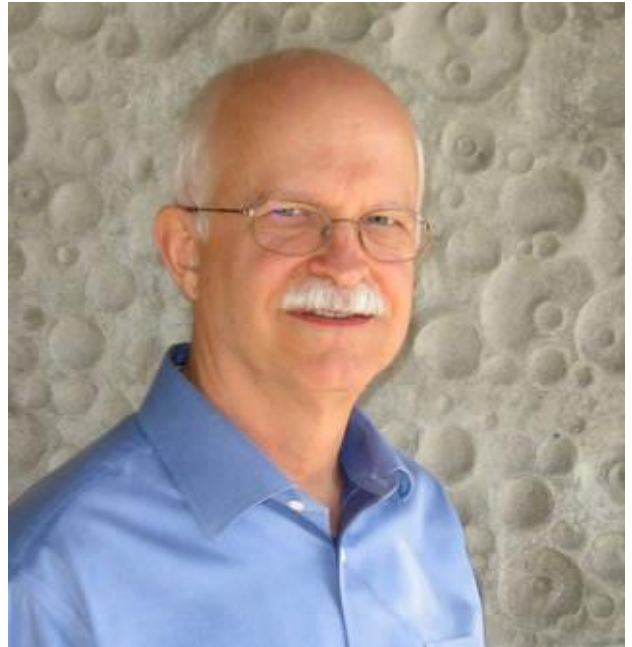
When you fill out our sign-up sheet, let us know how many guests from your group, what you're bringing and if you would like to participate in the gift exchange. You can email [Karen Zamel](#) or our Board SMCASBD@groups.io if you have questions. We look forward to seeing you soon!



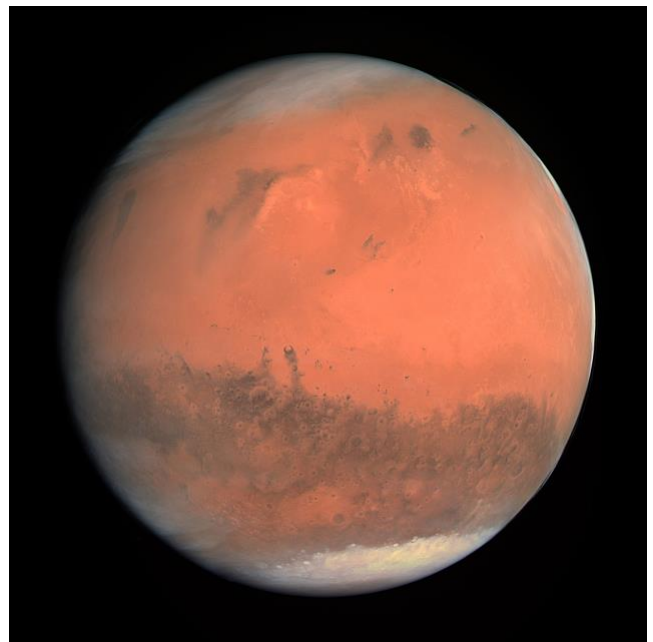
SMCAS members enjoyed the many different dishes at 2022's Autumnal Equinox.

General Meeting, March 3, 7pm & Lecture 8pm: Exploration of Mars for Habitable Environments and Life at CSM

SMCAS continues to hold general meetings and lectures, the first Friday of each month between September and June, except for Januarys. As usual, the general meeting begins at 7pm in Building 36, College of San Mateo, ISC Room (#110). Then we'll transition over to the Planetarium for a lecture. Our next meeting will be Friday, Feb. 3 but we're still working out the lecture details for that one but hope to have a SMCAS member give it but have details for March's meeting. March's lecture will be by David Des Marais, a Mars expert. He is the principal investigator of the Ames Research Center team of the NASA Astrobiology Institute. Des Marais is an interdisciplinary scientist for astrobiology on both the Mars Exploration Rover 2003 science operations working group and the Mars 2005 CRISM infrared spectrometer. He serves on the editorial boards of the two journals Astrobiology and Geobiology. His areas of specialization have included the stable isotope geochemistry of carbon in lunar samples, meteorites and oceanic basalts, the biogeochemistry of microbial communities in hypersaline environments, and the biogeochemistry of ancient (Precambrian) carbonates and organic matter. David Des Marais received a Ph.D. in Geochemistry from Indiana University in 1974. ♦



Dr. David Des Marais



Mars

Become a Citizen Scientist! Make observations of Comet ZTF in January!

By Ken Lum

Dr. Franck Marchis (SETI and Unistellar) came and gave a great talk on Nov. 4, 2022 on how we can all become Citizen Scientists. While Dr. Marchis's emphasis is on using a global network of eVscopes for making scientifically relevant observations, it must be said that anyone with a telescope and expertise in using it can still participate. This mostly amateur-level activity has always served as an important supplement to the data collection and discoveries of oversubscribed professional observatories.

Project tutorials have been posted on the Unistellar website (www.unistellar.com) and can be accessed via the menu item listed as "Citizen Science" at the top of the Home page. Video tutorials have also been produced for some categories of activities and the URLs of these are listed below. Dr. Marchis classified astronomical Citizen Science activities into these categories:

1) Asteroid occultations of stars. This technique has been used to help determine the physical shapes of asteroids. (See Figure 1.) For eVscope users, Unistellar has kindly posted a YouTube video on how this is done:

Occultation 101: Become a Shadow Chaser with Your eVscope and is at <https://www.youtube.com/watch?v=MvhXdzwuKUA>. The video is using an older version of the app so you will have to make some adaptations to use the latest app version 2.2.0.

2) Planetary Defense. For gathering data on the orbits and shapes of Near-Earth

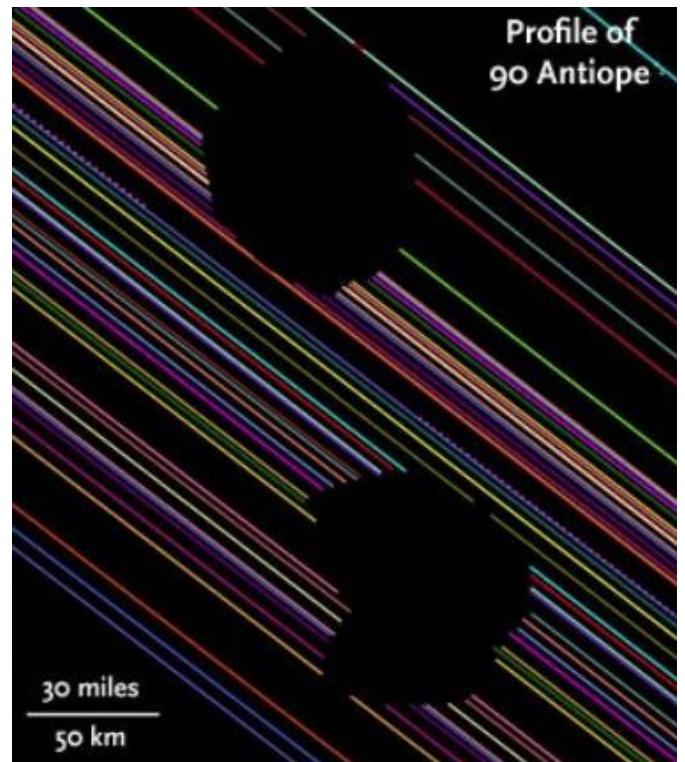


Figure 1. Using asteroid occultation timings to determine the shapes of asteroids. *Image by Unistellar.*

asteroids. A dramatic video was shown of how NASA's **DART, Double Asteroid Redirection Test**, mission collided on September 26, 2022 with the asteroid moon Dimorphos as it orbited the asteroid Didymos. (See Figure 2 on page 8.)

Amateur astronomers used eVscopes on Reunion Island in the Indian Ocean to image the cloud of dust kicked up by the spacecraft. (See Figure 2). A video of it can be seen at <https://www.seti.org/unistellar-citizen-science-network-successfully-captures-dart-impact>.

The DART spacecraft managed to successfully shorten the orbit of Dimorphos around Didymos by about 32 minutes.

(continued on page 8)

Become a Citizen Scientist! (cont'd)



Figure 2. Asteroid dust being blown off by the collision of the DART probe with Dimorphos. *Photo by Bruno Payet.*

A Unistellar video on Planetary Defense has been uploaded to YouTube to walk you through this activity. It is at: <https://www.youtube.com/watch?v=k287mOAFmj4>

3) Exoplanet Transits. For exoplanet timing and confirmation. (See Figure 3 on page 9.) These observations have focused mostly on candidates discovered by the **TESS (Transiting Exoplanet Survey Satellite)** mission that needed better characterization. A Unistellar YouTube video tutorial has been uploaded to provide step by step instructions on how to participate. It's called, **Transit 101: Become an Exoplanet Hunter with your eVscope** and is at <https://www.youtube.com/watch?v=KBCfzvEZI5k>.

4) Transient Events campaign. Search for transient objects such as novae and supernovae. (See Figure 4 on page 9.) The GOTO and imaging capabilities of the eVscope will make this kind of search more efficient although such searches have been done even visually and manually in the past with ordinary Dobsonian telescopes. Professionals are now using scripted robotic telescopes to do this kind of work culminating with the Vera Rubin LSST telescope that will be put into operation soon. Unistellar has not released a video tutorial on this subject but the tutorial on its website under **Citizen Science/Cosmic Cataclysms** provides instructions for getting started.

5) Cometary Activity. To collect data on the brightness variation and evolution of comets. A great opportunity is coming next January to observe Comet ZTF (C/2022 E3) (ZTF stands for Zwicky Transient Facility built into the Palomar 48-inch Oschin Schmidt camera) when it will be ideally positioned in and near Ursa Minor as it transits the north celestial pole. This will make it conveniently observable both in the evening and overnight throughout January. During this time it is forecast to brighten to about seventh magnitude or perhaps brighter before slowly fading. This would be a great object with which to start doing Citizen Science if you have not done this sort of thing before. A finder chart can be found on Sky and Telescope at: <https://skyandtelescope.org/astronomy-news/comets-to-view-in-2022/>

To begin Citizen Science observations, go to
(continued on page 9)

Become a Citizen Scientist! (cont'd)

the Unistellar app on your smart phone and tap on the flower icon at the middle bottom of the Catalog page. This will take you to the Scientific Observations page. Scroll down to Cometary Activity and tap on it. This will take you to the Point to the Target page.

Tap on the **Find predictions** button and go to the **Cometary Activity Missions** page.

Scroll down to **Mission E3** for this comet and note the app settings for this object showing:

Record duration:
20 minutes

Exposure time:
3971ms (3.971s)

Gain 25 db

To be entered to standardize all observations between different eVscopes. And then start taking data and images. I confess to never having done this before so I will also be learning for the first time along with everyone else. Best of luck everyone!

A recording of Dr. Marchis's talk can be found on YouTube at:
<https://www.youtube.com/watch?v=yKZ87dGLWn0&t=2441s>.

Explore other possible observing projects in the Scientific observations page. ♦

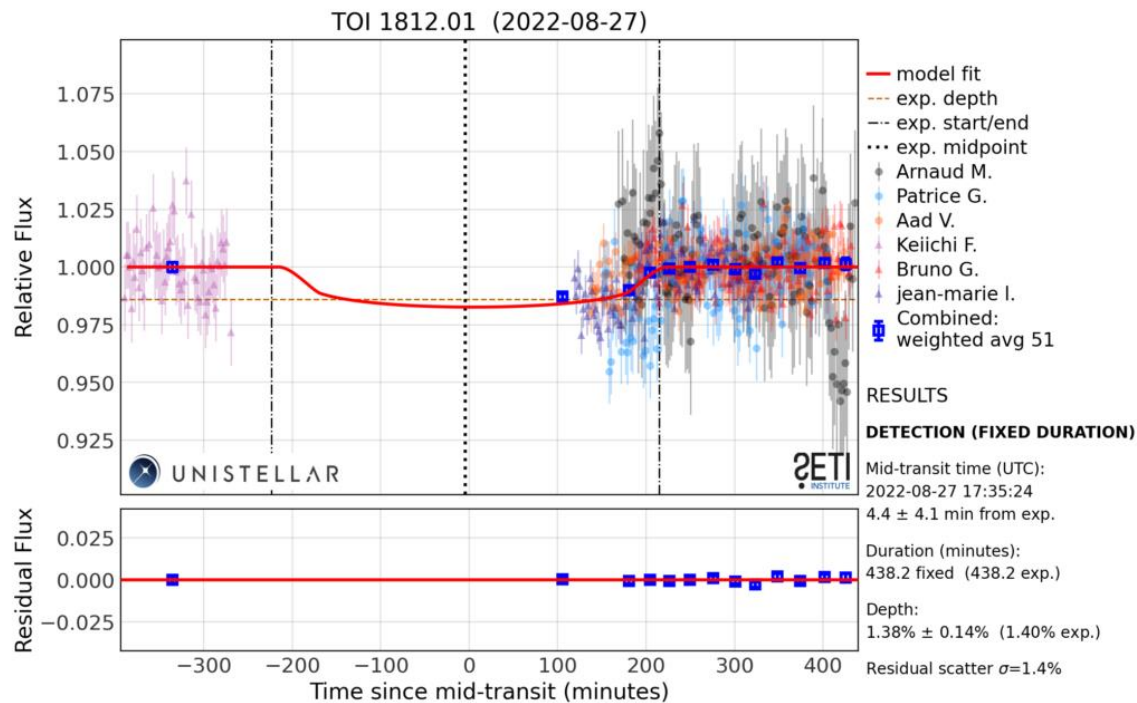


Figure 3. Light curve of TOI 1812.01 discovered by TESS but didn't have its orbital period determined to be 112 (Earth) days until observed by 20 citizen scientists with eVscopes. *Photo by NASA/SETI.*



Figure 4. SN 2022hrs in NGC 4647 next to M60. *Photo by Ken Lum.*



Frank Seminario's campsite at the Golden State Star Party 2022. *Photo by Frank Seminario.*

Golden State Star Party: June 29 through July 3, 2022

By Frank Seminario

In this issue, I am going to take a break in my astrophotography series to write about my experience at the annual Golden State Star Party (GSSP) June 29 through July 3. This year's event was the first occurrence in two years due to COVID. It is held in Adin, California at Frosty Acres Ranch, which is about 350 miles north of the Bay Area. The event lasts four nights and was limited to 200 astronomers (half the traditional capacity) due to COVID concerns. The main attraction is the dark sky. Attending GSSP is a very different experience than the SMCAS Star Parties held at Crestview. At Crestview, you may see only 20 to 30 bright stars. After the sun sets in Adin, the entire Milky Way is visible from horizon to horizon. Thousands

of stars dot the sky making it a challenge to even find your telescope's alignment stars.

Our trip to Adin started very early morning of June 29. It's a leisurely drive up Hwy 5 with a right turn at Mt. Shasta. Adin is a ranch community with endless fields of grass and few trees. Packing for this event is a challenge since there are no services at the event location and the weather is fairly hostile. In addition to your telescope equipment, you need to bring along enough food, water, and shelter to get through the next four days. The event days are hot ... very hot. Think 90+ degrees with little to no humidity. You are also at 4,200 feet of elevation so the sun feels even hotter. At night, the temperature

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Golden State Star Party: June 29 through July 3 (cont'd)



M51 – Whirlpool Galaxy taken at GSSP 2022. *Photo by Frank Seminaro.*

falls into the 40s. While it's a relief from the heat, sitting outside for long periods at night gets quite cold. We arrived in Adin late in the afternoon. There is a great "if we ain't got it ... you don't need it" store about 3 miles from the event location. Oddly, they carried some very good wine at an unheard of low prices so, we gladly stocked up. Upon entering the field, we spotted a bald eagle on top of a utility pole. A good omen. One of the tips I learned from attending GSSP in the past was to set up camp upwind from the dirt road through the camping area. The dryness, combined with the fine talc like dust, likes to find its way into your telescope, RV, clothes, food ... pretty much everything. Cars driving on the road know this and try to be considerate by driving slowly.

Upon finding a suitable spot, we set up camp in time to walk around and see all kinds of interesting telescopes and camping setups. We looked over a 36-inch Dobsonian, a dual Dobsonian binoviewer, another setup with

remote controlled tank treads the owner used to deploy a very heavy looking telescope. One attendee had at least ten individual astrophotography setups all around his car. He was a very busy guy at night on the computer, controlling all of them.

Important to note: Full darkness at the end of June doesn't occur until around 10pm. When it arrived, we were rewarded with a spectacular view of the Milky Way. One of my favorite objects – The Sagittarius Star Cloud was nearly visible to the unaided eye. In low powered binoculars, it is easily visible and a good starting point to wander up the Milky Way to other objects. Our first night was spent photographing a list of objects we made to keep the telescope on one side of the equatorial mount. Not performing a meridian flip helps maintain the accuracy of your mount's polar alignment. We just went object to object with a predetermined length

(continued on page 12)

Golden State Star Party: June 29 through July 3 (cont'd)

and number of shots. My astrophotography ended at around 4am when morning glow started to arrive in the eastern horizon.

Every event has “that guy” in attendance. For this year’s GSSP, “that guy” decided to place his very loud generator nearby where we were camping. That generator quickly became the talk of every nearby astronomer. As 2am approached on the first night, the generator roared on. Somebody (not me) finally took charge and followed an extremely long extension cord to a large tent quite a distance away from the generator. An exchange of words was had with the generator’s owner who remained defiant. The generator roared on for another hour. At 3am, the generator mysteriously shut down to a loud round of applause. Apparently, somebody disconnected the sparkplug wire in the darkness. That generator was never used again.

Our club president – Michael Cook arrived the next day with his daughter, Izzy. They setup camp nearby and we all made fast friends with members of the Santa Cruz club. There were also a number of vendors in attendance with all types of astro-gear. They were lifesavers to a few who forgot equipment pieces at home. On Saturday morning, there was a swap meet. A few treasures changed hands. I was lucky enough to score a new iOptron heavy duty tripod from a Santa Cruz club member for my CGEM mount for a very reasonable price.

One of the traditional amenities at GSSP was missing this year – the shower truck. The vendor for this service was booked by the federal government for the firefighters battling California’s wildfires. After being in

the extreme heat for a day, a shower feels really good. My wife and I improvised with a 2-gallon portable pump shower heated by the sun. It was the best investment I made for this trip. While our RV does have a shower, it is quite small inside. I liken it to trying to take a shower while stuffed inside a garbage bag.

The remaining days and nights were “rinse & repeat” – sweat during the day, solar charge our batteries in the sun, socialize with other astronomers, take a shower, eat dinner, drink some wine, set up, photograph a list of objects and in between photos, run to look through your neighbor’s telescope visually. A big GSSP improvement this year was the availability of cell service. In the past there was zero signal. The new connectivity helped immensely. Unfortunately, the improved cell service also indicates the area is becoming more populated. There was more evidence of light pollution than I remembered in the past. While the sky was still very dark, the Milky Way did not have the 3D effect as seen visually in the past. The conditions still provided for some of the best skies where I have done astrophotography.

When July 3 morning rolled around, everyone looked tired and worn out. I exchanged contact information with a number of other astronomers and we all plan on returning next year. The final task of fitting everything back into your car or RV seemed daunting. We finally left the field at 11am to start the journey home. One of the benefits of GSSP is the location. It is in close proximity to both McArthur-Burney Falls State Park and Mt.

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Golden State Star Party: June 29 through July 3 (cont'd)

Lassen Volcanic National Park. After GSSP ended, we did a driving tour through both. They are well worth the effort.

In the end, the results of travelling out to Adin were well worth the effort. I captured a lot of data on a number of objects. One of my favorites was the K2 PANSTARRS comet. I never photographed a comet before. I was surprised to see how much the comet moved against the stars in the background as each individual shot progressed. I have posted most all of my processed pictures on the SMCAS Facebook page. I do plan on revisiting the data as my post-processing skill with PixInsight improve. Post-processing is where we will pick up next quarter's column.



Comet K2 PANSTARRS taken at GSSP 2022. *Photo by Frank Seminaro.*

For more information on GSSP, please visit: goldenstatestarparty.org. ♦

SMCAS's Nov. 26, 2022 Star Party



SMCAS Board Member Frank Seminaro sets up his astrophotography gear at Nov. 26's SMCAS Star Party. *Photos by Michelle Morales Torres.*

Exploring Light Pollution

By Michelle Morales Torres

With the recent rain, I've been exploring the topic of light pollution. It's what it sounds like – when there is too much artificial light. I'm always surprised when I come across someone that isn't familiar with the term or the concept. That's when it's even more important to share it with as many people as possible. We think it's only natural that one would need to get away from city lights to see the stars. But what if we aren't able to get away from them?

There are four different kinds of light pollution. They are glare, skyglow, light trespass and clutter. Glare is when there is an excessive brightness that causes visual discomfort. A good example is excessively bright headlights and really bright LEDs in light poles. Skyglow is when there is brightening of the night sky over inhabited areas. That's easy to see when you get away from a big city, you can see the glow from the city lights. Light trespass is when light goes some places unintended or unnecessarily. For instance, when your room gets flooded by a light pool. Lastly, clutter light is an excessive grouping of lights. A great example of clutter light is Time Square.

With all this existing light, what can one do to battle against it? There are some simple things we can do to fight light pollution: Turn off the light that aren't being used. Use fewer lights inside and outside and be sure your exterior lights are pointing down. Close your blinds or drapes at night. Avoid driving at night. Lastly, turn off all of your lights when you go to bed.

A key step homeowners, city managers, and other people responsible for infrastructure can help limit light pollution by keeping lights low to the ground. Instead of using 25-foot poles to light a parking lot, conservationists say that 10-foot poles are just as effective. Also, for walkways, foot-lights are just as useful as overhead lamps. Experts also recommend using shielding light fixtures, so they illuminate their target instead of sending light everywhere. Some other useful tools for exterior lighting are timers, dimmers and motion sensors.

Another important factor for light sensitive animals, exterior light fixtures should use warmer colors instead of bright-white lights. Studies have shown that turtle hatchlings aren't affected by warm amber glows. In addition, this type of light is better for us, too. Other studies have shown that the blue-white light, common in smartphones and newer TVs, can reduce the production of melatonin. This is one of our hormones that helps to regulate our sleep-wake cycles. Dim, red lights are best to use at night. That's another reason why it's not recommended to use electronic devices before going to bed. It's recommended to disconnect from devices an hour before bedtime or to use an app that filters out the blue light.

As the consequences of light pollution have become more obvious, lighting regulations are slowly beginning to evolve. ♦



NASA Night Sky Notes

Spot the Messenger: Observe Mercury

By David Prosper

Most planets are easy to spot in the night sky, but have you spotted Mercury? Nicknamed the Messenger for its speed across the sky, Mercury is also the closest planet to the Sun. Its swift movements close to our Sun accorded it special importance to ancient observers, while also making detailed study difficult. However, recent missions to Mercury have resulted in amazing discoveries, with more to come.

Mercury can be one of the brightest planets in the sky – but also easy to miss! Why is that? Since it orbits so close to the Sun, observing Mercury is trickier than the rest of the “bright planets” in our solar system: Venus, Mars, Jupiter, and Saturn. Mercury always appears near our Sun from our Earth-bound point of view, making it easy to miss in the glare of the Sun or behind small obstructions along the horizon. That’s why prime Mercury viewing happens either right before sunrise or right after sunset; when the Sun is blocked by the horizon, Mercury’s shine can then briefly pierce the glow of twilight. Mercury often appears similar to a “tiny Moon” in a telescope since, like fellow inner planet Venus, it shows distinct phases when viewed from Earth! Mercury’s small size means a telescope is needed to observe its phases since they can’t be discerned with your unaided eye. Safety warning: If you want to observe Mercury with your telescope during daytime or before sunrise, be extremely careful: you don’t want the Sun to accidentally enter your telescope’s field of view. As you may already well understand, this is extremely dangerous and can not only

destroy your equipment, but permanently blind you as well! That risk is why NASA does not allow space telescopes like Hubble or the JWST to view Mercury or other objects close to the Sun, since even the tiniest error could destroy billions of dollars of irreplaceable equipment.

Despite being a small and seemingly barren world, Mercury is full of interesting features. It’s one of the four rocky (or terrestrial) planets in our solar system, along with Earth, Venus, and Mars. Mercury is the smallest planet in our solar system and also possesses the most eccentric, or non-circular, orbit of any planet as well: during a Mercurian year of 88 Earth days, the planet orbits between 29 million and 43 million miles from our Sun – a 14-million-mile difference! Surprisingly, Mercury is not the hottest planet in our solar system, despite being closest to the Sun; that honor goes to Venus, courtesy its thick greenhouse shroud of carbon dioxide. Since Mercury lacks a substantial atmosphere and the insulating properties a layer of thick air brings to a planet, its temperature swings wildly between a daytime temperature of 800 degrees Fahrenheit (427 degrees Celsius) and -290 degrees Fahrenheit (-179 degrees Celsius) at night. Similar to our Moon, evidence of water ice is present at Mercury’s poles, possibly hiding in the frigid permanent shadows cast inside a few craters. Evidence for ice on Mercury was first detected by radar observations from Earth, and follow-up

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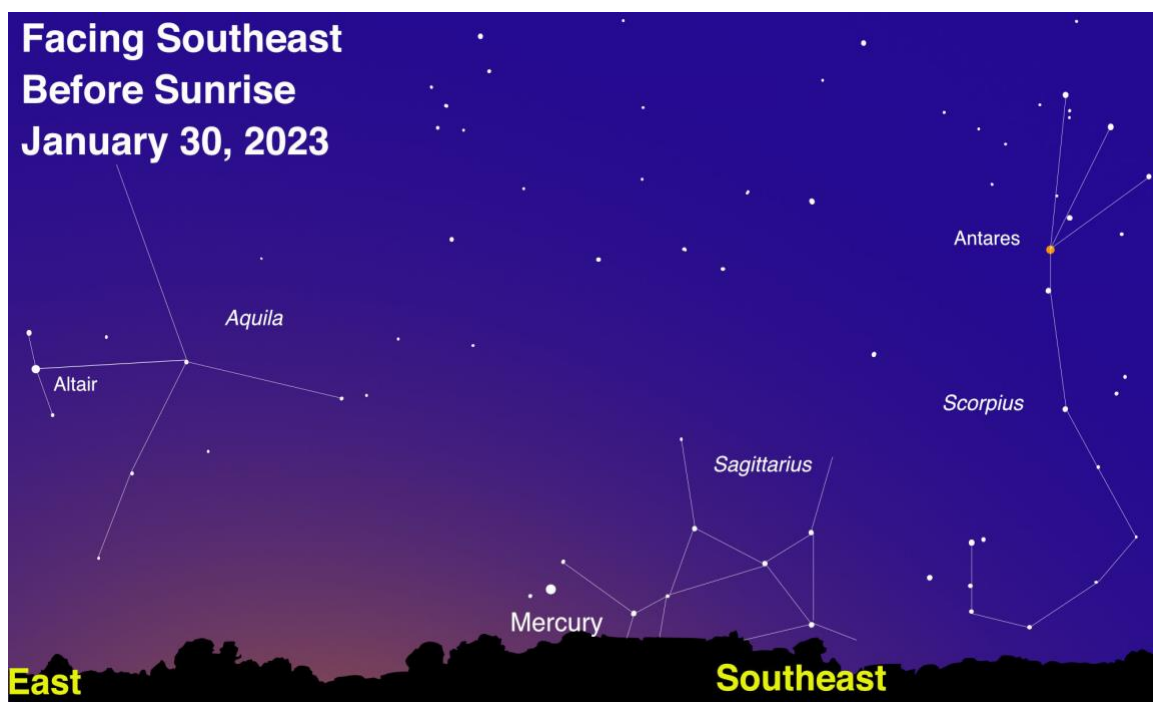
NASA Night Sky Notes

Spot the Messenger: Observe Mercury (cont'd)

observations from NASA's MESSENGER mission added additional strong evidence for its presence. Mercury sports a comet-like tail made primarily of sodium which has been photographed by skilled astro-photographers. The tail results from neutral atoms in its thin atmosphere being pushed away from Mercury by pressure from the nearby Sun's radiation.

NASA's Mariner 10 was Mercury's first robotic explorer, flying by three times between 1974-1975. Decades later, NASA's MESSENGER first visited Mercury in 2008,

flying by three times before settling into an orbit in 2011. MESSENGER thoroughly studied and mapped the planet before smashing into Mercury at mission's end in 2015. Since MESSENGER, Mercury was briefly visited by BepiColombo, a joint ESA/JAXA probe, which first flew by in 2021 and is expected to enter orbit in 2025 - after completing six flybys. Need more Mercury in your life? Check out NASA's discoveries and science about Mercury at solarsystem.nasa.gov/mercury/ and visit the rest of the universe at nasa.gov. ♦



Mercury reaches maximum western elongation on the morning of Jan. 30, which means that your best chance to spot it is right before sunrise that day! Look for Mercury towards the southeast and find the clearest horizon you can. Observers located in more southern latitudes of the Northern Hemisphere have an advantage when observing Mercury as it will be a bit higher in the sky from their location, but it's worth a try no matter where you live. Binoculars will help pick out Mercury's elusive light from the pre-dawn glow of the Sun. *Image created with assistance from Stellarium.*

Directions to SMCAS Public Star Parties (Weather Permitting)

From Hwy 101 or El Camino: Take Brittan Avenue in San Carlos, west (toward the hills). Follow Brittan 2.3 miles (from El Camino) to Crestview Drive. Turn right on Crestview. In half-a-block, you will see a small, blue-posted sign with an arrow, indicating the entry road into Crestview Park. It lies between houses with addresses #998 and #1000 Crestview Drive.

From Highway 280: Take Edgewood Road exit. Go east (toward the Bay) about 0.8 miles. Turn left at Crestview Drive. Go 0.5-mile uphill to where Crestview meets Brittan. Again, drive the half-block, to the small blue sign on the right, and the entry road on the left.

From Hastings and Club Drives: From Belmont, take Carlmont Drive to Hastings Drive. Follow Hastings about 1.5 miles, first uphill, then down, to San Carlos where it becomes Witheridge Road, then ends a block later at Club Drive. Turn right and climb Club Drive to Crestview Drive. Turn left and continue some 2 miles, first up, then down past Leslie Drive, to the small blue Crestview Park sign on the left. Turn right into the Crestview Park entry road.

Crestview Park - San Carlos

Come on out, and bring the kids, for a mind-blowing look at the Universe!

Bring your binoculars, telescopes, star guides, and lounge chairs for some informal star gazing at Crestview Park.

Dress warmly and wear a hat. Only visitors with telescopes should drive in. Others should park on the street and walk in or arrive before dark so that car headlights don't affect the observers' dark adaptation. Bring small flashlights only, covered with red cellophane or red balloon.

These measures avoid safety issues of maneuvering in the dark, as well as ruining the night vision of the viewers.

Please don't touch a telescope without permission. And parents, please don't let children run around in the dark.

Note: If bringing a telescope and arriving after dark, please enter the Park with your headlamps and white interior lights off. **If you aren't bringing a telescope, whether before or after dark, please park along Crestview Drive, and walk in.**

Crestview Park is residential, adjacent to homes and backyards. Before inviting potentially noisy groups, please call Ed Pieret at (650) 595-3691 for advice and advisories. **Call Ed also to check the weather and 'sky clock' and to see whether the Star Party is still scheduled.**

Crestview Star Party schedule is here:

<http://www.smcasastro.com/crestview-park.html>

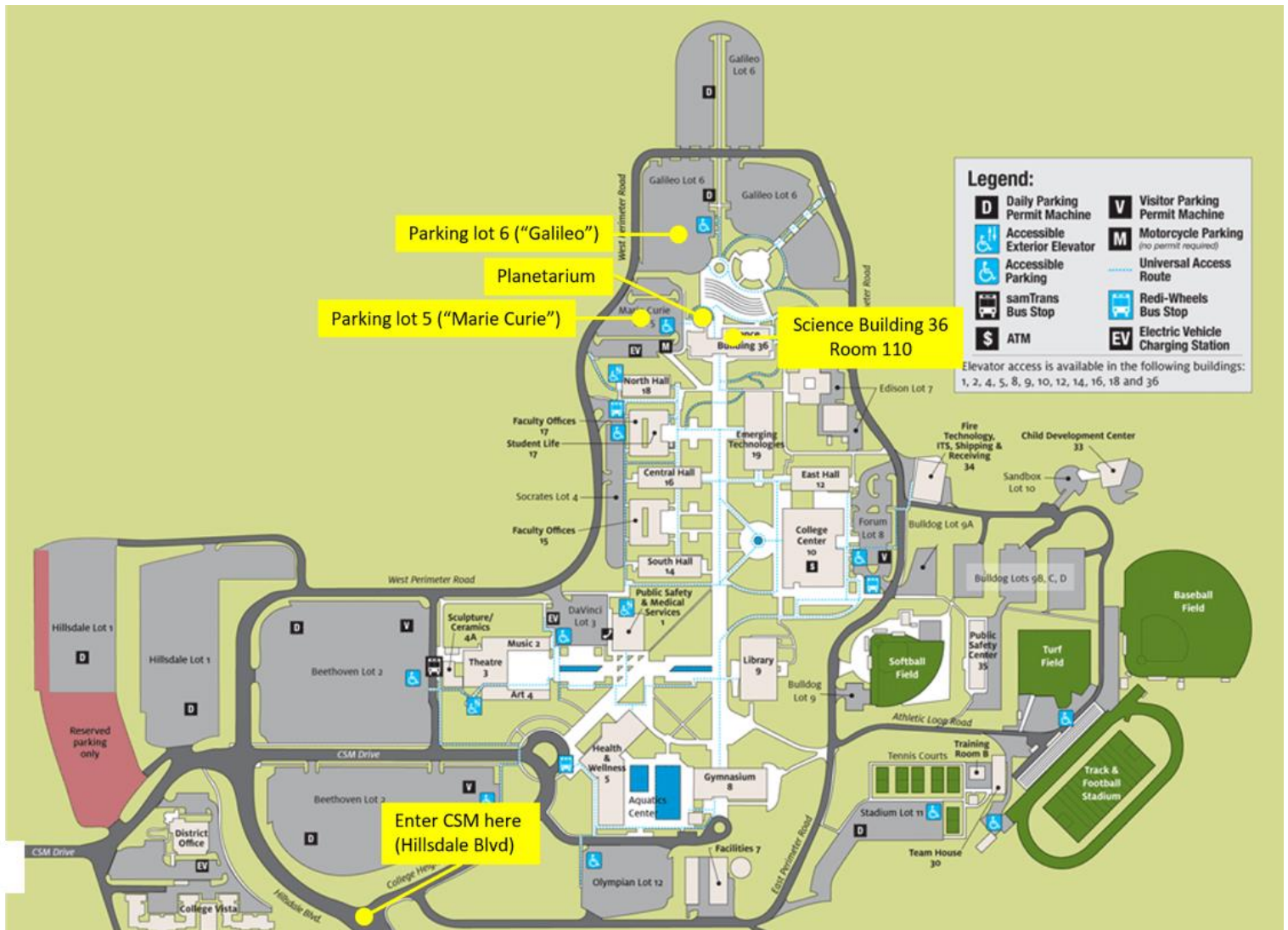
From San Carlos, take San Carlos Avenue to Club Drive, and climb to the 5-way intersection. Take the half-right to continue on Club Drive past Witheridge Road to Crestview Drive. Proceed as above to Crestview Park.



Directions to SMCAS Meetings at The College of San Mateo:

Directions to the CSM Planetarium for Meetings:

After exiting Hwy 92 at Hillsdale Blvd, climb the hill towards CSM, passing two traffic lights to the stop sign at the top of Hillsdale Blvd. Continue straight onto West Perimeter Road and follow it until you reach Lot 5, "Marie Curie", or Lot 6, "Galileo." Science (ISC) Bldg. (36) and the Planetarium lie straight ahead. Enter Bldg. 36 either through the door facing the lot or walk around the dome to the courtyard entrance. We meet in ISC room, #110 for pizza and soft drinks one hour prior to the talk in the Planetarium (Pictured below.)





San Mateo County Astronomical Society

Membership Application

SMCAS@live.com; P.O. Box 974, Station A, San Mateo CA 94403; (650) 678-2762

rev 02272020

Become an SMCAS Member Today! Here's what you get:

- **Members Community**

Friendly advice and guidance from experienced recreational astronomers; access to SMCAS group emails, which provide general orientation information, announcements of astronomy events, file access and exchange.

- **SMCAS Events**

General meetings are held the first Friday of most months, at 7pm in the Integrated Science Center (ISC) Room and Planetarium in the Science Center (Bldg. 36) at the College of San Mateo (CSM), 1700 W. Hillsdale Blvd., San Mateo. Meetings include lectures and presentations on space science, an activity session, and refreshments (usually pizza).

We also offer stargazing two Saturdays a month, weather permitting. Visitors and those without telescopes are welcome; members are glad to share! SMCAS also has sponsored dark-sky campouts at Fremont Peak State Park, field trips to SLAC, KIPAC and Lick Observatory, plus **member-only events, including Star-B-Ques and quarterly potlucks.**

- **Subscriptions (free with your membership)**

The Event Horizon, SMCAS' newsletter, with SMCAS and member information, viewing tips and articles.

The Reflector, published quarterly by the Astronomical League, a national alliance of astronomy groups like SMCAS.

- **Significant Discounts on Equipment and Publications**

Discounts on purchases at Bay Area astronomical equipment retailer Orion Telescope Center, on sky calendars and ephemerides, and on such periodicals as *Sky & Telescope* and *Astronomy*.

- **Access to Loaner Equipment**

Use of SMCAS loaner telescopes and other astronomy equipment.

- **Sharing your Appreciation of Astronomy and Space Science with the General Public.**

Your SMCAS membership helps bring astronomy to interested lay people, especially students and children

Annual Dues: (SMCAS is a tax-exempt non-profit 501(c)(3). Dues may be tax deductible; consult your tax advisor):

\$30 Regular Family Membership; \$15 Student Membership

Every membership includes all members of your immediate family, (including your kids).

To join you can:

Send application (see reverse side), with payment, to: SMCAS, P.O. Box 974, Station A, San Mateo CA 94403.

- Bring the completed application and payment to a meeting or event and give it to any SMCAS officer.
- Go online at <http://www.smcasastro.com>, click on the Membership tab and pay via PayPal.

Membership Application on next page



San Mateo County Astronomical Society

Membership Application

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rev 02272020

Date: _____ Please check one: ☐ New Member or ☐ Renewal

☐ \$30 Regular Family Membership; ☐ \$15 Student Membership

All members, please indicate areas of interest below. New members, please complete entire form. Renewing members, please provide your name and any information that has changed in the last year.

We will list your name, address, email address, and phone number(s) in our membership roster unless you have checked the box preceding that information. The membership roster is distributed to active members only.

Each member's name and mailing address must be provided to the Astronomical League (AL), SMCAS' umbrella organization. If you don't want AL to have your phone number and email address, indicate below.

☐ Name(s) _____ ☐ Email Address _____

☐ Address _____

☐ City & Zip Code _____

☐ Phone Number(s): _____ ☐ Do not provide my phone number(s) to the AL.

☐ Don't provide my email address to the AL. (Checking this means you can ONLY get **The Reflector** by regular mail)

Please check one: send **The Reflector** ☐ by mail, or ☐ by email.

Areas of Interest:

SMCAS encourages member involvement. We invite you to provide additional information about your interests, skills, occupation and prior experience. Please identify SMCAS projects and functions that you might like to help facilitate.

Please indicate which of the following activities might be of interest to you:

____ Star Parties - Do you own a telescope you can bring: Yes (☐) No (☐)

____ General Meetings - Finding (or being) a Speaker. Official greeter. Set up or take down ISC or refreshments.

____ Family Science Day & Astronomy Festival (Usually at CSM the first Saturday in October).

____ Social Events - Equinoctial and Summer Solstice potlucks, Summer Star-B-Que, Holiday Potluck.

____ SMCAS Membership and Promotional Drives

____ Communications – 'Event Horizon' Newsletter, Website(s), Facebook page, group email, Publicity posting.

____ Educational Programs – School, museum and library star parties, Bay Area Astro teacher assistants.

Other/Comments: _____