The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

Oct. – Dec. • 2021 Issue

780th General Meeting: TBD
781st General Meeting: November 19
782nd General Meeting: TBD

EVENT HORIZON

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 nonpandemic 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 ***http://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 near the end of this newsletter. The Membership Application form is on the back page.

Partial Lunar Eclipse November 19 & 20

Partial Lunar Eclipse with November's Full Moon November 19 & 20. See page 10 for more details.

Table of Contents

PLEASE NOTE: CSM is still closed due to the pandemic.

Cover: Photo by Johannes Plenio.
Below: Photo by Thirdman.

From the Prez

Hello All,

Our Crestview Installation-of-Officers on August 7 was a successful return to in-person activities. It was well-attended, drawing nearly 60 to the potluck and even more to stargaze after dark. There was lots of great food.

With well over a dozen 'scopes on hand, the sky favored us with spectacular views. All got to admire the eVscopes that about half-a-dozen of our members have put to use since early 2020.

Last September, we performed the concluding Star Party for CSM's Family Science & Astronomy Day (FSAD), livestreaming as we had our online meetings with lectures over the past year. CSM's 2021 FSAD was also virtual, so we used the same approach for our Zoom broadcast on Saturday, September 25 between 8 and 9 pm.

The Moon gave us three Saturdays in a row; Aug. 28, Sept. 4 and 11 to preview for FSAD. Because of these several events (plus our Equinox dinner discussed below), we skipped September's general meeting, but will resume them in October. Remaining Star Party Saturdays through 2021 include Oct. 2, 9 and 30, followed by Nov. 6 and Dec. 4.

The Club's considering, once again, separating our monthly general meetings from the Saturday Star Parties by scheduling them either on alternate Saturdays or on weekdays; probably a Friday and maybe a first Friday, as we used to. The meetings would continue as virtual livestreams for, at least, as long as CSM remains closed, now estimated until at least Spring semester 2022.

As referenced above, we also resumed, on Sept. 18, our Equinox potluck dinners in the Fireside Room at the Crystal Springs United Methodist Church (UMC). We hope to plan a holiday party at the UMC in early January, with a date TBD.

I want to thank Bill Lockman for his dedicated work scripting the simulcasts, and Edmund Pieret for coordinating and managing the Zoom system. Thanks also to our dedicated observers (besides Bill and Ed) who take our star parties online. These include Michael Cooke, Chanan Greenberg, Ken Lum and Frank Seminaro; Bud Wittlin also recently added an eVscope.

Lisa Cooke does great work editing our program recordings for posting at our YouTube channel, as well as her superb artwork for our patches and certificates. She and husband Michael also keep our Facebook page postings up to date.

In addition, I want to give another tip of the hat to Michelle Morales Torres, who does a superb job editing our Event Horizon. A crack committee consisting of Bill Lockman, Ken Lum and Ed Ching provide her great assistance with edits and rewrites.

In the last week, our VP, Ed Pieret, suffered a painful case of shingles, and Bill Lockman related a severe Covid illness afflicting his wife, Karen's, cousin. I urge you all to join me in praying for their relief and recovery, and in wishing them all a rapid and complete recovery. Good luck and good health to all of you as well as to your friends and families.

(continued on page 4)

From the Prez (cont'd)

To any and all members, feel welcome to contact me, or other members of the Board, if you have any questions, or if we can assist you in any way. Thanks again for supporting the San Mateo County Astronomical Society. All the best.

Mike Ryan

(650) 678-2762

jmrastro@yahoo.com

The Western Veil.

Upcoming Events

PLEASE NOTE: CSM is still closed due to the pandemic. SMCAS in-person Star Parties have resumed at Crestview Park. Click here to see the schedule.

Saturday, October 2: Star Party – at sunset (6:51pm) – Star Parties, Crestview Park, 1000 Crestview Drive, San Carlos, CA 94070.

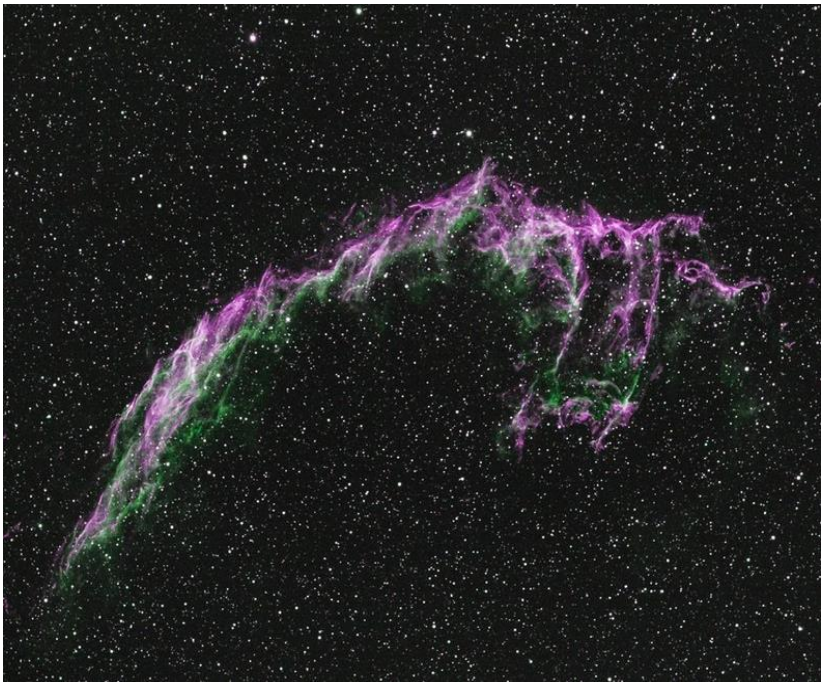
Saturday, October 9: Star Party – at sunset (6:44pm) –Star Parties, at Crestview Park.

Saturday, October 30: Star Party – at sunset (6:08pm) –Star Parties, at Crestview Park. Don't miss the third to the last one of the year!

Saturday, November 6: Star Party – at sunset (5:02pm) –Star Parties, at Crestview Park. Don't miss the second to the last one of the year!

Friday, November 19: Lecture – 7pm via Zoom — "From Astrometry To Discovery" by Professor of Astronomy, Dr. Wei-Chun Jao of Georgia State University. He will present his discoveries from the data of the European Space Agency GAIA mission. The Zoom Meeting ID is 253 926 2920 and the password is SMCAS.

Saturday, December 4: Star Party – at sunset (4:51pm) – Star Parties, at Crestview Park. Don't miss the last one of the year!



The Eastern Veil.

Congratulations on SMCAS's outstanding role in CSM's Family Science and Astronomy Day

By Mike Ryan

September 25, the College of San Mateo presented its annual public science festival, their Family Science and Astronomy Day (also known as FSAD), preferentially held each year on the final Saturday in September. It's the longest-running public event in the history of the College of San Mateo and the San Mateo County Community College District.

It's local predecessor, Astronomy Day, dates from 1971, with the founding of the now-defunct Astronomical Association of Northern California, that was established during a Star Party weekend at Fremont Peak State Park. It went national soon after, picked up by Western Amateur Astronomers, then the Astronomical League, and others. By the 1980's, it had reached Europe, Japan and propagated to other parts of the world.

SMCAS, which was named SMAS, San Mateo Astronomical Society, until 1976, had met at CSM's College Heights campus since 1963. We lost our public access to the campus in July 1978, as the state educational establishment spitefully retaliated to voters' passage of Proposition 13, the landmark property-tax initiative.

We were able to return SMCAS to CSM in 2000 and led CSM's public outreach campaign for years. The construction of CSM's new science center, observatory and planetarium took the public outreach events off the field and out of our hands, away from our telescopes and into the buildings.

But, while the event has evolved to include physics, geology, chemistry and biology displays and demonstrations, our members still played key roles in the astronomical events. We helped attract hundreds of attendees to CSM. In fact, our success motivated the District to feature Astronomy as its showcase discipline beyond the boundaries of San Mateo County and, at times, even outside California.

Unfortunately, the educational establishment's long, broad implementation of COVID restrictions has greatly reduced the appeal and attendance of the FSAD. SMCAS, though, has continued to make an unequalled contribution to CSM's outreach events, both last September, and September 25.

I hope those who wanted to know were informed and aware of FSAD's events. I know we presaged them in previous announcements. CSM and the College District had claimed responsibility for publicizing the event and informing the public.

So, who among us do we have to thank for the Society's efforts? If you get a chance, please take the opportunity to thank (in no particular order) Ed Pieret, Bill Lockman, Ken Lum, the Cooke family (Michael and Lisa), and Frank Seminaro. I, Mike Ryan, have been privileged to assist as well. I wish our Society had a dollar (or more!) for every uncompensated hour that these members have provided.

I also tip my hat to many other members who, while they may not have been engaged in the recent FSAD, have both supported and facilitated other Society events and activities. These include Karen Boyer, Marion and Collette Weiler, Chanan Greenberg, Ed Ching, Michelle Morales Torres, Bud Wittlin, Karen Zamel, and various others whose names momentarily escape me, and to whom I apologize. ◆

Due to fog, prerecorded images had to be shown. If you'd like to see these images and the script. Please click on the appropriate link below:

FSAD 2021 star party images

FSAD 2021 star party observing list and dialogue

Frank's Astrophotography Series: Equipment – Part 2

By Frank Seminaro

Last month I wrote about the Starizona Hyperstar and the new ZWO color astrophotography cameras. For this issue, I am going to cover wires, power and introduce an amazing little device called the ASIAIR Pro. This device is the heartbeat of my astrophotography rig and just like our circulatory system, it needs connections to all the other equipment. This requires wires, wires everywhere. (See Figure 1.)

Figure 1: Wires needed to carry power and signal in my astrophotography rig.

My astrophotography set up requires A LOT of wires. Managing them with care is important to make the proper connections, avoids both reversed polarity, and mount snags while slewing your scope. My rig needs connections between stationary equipment on the ground and equipment on the mount that needs to move in all directions. Minimizing the number of wires between these two areas will lessen the chance of a potentially disastrous snag. One way to solve this is to place the distribution of power directly onto the mount head itself. This will require only one wire between the battery on the ground up to the mount head. I use the West Mountain RIGrunner 4005 available on powerwerx.com. (See Figure 2.) This device will take the 12v power from your battery or power supply and allow you to connect five devices via a fused distribution block.

The connections used on the distribution block are called Anderson Powerpoles. (See Figure 3.) These connectors are widely used in many application areas. They allow for quick connect/disconnects and eliminate the chance of a reversed polarity situation. Powerwerx.com sells these connectors and wire so you can make your own, buy premade or custom order with various other connectors (i.e., cigarette lighter, banana, or 2.1mm plug). Wire size of 12 gauge will handle most astronomy applications. All are reasonably priced and a good investment even beyond astronomy.

Figure 2: The West Mountain RIGrunner 4005 fused power distribution block.

(continued on page 8)

Frank's Astrophotography Series (cont'd)

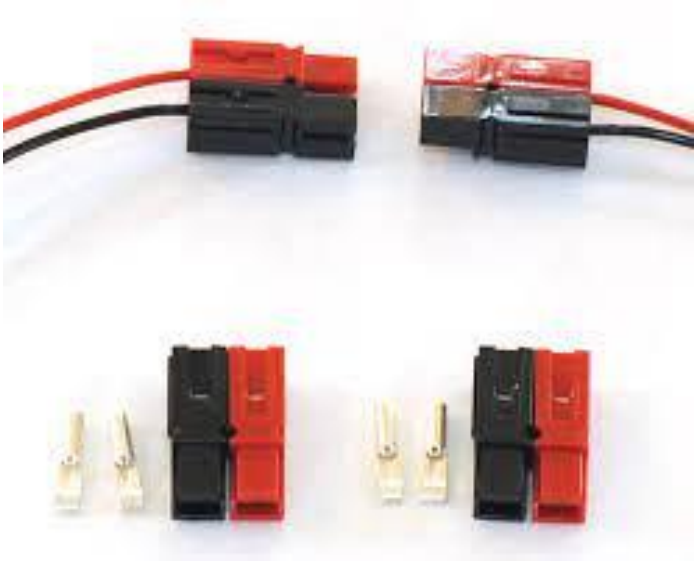


Figure 3: Anderson Powerpole connectors.

Let's talk power for a moment. Astrophotography requires a lot of it. Besides the mount, I use 12v power for a main camera, guide camera, electronic focuser, mini-computer, and dew heater. I power each device directly from the RIGrunner mentioned above. For my situation, I power my AP1200 mount from a separate battery or power supply. The AP1200 is heavy duty and as such, draws a lot of power. Additionally, the power connection for the AP1200 is below the mount head eliminating the possibility of a snag. Finally, due to the mount's power draw, there is a possibility of it introducing electronic interference (noise) into the camera if connected to the same battery. Not all mounts have this situation and could be powered from a single distribution block and one battery.

You can thank Tesla for a new generation of batteries now being introduced to the market. The days of lugging your heavy deep cycle marine battery are coming to an end. New battery chemistries are allowing much lighter batteries with even greater performance. For an example, just five years ago AGM (absorbed glass mat) batteries were the rage, replacing all the old-style lead acid batteries. Your car probably has this particular battery type installed. Recently, Lithium Iron Phosphate (LiFePo) is now becoming the rage. For comparison, a 12 volt 80 amp-hour AGM battery weighs almost 60lbs and costs around $250. A 12 volt 100 amp hour LiFePo battery weighs only 26 pounds. The differences don't stop there. An AGM battery can only use 50% of its amp hour capacity before it needs to be recharged. A LiFePo can use 100% of its amp hour capacity. That's two times gain in capacity at half the weight. If your mount draws on average four amps per hour, the LiFePo could theoretically run it for 25 hours before a recharge is needed. Most mounts use less than two amps. The downside is the LiFePo batteries are very expensive ($700 for the one mentioned above). The new battery technology is becoming available to astronomers via the popular new portable power stations at a much lower cost. There is an array of manufacturers for these products including Goal Zero Yeti, Renogy and Jackery. They come in an array of capacities and offer different connection types. I selected the Jackery Explorer 240 portable power station. (See Figure 4.) It is about the size of a lunch pail, weighs only six pounds, and has a 17-amp hour battery. It also has a built-in inverter to power small appliances (note the 110 volt power plug output). I recently used a 24-inch TV at the SMCAS Star parties to display images from EV Scopes.

(continued on page 9)

Frank's Astrophotography Series (cont'd)

I ran the TV for four hours and only reduced the power station by 10%. One great feature is the ability to recharge via a solar panel. This is great option if you are at a remote Star Party or just camping. You can usually find them on sale for around $150.

Let's go back to discussing wires because there are more. Besides power, each device needs to be connected to a central computer so you can operate it. In the past, this meant a laptop with USB wires between each device and USB ports. More wires to get snagged and manage. My rig needs computer connections for the main camera, guide camera, and electronic focuser. But why be connected at all? Why not place the computer onto the mount head? Thankfully, several manufacturers figured this out and offer minicomputers dedicated to astrophotography. I use the ZWO ASIAIR Pro and it is the heartbeat of my rig. (See Figure 5.)

In addition to connecting all of the devices, it wirelessly connects to an iPad, iPhone, or Android through a Wi-Fi connection. This means no more laptop! I will cover this game changing device in my next article. ◆

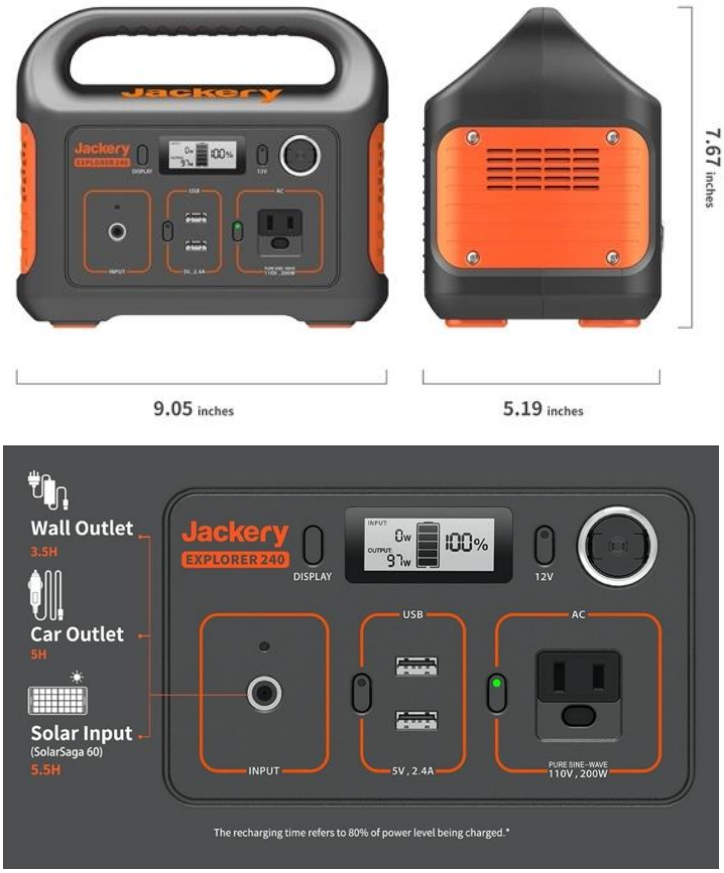


Figure 4: Jackery Explorer 240 portable power station.

Figure 5: ASIair Pro wireless imaging controller.

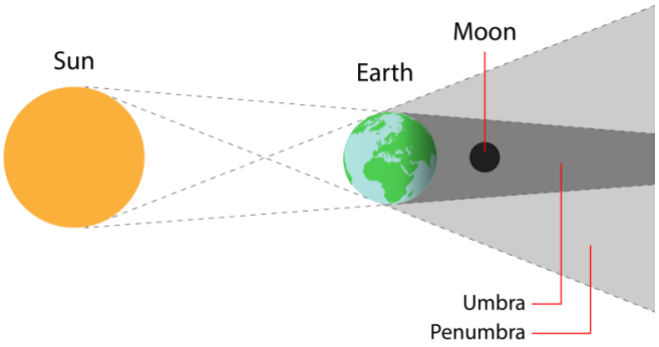
Partial Lunar Eclipse November 19

By Michelle Morales Torres

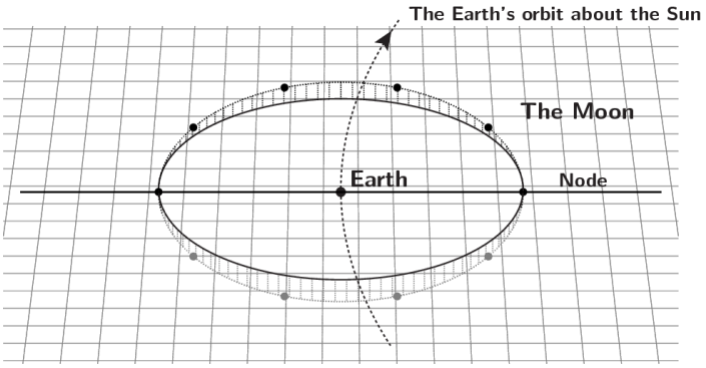
The biggest meteor shower of the summer, Besides bringing us the full Beaver Moon, November also brings us a partial lunar eclipse between the hours of 11:19pm on November 19 and 2:47am on November 20. The maximum coverage should occur around 1:04am, when 97% of the Moon's surface will be covered by the umbral shadow cast by the Earth, according to In-The-Sky.org, for those of us in San Mateo. Sometimes the timetables aren't always accurate so it's best to start observing early in case the time of the maximum eclipse starts earlier than stated.

In case you didn't know or need a reminder, lunar eclipses occur when the Earth passes between the Sun and Moon, making the Earth's shadow visible on the Moon. In order for this to occur, the Sun, Earth and Moon all have to be lined up. When the Moon orbits the Earth, it passes almost directly opposite of the Sun as it becomes full. If the Moon orbited the Earth in the same plane as the Earth orbits the Sun, there would be a lunar eclipse for each full moon. However, the plane defined by the Moon's orbital path around the Earth is tilted by 5 degrees with respect to the plane defined Earth's orbital path around the sun. The two points where the Moon's orbital path crosses the Earth's orbital plane around the Sun are called the Moon's nodes. Lunar eclipses occur when the two Lunar nodes and the Sun lie on a line (see the figure below) *and* the Moon passes near the node behind the Earth and Sun.

The table to the right lists the times when each part of the eclipse will begin and end, again courtesy of In-The-Sky.org. ◆



The geometry of the Earth's shadow during a lunar eclipse. (In-The-Sky.org)



This diagram depicts the plane of the Earth's orbit around the Sun. A lunar eclipse occurs only when one of these node crossings coincide with a full moon. (In-The-Sky.org)

Date	Local time	Lunar Eclipse Phase
Nov. 19	11:03pm	Moon begins to enter the Earth's penumbra.
Nov. 19	11:20pm	Moon begins to enter the Earth's umbra. Partial eclipse begins.
Nov. 20	1:04am	Greatest eclipse.
Nov. 20	2:48am	Moon fully outside the Earth's umbra. Partial eclipse ends.
Nov. 20	4:04am	Moon leaves the Earth's penumbra.

NASA Night Sky Notes
Weird Ways to Observe the Moon

By David Prosper

International Observe the Moon Night is on October 16 this year– but you can observe the Moon whenever it's up, day or night! While binoculars and telescopes certainly reveal incredible details of our neighbor's surface, bringing out dark seas, bright craters, and numerous odd fissures and cracks, these tools are not the only way to observe details about our Moon. There are more ways to observe the Moon than you might expect, just using common household materials.

Put on a pair of sunglasses, especially **polarized sunglasses**! You may think this is a joke, but the point of polarized sunglasses is to dramatically reduce glare, and so they allow your eyes to pick out some lunar details! Surprisingly, wearing sunglasses even helps during daytime observations of the Moon.

One unlikely tool is the humble **plastic bottle cap**! John Goss from the Roanoke Valley Astronomical Society shared these directions on how to make your own bottle cap lunar viewer, which was also suggested to him by Fred Schaaf many years ago as a way to also view the thin crescent of Venus when close to the Sun:

"The full Moon is very bright, so much that details are overwhelmed by the glare. Here is an easy way to see more! Start by drilling a 1/16-inch (1.5 mm) diameter hole in a soft plastic drink bottle cap. Make sure it is an unobstructed, round hole. Now look through the hole at the bright Moon. The image brightness will be much dimmer than normal – over 90% dimmer – reducing or eliminating any lunar glare. The image should also be much sharper because the bottle cap blocks light from entering the outer portion of your pupil, where imperfections of the eye's curving optical path likely lie." Many report seeing a startling amount of lunar detail!

You can **project the Moon!** Have you heard of a "Sun Funnel"? It's a way to safely view the Sun by projecting the image from an eyepiece to fabric stretched across a funnel mounted on top. It's easy to make at home, too – directions are here: bit.ly/sunfunnel. Depending on your equipment, a Sun Funnel can view the Moon as well as the Sun– a full Moon gives off more than enough light to project from even relatively small telescopes. Large telescopes will project the full Moon and its phases, with varying levels of detail; while not as crisp as direct eyepiece viewing, it's still an impressive sight! You can also mount your smartphone or tablet to your eyepiece for a similar Moon-viewing experience, but the funnel doesn't need batteries.

Of course, you can join folks in person or online for a celebration of our Moon on October 16, with International Observe the Moon Night – find details at moon.nasa.gov/observe. NASA has big plans for a return to the Moon with the Artemis program, and you can find the latest news on their upcoming lunar explorations at nasa.gov.◆

(continued on page 12)

NASA Night Sky Notes
Weird Ways to Observe the Moon (cont'd)

Sun Funnels in action! Starting clockwise from the bottom left, a standalone Sun Funnel; attached to a small refractor to observe the transit of Mercury in 2019; attached to a large telescope in preparation for evening lunar observing; projection of the Moon onto a funnel from a medium-size scope (5-inches).

***Safety tip*:** NEVER use a large telescope with a Sun Funnel to observe the Sun, as they are designed to project the Sun using small telescopes only. Some eager astronomers have melted their Sun Funnels, and parts of their own telescopes, by pointing them at the Sun - large telescopes create far too much heat, sometimes within seconds! However, large instruments are safe and ideal for projecting the much dimmer Moon. Small telescopes can't gather enough light to decently project the Moon, but larger scopes will work.

(continued on page 13)

OBSERVE the MOON

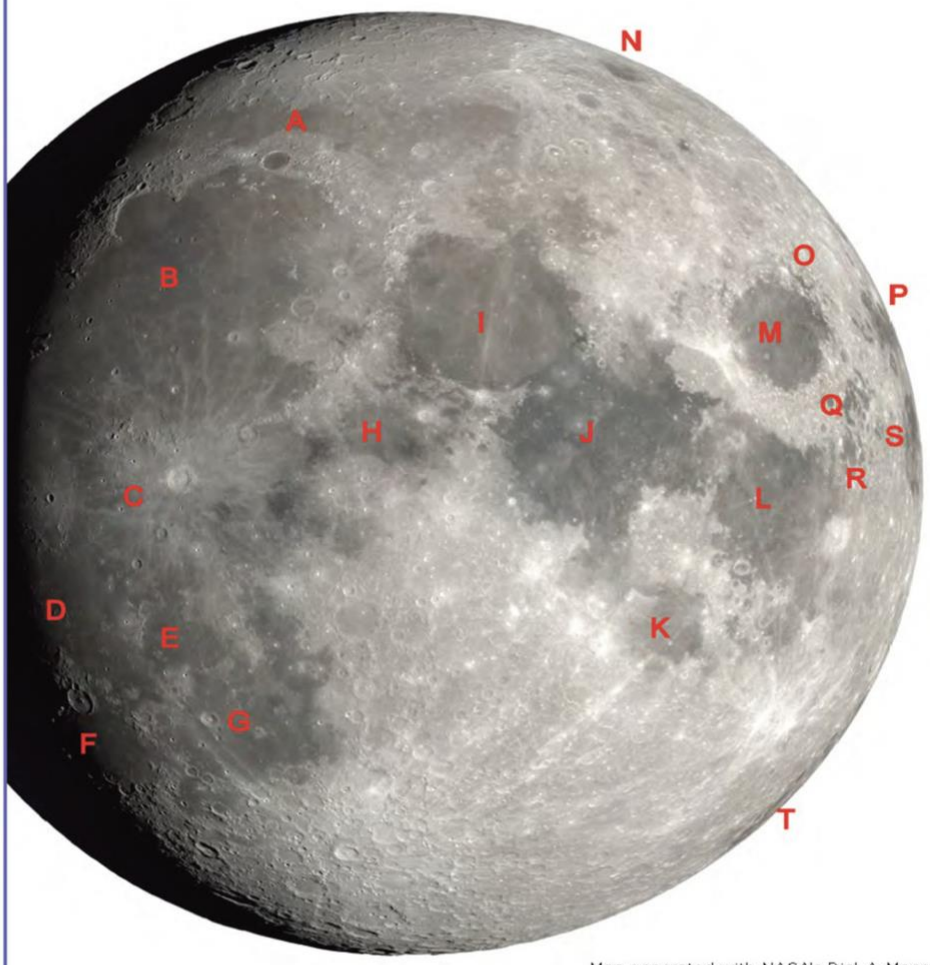
International OBSERVE THE MOON NIGHT 2021

SATURDAY 16TH OCTOBER

NORTHERN HEMISPHERE MOON MAP WITH LUNAR MARIA (SEAS OF BASALT)

Moon Map
This map was created for International Observe the Moon Night 2021. It depicts the Moon as it will appear from the northern hemisphere at approximately 11:00 PM EDT on October 16, 2021 (3:00 AM UTC on October 17).

Lunar Maria (Seas of Basalt)
You can see a number of maria tonight. Once thought to be seas of water, these are actually large, flat plains of solidified basaltic lava. They can be viewed in binoculars or even with the unaided eye. Tonight, you may be able to identify 18 maria on the Moon. This includes four seas along the eastern edge that are often hard to see. Because of libration, a slight apparent wobble by the Moon in its orbit around Earth, tonight we get to peek slightly around the northeast edge of the Moon, glimpsing a sliver of terrain normally on the Moon's far side.



Map generated with NASA's Dial-A-Moon (https://svs.gsfc.nasa.gov/4874)

A. Mare Frigoris (Sea of Cold)
B. Mare Imbrium (Sea of Rains)
C. Mare Insularum (Sea of Isles)
D. Oceanus Procellarum (Ocean of Storms)
E. Mare Cognitum (Known Sea)
F. Mare Humorum (Sea of Moisture)
G. Mare Nubium (Sea of Clouds)
H. Mare Vaporum (Sea of Vapors)
I. Mare Serenitatis (Sea of Serenity)
J. Mare Tranquillitatis (Sea of Tranquility)
K. Mare Nectartis (Sea of Nectar)
L. Mare Fecunditatis (Sea of Fertility)
M. Mare Crisium (Sea of Crises)
N. Mare Humboldtianum (Humboldt's Sea)
O. Mare Anguis (Serpent Sea)
P. Mare Marginis (Border Sea)
Q. Mare Undarum (Sea of Waves)
R. Mare Spumans (Sea of Foam)
S. Mare Smythii (Smyth's Sea)
T. Mare Australe (Southern Sea)

MOON.NASA.GOV/OBSERVE #ObserveTheMoon

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

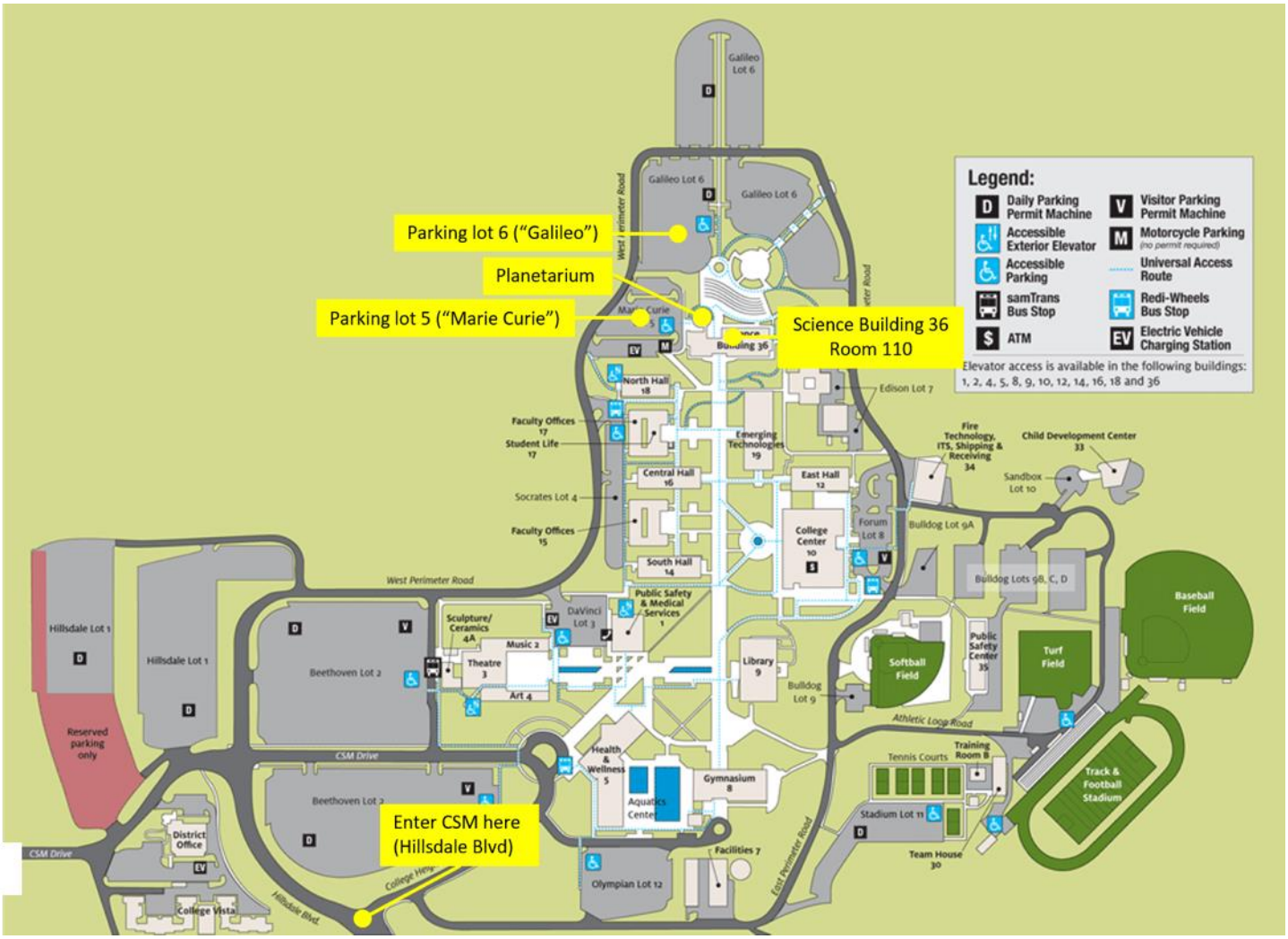
From San Carlos, take San Carlos Avenue to Club Drive, and climb to the 5-way intersection. Take the half-right to continue on Club Drive past Witheridge Road to Crestview Drive. Proceed as above to Crestview Park.

Directions to SMCAS Meetings at The College of San Mateo:

NOTE: CSM is closed due to the pandemic.

SMCAS events are online until further notice.

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

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

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: _____