

# The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

October 2018 — 654th General Meeting Notice



# 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. 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 info is found at [www.smcasastro.com](http://www.smcasastro.com), where those who want can join via Paypal.

Membership includes access to this monthly Event Horizon newsletter, discounted costs and subscriptions to calendars and magazines, monthly star parties of the Society and the College of San Mateo, use of loaner telescopes, field trips, social occasions and general meetings presenting guest speakers and programs. For additional information, please email us at [SMCAS@live.com](mailto:SMCAS@live.com), or call us at (650) 678-2762.



*THE HMP OKARIAN* trekking across the Northwest Passage in a scene from *A Passage to Mars*, a film presented by Dr Pascal Lee at our September meeting. The Okarian is a prototype human driven planetary exploration rover. See Ken Lum's review article starting on page 4 for more on the film and the science.

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## UPCOMING DATES

**Oct 5:** General Meeting, Pizza, and Presentation at the CSM Planetarium. Details on p. 3.

**Oct 9:** SMCAS Board Meeting, CSM ISC room.

**Oct 13:** SLAC/KIPAC Kids Night. **Volunteers Needed!**

**Oct 20:** Family Science and Astronomy Festival at CSM. **Volunteers Needed!**

More events and further details on page 6.

## President's Corner

Hello SMCAS members!

It's already September and even though the past several months have been challenging for California observers due to the smoke and disappointing weather conditions, we are headed into the best viewing time of the year so let's hope for good skies.

As your new President, I have asked the Board to focus on two areas right away: first, extending our outreach efforts by increasing member involvement and expanding our audiences and second, improving our information technology tools and communication to better serve our members and the public. Two working groups have been formed and are compiling recommendations for the Board to consider. If you would like to participate on these working groups, please contact a SMCAS Board member immediately.

We have two large events in October that will be supported by SMCAS—The Family Science and Astronomy Festival on October 20th and the SLAC open house on October 13th. Volunteers are needed so please contact any board member if you can attend.

Clear Skies!

***Frank Seminario***

*President, San Mateo County Astronomical Society*

## Observing Mars: Bad News and Good

***By Ted Jones***

At the end of July, Mars was closer to Earth than it has been in 15 years, an event amateur observers had been looking forward to for some time. Unfortunately, a dust storm that began in late May grew to cover the entire planet by mid to late June. In a telescope Mars was an impressive rust-red ball, but it was next to impossible to see any features of the Martian surface.

The view from Earth was not the only cause for disappointment. On Mars itself, the solar powered Opportunity Rover found itself in perpetual darkness, causing it to enter a "low power fault mode" in mid-June. As of the time of writing, the Martian skies are clearing and NASA has been attempting to contact Opportunity, but it still has not been heard from and its fate is uncertain. (The nuclear powered Curiosity Rover was exploring a crater which gave it shelter, and it has come through the storm in good shape).

### **A Missed Opportunity**

At the end of July, Mars was the closest it had been since 2003, only 0.39 AU away (one AU, or astronomical unit, is the mean distance between Earth and the Sun, about 93 million miles). The planet had an apparent diameter of over 24 arcseconds, considerably larger than Saturn's 18 arcseconds (not including the rings). For some time it shone brighter than Jupiter, reaching a brilliant magnitude  $-2.8$ .

It will be a very long time—decades—before Mars is so close again. It seems that amateur observers have missed a rare opportunity.

### **Not the Last Chance: 2020 Looks Very Good**

It's not as bad as it might sound! First of all, the storm is dying out and Mars, though diminished, is still big and bright. Following a rule of thumb that surface features on Mars are observable when the

**Continued on p. 5**

## Dr Mandeep Gill

Observational Cosmologist  
KIPAC, SLAC, Stanford

### ***The Thrill of Discovery! Seeing Gravitational Waves AND Light From a Neutron Star Collision***

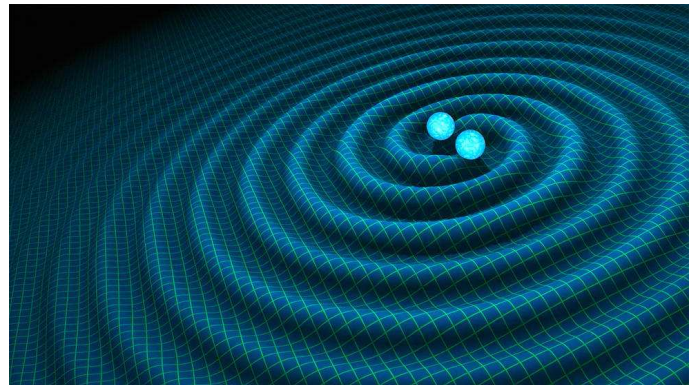
Friday, October 5, 2018, College of San Mateo, Building 36

SMCAS General meeting at 7:00 p.m. ISC Room, room 110

Presentation at 8:00 p.m. in the CSM Planetarium

Free and open to the public, free parking (lots 5 and 6 recommended)

“Holy Smokes—Seeing Gravitational Waves AND light from a Neutron Star Smashup? Now we’re big time!”. On Aug 17, 2017, astronomers around the world saw an event they had waited a long, long time for—observing gravitational waves and electromagnetic radiation from a binary neutron star merger. In this talk, Dr Gill will discuss what it was like to be in the center of that discovery maelstrom, and what we have learned from it so far, along with what we hope to learn from seeing future events of this form.



*Conception of gravitational waves produced by neutron stars. Credit: R. Hurt/Caltech-JPL.*



Dr. Gill teaches and conducts research in particle physics and cosmology—past and future. He is an observational cosmologist specializing in gravitational lensing and gravitational wave optical counterpart detection and also Outreach Coordinator at the Kalvi Institute of Particle Physics and Cosmology at SLAC National Accelerator Laboratory. He is also an Astronomy Instructor at Stanford University. He earned his doctorate at UC Berkeley in 2004 in Experimental High Energy Particle Physics. In Summer

2005 he visited the Large Hadron Collider at CERN in Geneva, and observed the construction of the CMS and Atlas experiments. At Caltech in 2006 he worked on second order weak lensing of distant galaxy clusters (and ultimately better dark matter distribution determination). From 2006 to 2009 he was a postdoctoral research fellow at the Center for Cosmology and Particle Physics at The Ohio State University. There he concentrated on gravitational weak lensing and the determination of cosmological parameters using this technique.

## Passage to Mars

**By Ken Lum**

Dr. Pascal Lee of the Mars Institute came last month to show his 2016 movie, *Passage to Mars* which gives an account of one of the expeditions that Dr. Lee and his team conducted in the arctic to simulate a human Mars mission. The Mars Institute is an organization founded in 2002 by Dr. Lee to simulate prospective human missions to Mars. It is headquartered at NASA Ames Research Institute.

The movie begins with a description of how we have found Mars to be actually a desolate and forbidding place seemingly hostile to the presence of life. Nonetheless, of all the major bodies orbiting in the Solar System, besides Earth, Mars is still a world with conditions, perhaps more so in the past, most compatible with having an independent origin of life. And therefore, the planet continues to hold a magnetic attraction for those seeking evidence for life outside of Earth.

Dr. Lee and his colleagues at the Mars Institute and the SETI Institute have established an outpost on Devon Island in northern Canada at about 75° N. latitude to test equipment and procedures, and train personnel for exploring Mars. Being so cold and dry and uninhabited by humans, it offers an environment similar enough to that of Mars to provide a safe and accessible analogue for the Mars environment.

What is now called the *Northwest Passage Drive Expedition* started with the delivery of a Humvee equipped with tractor treads named *HMP* (Haughton-Mars Project) *Okarian* (named for creatures from one of Edgar Rice Burrough's novels about Mars) to the town of Kugluktuk in the Nunavut Region of Canada in the spring of 2009 (see photo, p. 1). The purpose of the expedition was to perform an overland (actually over-ice) delivery of the Humvee to the HMP Research Station on Devon Island by driving about 2000 km over sea-ice through the Northwest Passage. Upon delivery, it would be used as a human driven planetary exploration rover simulator to test



*Dr Pascal Lee and Marion Weiler*

equipment and procedures for exploration of the Moon and Mars and as a supplement and back up for another Humvee called *Mars-1* already at the Station. With Dr. Lee as the leader, there were 4 other crew members who lived in the Humvee for the duration of the journey. Filmmaker Jean-Christophe Jeauffre later joined the expedition to document it and make the movie.

Starting in April of 2009, the expedition only had a few weeks to reach Devon Island before the sea-ice started to break up from the approaching summer. Along the way, the expedition encountered delays due to bad weather, electrical and mechanical breakdowns, and a serious crew injury. A sinking into a lead (a fracture in the sea-ice) threatened the catastrophic loss of the vehicle into the sea below. Fortunately, the crew were able to pull the *Okarian* free and continue on. But the delays made it impossible to reach Devon Island in 2009 forcing a stop in Cambridge Bay. A subsequent airlift of the Humvee to Resolute Bay was made to await another attempt in May of 2010.

Mechanical problems continued to plague the expedition in 2010 forcing a crew member to return to Resolute Bay to get spare parts. Then,

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### **Passage to Mars, continued from p. 4**

just within sight of Devon Island, the Okarian suffered a catastrophic breakage of one of the treads. This forced two crew members to go ahead on snowmobiles to the HMP Research Station to scavenge spare parts from the *Mars-1* Humvee and bring them back for repair. Running low on food and fuel, the team finally made it successfully ashore on the *terra firma* of Devon Island on May 16, 2010 and delivered the *Okarian* to the HMP Research Station the following year on July 11, 2011. The movie shows well the exuberant reaction of the crew as they beach the *Okarian*.

The trials and travails of this expedition really pointed out the limits of reliability of current technology even in the relatively “friendly” hostile environment of Earth's arctic. But on Mars, any of these failures would be fatal. Obviously, every conceivable system would need perhaps even multiple backups. Fortunately, Dr. Lee's expedition did not appear to suffer too much from crew

interpersonal conflicts so they worked well as a team. These issues will continue to be identified as Dr. Lee proceeds with his research.

Seeing this movie a second time allowed me to identify the critical events of the expedition with greater awareness. Also, Mr. Jeauffre's alternating cinematography of scenes both from Earth and from Mars was very impressive and made the movie, along with its haunting music, even more worthwhile to see again. The views of the Northwest Passage landscape shared much with that of the desolation of Mars. I highly recommend the movie, and a copy of it can be found at the San Mateo City Main Public Library.

#### **References:**

1. Passage to Mars. Directed by Jean-Christophe Jeauffre. 2016. Video available at the San Mateo City Main Public Library.
2. Wikipedia. [Northwest Passage Drive Expedition](#). Retrieved September 29, 2018.

### **Observing Mars, continued from p. 2**

planet's apparent diameter is at least 10 arcseconds, we have until the end of November before Mars will be too far away. It's still worth a look right now!

However the main purpose of this article is to call attention to 2020, when we should have another very good opportunity to observe Mars, in fact a better one than this year for northern observers in one important respect.

On October 13, 2020 Mars will be 0.43 AU from Earth, which is only about 10% farther away than it was in July. The planet's apparent diameter will be correspondingly a little smaller, 22.5 arcseconds, but still bigger than Saturn and very good for observing surface features.

This year although Mars was very close to Earth, it was also very far south for a planet, reaching a southern declination of  $-26.5^\circ$ . This is a poor

position for observers at our latitude. As seen from San Mateo in late July, Mars did not quite reach  $27^\circ$  altitude at solar midnight. As a result, we had to look through a lot of Earth's atmosphere to see it. Good seeing is especially important for planets, but hard to get at such low altitude.

In 2020, Mars will be further north than it is now, and as a result it will reach almost  $58^\circ$  altitude in San Mateo at solar midnight on October 13. The difference in altitude makes a disproportionately large difference in how much of Earth's atmosphere we have to look through. With any luck, we should get a steadier view of an only slightly smaller planetary disk. Even before this year's planet wide dust storm, 2020 looked like it could turn out better than 2018 for observers at our latitude. With any luck, it will!

## Upcoming SMCAS Meetings and Events

We have many fun and interesting activities planned in the coming months. See the web site ([www.smcasastro.com](http://www.smcasastro.com)) or contact Marion Weiler (mgwe@pacbell.net) for more information or to volunteer at any of these events. Please contact Ed Pieret (epieret@comcast.net) if you are available to help out with Star Parties at Crestview Park and other locations.

Fri, Oct 5	7:00 pm	<b>General Meeting, Pizza Social and Presentation</b>
Sat, Oct 6	6:30 pm	<b>Crestview Park Star Party</b>
Tue, Oct 9	7:00 pm	<b>SMCAS Board Meeting</b>
Sat, Oct 13	4:00 pm	<b>SLAC/KIPAC Kids Night at SLAC, Palo Alto — Volunteers needed!</b>
Sat, Oct 20	all day	<b>Family Science and Astronomy Festival at CSM — Volunteers needed!</b>
Fri, Nov 2	7:00 pm	<b>General Meeting, Pizza Social and Presentation</b>
Sat, Nov 3	6:00 pm	<b>Crestview Park Star Party</b>
Sat, Nov 10	5:00 pm	<b>Crestview Park Star Party</b>
Tue, Nov 20	7:00 pm	<b>SMCAS Board Meeting</b>
Sat, Dec 1	5:00 pm	<b>Crestview Park Star Party</b>
Fri, Dec 7	7:00 pm	<b>General Meeting, Pizza Social and Presentation</b>
Sat, Dec 8	5:00 pm	<b>Crestview Park Star Party</b>

*General meetings and board meetings are held in the ISC Room (room 110) in building 36 at the College of San Mateo, unless otherwise noted. For directions to the building or to the star party site at Crestview Park in San Carlos, see page 10. All SMCAS members are welcome at board meetings.*

*The times given for the star parties are approximately at sunset. Arrive then to set up a telescope or if you want to learn about telescopes. If you would like to merely see the wonders of the night sky through our telescopes, observing starts about an hour later and usually continues for about two hours.*

## Observe the Moon

By Jane Houston Jones and Jessica Stoller-Conrad

This year's International Observe the Moon Night is on Oct. 20. Look for astronomy clubs and science centers in your area inviting you to view the Moon at their star parties that evening!

On Oct. 20, the 11-day-old waxing gibbous Moon will rise in the late afternoon and set before dawn. Sunlight will reveal most of the lunar surface and the Moon will be visible all night long. You can observe the Moon's features whether you're observing with the unaided eye, through

binoculars or through a telescope.

Here are a few of the Moon's features you might spot on the evening of October 20:



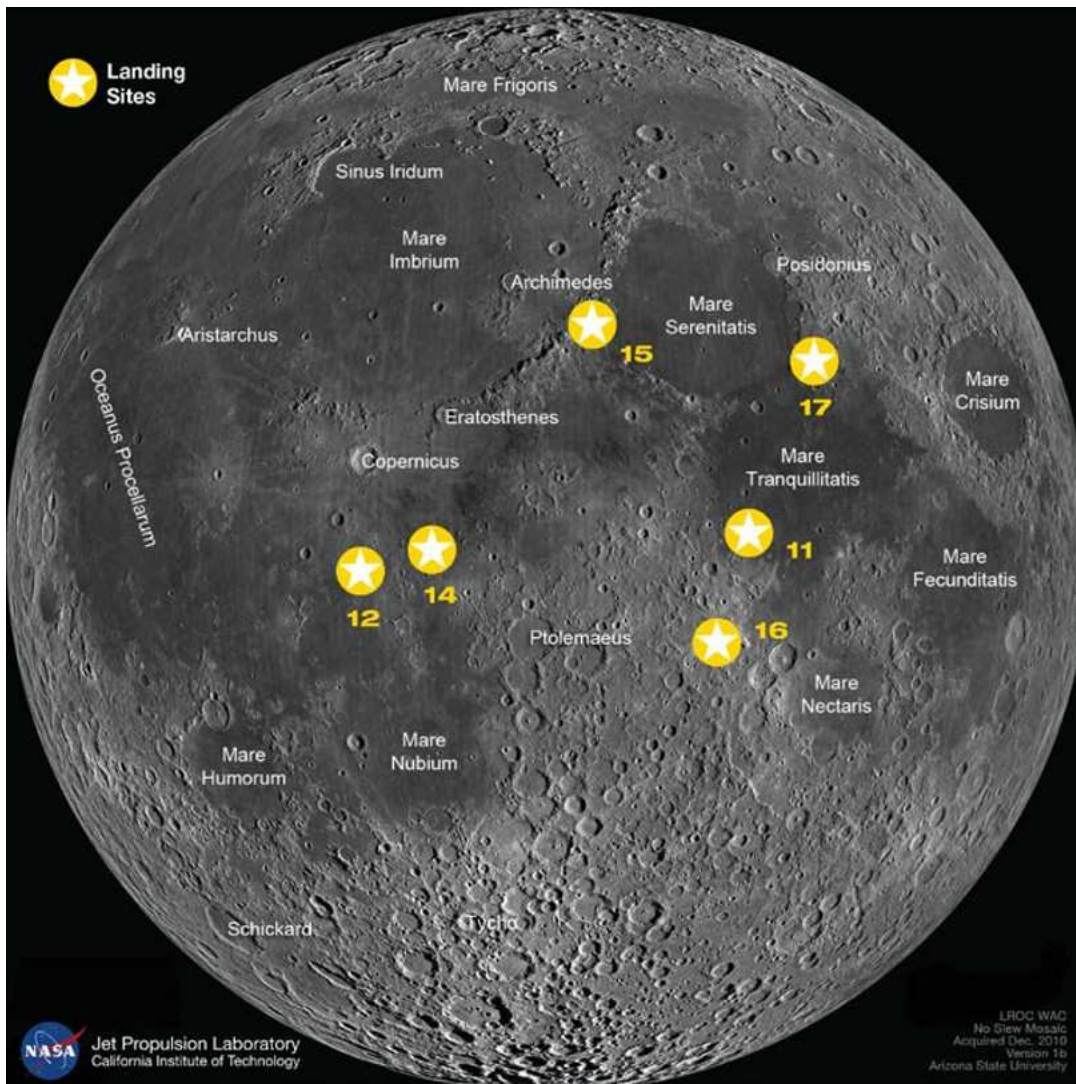
Sinus Iridum—Latin for “Bay of Rainbows”—is the little half circle visible on the western side of the Moon near the lunar terminator—the line between

light and dark. Another feature, the Jura Mountains, ring the Moon's western edge. You can see them catch the morning Sun.

Just south of the Sinus Iridum you can see a large, flat plain called the Mare Imbrium. This feature is called a mare—Latin for “sea”—because early astronomers mistook it for a sea on Moon's surface. Because the Moon will be approaching full, the large craters Copernicus and Tycho will also take center stage.

Copernicus is 58 miles (93 kilometers) across. Although its impact crater rays—seen as

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*This image shows some of the features you might see if you closely observe the Moon. The stars represent the six Apollo landing sites on the Moon. Credit: NASA/GSFC/Arizona State University (modified by NASA/JPL-Caltech).*

## October Rise and Set Chart

<b>SMCAS 2018 (PDT)</b>		<b>Oct 6 Rise</b>	<b>Oct 6 Set</b>	<b>Oct 20 Rise</b>	<b>Oct 20 Set</b>
Sun		7:09 AM	6:43 PM	7:22 AM	6:24 PM
Moon		4:13 AM	5:45 PM	4:47 PM	3:16 AM
Mercury	Difficult after sunset	8:06 AM	7:12 PM	9:00 AM	7:09 PM
Venus	Mostly in sun's glare	9:41 AM	7:21 PM	8:23 AM	6:15 PM
Mars	Much of the night	4:02 PM	1:48 AM	3:24 PM	1:28 AM
Jupiter	After sunset	10:26 AM	8:36 PM	9:45 AM	7:50 PM
Jupiter's moons		c i j e g		c i j e g	
8 PM, East on left		J=Jupiter, c=Callisto, e=Europa, g=Ganymede, i=Io			
Saturn	In the evening	1:33 PM	11:08 PM	12:42 PM	10:17 PM
Uranus	Much of the night	7:25 PM	8:44 AM	6:28 PM	7:46 AM
Neptune	Much of the night	5:29 PM	4:53 AM	4:34 PM	3:57 AM
Pluto	In the evening	2:38 PM	12:21 AM	1:43 PM	11:23 PM

- Star Party is at Crestview on the 6th.
- Jazz Under the Stars is at CSM on the 20th.

– courtesy of Ron Cardinale

## Fundraising for the Group: SMCAS Participates in AmazonSmile and Receives a Percentage of Your Purchase

SMCAS is now enrolled in AmazonSmile, a program that enables certified 501(c)(3) non-profit organizations to receive donations from eligible purchases at Amazon.



To enroll in the program, go to [smile.amazon.com](https://smile.amazon.com). On your first visit to this site, you can select a charitable organization – San Mateo County Astronomical Society (SMCAS) – that will receive 0.5% of the purchase price of eligible items on Amazon. How will you know if an item is eligible? Items are clearly and literally marked on the product detail pages with “Eligible for AmazonSmile donation.” For more information, go to [smile.amazon.com/about](https://smile.amazon.com/about).



October 2018							Today	◀	▶
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday			
30 6:56 PM Sunset	01	02	03	04	05 7:00 PM General Membership Meetin	06 6:45 PM Crestview Star Party			
07 6:46 PM Sunset	08	09	10	11	12	13 4:00 PM SLAC Kids Night			
14 6:36 PM Sunset	15	16	17	18	19	20 2:00 PM FS&AF			
21 6:26 PM Sunset	22	23	24	25	26	27			
28 6:17 PM Sunset	29	30	31	01	02 7:00 PM General Membership Meetin	03 6:00 PM Crestview Star Party			

• observing event • club event • community event

*Calendar courtesy of Ed Pieret*

### **Observe the Moon, continued from p. 7**

lines leading out from the crater—will be much more visible at Full Moon, you will still be able to see them on Oct. 20. Tycho, on the other hand, lies in a field of craters near the southern edge of the visible surface of the Moon. At 53 miles (85 kilometers) across, it's a little smaller than Copernicus. However, its massive ray system spans more than 932 miles (1500 kilometers)!

And if you're very observant on the 20th, you'll be able to check off all six of the Apollo lunar landing site locations, too!

In addition to the Moon, we'll be able to observe two meteor showers this month: the Orionids and the Southern Taurids. Although both will have low rates of meteors, they'll be visible in the same part of the sky.

The Orionids peak on Oct. 21, but they are active from Oct. 16 to Oct. 30. Start looking at about 10 p.m. and you can continue to look until 5 a.m. With the bright moonlight you may see only five to 10 swift and faint Orionids per hour.

If you see a slow, bright meteor, that's from the Taurid meteor shower. The Taurids radiate from the nearby constellation Taurus, the Bull. Taurids are active from Sept. 10 through Nov. 20, so you may see both a slow Taurid and a fast Orionid piercing your sky this month. You'll be lucky to see five Taurids per hour on the peak night of Oct. 10.

You can also still catch the great lineup of bright planets in October, with Jupiter, Saturn and Mars lining up with the Moon again this month. And early birds can even catch Venus just before dawn!

You can find out more about International Observe the Moon Night at [moon.nasa.gov/observe](http://moon.nasa.gov/observe).

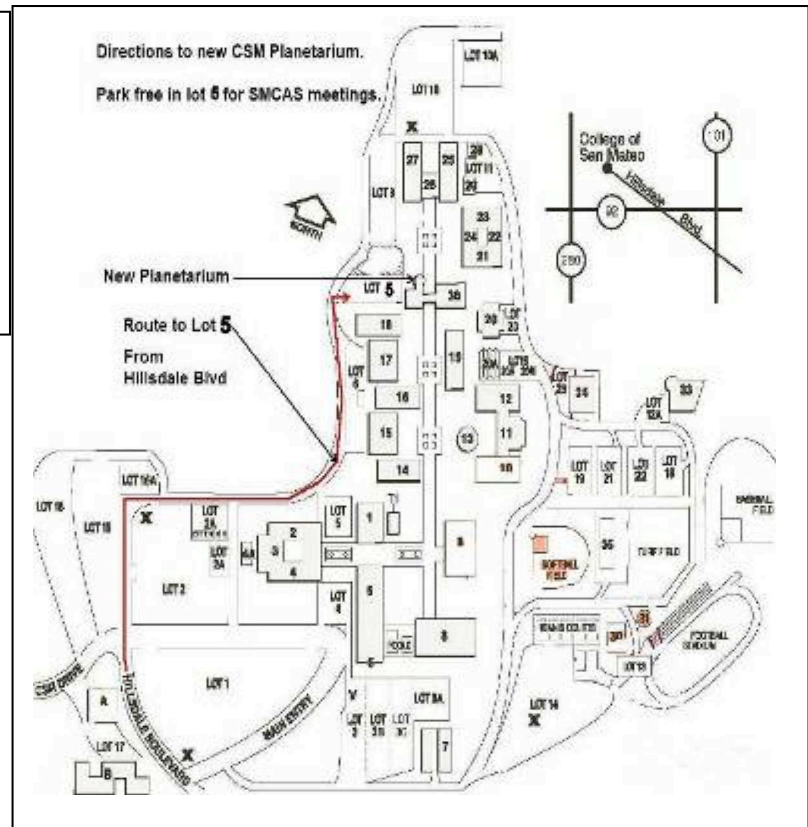
*This article is provided by NASA Space Place. With articles, activities, crafts, games, and lesson plans, NASA Space Place encourages everyone to get excited about science and technology. Visit [spaceplace.nasa.gov](http://spaceplace.nasa.gov) to explore space and Earth science!*

## Directions to SMCAS Meetings at CSM, and to Star Parties

Star Parties are Free to Members and Visitors and are Held Regularly, Weather Permitting

### 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. Continue straight, bear right then, after the 2nd stop sign, bear left over the rise. Enter the next parking lot on the right, called Lot 5, "Marie Curie". Science Bldg 36 and the planetarium lie straight ahead. Enter Bldg. 36 thru the door facing the lot, or walk around the dome to the courtyard entrance.



## Crestview Park

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 flash-lights 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.

**From Hwy 101 or El Camino**, take Brittan Avenue in San Carlos, west (to 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 sign on the right, and the entry road on the left.

### Directions to Crestview Park for Star Parties

**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.

**2nd Note:** 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.



# San Mateo County Astronomical Society Membership Application

rev 04022017

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

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' parent 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: \_\_\_\_\_

<http://www.SMCASASTRO.com>