

The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

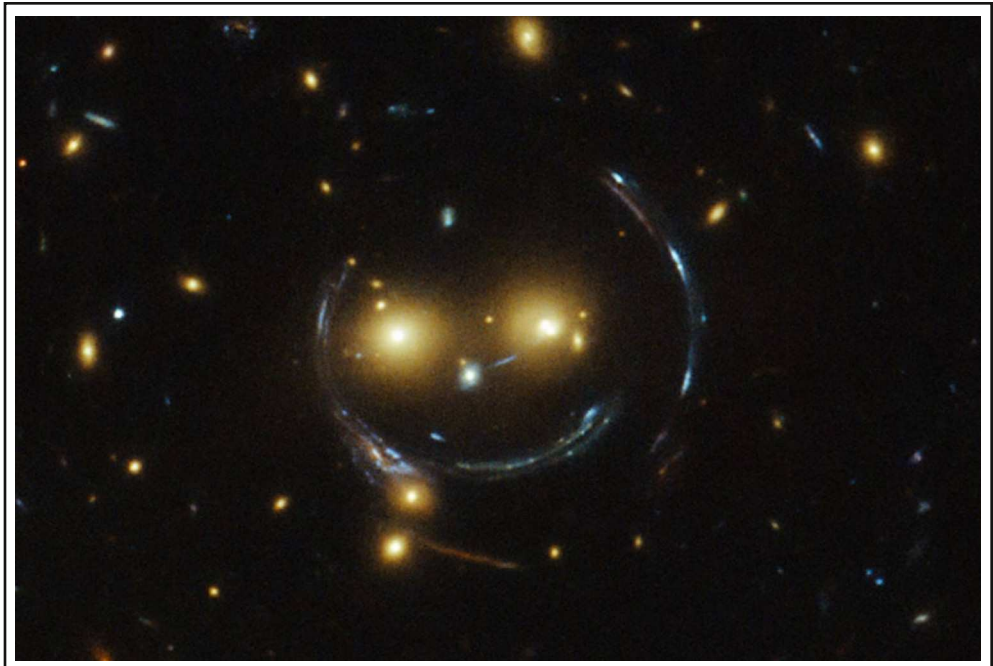
October 2015 — 631st General Meeting Notice



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.smcas.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, or call us at (650) 678-2762.



GRAVITATIONAL LENSING as in this Hubble image of galaxy cluster SDSS J1038+4849 provides a way to determine the masses of galaxies and the distribution of dark matter. This was the topic of the keynote presentation at the general meeting on September 4 by Dr. Phil Marshall of the Kavli Institute of Particle Astrophysics at the Stanford Linear Accelerator Center. Article on page 5.

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DATES TO SAVE

Sep 26: Fall Equinox Spaghetti Feed/Potluck at Crystal Springs Methodist Church, San Mateo. Bring a dish to share.

Oct 2: General Meeting, Pizza, and Presentation at the CSM Planetarium. Details on page 4.

Oct 17: Family Science and Astronomy Festival at CSM. Details on page 10.

More events on page 7.

President's Corner

The annual CSM and SMCAS sponsored Science and Astronomy Festival is on the calendar for Saturday, October 17 from 2:00pm to 11:00pm. As usual, SMCAS will be providing a number of activities during the day, helping out at the star party at the observatory in the evening at the rooftop observatory. Plus, SMCAS has arranged the evening keynote presentation: "The Exploration of Pluto-- NASA's New Horizons Mission" by Dr. Dale Cruikshank and Dr. Oliver White, Research Scientists, NASA Ames Research Center. We will need SMCAS volunteers to man our daytime workshops and activities from 2:00pm to around 5:00pm. If you can help out in any capacity, please contact our volunteer coordinator Ed Pieret. This is a fun event to participate in!



Ed Pieret explaining the solar system

New at the festival this year is that in addition to our normal indoor lab room spaces for some of our workshops, we will also be able to take advantage of the newly opened Sun Plaza by the parking lot next to the Planetarium and Building 36. If you haven't had a chance to see it yet, it is worth making a visit to it during daylight to take a look. It will be a great location for holding events. It includes a beautiful sundial monument designed by CSM Physics Professor Mohsen Janatpour, a amphitheatre style seating leading up to the science building and Planetarium.



Rachel Freed with her 8-inch Meade

On September 28, SMCAS provided the Star Party for SLAC Kid's Night at the Arrillaga Recreation Center field on the SLAC campus in Menlo Park. This was a unique opportunity for us, and we had the honor of holding the first ever star party at this location. This turned out to be an excellent location for a star party. The field is quite large, probably equivalent to two football fields, high enough up around its surroundings that there are no significant obstacles to viewing in any direction. Plus, due to its location in the interior of the SLAC campus and the residential nature of that part of Menlo Park, the area is darker than other areas on the peninsula. The main viewing issue we encountered that night was that it was close to a full moon! We hope to host

another star party there in the future, on a night when we can take full advantage of the location.

The SLAC Kid's Night event had many other activities going on during the day, as SLAC employees hosted activities

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President's Corner, continued from p. 2

ranging from Plasma Tube demonstrations, how comets are formed, 3D visualizations, and more. While these SLAC activities were going on during daylight hours, SMCAS provided solar viewing. Thanks go out to SMCAS members who participated, including Ken Lee, Rachel Freed, Ed Pieret, Vikas Kapur. A few photos from the event accompany this article.

Other events coming up: we have our Fall Equinox Spaghetti Social at 6:00pm, September 26. This will be held at our usual location at the Crystal Springs Methodist Church. Bring the family, a potluck dish, and your appetite! And the following night of September 27 CSM is hosting a Harvest Supermoon Total Eclipse viewing event from 6:30pm to 9:30pm at the CSM Observatory. In addition, they will have a telescope set up on the College Center Terrace from 6:30–7:30 pm.

Marion Weiler

President, San Mateo County Astronomical Society



Solar viewing with Ken Lum

The Perseus Group of Constellations

Several Fall constellations take their names from the classical myth of the hero **Perseus**, who was the son of the god Zeus and a mortal mother. His first heroic deed was the slaying of Medusa, one of three monstrous sisters called the Gorgons. Her hair was a mass of poisonous snakes, and she was so generally hideous that anyone who saw her face would be turned to stone.

Medusa's head appears as part of the constellation of Perseus. Her eye is the “demon star” Algol, the best known eclipsing binary variable star. Its magnitude drops from 2.1 to 3.4 every 2.87 days. It has been considered unlucky in many cultures since ancient times. The name Algol is derived from the Arabic *Ra's al Ghul*, meaning the demon's (or ghouls) head. This is also the name of a Batman villain, linking an ancient superhero with a modern one.



Benevenuto Cellini, Perseus with the Head of Medusa (1545). Photograph by Paolo Villa, under the Creative Commons Attribution-Share Alike 4.0 International license.

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SMCAS General Meeting and Special Presentation on Oct 2, 2015

Polar Trek to Mars

Dr. Pascal Lee, Planetary Scientist, SETI Institute

Friday, Oct 2, 2015 , [College of San Mateo, Building 36](#)
SMCAS General meeting at 7:00 p.m. ISC Room, room 110
Presentation at 8:00 p.m. [Planetarium](#)
Free and open to the public, free parking.



Pressurized rovers are airtight all-terrain motorhomes in which future planetary explorers will live, work, sleep, and drive during multiple-day excursions far away from their home base. Although pressurized rovers are commonly featured in science-fiction lore and technical studies on paper, there is still very little practical experience with the use of such vehicles in terrestrial field exploration.

Since 2003, the NASA Haughton-Mars Project (HMP) has been leading a series of field simulations of planetary pressurized rover traverses on Devon Island, High Arctic, a bleak and barren polar analog often described as Mars On Earth. Rover traverses at HMP are also set in a true exploration environment in which dangers, while not as unforgiving as on Mars, are nevertheless real and relevant. This talk summarizes the HMP's experience with simulated pressurized rover treks to date, and lessons learned for planning future road trips on the Moon or Mars. Here, the expedition crew encountered conditions and challenges analogous in basic ways to those awaiting future pressurized rover crews on Mars: hostile environment, dust storm-like blizzards, uncertain route, treacherous terrain, equipment failure, tight crew quarters, limited resources, remoteness, and isolation.



Dr Pascal Lee is a Planetary Scientist at the SETI Institute. He is also Chairman of the Mars Institute, and Director of the NASA Haughton-Mars Project at NASA Ames Research Center in Mountain View, California. Pascal Lee is internationally recognized for his efforts to advance the human exploration of Mars, in particular via its moons Phobos and Deimos. He has led, or participated in, the development of several new mission concepts to explore Mars and its moons, of new spacesuit technologies for Moon and Mars exploration, and of pressurized vehicles for future human planetary exploration. He is author or co-author of over 100 scientific papers, and his first book, [Mission: Mars](#), won the 2015 Prize for Excellence in Children's Science Books from the American Association for the Advancement of Science (copies for signing will be available).

[September Meeting Review](#)

Weighing Galaxies

By Ken Lum

The keynote speaker for our Sept. SMCAS meeting was Dr. Phil Marshall of the Kavli Institute of Particle Astrophysics at the Stanford Linear Accelerator Center. Dr. Marshall spoke about how to measure the masses of galaxies by assessing their ability to bend the light coming from background galaxies according to General Relativity. This phenomenon is called Gravitational Lensing. These measurements indicate that galaxies contain a hefty amount of invisible matter over and above their visible matter content thereby exerting an exaggerated gravitating force influence on the behavior of galaxies. It is thought that this invisible "dark matter" makes up well over 80% of all the matter of galaxies and of the contents of the Universe.

Dr. Marshall has been using the phenomenon of gravitational lensing to measure the masses of galaxies with particular emphasis on observing spiral and elliptical galaxies. More massive galaxies have been found to bend background light much more than less massive galaxies. These more massive galaxies tend more to be elliptical galaxies which are characterized by low present-day star birth rates and have much less gas and dust than the much more gassy and dusty spiral galaxies that now have a much higher rate of star formation such as our Milky Way. This abundance of dust and gas provides the raw material for the greater star formation rates that occur in spiral galaxies.

It is now thought that elliptical galaxies contain many more of the smaller and less visible red dwarf stars than spiral galaxies but not enough to explain the large amount of dark matter detected in them. This characteristic of elliptical galaxies probably comes from their early peak of star formation driven by numerous galactic mergers causing a rapid depletion of the gas and dust



Dr. Phil Marshall with SMCAS President Marion Weiler at the September 4 meeting

needed to continue star formation. This resulted in the formation of compact massive stellar cores that then acquired more stars from more mergers with mostly smaller galaxies to become the great galactic behemoths we observe today. Due to early depletion, they do not have enough left over dust and gas for further star formation presently.

By contrast, spiral galaxies appear to acquire their mass differently by picking up cold gas steadily and less violently from their surroundings in a process called **cold-gas accretion** and less so from galactic mergers. As a result, there was less rapid star formation in their early histories and more gas and dust left over that we can now observe in present day spirals and which fuel their continuing ability to form stars to the present. So it appears that galaxy types are very much determined by the initial conditions of their formation.

A more detailed description of these processes and how they have been observed can be found in the recent article, "How Galaxies Grow" by Camille Carlisle in the September, 2015 issue of *Sky and Telescope*.

[Members Forum](#)

SMCAS Members at Sequoia-Kings Canyon Dark Sky Festival

By Mike Ryan and Michael Ryan

On Friday and Saturday, September 11th and 12th, members Mike Ryan and (son) Michael Ryan joined National Park Service (NPS) volunteers for the 2nd Annual Sequoia-Kings Canyon National Parks' Dark Sky Festival (DSF). They presented "An Illustrated Guided Tour of the Night Sky" to invited guests and campers, which presents features of the North Circumpolar Sky, followed by a trip down the Summer Milky Way to the heart of the Galaxy.

The Ryans presented in concert with the Starchaserz group, whose mobile observatory provides real-time images of deep-sky objects (DSOs). On Friday about 9pm, clouds blocked those live images, necessitating the use of stored imagery with the background of mood music and dramatic narration. On Saturday, the clouds returned, thwarting the earlier planned start at 8:30, but then lifted about 9:30 permitting the use of the SUV-mounted 14" Meade LX200 catadioptric telescope.

The NPS had planned to offer presentations at Grant Grove in Kings Canyon, at the Wuksachi-

Lodgepole camping areas at the 7,000-foot level in Sequoia National Park, and at a Presbyterian Church in Three Rivers, the town just below the Sequoia entrance. However, fire filled the sky with smoke over Wuksachi-Lodgepole, blocking the stars and closing Kings Canyon. So, the plan was cut to two programs, both presented in Three Rivers. The changes cut attendance from the expected hundreds to dozens, but those who attended were enthusiastic, and we were invited back next year.

New SMCAS members Mary Ann McKay and husband Ed Pease had hoped to attend, but the out-of-control "Rough" fire blocked access to Kings Canyon, closed roads and forced cancellation of their reservations, among many others'.

In August, the Ryans and Starchaserz similarly supported the 5th Annual Lassen Volcanic National Park DSF. The 2nd show of that series was canceled when fire largely burned the Lassen National Forest., but the event has proceeded successfully for the last 3 years.

Perseus, continued from p. 3

According to the legend, as Medusa lay dead at Perseus' feet the winged horse **Pegasus** sprang into being from her blood, together with his human brother Chrysaor. Pegasus flew off and does not reappear in the story of Perseus. Later, however, he was tamed by the goddess Athena and had some adventures of his own.

On his way home from killing Medusa, Perseus met the princess **Andromeda**, daughter of King **Cepheus** and Queen **Cassiopeia** of "Aethiopia".

The Queen had offended the sea god Poseidon, who had demanded Andromeda as a sacrifice. Perseus first saw her chained to a rock in a harbor, waiting to be eaten by the sea monster **Cetus**. Perseus killed the monster and married Andromeda. It's a happy ending, we're told, although a modern reader might find the remarkably violent wedding a little unsettling.

Event Update

Star Parties, Fall Equinox Dinner, Monthly Meetings, and Family Science and Astronomy Festival on the Horizon for SMCAS this Year!

We have many fun and interesting activities planned through the end of the year. While the new website is under construction, please 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.

Sat, Sep 26	6:00 pm	Fall Equinox Spaghetti Feed/Potluck, Crystal Springs Methodist Church, San Mateo
Sun, Sep 27	6:30 pm	Total Eclipse of the Harvest Supermoon Event, CSM Bldg. 36 Observatory & Bldg. 10 Terrace
Fri, Oct 2	7:00 pm	General Membership Meeting, Pizza Social and Presentation
Sat, Oct 3	7:00 pm	Crestview Park Star Party
Sat, Oct 10	6:30 pm	Crestview Park Star Party
Sat, Oct 17	2:00 pm	Family Science and Astronomy Festival
Fri, Nov 6	7:00 pm	General Membership Meeting, Pizza Social and Presentation
Sat, Nov 7	5:00 pm	Crestview Park Star Party
Sat, Nov 14	5:00 pm	Crestview Park Star Party
Fri, Dec 4	7:00 pm	General Membership Meeting, Pizza Social — Location to be announced
Sat, Dec 5	6:00 pm	Holiday Party, Crystal Springs Methodist Church, San Mateo
Sat, Dec 12	5:00 pm	Crestview Park Star Party
Sat, Dec 13	Midnight+	Geminids Meteor Shower peaks — King of meteor showers

October Rise and Set Chart

SMCAS 2015 (PDT)	Oct 3 Rise	Oct 3 Set	Oct 10 Rise	Oct 10 Set	Oct 17 Rise	Oct 17 Set
Sun	7:06 AM	6:48 PM	7:13 AM	6:38 PM	7:19 AM	6:28 PM
Moon	11:35 PM	1:08 PM	5:06 AM	5:40 PM	11:29 AM	9:54 PM
Mercury	6:40 AM	6:25 PM	5:55 AM	6:01 PM	5:50 AM	5:51 PM
Venus	3:36 AM	4:45 PM	3:34 AM	4:36 PM	3:35 AM	4:29 PM
Mars	4:15 AM	5:27 PM	4:09 AM	5:11 PM	4:03 AM	4:54 PM
Jupiter	4:46 AM	5:41 PM	4:25 AM	5:17 PM	4:04 AM	4:53 PM
Jupiter's moons	J i g e c		c J i g e		c J e	
5 AM next day, E on left	J=Jupiter, c=Callisto, e=Europa, g=Ganymede, i=Io					
Saturn	11:16 AM	9:20 PM	10:51 AM	8:54 PM	10:27 AM	8:29 PM
Uranus	7:06 PM	7:55 AM	6:38 PM	7:27 AM	6:10 PM	6:58 AM
Neptune	5:24 PM	4:33 AM	4:56 PM	4:05 AM	4:29 PM	3:37 AM
Pluto	2:21 PM	12:13 AM	1:54 PM	11:41 PM	1:27 PM	11:14 PM

- Uranus at opposition on the 12th.

– Star Parties are at Crestview on October 3 and 10.

– Jazz Under the Stars was not yet scheduled at the time of publication. First quarter will be on October 20.

– *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. 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.

< October 2015 >						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
				1	2 <small>7:00 PM General Membership Meetin</small>	3 <small>7:00 PM Crestview Star Party</small>
4	5	6	7	8	9	10 <small>6:45 PM Crestview Star Party</small>
11	12	13	14	15	16	17 <small>2:00 PM FS&AF</small>
18	19	20	21	22	23	24
25	26	27	28	29	30	31

• observing event • club event • community event

Calendar courtesy of Ed Pieret

Moon and Planets

On September 27 the full Moon will rise a few minutes before 7:00pm with a total eclipse already well under way. Totality will be from 7:11 to 8:23pm, likely beginning before the Moon becomes visible above obstructions on the horizon for most of us. The partial eclipse ends at 9:27pm.

Venus, Mars, and Jupiter can be seen in the morning sky during all of October. Toward the end of the month Venus and Jupiter will move to within just over 1 degree of each other, with Mars not far away.

Mercury will make a morning appearance during October. However, this is not a great opportunity to observe the planet, which is almost at perihelion. Its maximum Western elongation (a meager 18 degrees) will be reached on the 16th but even then it will be very low just before sunrise.

Saturn will remain visible in the evening through the end of the month.

Uranus will be at opposition on the night of the 11th. Neptune reached opposition at the end of August and can still be seen for most of the night.

Family Science & Astronomy Festival

+ Makerspace



Saturday, October 17, 2015 • 2–11 pm

Keynote Presentation: “The Exploration of Pluto--NASA’s New Horizons Mission” by Dr. Dale Cruikshank and Dr. Oliver White, Research Scientists, NASA Ames Research Center. Science demonstrations by CSM faculty, astronomy workshops by SMCAS, Planetarium shows, Telescopic observation of the celestial bodies, and much more! Free and open to the public.

College of San Mateo, Science Building 36, Plaza of the Sun & Theatre Building 3
1700 W. Hillsdale Blvd., San Mateo, CA 94402

Visit collegeofsanmateo.edu/events for full event schedule and additional information.

Festival coordinator: Mohsen Janatpour, janatpour@smccd.edu, (650) 574-6272

Sponsored by CSM Math/ Science Division, San Mateo County Astronomical Society, CSM Library, and Pacific Library Partnership.



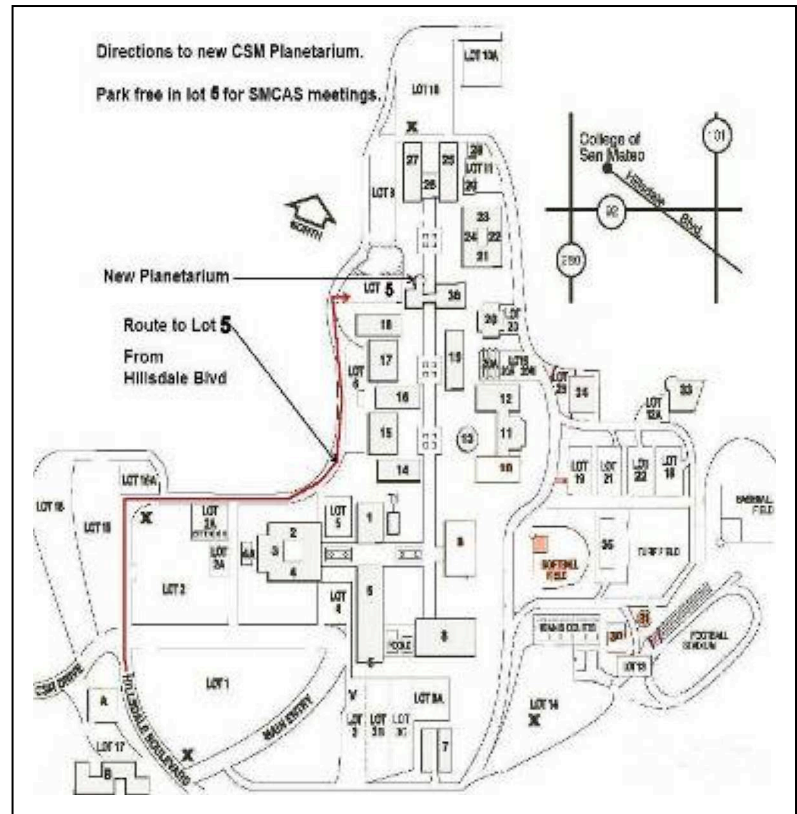
College of San Mateo

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.

Membership Application and Society Information

To join the San Mateo County Astronomical Society or to renew membership, you can pay dues via Pay Pal on our website (www.smcas.net), at any monthly meeting, or send your check, payable to SMCAS, to: **SMCAS, PO Box 974, Station A, San Mateo, CA, 94403.**

Dues are currently \$30 for a new (family) membership and renewing member and \$15 for a student membership.

Please check one of the following boxes: () New member () Membership renewal () Student () Address or info change

NOTE TO RENEWING MEMBERS: Please complete the following form only if you have a change to your membership or contact info.

Name(s) _____

Address/City/Zip: _____

Phone(s) _____ Email _____

SMCAS – Society Information

Meetings of the San Mateo County Astronomical Society are held the **first Friday of the month (except in July and August)** in the Planetarium at the College of San Mateo, 1700 West Hillsdale Blvd. in San Mateo. Exit Hwy. 92 at West Hillsdale Blvd. and, proceed uphill through the second and third sets of traffic lights, to the first stop sign at the top of the hill. Continue straight, bearing right then, after the second stop sign, left up over a rise. After the third stop sign, enter the first parking lot on the right with a sign 'Lot 5, Marie Curie', identifying the top level plus those below.

Science Bldg. 36 adjoins the lot, with the geodesic planetarium dome to its left. Circle the planetarium, or enter Bldg 36 thru the door facing Lot 5. For the 4th floor observatory, use the elevator just inside on the right. The planetarium corridor is ahead on the left. Turn left at the restroom sign.

Officers: President: Marion Weiler; **Vice-President:** Ed Pieret; **Treasurer:** Karen Boyer; **Secretary:** Vacant. **Board Directors-At-Large:** Bob Franklin, Ken Lum, Ed Ching, Mike Ryan, and Andy Thanos.

October Event Horizon Editor: Ted Jones. **NOTE:** Newsletter is posted by the beginning of each month (except for July and August). Submissions and photos are welcome by the 15th of the month before publication.

SMCAS Contact Information

Website: www.smcas.net

The CSM Astronomy Department schedule is at www.collegeofsanmateo.edu/astronomy/events.

Email: SMCAS@live.com

Society Yahoo group: <http://groups.yahoo.com/group/smcas>.

Yahoo Group Subscription: email smcas-subscribe@yahoogleroups.com to subscribe.

Event Horizon: To submit articles or photos, please contact Ed Pieret — epieret@comcast.net or 650.862.9602.