

The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

January/February 2016 — 633rd General Meeting Notice



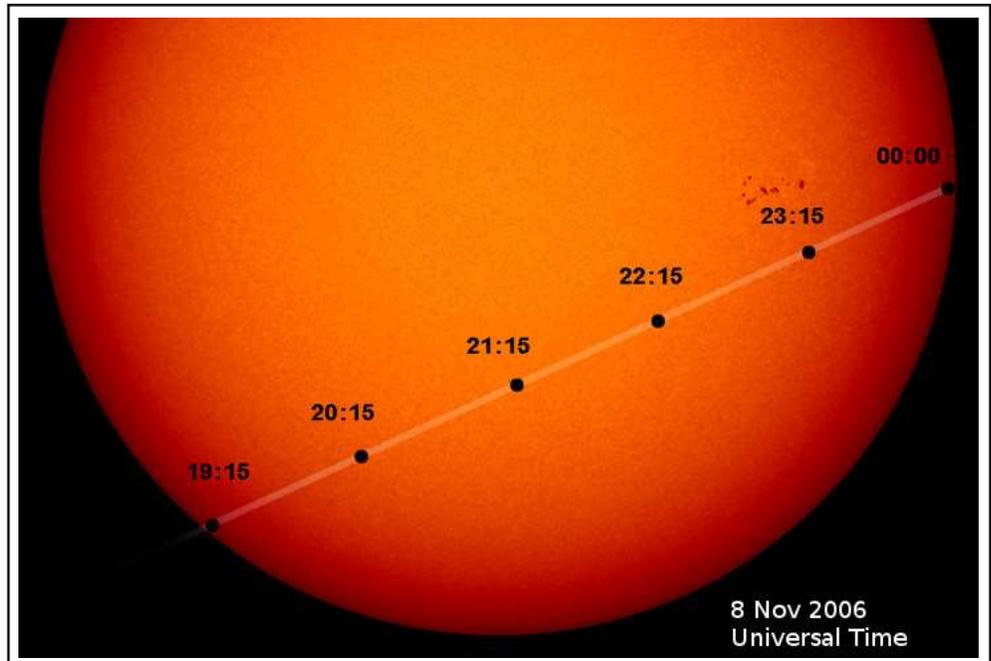
EVENT HORIZON

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.net, 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.

Table of Contents

President's Corner.....	2
February Speaker.....	3
Solar System Outlook.....	4
SMCAS Event Schedule.....	5
Astronomy Myths.....	6
Rise and Set Chart.....	7
Calendar.....	8
Directions to CSM and Crestview.....	9
Membership form and club information.....	10



ASTRONOMICAL EVENTS in 2016 will include a transit of Mercury on the morning of May 9. This image from SOHO (ESA & NASA) shows the planet's path across the face of the Sun in the most recent transit, in 2006. More noteworthy events this month and later in the year are covered in the article on page 4.

DATES TO SAVE

Feb 5: General Meeting, Pizza, and Presentation at the CSM Planetarium. Details on page 3.

Mar 4: General meeting, CSM Planetarium.

Mar 11: Bayside School Star Party and STEM Fair.

Mar 19: Spring Equinox Social, Crystal Springs Methodist Church.

More events on page 5.

President's Corner

I hope the new year is off to a great start for you all of you! For astronomers in general, the year is starting off with an amazingly good surprise: the prediction of a new planet in the solar system based on mathematical calculations, yet to be confirmed with direct observation. The last planet to be discovered was Pluto in February of 1930. But, now that Pluto is no longer considered a planet, we have to go back to the discovery of Neptune in September of 1846, over 170 years ago, to find the last real planet discovery. Although the number of new exoplanets being found is now in the thousands, and finding one more planet out in the galaxy doesn't make the news anymore, finding a new planet in our own solar system may be a once in a lifetime event for us! Stayed tuned to see how this story turns out and history being made.

One of the big unanswered questions about the universe is whether life exists elsewhere besides earth. Although we don't know the answer yet, many scientists are working on this question and perhaps we will have an answer to this question in our lifetime as well. Our February meeting speaker, Dr Lynn Rothschild, will give us some insights into the current state of the search for life and conditions amenable to life elsewhere. Dr Rothschild is one of the world's top astrobiologists, and speaks on this topic internationally, from the Vatican to Windsor Castle, and appears on many science shows such as on the Discovery channel. See page 3 of this Event Horizon for more details. We are indeed fortunate to have her present to our group!

Being able to bring such great speakers to SMCAS, running our meetings, socials and other events, your membership in the Astroleague and the Reflections magazine, as well as just covering the basic organizational expenses such as insurance does cost money. SMCAS primarily covers these expenses through the generosity of our members via annual memberships. We also take in a small amount of money from donations for pizza at our monthly meetings (donations for pizza from members are optional, not required, one of the benefits of membership), and from purchases made on Amazon.com through their Smile program (contact Ed Pieret to find out how to start using this program, which benefits SMCAS but does not cost you any extra on your purchases at Amazon).

Lastly, we are on an calendar year membership cycle, with renewals due at year end. So if you have not yet renewed for 2016, please do so now, and continue to support our mission and enjoy all the benefits of membership. You can easily renew via credit card via PayPal, from our payment site at:

<http://www.smcas.net/membership/>

See you at the general meeting February 5th!

Marion Weiler

President, San Mateo County Astronomical Society

SMCAS General Meeting and Presentation on Feb 5, 2016

Dr. Lynn Rothschild

Senior Scientist, Astrobiology/Synthetic Biology, NASA Ames Research Center

Are We Truly Alone? The Search for Life in the Universe

Friday, Feb 5, 2016 , [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.



Each recent report of liquid water elsewhere in the solar system has reverberated through the international press and excited the imagination of humankind. Where there is liquid water on Earth, virtually no matter what the physical conditions, there is life. Dr. Lynn Rothschild is an evolutionary biologist known for her work on life in extreme environments and a founder of the field of astrobiology.

At NASA's Ames Research Center, she leads a program in synthetic biology and works with industry, government agencies worldwide, and academia, including at Brown and Stanford University. The prevalence of potential abodes for life in our solar system and beyond, the survival of microbes in space, modeling of the potential for transfer of life between celestial bodies, and advances in synthetic biology all suggest that life could be more common than previously thought.

Dr. Rothschild is a fellow of the Linnean Society of London, The California Academy of Sciences and the Explorer's Club. In May she received the Isaac Asimov Award from the American Humanist Association, and later this month will receive the Horace Mann Award from Brown University. She lectures frequently worldwide, including at the Vatican and Windsor Castle, and appears frequently on radio and television programs such as NPR, Science and Discovery channels.

Dr. Rothschild's current research includes examining a protein-based scenario for the origin of life, hunting for the most radiation resistant organisms, and determining signatures for life on extrasolar planets.



Since 2011 she has been the faculty advisor of the award-winning Stanford-Brown iGEM team, which has pioneered the use of synthetic biology in NASA's missions, such as the human settlement of Mars, introducing innovative technologies including BioWires and a biodegradable UAV. Her lab is working on projects as diverse as recreating the first proteins *de novo*, bioprinting, biomining, and using synthetic biology to precipitate calcite and produce glues for making bricks on Mars or the Moon. Her lab will begin to move these plans into space in a synthetic biology secondary payload on a DLR satellite, EuCROPIS, scheduled to launch in March 2017.

The Solar System This Month and Later This Year

By Ed Pieret and Ted Jones

This month

All Five visible planets (Mercury, Venus, Mars, Jupiter and Saturn) will be in the Morning sky until mid- February. You will need to get up and out shortly before dawn to see this unusual sight. The last time it happened was in 2005.

Of course, our local weather has made it unlikely that we will be able to observe this event. If we do get a clear morning, I would encourage you to leave your bed early and take advantage of the opportunity.

A series of lunar occultations of Aldebaran will continue through 2016. One just barely visible from San Mateo (weather permitting) will occur on February 16, with the star disappearing behind the Moon's dark limb at about 1:03am local time, only about a half hour before moonset. The Moon will be very low in the West and we will miss the reappearance. Other fainter stars will be occulted throughout the evening as the Moon crosses the Hyades.

Later this year

A transit of Mercury will occur on the morning of May 9 beginning 4:12am, before our sunrise, and

continuing until 11:42pm local time. The greatest transit occurs at 7:58 AM.

Venus will remain in the morning sky until around the beginning of May, then reappear in the evenings starting in mid-July.

Starting in the Spring it will be possible to see Mars, Jupiter, and Saturn in the same evening. The table below gives their opposition dates, apparent diameter (in arcseconds), magnitude, and distance from Earth. The two diameters for Saturn are with and without the rings.

Planet	Date	Diam	Mag	Dist
Jupiter	8 Mar	44	-2.5	4.4 AU
Mars	22 May	19	-2.1	0.5 AU
Saturn	6 Jun	18/42	0.0	9.1 AU

Oppositions of Mars are approximately biennial events. Because Mars is close and the orbits are eccentric, the Earth-Mars distance at opposition is rather variable. This year's opposition will be a close approach. Unfortunately for observers at our latitude Mars will be rather far south, and low in our sky. The next two oppositions will be closer,

[Continued on page 6](#)



Positions of the Planets in the morning sky through mid-February. For more information, go to earthsky.org/science-wire/when-will-all-five-visible-planets-appear-simultaneously

Event Update

Upcoming Holiday Party, Star Parties, and Monthly Meetings, for SCMAS this Year and Beyond!

We have many fun and interesting activities planned through the end of the year and continuing into 2016. 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.

Fri, Feb 5	7:00 pm	General Meeting, Pizza Social and Presentation
Sat, Feb 6	5:30 pm	Crestview Park Star Party
Sat, Feb 27	6:00 pm	Crestview Park Star Party
Fri, Mar 4	7:00 pm	General Meeting, Pizza Social and Presentation
Fri, Mar 11	6:00 pm	Bayside School Star Party and STEM Fair
Sat, Mar 12	6:00 pm	Crestview Park Star Party
Sat, Mar 19	7:00 pm	Spring Equinox Social, Crystal Springs Methodist Church
Fri, Apr 1	7:00 pm	General Meeting, Pizza Social and Presentation
Sat, Apr 2	7:30 pm	Crestview Park Star Party
Fri, Apr 8	7:00 pm	Symvisio: A Visual Equivalent of Symphony, by Mohsen Janatpour, CSM Theater
Sat, Apr 9	7:30 pm	Crestview Park Star Party
Fri, May 6	7:00 pm	General Meeting, Pizza Social and Presentation
Sat, May 7	7:30 pm	Crestview Park Star Party
Sat, May 7	5:00 pm	KIPAC Open House + Star Party (contact Marion Weiler)

[Astronomy Myths](#)

The Moon is Tilting on its Side, Foretelling Disaster

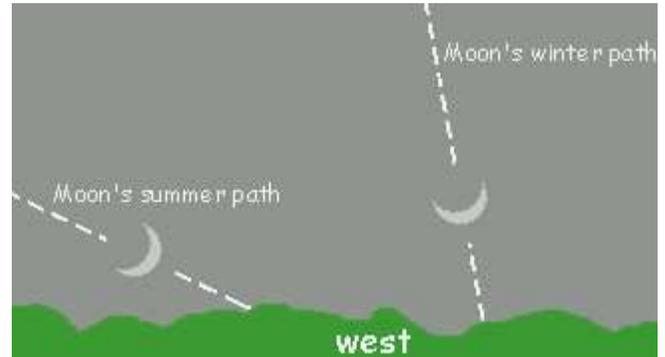
By Ed Pieret

Around this time of year, you may notice that the Moon seems to be tilted, especially the Crescent Moon at Sunset. In the last few weeks I have been asked why by Teachers and even a school principal.

Some people use this fact to “prove” that the Earth is about to face some disaster – pole shift, collision with Planet X or other such silliness. In fact, this apparent tilt has been observed for centuries.

The Moon does not generate its own light – the apparent shape of the Moon is just the lit part of a sphere. If you have trouble picturing this, take a ball outside on a day where the Moon is visible and the Sun is shining. Hold the ball up near the Moon and observe the sunlit part of the ball. You will see that it is identical to the visible part of the Moon.

The Moon appears more tilted in the winter than the summer because the Earth is tilted. This is what gives us our seasons. During the summer the ecliptic (the apparent path of the Sun, Moon



A more complete explanation can be found at <http://starchild.gsfc.nasa.gov/docs/StarChild/questions/question43>. That is where I borrowed the above illustration.

and Planets) is higher during the day and lower during the night. During the Winter this is opposite, with the elliptic lower during the day and higher during the evening.

Because the ecliptic is higher during the evening in the winter, the path of the Moon across the sky is higher. At sunset it approaches the Sun at a much higher angle than it does in the Summer giving it the tilted appearance.

Solar System, continued from page 4

and in 2020 Mars will be well positioned for us north of the equator.

Neptune and Uranus reach opposition on September 2 and October 15, respectively.

For those interested in looking for planets much farther out, a recent blog post by Konstantin Batygin and Michael Brown [1] is somewhat discouraging. Based on its estimated orbit, they state that at perihelion their proposed planet 9 would be “not particularly faint”. By this they apparently mean something like magnitude 18–20. Perhaps optimistically they say that “many” high

end back yard telescopes would be able to see it near perihelion.

However, several sky surveys capable of finding such an object have not done so. It seems planet 9, if it exists, is not near perihelion. Summing up several pieces of evidence, Batygin and Brown conclude “So where is it? Probably distant. 500 AU+. Probably fainter than 22nd magnitude. Very possibly in the middle of the Milky Way galaxy.”

[1] www.findplanetnine.com/p/blog-page.html

February Rise and Set Chart

SMCAS 2016 (PST)		Feb 6 Rise	Feb 6 Set	Feb 27 Rise	Feb 27 Set
Sun		7:07 AM	5:38 PM	6:42 AM	6:01 PM
Moon		5:26 AM	4:00 PM	10:47 PM	9:20 AM
Mercury	Briefly before sunrise	5:43 AM	3:33 PM	6:01 AM	4:21 PM
Venus	Before sunrise	5:27 AM	3:09 PM	5:36 AM	3:52 PM
Mars	In the wee hours	12:54 AM	11:20 AM	12:18 AM	10:26 AM
Jupiter	Most of the night	8:17 PM	8:53 AM	6:43 PM	7:25 AM
Jupiter's moons		c g e j i		c g e j i	
12 AM that night, E=left		J=Jupiter, c=Callisto, e=Europa, g=Ganymede, i=Io			
Saturn	In the wee hours	3:04 AM	12:52 PM	1:47 AM	11:35 AM
Uranus	In the evening	9:46 AM	10:29 PM	8:26 AM	9:10 PM
Neptune	Briefly after sunset	8:12 AM	7:19 PM	6:51 AM	6:01 PM
Pluto	Before sunrise	5:19 AM	3:08 PM	3:59 AM	1:48 PM

- Star Parties are at Crestview on the 6th and 27th.

- 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.

San Mateo County Astronomical Society Event Calendar						
February 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1 	2	3	4	5 7:00 PM General Membership Meetin	6 5:40 PM Crestview Star Party Sunset: 5:40 PM
7	8 	9	10	11	12	13 Sunset: 5:47 PM
14	15 Washington's 	16	17	18	19	20 Sunset: 5:56 PM
21	22 	23	24	25	26	27 6:00 PM Crestview Star Party Sunset: 6:03 PM
28	29	1	2	3	4	5

San Mateo County Astronomical Society Event Calendar from the Night Sky Network.

Calendar courtesy of Ed Pieret

Crestview Star Parties – A Chance to do Real Astronomy

By Ed Pieret

The majority of our members have never attended a Crestview Star Party. This is a shame since they have missed out on the opportunity to actually see the wonders of the night sky with their own eyes. Everyone is welcome at these events, both members and non-members. Children are not only welcome, but encouraged to attend.

At the Star Party we set up around sunset and start observing about an hour later. If you are curious about amateur telescopes, thinking of buying your own telescope or would like help with setting up a telescope you own, come at sunset.

If you would just like to learn about the constellations or view astronomical objects, come an hour later but not much more than two hours later.

Some members may be concerned about the rules or that they won't know how to behave. The rules are simple – don't bring white light and respect the telescopes (don't kick, grab or touch glass surfaces). To avoid light, park in the street unless you are bringing a telescope.

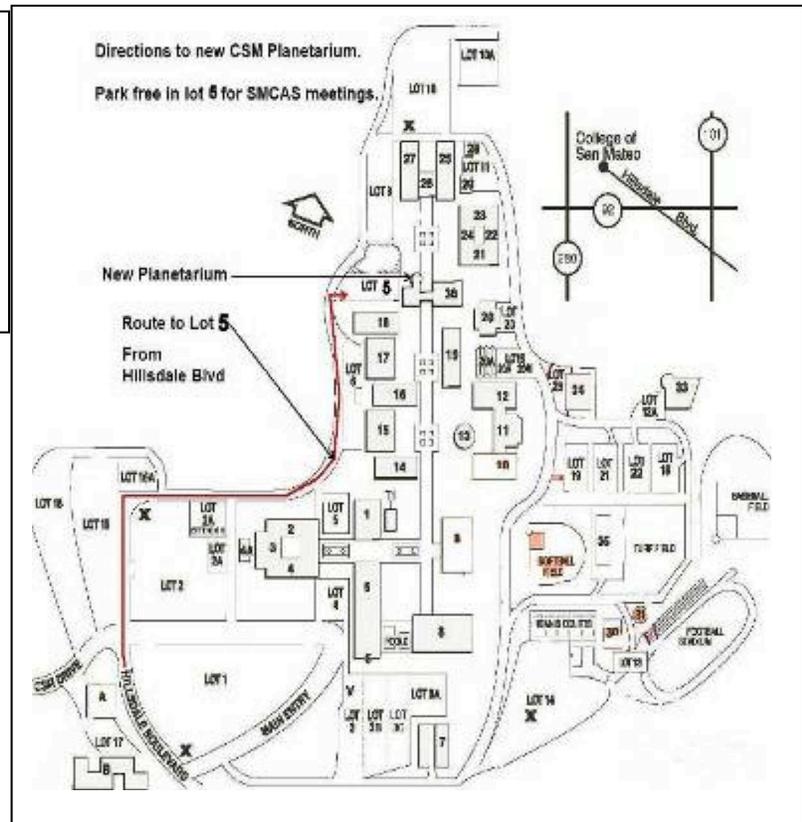
You will find that the astronomers are very welcoming – we love having visitors.

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.

January/February 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@yahoogroups.com to subscribe.

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