

# The SAN MATEO COUNTY ASTRONOMICAL SOCIETY

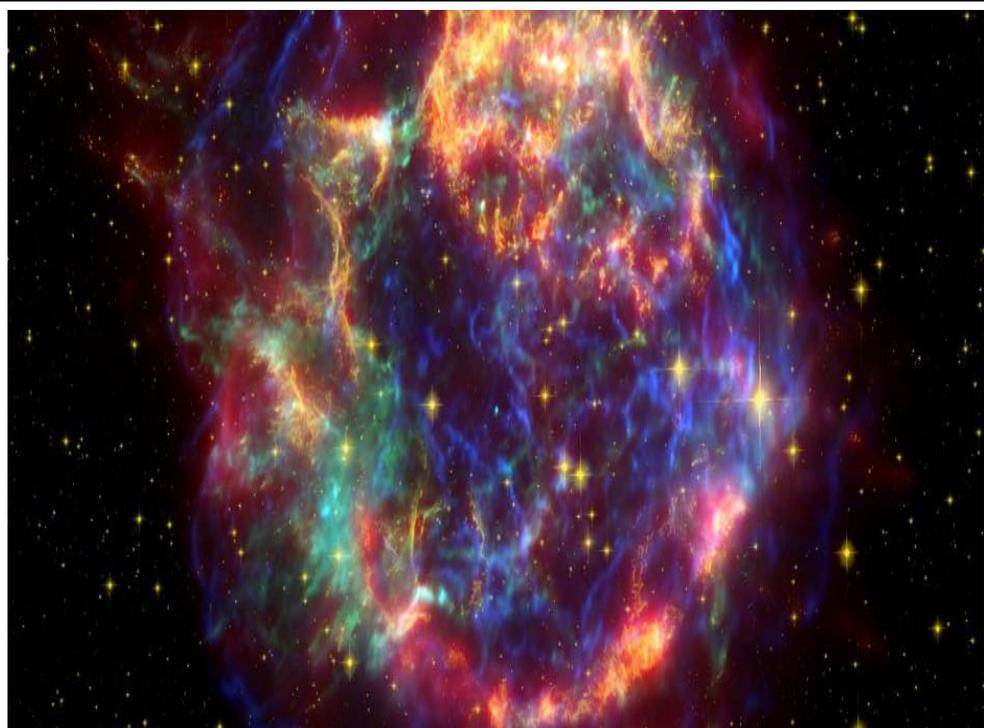
January-February 2015 – 626th General Meeting Notice



# 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](http://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](mailto:SMCAS@live.com), or call us at (650) 678-2762.



During the 226 million years it takes for the Sun to make one orbit of the Milky Way, measurable amounts of heavy elements from supernovae explosions — including plutonium-244 — fall on the Earth, accumulating in deep ocean sediments. This is a false colour image of supernova remnant Cassiopeia A using observations from both the Hubble and Spitzer telescopes as well as the Chandra X-ray Observatory (cropped). Image credit: NASA/JPL-Caltech. Article on page 7.

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## SAVE THESE DATES!

- SMCAS General Meeting**  
 Friday, February 6, 2015. CSM Planetarium, 7:00 p.m.  
 Evening's activities include pizza, an informal general meeting, and a special presentation at 8:00 p.m. featuring **Dr. Sarah Stokes Kernasovskiy**. Find details on page 3.
- SMCAS General Meeting**  
 Friday, March 6, 2015. CSM Planetarium, 7:00 p.m. for informal general meeting and pizza, 8:00 p.m. for presentation. Details to come.
- Spring Equinox Dinner**  
 Saturday, March 28, 2015. The Fireside Room at the Crystal Springs Methodist Church, 2145 Bunker Hill Drive, San Mateo. 7:00 p.m.

## President's Corner

Welcome to the New Year! I hope everyone had a great holiday season!

In keeping with ringing in the New Year, I can't resist the opportunity to invoke a couple old phrases like "out with the old and in with the new" or "everything old is new again"! In this case our old normal star party location is now back in operation at the newly remodeled and reopened Crestview Park. It is now our new old star party location. We bid farewell to what was the new location last year, but now the old location: Brittan Acres School.

And continuing the theme of ringing in the new, 2015 is off to what looks like a great year for SMCAS. If the weather allows, we will be ringing in the new by participating in the Google Star Party on Tuesday, February 10th. This is shaping up to be a really great star party involving all the astronomy clubs in the Bay Area supporting an expected turnout of up to around 1,000 participants. It may be one of the biggest star parties in the Bay Area in some time. This is not only our chance to do outreach to the public in a big way, recruit new members, but is also a chance for us to have a lot of fun networking and socializing with members of other astronomy clubs that we normally don't get to work with. We are expecting a turnout of around 16 members from SMCAS. Thanks to Ed Pieret for organizing our participation in this!

Beyond January, our calendar of events and general meeting schedule this year will follow our normal pattern of recent years but with one known exception at this point: our April 3rd Friday evening meeting date coincides with Prof. Mohsen Janatpour's annual Art and Science lecture in the CSM Theatre that we also have historically supported. So there will be no general SMCAS meeting that night, but SMCAS can attend the presentation and then we will hold a star party in the Theatre atrium.

And with the New Year comes the start of a New Year's SMCAS annual membership cycle. So if you haven't renewed your membership for 2015 (or joined) yet, please take the time to do so. You can renew online via our secure PayPal website at [http://www.smcas.com/membership/sign\\_up/](http://www.smcas.com/membership/sign_up/) or you can pay by mail, or pay in person at the next meeting if you can track down our Treasurer Tom Stephany when he isn't eclipse chasing in the frozen north — he will be traveling to the small town of Longyearbyen on Spitzbergen island, somewhere north of Norway between the Arctic Circle and the North pole, for the March 20 solar eclipse. We'll look forward to hearing more about his exploits when he returns.

In any event, don't forget about the benefits of membership in SMCAS. In addition to the socializing, pizza and intellectually stimulating speakers at our monthly general meetings, you have access to the wealth of astronomy advice and mentoring from our more experienced members, discounts on popular publications and astronomical calendars, membership in the AstroLeague including their quarterly glossy publication 'The Reflector,' eligibility for discounts at Orion Telescope, and more!

Lastly, thank you for your past and future support of SMCAS!

**Marion Weiler**, President, SMCAS  
mgwe@pacbell.net

## Monthly Meeting on February 6: Dr. Sarah Stokes Kernasovskiy to Speak on CMB Polarization and Life at the South Pole

**SPEAKER:** Dr. Sarah Stokes Kernasovskiy

Kavli Institute for Particle Astrophysics and Cosmology

**TOPIC:** CMB Polarization and Life at the South Pole

**DATE:** Friday, February 6, 2015

**TIME:** Presentation — 8:00 p.m.

**WHERE:** [The CSM Planetarium](#), Bldg. 36, Parking Lot 5

**FREE:** Presentation is free and open to the public.



Sarah Stokes Kernasovskiy is a postdoctoral scholar at Stanford University and the Kavli Institute for Particle Astrophysics and Cosmology (KIPAC). Her research focuses on the measurement of B-mode polarization of the Cosmic Microwave Background (CMB), including the technological developments needed for the next generation of telescopes. A positive detection of B-mode polarization could be direct evidence for the theory of cosmic inflation. Finding evidence of inflation is one of the highest priorities in cosmology today.

Sarah's graduate student work focused on BICEP2 and the Keck Array, which are telescopes at the South Pole. Sarah has completed 4 seasons at the South Pole Station on these projects. Outside of research, she is an accomplished trail runner, having completed several 100 milers as well as the Race Around the World, and has also taken time off to trek in another remote area: the Himalayas! Sarah received her undergraduate degree in Physics at California Institute of Technology in 2008, and completed her PhD in Physics at Stanford University in 2014 with her thesis 'Measuring the Polarization of the CMB with the Keck Array and BICEP2'.

In her talk, Sarah will discuss the various telescopes used in the CMB measurements, research goals and findings, as well as give us a glimpse of the challenges of life and research at the South Pole Stations.



*Sarah (with John Kovac) at work on part of the Keck Array at the South Pole.*

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## Event Review

### December Meeting's Dr. Steven Kane Focused on the Discovery of Exoplanets

Dr. Steven Kane of San Francisco State University explains the discovery of exoplanets found in the Habitable Zones (HZ) around their host stars. This is the zone around any star where the temperature is between 273°K (0°C) to 373K° (100°C) where liquid water could exist on the surface of a planet (like it does on Earth). This is important as it is felt that liquid water is a necessary ingredient for the existence of life as we know it. Of all the approximately 1800 exoplanets discovered so far, relatively few HZ exoplanets have actually been discovered thus far with Kepler-186f being the first one discovered with NASA's Kepler space telescope mission that resembles the Earth with a mass only about 10% larger than Earth. It was announced just last year.



Dr. Kane has been working to differentiate planets with Earth-like masses found in the Kepler data from one another in ways that would distinguish those which may be habitable from those which are not such as the situation with Venus vs. Earth. As such, he is trying to find Venus-like planets in a "Venus Zone" around their host stars to help him and his students make the distinction. Thus far, 43 such Venus-like candidates have been found. The abstract of their work is at: <http://arxiv.org/abs/1409.2886>

- Courtesy of Ken Lum

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## Renew Your SMCAS Membership for 2015

It's time to renew SMCAS memberships for 2015! So, renew [on line](#) or at any general meeting with check or credit card. What does your membership include?

- Monthly meetings (September through June) at the CSM Planetarium — with pizza, great speakers and networking with astronomy-minded friends.
- Special events including our Fall and Spring Equinox dinners, summer Star-B-Que at Hidden Villa in Los Altos.
- Participation in great community events including the annual Family Science and Astronomy Festival at College of San Mateo.
- Membership in the Night Sky Network.
- A discount on purchases made at Orion Telescope Center in Cupertino
- Significant discounts on the Astronomy Magazine Calendar, the Ottewell, Astronomical Calendar, and the RASC Observers Handbook.

## Event Review

### SMCAS Holiday Party Delights Club Members and Their Families

More than 35 club members and their families attended the SMCAS holiday party in December. Participants brought and shared food and beverages, fun and friendship. Following the potluck dinner, Ken Lum continued his travel log presentation for the group, providing a fun glimpse into visits around the world...exotic locations with historic antique telescopes.



*Celebrating with a wave and a "go forth and prosper" in the New Year...club members (from left) Michael Ryan, Ken Lum, and John Garis.*

*- Courtesy of Marion Weiler*

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## The Marketplace

### **One Orion Stratus eyepiece: focal length 8 mm.**

Barrel outside diameters either 2" or 1.25", but only accepts 1.25-inch filters. Excellent condition, one owner, owned about 3 years. Reason for selling: upgrading to Pentax eyepiece. Orion charges about \$100 to \$110 each (sale price) or \$140 each (regular price) for Stratus eyepieces. Asking \$60. Contact John Fiske at 650-342-8056 or [jnfiske@yahoo.com](mailto:jnfiske@yahoo.com).

### **One Orion Dynamo Rechargeable 12 V Mobile Power Station (battery) with spotlight**

This is the smaller "Dynamo" battery, apparently no longer sold by Orion (replaced by the "Dynamo Pro 17"). Has connecting cord to telescope and recharging cord. Owned about 6 years. Reason for selling: inadequate power supply for my Orion 14-inch go-to dob, so I bought the Dynamo Pro 17. Should work fine for a smaller telescope...it worked well when I had a 10-inch Orion Newtonian. Original cost was about \$90. Asking \$10. Contact John Fiske at 650-342-8056 or [jnfiske@yahoo.com](mailto:jnfiske@yahoo.com).

## February Rise and Set Chart

<i>SMCAS 2015</i> <i>(PST)</i>	<u>Feb 14</u> <u>Rise</u>	<u>Feb 14 Set</u>	<u>Feb 21</u> <u>Rise</u>	<u>Feb 21 Set</u>	<u>Feb 28</u> <u>Rise</u>	<u>Feb 28 Set</u>
Sun	6:58 AM	5:47 PM	6:49 AM	5:55 PM	6:40 AM	6:02 PM
Moon	3:04 AM	1:29 PM	8:31 AM	9:32 PM	1:52 PM	3:23 AM
Mercury	5:41 AM	3:51 PM	5:33 AM	3:42 PM	5:33 AM	3:48 PM
Venus	8:15 AM	7:57 PM	8:08 AM	8:12 PM	8:00 AM	8:26 PM
Mars	8:22 AM	8:13 PM	8:07 AM	8:12 PM	7:52 AM	8:11 PM
Jupiter	4:51 PM	6:46 AM	4:19 PM	6:16 AM	3:47 PM	5:46 AM
Jupiter's moons	g J i e c		c g J i e		g J i e c	
8 PM, East on left	J=Jupiter, c=Callisto, e=Europa, g=Ganymede, i=Io					
Saturn	1:42 AM	11:44 AM	1:15 AM	11:17 AM	12:49 AM	10:50 AM
Uranus	9:05 AM	9:39 PM	8:38 AM	9:13 PM	8:12 AM	8:47 PM
Neptune	7:34 AM	6:38 PM	7:07 AM	6:12 PM	6:41 AM	5:46 PM
Pluto	4:38 AM	2:29 PM	4:12 AM	2:03 PM	3:45 AM	1:36 PM

- Jupiter is at opposition on the 6th.  
 - Star parties are at Crestview on the 14th and 21st.  
 - Jazz Under the Stars is at CSM on the 28th.

— Provided 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).

## SMCAS Monthly Calendar — February 2015

February 2015						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1 sunset 10:18	2	3	4	5	6 7:00 PM SMCAS Meeting	7
8 sunset 10:18	9	10	11	12	13 7:30 PM CSM Planetarium Show	14 5:00 PM Crestview Star Party
15 sunset 10:18	16	17	18	19	20	21 5:00 PM Crestview Star Party
22 sunset 10:18	23	24	25	26	27	28

- Courtesy of Ed Pieret

### 25-Million-Year-Old Galactic Dust Provides Insight Into Supernovae: Australian National University Press Release (Continued From Photo on Page 1)

Scientists plumbing the depths of the ocean have made a surprise finding that could change the way we understand supernovae, exploding stars way beyond our Solar System. They have analysed extraterrestrial dust thought to be from supernovae, that has settled on ocean floors to determine the amount of heavy elements created by the massive explosions.

“Small amounts of debris from these distant explosions fall on the Earth as it travels through the galaxy,” said lead researcher Dr. Anton Wallner, from the Research School of Physics and Engineering. “We’ve analysed galactic dust from the last 25 million years that has settled on the ocean and found there is much less of the heavy elements such as plutonium and uranium than we expected.”

The findings are at odds with current theories of supernovae, in which some of the materials essential for human life, such as iron, potassium and iodine are created and distributed throughout space. Supernovae also create lead, silver and gold, and heavier radioactive elements such as uranium and plutonium.

Dr. Wallner’s team studied plutonium-244 which serves as a radioactive clock by the nature of its radioactive decay, with a half-life of 81 million years. “Any plutonium-244 that existed when the Earth formed from intergalactic gas and dust over four billion years ago has long since decayed,” Dr. Wallner said. “So any plutonium-244 that we find on Earth must have been created in explosive events that have occurred more recently, in the last few hundred million years.”

The team analysed a 10 centimetre-thick sample of the Earth’s crust, representing 25 million years of accretion, as well as deep-sea sediments collected from a very stable area at the bottom of the Pacific Ocean.

“We found 100 times less plutonium-244 than we expected,” Dr. Wallner said. “It seems that these heaviest elements may not be formed in standard supernovae after all. It may require rarer and more explosive events such as the merging of two neutron stars to make them.” The fact that these heavy elements like plutonium were present, and uranium and thorium are still present on Earth suggests that such an explosive event must have happened close to the Earth around the time it formed, said Dr. Wallner. “Radioactive elements in our planet such as uranium and thorium provide much of the heat that drives continental movement, perhaps other planets don’t have the same heat engine inside them,” he said.



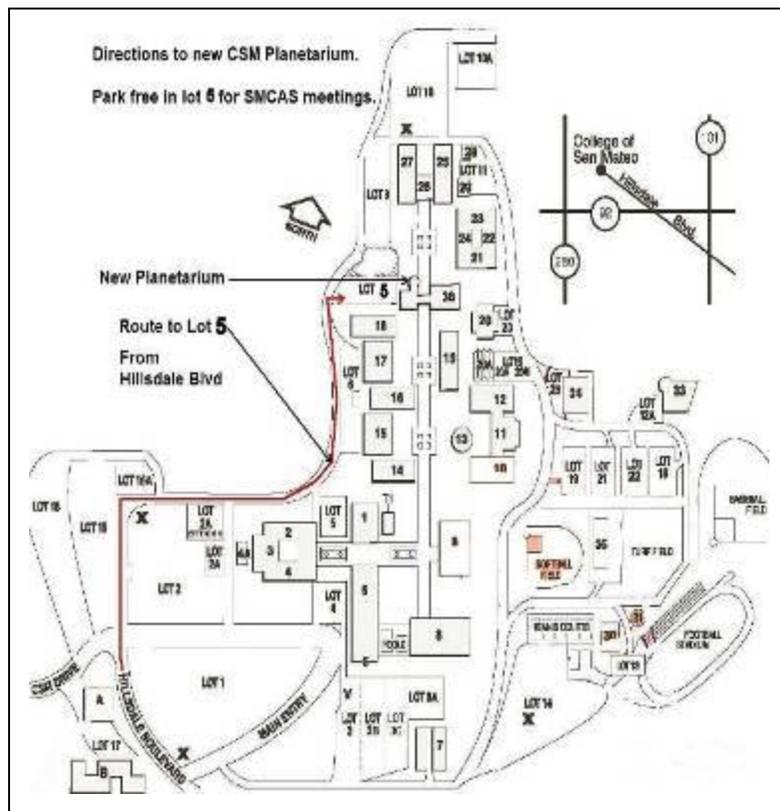
*Dr. Anton Wallner in the Nuclear Physics Department at Australian National University. Image credit: Stuart Hay, ANU.*

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

Star parties are held monthly, weather-permitting, and are free to members and visitors.

### 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



## 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.

### Directions to Crestview Park for Star Parties

**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.

**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:** Brittan Acres 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, please send your dues by check, payable to "SMCAS", to this address: **SMCAS (at) PO Box 974, Station A, San Mateo, CA 94403.** Or, use Paypal at [www.smcas.com](http://www.smcas.com).

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 only for a change to your membership or contact info.

Name(s) \_\_\_\_\_

Address/City/Zip: \_\_\_\_\_

Phone(s) \_\_\_\_\_ Email \_\_\_\_\_

**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 4<sup>th</sup> 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; **Secretary:** Karen Boyer; **Treasurer:** Tom Stephany

**Board Directors-At-Large:** Bob Franklin, Ken Lum, Karen Zamel, Jeff Dye, Ali Emami. Andy Thanos.

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

## SMCAS Contact Information

**Website:** <http://www.smcas.com>.

The CSM Astronomy Department schedule is at [www.collegeofsanmateo.edu/astronomy/events](http://www.collegeofsanmateo.edu/astronomy/events).

**Email:** [SMCAS@live.com](mailto:SMCAS@live.com)

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

**Yahoo Group Subscription:** email [smcas-subscribe@yahoogroups.com](mailto:smcas-subscribe@yahoogroups.com) telling your interest in title and body text.

**Event Horizon:** To offer articles or photos, please email the Editor, [karenzamel@gmail.com](mailto:karenzamel@gmail.com) or phone (650) 814-3902.