

# ★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 61, No. 12 - December 2013

## **GENERAL MEETING – DECEMBER 18, 2013**

*Randall Museum . 199 Museum Way . San Francisco*

*7:00 pm Doors Open . 7:30 pm Announcements . 8:00 pm Speaker*

*SFAA's General Meetings occur on the 3<sup>rd</sup> Wednesday of each month (except January)*

**December 18**

**NuSTAR'S EXTREME UNIVERSE**

**LYNN COMINSKY**

**Chair, Physics and Astronomy Department  
Sonoma State University**



NuSTAR is NASA's newest eye on the X-ray sky, focusing X-rays at higher energies than the Chandra X-ray Observatory. Since launch in June 2012, NuSTAR has been uncovering black holes hidden deep within gaseous galaxies, including studies of the black hole at the center of our own Milky Way. It has also mapped out elements from supernovae, revealing details of the processes that create the "starstuff" from which we are made. In this talk, Prof. Cominsky will explain the technological advances that

made the NuSTAR mission possible, and will present several of its latest scientific discoveries.

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*Lynn Cominsky is the Chair of the Physics and Astronomy Department at Sonoma State University (SSU), where she has been on the faculty for over twenty years. She is an author on over 60 research papers in refereed journals, and the Principal Investigator on over \$12 million of grants to SSU. Prof. Cominsky is the founder and director of SSU's Education and Public Outreach Group, which supports several different NASA high-energy astrophysics missions. The group excels at K-12 teacher training, curriculum development, and the development of interactive web activities for students that teach math and science. In the past, she has served as the scientific director for the PBS NOVA television program "Monster of the Milky Way" and accompanying planetarium show "Black Holes: The Other Side of Infinity." In 1993, Prof. Cominsky was named SSU's Outstanding Professor, and the California Professor of the Year by*

*the Council for the Advancement and Support of Education. In 2007, she was named a Fellow of the California Council on Science and Technology, in 2009, a Fellow of the American Physical Society and in 2013, a Fellow of the American Association for the Advancement of Science.*

## **PRESIDENT'S MESSAGE**

**Greetings Stargazers!**

**Happy Winter Solstice!**

In early December, our club provided views of the sky through telescopes to the public, in 36 degree weather at 5am on a Sunday morning at the Randall Museum in San Francisco. The event was planned in late November, when Comet ISON still might have had a chance to be "entertaining" even if not "Comet of the Century." I can't say how proud I am to be President of a club with volunteers who will pack up at 4am in the winter to show views of Jupiter and Comet Lovejoy in place of the "Comet of the Century" that just wasn't. I wish I could have shared the morning with our dedicated club members but I've had some pressing family matters distracting me from hobby time.

For those of you who attend Mt. Tam Star Parties, I wanted to pass along a note about the Pantoll gate being locked, or not, after sunset and why that might be. In the case of the last public night for the Nov 2nd Science Festival night, our SFAA volunteers left the mountain finding an open and unlocked gate and no "star lock" with our code for the night. I touched base with Ranger Ryen to find out if we have reason for concern, and it turns out that for that night the Rangers had been called to provide emergency assistance to another law enforcement agency in the county so they were not around to set up the locked gate for us. In future cases like this, our club members needn't worry about the lock and lack of park closure -- if there is no "star lock" set up for us we can drive through and leave the gate open.

According to my husband Doug this is the Season of M46 -- it's an open cluster with a little planetary nebula pal NGC 2438!

**Clear, dry, dark-ish skies!**

**ANGIE TRAEGER  
President  
San Francisco Amateur Astronomers  
2013**

# IMPORTANT DATES & UPCOMING SFAA VIEWING EVENTS

## SFAA GENERAL MEETINGS & LECTURES

*Randall Museum, 199 Museum Way (Near 14<sup>th</sup> Street and Roosevelt)*

*Third Wednesday of each month: 7:00 p.m. Doors open. 7:30 p.m. Announcements. 8:00 p.m. Speaker*

SFAA Board Meetings are held in person on even numbered months February through December at the Randall Museum, just prior to the General Meeting. Board Meetings are held virtually (via Google Hangout as of 2013) on odd numbered months March through November, during the week of the General Meeting and typically on the Tuesday night before. Virtual Meeting dates are chosen in the prior in-person meeting and will then be posted on our club calendar. In January there is no board meeting as we hold our Awards and Installation dinner.

**December 18**

**SFAA ANNUAL DINNER – JANUARY 18, 2014**  
**SAVE THE DATE**  
**DETAILS IN THIS NEWSLETTER**

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### CITY STAR PARTY

[http://www.sfaa-astronomy.org/star\\_parties/city/](http://www.sfaa-astronomy.org/star_parties/city/)

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### MT TAM SPECIAL USE PERMIT STAR PARTIES MEMBERS ONLY

SPECIAL USE PERMIT observing nights on Mount Tamalpais are private, open *only* to SFAA members. Please arrive by sunset. SFAA/Mt. Tam permit required for each car to comply with park rules. Contact [treasurer@sfaa-astronomy.org](mailto:treasurer@sfaa-astronomy.org) if you don't have an up to date permit. We must vacate the mountain by 2:00 a.m. except on specially approved nights (such as Messier Marathon).

**ALWAYS ON A SATURDAY**  
**December 28 – 4:00 p.m. to 1:30 a.m.**

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### MT TAM PUBLIC STAR PARTIES (April through October)

Public nights on Mount Tamalpais start with a lecture in the Mountain Theatre followed by public viewing in the Rock Springs parking lot. SFAA members may view privately after crowd departs from approx. 11 pm-2 am. For more information: <http://www.sfaa-astronomy.org/starparties/>



San Francisco Amateur Astronomers  
P.O. Box 15097  
San Francisco, CA 94115

**BALLOT FOR 2014 OFFICERS & BOARD OF DIRECTORS**

**President** (*Vote for one*)

- Matthew Jones
- \_\_\_\_\_

**Vice-President** (*Vote for one*)

- Douglas Smith
- \_\_\_\_\_

**Secretary** (*Vote for one*)

- Ryan Binford
- \_\_\_\_\_

**Treasurer** (*Vote for one*)

- Michael Patrick
- \_\_\_\_\_

**Directors** (*Vote for 9 – the top 7 become the Board Members and the 2 with the next highest votes become the Board Alternates*)

- Anthony Barreiro
- Jim Burke
- Anil Chopra
- Bob Haberman
- Joe Heavey
- Suzanne Huang
- Sunil Nagaraj
- Paul Salazar
- Mitchell Schoenbrun
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

**VOTING INSTRUCTIONS**

You may cast your ballot at the membership meeting on 18 December 2013, or you may mail it to **SFAA Secretary, PO Box 15097, San Francisco, CA 94115**. Ballots must be received no later than January 15, 2014. Each club member may submit only one ballot; family memberships may submit a separate ballot for each voting family member.

The club members listed above are candidates for officers and board of directors of SFAA for the year 2014. Please vote for one candidate for each officer position and nine candidates for the board of directors including write-ins. Voting for more than one candidate for any officer position or for more than nine candidates for the board of directors will invalidate the entire ballot.

All candidates, including write-ins, must have committed to attending at least seven board meetings and may not miss more than three consecutive meetings during the calendar year for which they are nominated.

The seven Board of Director candidates who receive the highest number of votes will become regular board members. The two candidates receiving the next highest number of votes will become alternate board members. The new officers and board of directors will be installed at the Annual Awards Dinner in January.

**San Francisco Amateur Astronomers  
Annual Awards Dinner  
Saturday  
January 18, 2014  
Delancey Street  
600 Embarcadero, San Francisco  
Socializing - 6:30 p.m.  
Dinner – 7:00 p.m.**

The 2014 Annual Awards Dinner is being held at the Delancey Street Restaurant (600 Embarcadero) on Saturday, January 18th, 2014.

If you are looking to take a break from harsh outdoor evening conditions of stargazing to socialize with your fellow club members in relative luxury, this event is for you! Rumor has it our venue even has chairs and tables 😊 We'll share a 4-course meal together, install the newly elected 2014 Board, and say thanks to a few of our members who've helped the club over the year. All members and their guests are welcome to attend. Tickets are \$20, which includes the 4-course meal and one soft drink. Payments are accepted via Paypal (use menu and button below).

**Payment and meal choices are due by Wednesday, January 8th.**

Meal choices

Chicken: Rotisserie Rosemary and Garlic Chicken with sauteed vegetables

Gumbo: Serious Soulfood Gumbo with crab, chicken, shrimp, sausage, and rice

Pasta Primavera: Angel Hair Pasta in a light red sauce with fresh tomatoes, garlic, basil, and asparagus

<http://www.sfaa-astronomy.org/sfaa-annual-awards-dinner-sat-january-18th-2014/>



## UPCOMING LECTURES

**FEBRUARY 19, 2014**

**STEVE GOTTLIEB**

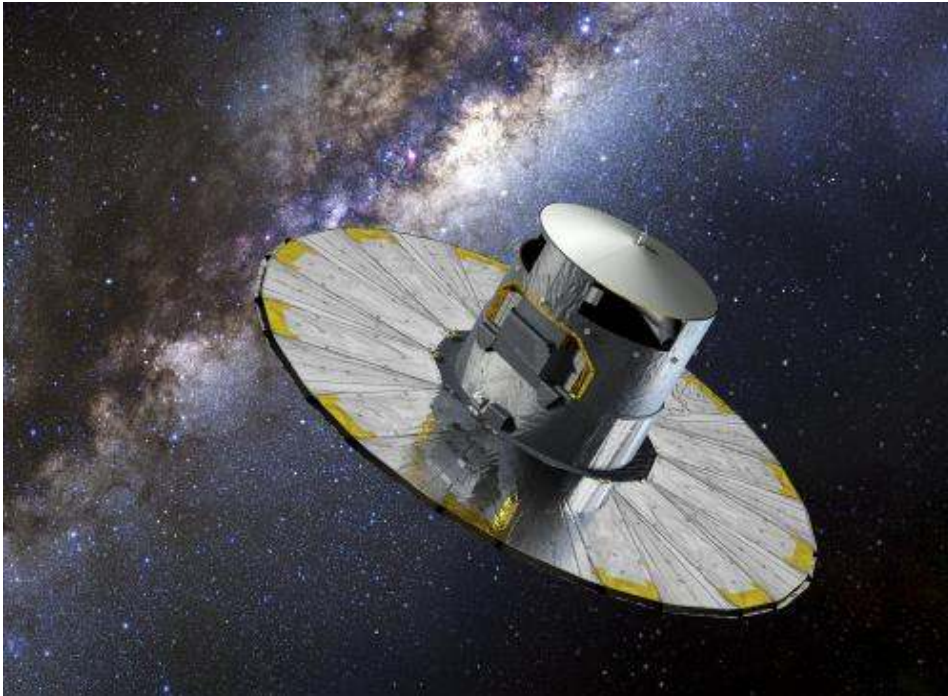
### ***Unwrapping the Visual Discovery of Spiral Nebulae***

Join visual observer Steve Gottlieb for an intriguing talk on ***Unwrapping the Visual Discovery of Spiral Nebulae***. This is the story of William Parsons' (Lord Rosse) first visual observations of M51 with his massive 72-inch speculum reflector in the spring of 1845 and the subsequent discovery of spiral structure in dozens of "nebulae". Gottlieb will discuss how our pre-conceived notions and knowledge of the nature of the objects we view in the telescope affect our visual perception at the eyepiece. Beautiful eyepiece sketches of several spirals by Rosse and other mid-19th century observers will be presented.

Steve Gottlieb has been an active visual observer since 1977 starting with a 6-inch reflector and currently with a 24-inch f/3.7. Gottlieb has observed the entire NGC visible from the U.S. (7100 total) and logged over 11,000 deep sky objects. These observations have been used to make numerous historical corrections of NGC and IC identifications as a member of the NGC/IC Project. Gottlieb has also compiled the databases in computerized Digital Setting Circles by Lumicon and Celestron and selected the objects in Orion's "Deep Map 600" star chart.



# Europe's billion-star surveyor set for launch



[Enlarge](#)

Gaia is an ambitious mission to chart a three-dimensional map of our Galaxy, the Milky Way, in the process revealing its composition, formation and evolution. Gaia will provide unprecedented positional and radial velocity.

By repeatedly observing a billion stars, with its billion-pixel video camera, the Gaia mission will allow astronomers to determine the origin and evolution of our galaxy whilst also testing gravity, mapping our inner solar system, and uncovering tens of thousands of previously unseen objects, including asteroids in our solar system, planets around nearby stars, and supernovae in other galaxies.

Professor Gerry Gilmore, from the University of Cambridge and UK Principal Investigator for Gaia, said, "Gaia will be a revolution in our knowledge of the local Universe. For the first time we will have a fair sample of what is out there, where it is, how it is moving, how unseen (dark) matter is distributed, where and

when stars formed and where and when the chemical elements of which we are made were created. Gaia will make a huge step towards understanding how the Milky Way came to be formed, and evolved into what we see today. For the first time, we will be able to see the Milky Way in 3-D. In fact in 6-D – where stars are, and how they are moving."

UK participation in the mission is funded by the UK Space Agency and scientists and engineers from around the UK have played key roles in the design and build of Gaia. The UK Science and Technology Facilities Council (STFC) funded the early development of the project, including the set-up of the data applications centre. STFC's current support involves the UK exploitation of the scientific data to be yielded from the mission.

The Cambridge Gaia Data Processing Centre will be the front line in processing Gaia's images, which will also be key to the discovery of many thousands of transient stars and supernovae: these will be made immediately available to schools and the public for their participation in the research.

Dr Chris Castelli, Acting Director of Technology, Science and Exploration at the UK Space Agency, said, "Gaia is an important space mission for the UK; we've won around €80 million of contracts from the European Space Agency to build the spacecraft and are providing a state of the art data centre that will turn the mission's raw data into the largest stellar catalogue ever made."

Andy Stroomer, Astrium UK's Director of Earth Observation, Navigation, and Science, added, "We are extremely proud of our contribution to the unique Gaia mission - the latest example in a long and successful heritage of supporting ESA science. Stevenage engineers have provided core systems for the Gaia satellite including video processing unit, satellite electrical platform, and mechanical subsystems,".

Gaia will map the stars from an orbit around the Sun, near a location some 1.5 million km beyond Earth's orbit known as the L2 Lagrangian point. The spacecraft will spin slowly, sweeping its two telescopes across the entire sky and focusing their light simultaneously onto a single digital camera, the largest ever flown in space.

Once Gaia starts routine operations, around Easter 2014, astronomers will have the challenge of dealing with a flood of data. Even after being compressed by software, the data produced by the five-year mission will fill over 30 000 CD ROMs. This data will be transmitted 'raw' and will need processing on Earth to turn it into a calibrated set of measurements that can be freely used by the astronomical community. The cutting edge computer technology developed at the Cambridge Data Processing Centre will be key to this process.

The first Gaia science will be discoveries of new sources – supernovae, extreme variable stars and blazars - which will be discovered at the Cambridge processing centre, and immediately made available for study by both professionals and the interested public. Gaia will discover many new sources which are bright enough for amateurs, and schools with access to public robotic telescopes, to become the first to confirm and obtain more information. Schools and amateurs will be able to load their data onto the Gaia web site (<http://gaia.ac.uk>) where it will be used in scientific analyses, and fully credited.

"A school class can be the first to 'adopt a supernova', observe it with robotic telescopes, such as the Faulkes, and provide critically important science information which we need to understand the new sources. That class will be doing original science, and will be credited for their research contributions," says Dr Heather Campbell, a scientist at Cambridge who is part of the Gaia science alerts analysis team.



"By participating in the Gaia Alerts programme, and remotely controlling the Faulkes Telescopes to observe exciting targets discovered just hours beforehand, UK schools will be making real contributions to the research side of this project." added Professor Paul Roche, Director of the FT project at the University of South Wales.

### **The UK and Gaia**

The UK has two major roles in the Gaia mission: building the spacecraft, and delivering the science.

UK industry and science institutes won some €80 million of industrial contracts to build Gaia, with leadership roles in building the heart of Gaia, the array of 106 CCDs, the control avionics and the critical micro-propulsion system, as well as playing a critical role in the development of the Gaia spectrometer.

Astrium at Stevenage was responsible for the spacecraft's super precision guidance and control system as well as the powerful on-board computers needed to process the torrent of data it will produce.

The 'eye' of Gaia's camera has the most sensitive set of light detectors ever assembled for a space mission. It is also the largest focal plane array ever to be flown in space and contains a mosaic of 106 large area, high performance Charged Coupled Device (CCD) CCD91-72 image sensors, which are custom designed, manufactured and tested by UK company e2v. Without these image sensors the Gaia mission would not be possible. These detectors were calibrated with the Gaia electronics at Mullard Space Science Laboratory.

SciSys UK Ltd is responsible for the spacecraft's operational simulator.

Gaia data will be processed and analysed ready for release to the scientific community and public at six data centres, including one in the UK, operating software developed and tested by a consortium of 400 people across Europe, including some 50 people at 6 Institutes in the UK (Cambridge, UCL-MSSL, Leicester, Edinburgh, The Open University, STFC RAL Space and Bristol).

University College London's Mullard Space Science Laboratory (MSSL) has a major role in spectroscopic science, and in conjunction with The Open University, is involved in software development including architecture, integration and validation, preprocessing development, spectra extraction and calibration.

The UK hosts the Cambridge data processing centre, where the Gaia imaging data are processed. These data provide brightness, colour, and position information, which enable the core Gaia science, determining distances motions and the intrinsic properties of each star. Gaia also has a spectrograph, to measure the radial velocities of 300 million stars, delivering their complete 3-D positions and 3-D velocities. The spectra will be processed at the French data centre, using software in part developed in the UK.

### **Details**

Shortly after its launch from Europe's space port in French Guiana, Gaia will deploy its sunshield, forming a 10.5 m-wide 'skirt' around the spacecraft's base. The shield has two purposes: to shade Gaia's sensitive telescopes and cameras from sunlight, allowing them to cool to their operating temperature of  $-110^{\circ}\text{C}$ , and to provide power to operate the spacecraft. The Sun-facing side of the shield is partially covered with solar panels to generate electricity.

Gaia will be placed in an orbit around the Sun, at the second Lagrange point L2, which is named after its discoverer, Joseph Louis Lagrange (1736-1813). For the Sun-Earth system, the L2 point lies at a distance of 1.5 million kilometres from the Earth in the anti-Sun direction and co-rotates with the Earth in its 1-year orbit around the Sun. An operational lifetime of 5 years is planned.

The Gaia spacecraft will be controlled from the European Space Operations Centre (ESOC, Darmstadt, Germany) using the two ground stations Cebreros (Spain) and Perth (Australia).

Science operations will be conducted from the European Space Astronomy Centre (ESAC, Villafraanca, Spain).

Mission Operations Commissioning will take place during the transfer phase of the mission, when the spacecraft is flying towards its destination: the second Lagrange point of the Sun-Earth system (L2). This early commissioning phase deals with the Service Module and with all Payload Module functions that can be checked-out during the transfer phase. For this purpose, during the transfer phase the nominal attitude with respect to the Sun is the same as the operational one. The final commissioning of the Payload Module occurs after orbit insertion around L2, consisting of final calibration of the instrument and demonstration of instrument performance.

**Explore further:** [Countdown to launch of ESA's billion-star surveyor Gaia](#)

Provided by [European Space Agency](#) 

## NIGHT SKY NETWORK

### December 2013 - THE EVENING SKY

December Sky Map: <http://skymaps.com/skymaps/tesmn1312.pdf>

December Sky Calendar: <http://skymaps.com/articles/n1312.html>

## BAY AREA ASTRONOMY EVENTS

Kenneth Lum

<http://tech.groups.yahoo.com/group/bayastro/?v=1&t=directory&ch=web&pub=groups&sec=dir&slk=94>

BAY AREA REGULARLY SCHEDULED EVENTS	
<p>EVERY FRIDAY NIGHT 7:00 PM – 10:00 PM excluding major holidays</p> <p>The Telescope Makers' Workshop</p> <p>CHABOT SPACE AND SCIENCE CENTER 10000 Skyline Boulevard Oakland, CA 94619-2450</p>	<p><b>THE TELESCOPE MAKERS' WORKSHOP</b> is held every Friday night from 7pm - 10pm, excluding major holidays (e.g. Christmas Day and New Year's Day) that fall on Fridays. The Workshop is always closed on Memorial Day Weekend. Attendance every Friday night is not mandatory, and members work at their own pace. The Workshop meets at Chabot Space &amp; Science Center, 10000 Skyline Blvd., Oakland. Contact us for more specific details:</p> <p>Contact: E-mail Richard Ozer (<a href="mailto:rozer@pacbell.net">rozer@pacbell.net</a>) or (510) 406-1914</p>
<p>EVERY FRIDAY &amp; SATURDAY EVENING, weather permitting 7:30 PM – 10:30 PM</p> <p>CHABOT SPACE AND SCIENCE CENTER 10000 Skyline Boulevard Oakland CA 94619-2450 (510) 336-7300</p>	<p><b>EXPLORE THE NIGHT SKIES AT THE CHABOT OBSERVATORIES</b> For more information: <a href="http://www.chabotspace.org/">http://www.chabotspace.org/</a></p> <p><b>Free Telescope Viewing</b> Regular hours are every Friday &amp; Saturday evening, weather permitting: 7:30pm -10:30pm Come for spectacular night sky viewing the best kept secret in the Bay Area and see the magnificence of our telescopes in action!</p> <p><b>Daytime Telescope Viewing</b> On Saturday and Sunday afternoons come view the sun, moon, or Venus through Chabot's telescopes. Free with General Admission. (weather permitting)</p> <p>12pm - 5pm: Observatories Open</p>
<p>Sunset – 5:11 PM (TWICE MONTHLY)</p> <p>Inclement weather (clouds, excessive wind and showers) will cause the event to be canceled without notice.</p> <p>SAN MATEO COUNTY ASTRONOMICAL SOCIETY STAR PARTY</p>	<p><b>STAR PARTIES AT CRESTVIEW PARK, SAN CARLOS</b></p> <p>Come out and bring the kids for a mind expanding look at the universe</p> <p>The City of San Carlos Parks and Recreation Department and the San Mateo County Astronomical Society has open Star Parties twice a month. These events are held in Crestview Park, San Carlos California. Note that inclement weather (clouds, excessive wind and showers) will cause the event to be canceled without notice.</p> <p>For more information call Bob Black, (650)592-2166, or send an email to <a href="mailto:SMCAS@live.com">SMCAS@live.com</a> or call Ed Pieret at (650)862-9602.</p> <p><b>Reasons to Attend</b></p>

	<p>If you have kids interested in space or planets bring them here for a real life view of planets, nebula, star clusters and galaxies.</p> <p>If you are thinking of buying a telescope or want help using a telescope you own, come here to talk with experienced users. If you think you might have an interest in astronomy come and talk to experienced amateur astronomers.</p> <p>Cautions</p> <p>Dress warmly and wear a hat.</p> <p>Visitors should park on the street and walk into the park so your headlights don't affect the observer's dark adaptation.</p> <p>Only park in the parking lot if you are arriving before dark and plan to stay until the end of the event. You shouldn't need lights but if you feel you do, only bring a small flashlight with the lens covered using red cellophane or red balloon.</p> <p>Please respect the telescopes and ask permission from the owner if you wish to touch.</p> <p>Parents, please watch your children.</p> <p>The park is residential, and adjacent to homes and backyards, please keep noise to a minimum.</p> <p>Schedule Time</p> <p>Astronomers arrive to set up at around sunset. Observing starts at about one hour after sunset and continues for two to three hours.</p>
<p><b>EVERY CLEAR SATURDAY MORNING OBSERVATORY 10:00 AM – 12:00 PM</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE 12345 Moody Road Los Altos Hills</b></p> <p><b>Cost: Free</b></p>	<p>Solar observing with a Hydrogen alpha solar telescope every clear Saturday morning. This allows spectacular views of solar prominences and unusual surface features on the Sun not otherwise visible with regular white light telescopes.</p> <p>Admission is free.</p> <p>Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd. exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lots for \$ 3.00.</p>
<p><b>EVERY CLEAR FRIDAY EVENING 9:00 PM – 11:00 PM</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE OBSERVATORY 12345 Moody Road Los Altos Hills</b></p> <p><b>Cost: Free</b></p>	<p>Foothill Observatory is open for public viewing every clear Friday evening from 9:00 p.m. until 11:00 p.m. Visitors can view the wonders of the universe through the observatory's computer-controlled 16-inch Schmidt-Cassegrain telescope. Views of objects in our solar system may include craters and mountains on the moon, the moons and cloud-bands of Jupiter, the rings of Saturn, etc. Deep space objects including star clusters, nebulae, and distant galaxies also provide dramatic demonstrations of the vastness of the cosmos. The choice of targets for</p> <p>Any evening's viewing depends on the season and what objects are currently in the sky.</p> <p>The public viewing programs at Foothill are free of charge and are open to guests of all ages. Please note that the observatory is closed when the weather is cloudy. Also note that visitor parking permits are available from the machines in the parking lots for \$3.00.</p> <p>Come to Foothill Observatory and join us in the exploration of our Universe!</p> <p>Foothill Observatory is located on the campus of Foothill College in Los Altos Hills, CA. Take Highway 280 to the El Monte Rd exit. The observatory is next to parking lot 4. Parking at the college requires visitor parking permits that are available from the machines in the parking lots for \$3.00.</p>

<p><b>BAY AREA EVENTS – DECEMBER 2013</b></p> <p><a href="http://groups.yahoo.com/neo/groups/bayastro/conversations/topics/49">http://groups.yahoo.com/neo/groups/bayastro/conversations/topics/49</a></p>	
<p><b>Tuesday, December 17 2013 - 12:00 pm, PST</b></p> <p><b>SETI Institute Colloquium Series</b>  <b>189 Bernardo Ave</b>  <b>Mountain View, CA 94043</b></p>	<p><b>JOHN BAEZ, UC Riverside</b>  <b>LIFE'S STRUGGLE TO SURVIVE</b></p> <p>When pondering the number of extraterrestrial civilizations, it is worth noting that even after it got started, the success of life on Earth was not a foregone conclusion. We recount some thrilling episodes from the history of our planet, some well-documented but others merely theorized: our collision with the planet Theia, the oxygen catastrophe, the snowball Earth events, the Permian-Triassic mass extinction event, the asteroid that hit Chicxulub, and more, including the global warming episode we are causing now. All of these hold lessons for what may happen on other planets.</p> <p><a href="http://plus.google.com/events/cfk79dtm5km6eemrvk288durbg">http://plus.google.com/events/cfk79dtm5km6eemrvk288durbg</a></p>
<p><b>Friday, 12/20/13</b>  <b>07:00 PM - 10:00 PM</b></p> <p><b>San Jose Astronomical Association</b>  <b>Houge Park</b>  <b>Twilight Drive</b>  <b>San Jose, CA 95124</b></p>	<p><b>HOUGE PARK STAR PARTY</b>  Meet with members of San Jose Astronomical Society for a Star Party, weather permitting.</p> <p>Cost: Free</p>
<p><b>Saturday, 12/21/13</b>  <b>07:30 PM - 08:15 PM</b></p> <p><b>Chabot Space and Science Center</b>  <b>10000 Skyline Blvd</b>  <b>Oakland, CA 94619</b></p>	<p><b>FARIDE KHALAF</b>  <b>SLS, OUR NEXT RIDE</b></p> <p>The future of space travel is percolating. For the first time in history, we are successfully launching privately designed and built large-scale space vehicles. There are many corporations and individuals contending to provide commercial space transportation for NASA to fly above the Earth's atmosphere. NASA's Space Launch System (SLS) is the new protocol for the American Space Program. In this presentation you'll gain some insight into the future of space travel and understand how our traditional means of exploration are now history.</p> <p>Website: <a href="http://www.chabotspace.org/space-talks.htm">http://www.chabotspace.org/space-talks.htm</a></p> <p>Cost: Free with admission</p>



**San Francisco Amateur Astronomers  
Application for New or Renewing Membership**

1. Memberships, with dues payment, are for one year and standard renewal dates of 1 July to 30 June and 1 January to 31 December.
2. Submitting appropriate dues in April, May, June, July or August, membership will run to 30 June of the next year.
3. Submitting appropriate dues in October, November, December, membership will run to 31 December of the next year; submitting appropriate dues in January, February or March, membership will run to 31 December of the same year.
4. Renewals are maintained at the original membership date unless the renewal is made later than the original cutoff date (e.g. September or March as described in 3). In such cases the membership date is shifted to the next renewal date 30 June or 31 December.
5. New or renewal memberships sent in via USPS mail will have membership start date based on postmark date.

**This application is for:**

- New
- Renewing

Name: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_

Email: \_\_\_\_\_

Home Telephone (optional): \_\_\_\_\_

Cell Phone (optional): \_\_\_\_\_

**Membership Type:**  Individual \$25.00 /  Family \$30.00 /  Student \$10.00 /  Supporting \$75.00

Please mail to me a Mt. Tamalpais Parking Permit

**To complete the membership process:**

- A. Print and fill out this form
- B. Make check or money order payable to San Francisco Amateur Astronomers
- C. Mail this form and payment to:

**Treasurer, SFAA  
PO Box 15097  
San Francisco, CA 94115**

New members will be entered onto the SFAA roster on the Night Sky Network (NSN) and will receive a verifying email from the NSN with username and password for the NSN. Renewing members will have their information updated but will not receive an email from the NSN. Both new and renewing members will receive a verifying email from the SFAA Treasurer upon completion of the membership process.



## 2013 Club Officers & Contacts

<i>President</i>	<b>ANGIE TRAEGER</b>	sfaapresident@sfaa-astronomy.org
<i>Vice President</i>	Matt Jones	vicepresident@sfaa-astronomy.org
<i>Secretary</i>	Douglas Smith	
<i>Treasurer</i>	Michael Patrick	treasurer1@sfaa-astronomy.org
<i>Speaker Chair</i>	Linda Mahan	speakerchair@sfaa-astronomy.org
<i>City Star Party</i>		
<i>Bulletin Editor</i>	Annette Gabrielli	editor@sfaa-astronomy.org
<i>Telescope Loans</i>	Anhil Chopra	telescopes@sfaa-astronomy.org
<i>Honorary</i>	John Dobson	
<i>Director</i>		
<i>and Board</i>		
<i>Member</i>		
<i>Emeritus</i>		
<i>Board Members</i>	Anhil Chopra Bob Haberman Sunil Nagaray Paul Salazar Mitchell Schoenbrun George Teiber	
<i>1<sup>st</sup></i>	Suzanne Huang	
<i>Alternate</i>		
<i>2<sup>nd</sup></i>	Joe Heavey	
<i>Alternate</i>		
<i>Webmaster</i>	Matthew Jones	

## Club Telescopes

The SFAA owns eight very fine, easy to use, loaner telescopes well-suited for deep sky, planets, and star parties. All scopes are available to any SFAA member. The loaner custodians for the majority of our fleet are Pete & Sarah Goldie. Please contact them at [telescopes@sfaa-astronomy.org](mailto:telescopes@sfaa-astronomy.org) for details if you are interested in borrowing a scope or if you have items you can donate for the loaner program (eyepieces, star maps/books, red flashlights, collimator, etc.). Please contact the appropriate member indicated below if you are interested in borrowing one of the telescopes.

- 1) 6" f/10.3 Dobsonian/Ken Frank ken@sfaa-astronomy.org
- 2) 8" f/7 Dobsonian/Pete Goldie
- 3) 8.5" f/6 Dobsonian/Pete Goldie
- 4) 10" f/8 Dobsonian/Pete Goldie
- 5) 114mm f/4 Newtonian StarBlast/Pete Goldie
- 6) 8" f/10 Celestron SCT/Annette Gabrielli/ annette@sfaa-astronomy.org
- 7) 8" f/10 Meade SCT/Stefanie Ulrey/treasurer@sfaa-astronomy.org
- 8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/ ken@sfaa-astronomy.org

## Club Astronomy Videos

The SFAA owns a series of astronomy videotapes featuring Alex Filippenko, a world-renowned professor of astronomy at UC Berkeley. The videotapes provide an introduction to astronomy and cover topics such as the Solar System, the lifecycles of stars, the nature of galaxies, and the birth of the Universe. The SFAA loans the tapes free to all members. If you are interested in viewing these tapes, you may check them out at any of the SFAA General Meetings. These tapes were kindly donated to the SFAA by Bert Katzung. For information on the course tapes themselves:

<http://www.teach12.com/ttc/assets/coursedescriptions/180.asp>

## Membership Dues

Membership is billed for each upcoming year on June 30. Members may receive no more than one bulletin after the expiration of membership.

## SFAA Website and Online Services

The SFAA web site at [sfaa-astronomy.org](http://sfaa-astronomy.org) is provided to our members and the general public for the sharing of club information and services. The web site contains links for club [star parties](#), [events](#), [newsletters](#), [lectures](#) and [meetings](#). If you wish to interact with other people who are interested in astronomy, the SFAA web site offers public and members only [bulletin board forums](#). If you wish to remain up-to-date on club activities, then we encourage you to subscribe to one or both of our public [mailing lists](#), which will allow you to receive our newsletter and/or club announcements via email. Other useful and interesting information and services are available on the site such as [observing location reviews](#), member [astronomy photos](#), and [members only telescope loans](#). Information about SFAA's membership, organization and by-laws are available at the club's online public document [archive](#). If you need to contact a representative of the SFAA, then please visit our [contacts](#) page to help in finding the right person to answer your questions.

***Above the Fog** is the official bulletin of the San Francisco Amateur Astronomers. It is the forum in which club members may share their experiences, ideas, and observations. We encourage you to participate by submitting your articles, announcements, letters, photos and*

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**San Francisco Amateur Astronomers**  
P.O. Box 15097  
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Information Hotline: (415) 289-6636

Web Page: [www.sfaa-astronomy.org](http://www.sfaa-astronomy.org)

*Sharing the Wonders of the Universe*

**Has your membership expired?** Your mailing label includes the month and year through which your membership is paid. If it is past, your membership has expired and this may be your last issue.