

# ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 61, No. 11 - November 2013

## GENERAL MEETING – NOVEMBER 20, 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)

## THE DIVERSITY OF HABITABLE ZONES AND THEIR PLANETS



The field of exoplanets has rapidly expanded from the exclusivity of exoplanet detection to include exoplanet characterization. A key step towards this characterization is the determination of which planets occupy the Habitable Zone (HZ) of their host stars. Thanks to increasing orbital period and mass/size sensitivity of both radial velocity and Kepler data, many exoplanets are now known to pass through or remain in the HZ, some of which are terrestrial in nature. In this talk I will describe the properties of the HZ, the dependence on the spectral type, and the time dependence that results from binary star systems. I will describe the diversity of exoplanets which are known to occupy the HZ of their stars, including planets in highly eccentric orbits, super-Earths, and potential analogs to the planet Venus.

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*Dr. Stephen R. Kane is an astrophysicist and professor at San Francisco State University. His interests lie primarily in the area of extra-solar planet detection and characterization, a topic in which he has more than 140 refereed journal publications. Originally from Australia, he graduated with a Bachelor of Science (Honours) from Macquarie University, Sydney in 1995. His postgraduate studies were undertaken at the Space Telescope Science Institute in Baltimore, USA and he received his Doctorate of Philosophy from the University of Tasmania in 2000. He has over 18 years of experience in the field of exoplanets and is proficient with many different approaches to the detection of exoplanets. He is the Principle Investigator of numerous exoplanet-related projects, including a photometric survey of known planet-hosting stars to search for transit signatures called TERMS (Transit Ephemeris Refinement and Monitoring Survey). He is the creator and maintainer of the Habitable Zone Gallery ([www.hzgallery.org](http://www.hzgallery.org) <<http://www.hzgallery.org>>) which tracks Keplerian planetary orbits and provides habitable zone information for known exosystems*

## PRESIDENT'S MESSAGE

Greetings Fellow Space Fans,

It's election time already! Hopefully you saw our recent announcement asking for volunteers or nominees for the 2014 board, and our request for help in adding more social activities to our club programs. Our drive to add social activities comes partly from the membership survey from this summer, and partly because adding them makes good sense. I myself became more active in the club through one of our club socials several years ago, at the Pier 23 Cafe. That night I remember meeting a fellow space fan named Matt Jones who mentioned that the board needed people to volunteer. Here we are a few years later, and guess who's running (presumably unopposed) for club President for 2014? Matt Jones!

In case you don't know Matt, I'd like to share a bit about his background with you. He's a very busy guy outside of work. He's a volunteer science and math tutor for We Teach Science. He runs a website about writing, called [fictorians.com](http://fictorians.com). For our club, he poured hours into building our new website last year and remains Webmaster this year. As Vice-President he runs many of our events such as our member socials. Aside from his volunteer work, he is working on his Divemaster certification and writing a science-fiction novel. One of his recent vacations was an astronomy-themed Caribbean cruise with the hosts of Astronomy Cast, called the, "(Not the) End of the World Cruise." And guess what ladies? Matt mentioned he's single and available!

Whether or not you can or can't help Matt find a girlfriend, if you have ideas for inexpensive activities or venues that would handle large groups for club socializing, I'd love to hear them ([sfaapresident@gmail.com](mailto:sfaapresident@gmail.com)).

On a personal but astronomy related note, I had a blast at the last Member Night on Mt. Tam. It was my first night out observing since starting to recover from the sleep deprivation of being a new mom. The weather was good, and I was able to hunker down for a while and focus on observing a couple of faint targets while also sharing views, knowledge, and equipment with fellow members. The group coordinated with one another to depart the lot in groups, which I think helped reduce interference from white dome lights, etc. My favorite view of the night was gritty looking NGC 6939 next to ethereal NGC 6946 in the same field, where one object is a star cluster and the other is a face-on galaxy. Ex-President Michael Portuesi and club member Robert had an informative discussion about our Sun's birthplace. Club member Andy generously shared two "pumpy pots" of hot chocolate and cups for everyone, which made it easier to stay warm and stay out late. Thanks to all of you who make our Member Nights fun, friendly, and educational.

As we head into Winter I wish you health, happiness, and good views of the Orion Nebula!

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.

**November 20, December 18**

**SFAA ANNUAL DINNER – JANUARY 18, 2014  
SAVE THE DATE – DETAILS TO FOLLOW**

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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. We must vacate the mountain by 2:00 a.m. except on specially approved nights (such as Messier Marathon).

**ALWAYS ON A SATURDAY  
November 30**

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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/>

# UPCOMING LECTURES

## December 18 NuSTAR'S EXTREME UNIVERSE LYNN COMINSKY



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.*

**December 7 and 8 – 5:30 A.M.  
Randall Museum  
199 Museum Way  
San Francisco CA 94114**

## **PUBLIC VIEWING OF COMET ISON ON IN SAN FRANCISCO**

*(Subject to cancellation due to inclement weather.)*



Image: [Credit: NASA, ESA, and the Hubble Heritage Team \(STScI/AURA\)](#)

SFAA will provide telescopes and binoculars at two events on the mornings of December 7<sup>th</sup> and 8<sup>th</sup> at the Randall Museum in San Francisco.

Comet C/2012 S1, also known as Comet ISON, was discovered in September 2012 by the International Scientific Optical Network (ISON) telescope in Russia. Due to its size and eventual close-up flyby of the Sun, it has been highly anticipated to brighten up and potentially be the ‘Comet of the Century’ but astronomers won’t know this until the days following the closest approach to the Sun on November 28<sup>th</sup>.

The public viewing events are scheduled for the early mornings of Saturday December 7<sup>th</sup> and Sunday December 8<sup>th</sup>, starting at 5:30 AM at the Randall Museum in San Francisco. This will be 10 days after the closest approach to the Sun, and the comet will be visible for a little over one hour, until the light of sunrise begins to impact the view. The event will conclude at 7:00 am. There is no charge for the event.

“Comets are of great interest to the general public, but few comets are bright enough to be found easily. The San Francisco Amateur Astronomers regularly hosts special events for viewing of the night sky and has added these two Comet ISON events to enable many to see the comet, whether it is a grand spectacle streaking across the sky, or a small object only visible in a telescope,” said SFAA President Angie Traeger. “Comets are notoriously unpredictable, so this might be a big event, or the comet might disintegrate in its passage around the Sun. We won’t know until after the flyby on Thanksgiving.”

The Randall Museum is located at 199 Museum Way, San Francisco, CA 94114. For more information about these two events, visit the SFAA website at [www.sfaa-astronomy.org](http://www.sfaa-astronomy.org). Visitors are reminded to wear warm clothing, as the early morning weather will be quite chilly. The event is subject to cancellation due to inclement weather. For up-to-the-minute updates on the event, call the SFAA hotline at 415-555-1212.

## COMET ISON: WHAT'S NEXT?

**Updated Nov. 16, 2013:** Comet ISON is now inside the orbit of Earth as it plunges headlong toward the sun for a fiery close encounter on Nov. 28th. The comet is putting on a good show for observatories around the solar system, especially after an outburst on Nov. 13-14 that boosted the comet's brightness 10-fold. NASA spacecraft and amateur astronomers alike are snapping crisp pictures of the comet's gossamer green atmosphere and suddenly riotous tail.



Comet ISON photographed on Nov. 15th by amateur astronomer Mike Hankey of Auberry, California. The comet's bright head and riotous tail are consequences of an outburst on Nov. 13-14 that significantly boosted the comet's level of activity. [More](#)

Because ISON has never passed through the inner solar system before (it is a first-time visitor from the distant Oort cloud), experts aren't sure what will happen next. Can the comet survive its Thanksgiving Day brush with the sun? Will it emerge as a bright naked-eye object?

Lowell Observatory astronomer Matthew Knight, a member of NASA's Comet ISON Observing Campaign, lays out some of the possibilities.

"I've grouped the possible outcomes into three scenarios, discussed in chronological order," says Knight. "It is important to note that no matter what happens, now that ISON has made it inside Earth's orbit, any or all of these scenarios are scientifically exciting. We're going to learn a lot no matter what."



*Photo: The breakup of Comet LINEAR (D/1999 S4) as viewed by Hubble Space Telescope in 2000. [More](#)*

### #1 Spontaneous Disintegration before Thanksgiving

The first scenario, which could happen at any time, is that ISON spontaneously disintegrates. A small fraction (less than 1%) of comets have disintegrated for no apparent reason. Recent examples include Comet LINEAR (C/1999 S4) in 2000 and Comet Elenin (C/2010 X1) in 2011. ISON is now reaching the region of space, within ~0.8 AU of the Sun where comets like these have disintegrated.

Comet ISON is being observed by a tremendous variety of telescopes on Earth and beyond. If ISON does disintegrate, it would be the best-observed case of cometary disruption in history and would likely contribute vast new information about how comets die.

### #2 Death by Sunburn around Thanksgiving Day

Assuming ISON survives the next few weeks intact, it faces an even more daunting challenge: making it around the Sun. At closest approach to the sun, the comet's equilibrium temperature will approach 5000 degrees Fahrenheit, hot enough to cause much of the dust and rock on ISON's surface to vaporize.

While it may seem incredible that anything can survive this inferno, the rate at which ISON will likely lose mass is relatively small compared to the actual size of the comet's nucleus. ISON needs to be 200 m wide to survive; current estimates are in the range 500 m to 2 km. It helps that the comet is moving very fast so it will not remain long at such extreme temperatures.



Unfortunately for ISON, it faces a double whammy from its proximity to the Sun: even if it survives the rapid vaporization of its exterior, it gets so close to the sun that the sun's gravity might actually pull it apart.

Destroyed comets can still be spectacular, though. Sungrazing Comet Lovejoy, for instance, passed within 100,000 miles of the sun's surface in December 2011. It disintegrated, forming a long tail of dust that wowed observers on Earth.

*Photo: Sungrazing Comet Lovejoy (C/2011 W3) seen over Australia in Dec. 2011. Image credit: Alex Cherney, TWAN. [More](#)*

### #3 Survival

The final case is the most straightforward: ISON survives its brush with the sun and emerges with enough nuclear material to continue as an active comet. If ISON survives intact, it would likely lose enough dust near the Sun to produce a nice tail. In a realistic best-case scenario, the tail would stretch for tens of degrees and light up the early morning sky like Comet McNaught (C/2006 P1) did in 2007.

The best of all possible worlds would be if ISON broke up just a bit, say, into a few large pieces. This would throw out enough extra material to make the comet really bright from the ground, while giving astronomers pieces of a comet to study for months to come.

"I'm clearly rooting for #3," says Knight.

"Regardless of what happens, we're going to be thrilled," he predicts. "Astronomers are getting the chance to study a unique comet traveling straight from 4.5 billion years of deep freeze into a near miss with the solar furnace using the largest array of telescopes in history."

"Hang on," he says, "because this ride is just getting started."

For updates and more information about Comet ISON as it approaches the sun, visit <http://isoncampaign.org>.

### Credits:

Author: [Dr. Tony Phillips](#) | Production editor: [Dr. Tony Phillips](#) | Credit: [Science@NASA](mailto:Science@NASA)

### More information:

Editor's note: The text of this story is closely based on a blog post by Matthew Knight at the CIOC web site. It is recommended reading for more information about the three scenarios: <http://www.isoncampaign.org/mmk/what-might-happen>

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**NIGHT SKY NETWORK**  
**November 2013 - THE EVENING SKY**  
**November Sky Map:** <http://skymaps.com/skymaps/tesmn1311.pdf>  
**November Sky Calendar:** <http://skymaps.com/articles/n1311.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

**EVERY FRIDAY NIGHT  
7:00 PM – 10:00 PM  
excluding major holidays**

**The Telescope Makers'  
Workshop**

**CHABOT SPACE AND SCIENCE  
CENTER  
10000 Skyline Boulevard  
Oakland, CA 94619-2450**

**THE TELESCOPE MAKERS' WORKSHOP** 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 & Science Center, 10000 Skyline Blvd., Oakland. Contact us for more specific details:

Contact: E-mail Richard Ozer ([rozer@pacbell.net](mailto:rozer@pacbell.net)) or (510) 406-1914

**EVERY FRIDAY & SATURDAY  
EVENING, weather permitting  
7:30 PM – 10:30 PM**

**CHABOT SPACE AND SCIENCE  
CENTER  
10000 Skyline Boulevard  
Oakland CA 94619-2450  
(510) 336-7300**

### **EXPLORE THE NIGHT SKIES AT THE CHABOT OBSERVATORIES**

For more information: <http://www.chabotspace.org/>

#### **Free Telescope Viewing**

Regular hours are every Friday & 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!

**Daytime Telescope Viewing** On Saturday and Sunday afternoons come view the sun, moon, or Venus through Chabot's telescopes. Free with General Admission. (weather permitting)

12pm - 5pm: Observatories Open

**Sunset – 5:11 PM  
(TWICE MONTHLY)**

**Inclement weather (clouds,  
excessive wind and showers)  
will cause the event to be  
canceled without notice.**

**SAN MATEO COUNTY  
ASTRONOMICAL SOCIETY  
STAR PARTY**

### **STAR PARTIES AT CRESTVIEW PARK, SAN CARLOS**

Come out and bring the kids for a mind expanding look at the universe

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.

For more information call Bob Black, (650)592-2166, or send an email to [SMCAS@live.com](mailto:SMCAS@live.com) or call Ed Pieret at (650)862-9602.

#### **Reasons to Attend**

If you have kids interested in space or planets bring them here for a real life view of planets, nebula, star clusters and galaxies.

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.

#### **Cautions**

Dress warmly and wear a hat.

Visitors should park on the street and walk into the park so your headlights don't affect the observer's dark adaptation.



	<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</b>  <b>10:00 AM – 12:00 PM</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE</b>  <b>12345 Moody Road</b>  <b>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</b>  <b>9:00 PM – 11:00 PM</b></p> <p><b>FOOTHILL COMMUNITY COLLEGE OBSERVATORY</b>  <b>12345 Moody Road</b>  <b>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 – NOVEMBER 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>	



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

1. Memberships, with dues payment, are for one year running from standard renewal dates of 1 July to 30 June and 1 January to 31 December.
2. Submitting appropriate dues in April, May, June, July, August, September, 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 Director and Board Member Emeritus</i>	John Dobson	
<i>Board Members</i>	Anhil Chopra Bob Haberman Sunil Nagaray Paul Salazar Mitchell Schoenbrun George Teiber	
<i>1st Alternate</i>	Suzanne Huang	
<i>2nd Alternate</i>	Joe Heavey	
<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](mailto: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](mailto:annette@sfaa-astronomy.org)
- 7) 8" f/10 Meade SCT/Stefanie Ulrey/[treasurer@sfaa-astronomy.org](mailto:treasurer@sfaa-astronomy.org)
- 8) 9.5" f/5.6 Celestron Newtonian/Ken Frank/ [ken@sfaa-astronomy.org](mailto: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 drawings. We would also like to hear from our new members. Tell us about yourself – what you have done in the past and what other clubs you have joined. **The deadline for the next issue is the 25th day of the month.** Send your articles to [Editor@sfaa-astronomy.org](mailto:Editor@sfaa-astronomy.org)

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



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.