

# ★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 56, No. 10 – October 2008

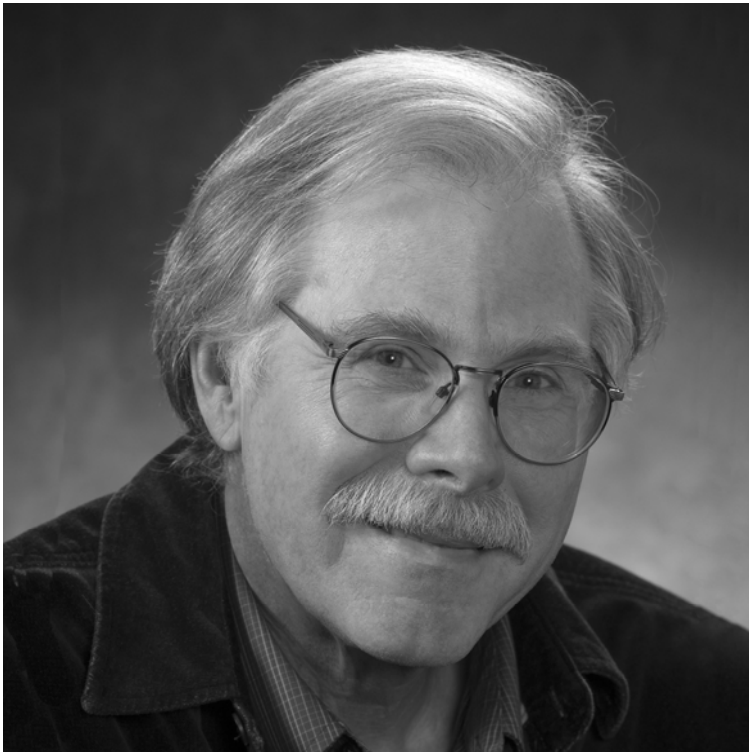
## Wednesday, November 19, 2008 – General Meeting

Randall Museum . 199 Museum Way . San Francisco

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

**Jeffrey N. Cuzzi, NASA Ames**

### WHAT HAVE WE LEARNED FROM THE CASSINI/HUYGENS MISSION TO SATURN



The Cassini-Huygens mission to Saturn and Titan, a joint venture of NASA and the European Space Agency, was launched in 1997 and arrived at Saturn in July 2004 for a four-year, 75-orbit tour of the Saturn system.

In early 2005, the ESA-built Huygens probe entered the atmosphere of Saturn's planet-sized moon Titan, which has a thick, hazy atmosphere, and obtained unique data during its descent including images of riverbeds and swampy lowlands. The talk will describe the results of Cassini and Huygens, as Cassini's four-year prime mission draws to a close and the two-year Extended Mission begins. Highlights will include results on the storms and winds of Saturn (including observations at depths never seen before), the structure, composition, age and origin of the magnificent ring system, the weather-beaten surface of Titan, with its dunes and lakes, and Saturn's retinue of strange icy moons including tiny Enceladus, with its south pole geysers and jets of water vapor and ice grains.

*Jeff Cuzzi's main interests are in planetary system origin and evolution. A radio astronomer in his early career, he was observing Saturn's weak ring emission with the NRAO interferometer in 1974 just when the exciting discovery was being made of strong radar backscattering from the rings. Resolving this paradox led him increasingly to learning about all aspects of Saturn's mysterious rings, and ultimately rings around other planets as well. He was invited to join the Voyager Imaging team in 1978, and led the Imaging team's rings subgroup through planning of all Saturn, Uranus, and Neptune encounter ring observations. In 1989 he was selected as Interdisciplinary Scientist for Rings on the NASA-ESA Cassini-Huygens mission, where his role is to coordinate ring observing strategies for scientists on all Cassini instrument teams. He has won awards from NASA, the AIAA, and the AGU for his work on planetary rings, and recently he has collaborated on several popular books on the Cassini results.*

## 2008 CLUB OFFICERS & CONTACTS

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## 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>

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## 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.

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*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 20th day of the month.** Send your articles to [Editor@sfaa-astronomy.org](mailto:Editor@sfaa-astronomy.org)

# IMPORTANT DATES

## SFAA GENERAL MEETINGS & LECTURES

*Wednesdays*  
November 19  
December 17  
January 21

7:00 p.m. Doors open. 7:30 p.m. Announcements. 8:00 p.m. Speaker  
Randall Museum, 199 Museum Way (Near 14<sup>th</sup> Street and Roosevelt)

## BOARD MEETINGS

*Tuesdays*  
November 11  
December 9  
January 13

7:00-8:30 p.m.  
Randall Museum, 199 Museum Way  
(Near 14<sup>th</sup> Street and Roosevelt)

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

Special Use Permit observing nights on Mount Tamalpais are private and open *only* to SFAA members. Please arrive by sunset (times listed below). A permit is required for each car. We must vacate the mountain by 2:00 a.m. except on specially approved nights (such as Messier Marathon).

### SATURDAYS - GATEKEEPERS NEEDED

September 27 ANNUAL STAR-B-QUE (Bootjack Picnic area) at 4:00 p.m. followed by SUP event (Rock Springs Parking Area) at 6:58 p.m.  
November 29 – 4:51 p.m.  
December 27 – 4:58 p.m.

## CITY STAR PARTIES - TELESCOPE CLINIC ONE HOUR BEFORE SUNSET

*Saturdays*

November 8 – 5:04 p.m. at Land's End (Point Lobos)  
December 20 – 4:51 p.m. at Randall Museum, 199 Museum Way (Near 14<sup>th</sup> Street and Roosevelt)

*Weather may cancel the City Star Party*

Please note that while City Star Parties WILL ALWAYS be held on Saturdays, some will be closer to the last quarter phase of the moon, while others will be close to first quarter. This is so we can work around dates for Mt. Tam public star parties as well as our members-only events on Mt. Tam.

*Map and directions – Land's End (Pt. Lobos)* <http://www.sfaa-astronomy.org/clubarchive/directions-pointlobos.php>

## MT TAM PUBLIC STAR PARTIES

### VOLUNTEER GATEKEEPERS ARE ALWAYS NEEDED

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, approx. 11 pm-2 am. For more information go here: <http://www.sfaa-astronomy.org/starparties/>



### NEW SFAA MEMBERS

Scope City is offering to new members a \$25 credit toward the purchase of telescopes and binoculars. Obtain a receipt for dues payment from Vivian White, Treasurer, [treasurer@sfaa-astronomy.org](mailto:treasurer@sfaa-astronomy.org). Contact Sam Sweiss at Scope City to arrange for your discount.

## PRESIDENT'S COLUMN

This month, I am writing a somewhat different version of my President's column. That is because I would like to hear from you rather than talking to you about our past and upcoming activities. I want to learn about your astronomical plans for 2009. Our club is only as good as the ideas and initiatives of you – our membership – are.

Yes, we will continue having star parties on Mt. Tam. But we are not sure about the future of our City Star Parties. We tried different formats and locations, and we experienced that it is very difficult to plan an event like this despite often unpredictable and rapidly changing weather conditions in the city. Some members like coming to the CSPs, many seem not to care whether we have this event or not. If you are passionate about our City Star Parties, then please let us know. Let us know what you like about them, where we should have them, and how you want to get engaged in keeping them alive.

The CSPs are only one of many examples. We will have monthly meetings and lectures, and we plan to go to Yosemite again next year. But what else do you care about when it comes to observing and astronomy? We live in a terrific location, have a great membership base, and we even have the means to organize additional events. But we really need to know what you are passionate about. And we need people to make all this happen. Let me know if you would like to serve on the Board, help organize one of our traditional events, or want to create a new event next year. You won't be on your own - the Board and the active membership will support you, but we need your initiative and participation to keep up the good work.

Here are some of the many things we need to organize next year. Use this as a starter list of ideas for how you can get involved:

- Be a gatekeeper at a Mt. Tam star party
- Host a telescope clinic at a city star party
- Give a talk at one of the CSPs at the Randall
- Provide refreshments for a General Meeting
- Write an article for the newsletter
- Write a regular column for the newsletter
- Provide content for our website

- Put together a current events news service
- Educate us about new online resources
- Teach workshops on telescope building etc.
- Provide the Mt. Tam hotline weather service
- Take on one of the many club functions
- Participate in public outreach star parties
- Conduct a Night Sky Network demonstration
- Organize an event like the annual dinner
- Organize next year's BBQ
- Help organize the Fremont Peak night
- Organize events for the 2009 solar eclipse
- Reinstate the tour to the Stanford accelerator
- Organize a visit to another research facility
- Act as point of contact with local museums
- Help organize a big OOT event like Yosemite
- Come up with another OOT event
- ... (Your very own idea)

Don't think there is no need for your creativity and support! Don't think you cannot pull this off!



Email me at [president@sfaa-astronomy.org](mailto:president@sfaa-astronomy.org)

DIRK LAMMERTS  
PRESIDENT

**!!!! SAVE THE DATE !!!!**  
**San Francisco Amateur Astronomers**  
**ANNUAL AWARDS DINNER**

*Saturday, January 24, 2009*  
*6:00 p.m. - No-host Bar 7:00 p.m. - Dinner*

**DELANCEY STREET RESTAURANT**  
*600 Embarcadero, San Francisco CA 94107 . (415) 512-5179*

**UPCOMING ELECTION - OPEN TREASURER POSITION**

The main duties of the Treasurer are processing renewals and new memberships, picking up mail from the post office box, banking the checks, and attending the board meetings. The Treasurer also maintains current and lapsed membership lists and sends an electronic file of address labels to the bulletin editor monthly. There are other occasional checks to be written, such as the post office box fees, insurance premiums and donations. About six hours a month on the duties of the office, plus the time needed for the board meeting.

If you have any interest and want to ask about it, please email me at [treasurer@sfaa-astronomy.org](mailto:treasurer@sfaa-astronomy.org).

**MEMBERSHIP DUES**



July, was time to renew your membership to the San Francisco Amateur Astronomers. Did you know that you are a member of the club the SF Weekly paper voted 2008's "Best Local Nerds"?! It's been a great year so far and there are many upcoming events you can attend. To make sure you don't miss out on all the fun to be had, please mail your payment to the following address, or bring it with you to a general meeting. If your address, email, or phone has changed, please include a note letting us know. Thanks!

\$10 - Youth (under 18) / Student Membership      \$25 - Individual Membership  
\$30 - Family or Foreign Membership                \$40 - Institutional Membership  
\$75 - Supporting Membership

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

For Astronomy magazine subscriptions that need to be renewed, please include an additional \$34 (or \$68 for 2 years) and a note with your membership renewal. Sky and Telescope can now be renewed directly at the same price when the notice comes to you, without going through SFAA, or at: <http://www.skyandtelescope.com/>

Vivian, SFAA Treasurer

# ***ANNUAL AWARDS .....***

**ASTROPHOTOGRAPHY, ASTRONOMICAL ARTS, WHERE POSSIBLE, AND LITERARY SUBMISSIONS RECEIVED ON OR BEFORE NOVEMBER 25 WILL BE POSTED IN THE DECEMBER NEWSLETTER**

## *Astrophotography*



Members are encouraged to submit astrophotographs (up to three entries per member) for judging. All entries will be accepted and exhibited at the December meeting and voted upon by the general membership. Entries must have been taken this year (2008) and be of an astronomical theme. Size should be reasonable (11' x 14' or less), mounted or unmounted.

## *Astronomical Arts*



This contest is open to all members and will be judged by the membership at the December General Meeting. Any art related to astronomy is welcome. Your drawings of astronomical objects are worth sharing with other club members, as well as craftwork, sculpture, jewelry, and paintings -- there are almost no restrictions here. Size is a consideration since we have to fit all entries, and club members, in the museum, alongside the Astrophotography Award entries. Also, no living critters, please. The museum may frown upon any living, breathing things that are not part of official exhibits. Live acts are restricted to the human kind. Please bring your entries to the December meeting. Any questions can be directed to club officers listed on page two in this bulletin.

## *Literary*



Submissions may be fact or fiction, humor or opinion. You may have a favorite story about an observing experience, a trip, or about people who have crossed your astronomical path in one memorable way or another. Share the stories of your astronomy observing and/or travel experiences, maybe an article you have written, and enable us to appreciate them with you.

**Members will cast votes at the upcoming Members' Night meeting on December 17.  
Prizes for first, second and third place winners will be awarded.**



## SFAA STAR REWARDS

### **Volunteers make SFAA activities possible – This program is for you!**

All SFAA activities and events are planned and organized by volunteers. We instituted this program to recognize the contributions of our members and to encourage broader participation in conducting future SFAA activities.

### **How do I earn STAR REWARDS points?**

You earn STAR REWARDS points by volunteering for SFAA activities. Qualifying activities will be published in the “Above the Fog” newsletter or via email announcement. The program will start on September 1, 2008. The initial list of qualifying activities is printed below. This list will be updated from time to time. We will announce at a later date how STAR REWARDS points will be handed out and administered.

<b>SFAA STAR REWARDS Qualifying Activities (updated: 08/17/08)</b>		
<b>Event</b>	<b>Qualifying activity</b>	<b>Points</b>
Academy of Sciences Opening	SFAA booth per 2 or 2.5 hour time slot	1
Annual Star-B-Q	Volunteer (officially signed up)	1
Mt. Tam public star party	Gatekeeper (officially signed up)	1
Mt. Tam SUP star party	Gatekeeper (officially signed up)	1
CSP	Speaker at quarterly CSP at Randall	1
General meeting	Providing refreshments	1

### **What can I use STAR REWARDS points for?**

SFAA will conduct a raffle drawing at the December General Meeting with, for example, astronomy or telescope gadgets, books, etc. as prizes. Your STAR REWARDS points can be exchanged for raffle tickets. The more points you enter, the more tickets you will receive, and the higher your chance of taking one of these prizes home. In addition, we might offer members to redeem STAR REWARDS points to secure a spot at special SFAA sponsored or subsidized events.

STAR REWARDS points earned through June 30, 2009 will expire December 31, 2009. STAR REWARDS points can be earned or redeemed by SFAA members in good standing only. STAR REWARDS points are transferable between SFAA members. Additional terms and conditions might apply. Terms and conditions for the SFAA STAR REWARDS program subject to change upon notice.

# WORLD WIDE TELESCOPE BRINGS SPACE EXPLORATION TO EARTH

Toney Burkhardt

<http://www.worldwidetelescope.org>

A service free of charge from Microsoft lets students and lifelong learners tour the night sky using high-resolution images from the world's best land-and space-based telescopes.

The final frontier got a bit closer as Microsoft Corp. officially launched the public beta of its WorldWide Telescope, which is now available at <http://www.worldwidetelescope.org>

WorldWide Telescope is a rich web application that brings together imagery from the best ground- and space-based observatories across the world to allow people to easily explore the night sky through their computers.

WorldWide Telescope has been eagerly anticipated by the astronomical and educational communities as a compelling astronomical recourse for students and lifelong learners, and as a way to make science fun for children.

"The WorldWide Telescope is a powerful tool for science and education that makes it possible for everyone to explore the universe," said Bill Gates, Chairman of Microsoft. "By combining terabytes of incredible imagery and data with easy-to-use software for viewing and moving through all that information, the WorldWide Telescope opens the door to new ways to see and experience the wonders of space. Our hope is that it will inspire young people to explore astronomy and science, and help researchers in their quest to better understand the universe."

The application itself is a blend of software and Web 2.0 services created with the Microsoft high-performance Visual Experience Engine, which allows seamless panning and zooming around the heavens with rich image environments. WorldWide Telescope stitches together terabytes of high-resolution images of celestial bodies and displays them in a way that relates to their actual position in the sky. People can freely browse through the solar system, galaxy and beyond, or take advantage of a growing number of guided tours of the sky hosted by astronomers and educators at major universities and planetariums.

"WorldWide Telescope brings to life a dream that many of us in Microsoft Research have pursued for years, and we are proud to release this as a free service to anyone who wants to explore the universe," said Curtis Wong, manager of Microsoft's Next Media Research Group. "There is Saturn in the sky, in relationship to the moon? Does the Milky Way really have a supermassive black

hole in the center of the galaxy? With the universe at your fingertips, you can discover the answers for yourself."

The service goes well beyond the simple browsing of images. Users can choose which telescope they want to look through, including the Hubble Space Telescope, the Chandra X-Ray Observatory Center, the Spitzer Space Telescope or others. They can view the locations of planets in the night sky – in the past, present or future. They can view the universe through different wavelengths of light to reveal hidden structures in other parts of the galaxy. Taken as a whole, the application provides a top-to-bottom view of the science of astronomy.

"Users can see the X-ray view of the sky, zoom into bright radiation clouds, and then cross-fade into the visible light view and discover the cloud remnants of a supernova explosion from a thousand years ago," said Roy Gould, a researcher at the Harvard-Smithsonian Center for Astrophysics. "I believe this new creation from Microsoft will have a profound impact on the way we view the universe."

Microsoft Research has formed close ties with members of the academic, education and scientific communities to make WorldWide Telescope a reality. NASA along with other organizations collaborated with Microsoft Research to provide the imagery, provide feedback on the application from a scientific point of view, and help turn WorldWide Telescope into a rich learning application.

Microsoft's mission to make the universe accessible to everyone was begun years ago by renowned Microsoft Senior Researcher Jim Gray. WorldWide Telescope is built on top of Gray's pioneering development of large-scale, high-performance online databases including SkyServer and his contributions to the Sloan Digital Sky Survey, a project to map a large part of the Northern sky outside of the galaxy. Microsoft Research is releasing WorldWide Telescope as a service free of charge to the astronomy and education communities as a tribute to Gray with the hope that it will inspire and empower kids of all ages to explore and understand the universe in an unprecedented way.



## STEPS TO DOWNLOAD WWT

- **Review the system to ensure that WWT can run on your computer.**
- **Click Download.**

If you don't have Microsoft .NET Framework 2.0, or later, installed on your computer, a message box displays prompting you to install it. Click "Yes" to go to the .NET Framework 2.0 SDKs, Redistributables & Service Packs page.

- On the .NET Framework 2.0 SDKs, Redistributable Package page, scroll down the page to the .NET Framework Version 2.0 Redistributable Package section, and then click the link for your computer's architecture and operating system. Note: Most computers currently use a 32-bit architecture and operating system and should click the Download x86 version.

- On the Microsoft .NET Framework 2.0 Redistributable Package page, read the system requirements to ensure that your computer has all the necessary software installed, and then click Download.

- In the File Download – Security Warning message box, click Run.

- In the Internet Explorer – Security Warning message box, click Run.

- Follow the software installation instructions.

- After the software has been installed, click the Windows Update link to make sure that you have all the latest service packs and security updates. Click Express to review all recommended software and follow the software installation instructions.

- In the File Download – Security Warning message box, click Run.

- In the Internet Explorer – Security Warning message box, click Run.

- Follow the instructions in the WorldWide Telescope Setup Wizard.

- After WWT installs, double-click the WWT icon on your desktop to open WWT.

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## NEWS OF NOTE

**NASA RELEASE: 08-291: LUNAR ORBITER IMAGE RECOVERY PROJECT (LOIRP) OVERVIEW**

<http://www.nasa.gov/topics/moonmars/features/LOIRP/>

<http://www.moonviews.com/>

<http://www.nasa.gov/exploration>

**NOW IN SIGHT: FAR-OFF PLANETS**

<http://www.nytimes.com/2008/11/14/science/space/14planet.html?ref=science>

**HUBBLE UP AND RUNNING, WITH A PICTURE TO PROVE IT**

<http://www.nytimes.com/2008/10/31/science/space/31hubble.html?ref=space>

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**BENJAMIN DEAN LECTURE SERIES**  
**Jewish Community Center of San Francisco**  
**3200 California Street (at Presidio Avenue)**

The Fall Benjamin Dean Lecture Series in Astronomy features exciting information about some of the newest telescopes and spacecraft exploring space. While the California Academy of Sciences is reopening to the public on September 27, the fall Dean Series will still be held at the Jewish Community Center at 3200 California Street in San Francisco. Tickets are \$5 each, and are available online at <http://www.calacademy.org/events/index.php> or at the door. Parking is available across the street in the UCSF Laurel Heights campus parking lot or in the JCCSF garage. The #1 California, #3 Jackson, #4 Sutter, and #43 Masonic MUNI lines stop directly in front of the building. The #38 Geary and #24 Divisadero stop four to five blocks away.

The lectures will return to Golden Gate Park to take up their permanent home in the new Morrison Planetarium in January with the first lecture of the 20<sup>th</sup> Anniversary Benjamin Dean Lecture Series. Speakers will be Fellows of the California Academy of Sciences, and will include cosmologist Alex Filippenko, planet hunter Geoff Marcy, SETI Director Jill Tarter, and astrobiologists David Morrison and David Des Marais.

**Monday, December 15, 7:30 p.m.**

**Dr. Robert Gold, Applied Physics Laboratory, Johns Hopkins University**

**“The MESSENGER Mission to Mercury”**

The MESSENGER spacecraft is on its way to orbit Mercury, a planet of extremes. Mercury has the greatest temperature variation, the highest density, and the most Earth-like magnetosphere of any planet. Despite Mercury often being the closest planet to Earth, very little was known about it because it is very difficult to observe and study. It has taken 30 years to mount an orbital mission to this terrestrial planet. MESSENGER has already flown by the planet twice. It has revealed exciting new information about Mercury’s structure and the geological processes that have shaped it. This lecture will cover the challenges of developing a spacecraft to deal with the extreme environment at Mercury and show some of the amazing scientific results from the MESSENGER flybys.

## MEMBERSHIP DUES

SFAA membership now comes due in June. Before now, dues were payable in the month a member first joined. Last year, the SFAA board voted to make everyone's dues payable at the same time - in June of each year. This was done for two reasons: 1) to save a great deal of work for our volunteer Treasurer, present and future, and, 2) for the convenience of members - it's easier to remember! In the past, many members forgot their due date and their membership unintentionally lapsed.

N.B. for those of you who have a club discounted *Sky and Telescope* magazine subscription, you will need to renew your subscription separately. The magazine will send you a renewal notice. In the past, you had to send that renewal notice with payment to the SFAA; now you can mail your *Sky and Telescope* subscription renewal payment directly to *Sky and Telescope*. **Note: Not renewing your club membership on time may mean your magazine subscription(s) will also terminate.**

Thanks for bearing with us during this transition process -- it'll all seem worth it next year! Just complete the membership form on the last page of the newsletter and submit with your renewal check to:

San Francisco Amateur Astronomers  
P.O. Box 15097  
San Francisco, CA 94108

### YEARLY RATES FOR MEMBERSHIP

\$10 – Youth (under 18) Student Membership	\$25 – Individual Membership
\$30 – Family or Foreign Membership	\$40 – Institutional Membership
\$75 – Supporting Membership	

### MEMBER BENEFITS INCLUDE

- Subscribing to our Announcements mailing list to receive newsletter, activity and event announcements.
- Interaction with world class speakers as they present cutting edge astronomical research
- Discounts on [Sky & Telescope](#) and [Astronomy](#) magazines\*
- Discounts on equipment and accessories at [local telescope retailers](#)
- Annual club Astrophotography, Literary & Art Awards
- Social events, such as our annual picnic and our awards dinner
- Club telescopes – use one of the club's loaner scopes on a month-to-month basis
- Yosemite Star Party – held at Glacier Point exclusively for SFAA members
- Access to events and resources in Northern California and beyond
- Field trips – to observatories and other locations of scientific interest, such as Mt. Wilson Observatory in Pasadena, Chabot Space and Science Center, Fremont Peak, and the Stanford Linear Accelerator Center
- Extended observing hours at the Mount Tamalpais Astronomy Program
- Access to dark sites in Northern California

San Francisco Amateur Astronomers  
POB 15097  
San Francisco CA 94115

Please make checks payable to San Francisco Amateur Astronomers and mail to:

\_\_\_\_\_ E-Mail  
\_\_\_\_\_ Hard Copy

You can choose E-Mail (Recommended) or hard copy delivery for Above the Fog (Check one)

Information: Name(s) \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_  
Home Phone \_\_\_\_\_  
E-Mail \_\_\_\_\_  
Zip \_\_\_\_\_

Membership Categories (Check one): \_\_\_\_\_  
\$10 Youth/Student \_\_\_\_\_  
\$25 Individual \_\_\_\_\_  
\$75 Supporting \_\_\_\_\_  
\$30 Family \_\_\_\_\_  
\$40 Institutional \_\_\_\_\_

Members pay one half the amount listed below  
Membership is billed for each upcoming year on June 30. Between January 1 and June 30, new

MEMBERSHIP APPLICATION

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



Information Hotline: (415) 289-6636

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