

# ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

**Vol. 63, No. 7 – July 2015**

**GENERAL MEETING**

**THE PRESIDIO . OBSERVATION POST . BUILDING 211**

**211 Lincoln Boulevard, San Francisco**

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

**Effective February 17, 2015: SFAA's General Meetings occur on the 3<sup>rd</sup> TUESDAY of each month (except January)**

**TUESDAY, AUGUST 18 - 7:30 P.M.**

**HABITABLE MOONS IN OUR SOLAR SYSTEM AND BEYOND**

a presentation by  
**CHRIS MCKAY**



Once monthly, the San Francisco Amateur Astronomers hosts distinguished guest speakers who are leaders in the fields of astronomy, physics, and related disciplines, to present the latest developments from cutting-edge scientific programs.

On August 18, join NASA Ames research scientist Chris McKay for a presentation on **Habitable Moons in our Solar System and Beyond**. Dr. McKay's research focuses on planetary science and the origin of life. He is also actively involved in planning for future Mars missions including human exploration.

In this presentation, McKay will discuss the expanding criteria for a habitable world. Taking into consideration the numerous extrasolar planets so far discovered and the prospect of discovering extrasolar moons, McKay believes it is timely to reconsider the possibilities for habitability in the Solar System and on extrasolar planets and moons, and how scientists determine the attributes and search methods for detecting habitable worlds and evidence of life.

*Chris McKay's research focuses on the evolution of the solar system and the origin of life. I'm also actively involved in planning for future Mars missions including human exploration. I have been involved with polar and desert research, traveling to the Antarctic Dry Valleys, the Atacama Desert, the Arctic, and the Namib Desert to conduct research in these Mars-like environments.*

## **SAN FRANCISCO AMATEUR ASTRONOMERS' NEW HOME**

**NEW MEETING LOCATION  
EFFECTIVE  
FEBRUARY 2015**

**THE PRESIDIO OBSERVATION POST - BUILDING 211**  
<http://www.presidio.gov/venues/Documents/Bldg%200211%20Floor%20Plan.pdf>

**Driving Directions**

<http://www.presidio.gov/venues/Pages/observation-post-at-the-presidio-driving-directions.aspx>

**Public transportation information link**

<http://www.presidio.gov/transportation/Pages/default.aspx>



# UPCOMING LECTURES



**September 15, 2015**  
**Elisa Quintana, SETI Institute**  
**Earth-Sized Planets in the Habitable**  
**Zones of Cool Stars**

A primary goal of the Kepler mission is to determine the frequency of Earth-sized planets in the habitable zones of other stars. M dwarfs, stars that are smaller and cooler than the Sun, comprise more than 70% of the stars in our galaxy. Finding that Earth-sized planets around M dwarfs are common, therefore, has big implications for determining the frequency of other Earths.

In April 2014 we announced the discovery of Kepler-186f, the first definitive Earth-sized planet found to orbit in the habitable zone of a star other than our Sun. We will discuss our methods of combining ground-based observations with transit modeling to confirm this system, and will present our theoretical studies on the formation and habitability of this planet. We will also present updates on several promising multi-planet systems that have Earth-sized, and possibly sub-Earth-sized, candidates in the habitable zones of cool low-mass stars in the Kepler field-of-view.

*Dr Elisa Quintana is a research scientist with the SETI Institute and NASA Ames Research Center where she works on the Kepler Mission to help search for and characterize extrasolar planets. Most recently, she led a team of astronomers to confirm Kepler-186f, the first Earth-sized planet found to orbit within the habitable zone of another star. Her research also includes creating computer models to study the formation, dynamical stability and habitability of rocky planets within and beyond our solar system.*



## SAN FRANCISCO AMATEUR ASTRONOMERS

### 2015 STAR PARTY DATES

## SEPTEMBER CHANGE OF DATE FOR MOUNT TAMALPAIS STAR PARTY

*We were recently informed that The Mountain Theater on Mount Tamalpais has been double-booked for Saturday September 19. SFAA and the Friends of Mt. Tam had been planning to present a public astronomy program that night with Dr. Carolyn Porco talking about a decade of exploring Saturn with the Cassini spacecraft followed by a public star party in the Rock Springs parking area. But there will be a concert in the Mountain Theater September 19, so the schedule has been changed.*

*We will hold a public astronomy program on Saturday, September 12, with Dr. Porco's lecture starting at 8:00 pm, followed by telescope observing. There will be a new Moon that night, so this will be a great opportunity to show the public the Milky Way and other deep sky objects that show up best in a dark sky.*

*On Saturday, September 19, there will be an SFAA members night star party at Mt. Tam's East Peak. East Peak has a wide open horizon and a dramatic view of the entire bay area (which we hope will be covered by fog!).*

*Please make note of these changes. Telescope operators and other interested SFAA members are always needed at our star parties, both on Mt. Tam and in San Francisco. You can find the Mt. Tam public astronomy program schedule at <http://www.friendsofmontam.org/astronomy/schedule>. SFAA members nights and City star parties are listed at <http://www.sfaa-astronomy.org/events/>.*

Below is the schedule for 2015 **San Francisco City Star Parties** staffed by volunteers of the SFAA. Note that the Presidio, our new host for SFAA meetings during the Randall Museum renovation, is a favored Star Party location for 2015. Lands End, a traditional City Star Party location, and Pier 17 adjacent to the Exploratorium museum, are the other Star Party sites.

Tuesday	August 25	Presidio Parade Grounds, 7:30 PM
Thursday	September 24	The Exploratorium, 6:30 PM
Thursday	October 22	Presidio Parade Grounds, 6:00 PM
Saturday	November 21	Lands End, 5:30 PM
Saturday	December 19	Presidio Parade Grounds, 5:30 PM



**FRIENDS OF  
MT TAM**

# Astronomy Nights on Mt. Tamalpais

Sign up for free Friends of Mt Tam **eMail  
Announcements**  
Free and open to all (no signup)

## 2015 MT TAM ASTRONOMY PROGRAMS

Our 27th year on the mountain

Dr. Lynn Rothschild, NASA-AMES, Synthetic Biologist  
[solarsystem.nasa.gov/people/profile.cfm?Code=RothschildL](http://solarsystem.nasa.gov/people/profile.cfm?Code=RothschildL)

### **"A Biological Perspective on the Meaning of Time"**

**Aug 22**  
**8:30pm**

Life is a phenomenon that integrates processes ranging from the near instantaneous reactions of photosynthesis to the more stately pace of evolution. How are these processes with radically different time scales creating and maintaining the diversity of life on earth? What are the clocks that nature uses to time them? And how is modern biology being used to alter the natural time scales?

Dr. Carolyn Porco, Space Science Institute, CICLOPS Director  
[spacescience.org/about\\_ssi/staff/porco.html](http://spacescience.org/about_ssi/staff/porco.html)

### **"In the Land of Enchantment: A Decade Exploring Saturn"**

**Sept 12**  
**8:00pm**  
(Note Date Change)

A glistening spaceship, with seven lonely years and billions of miles behind it, glides into orbit around a softly-hued, ringed planet. A flying-saucer shaped machine descends through a hazy atmosphere and lands on the surface of an alien moon. These visions are not a dream but tell of the explorations of the Cassini spacecraft and its Huygens probe in 2004. Come along for the ride, and witness the sights and magic worked by these emissaries from Earth to the enchanting realm of Saturn.

Dr. Geoff Marcy, UC Berkeley, Professor of Astronomy  
[astro.berkeley.edu/people/faculty/marcy.html](http://astro.berkeley.edu/people/faculty/marcy.html)

### **"Prospects and Hunting for Intelligent Life in the Universe"**

**Oct 17**  
**7:30pm**

Not one microbe has been found anywhere in the universe, except on Earth, nor have any intelligent civilizations been found. Is our Galaxy teeming with life, as suggested by science fiction, or might intelligent life be rare in the Milky Way Galaxy? New telescopes and techniques can answer these questions.



# **SAN FRANCISCO AMATEUR ASTRONOMERS EXPEDITION**

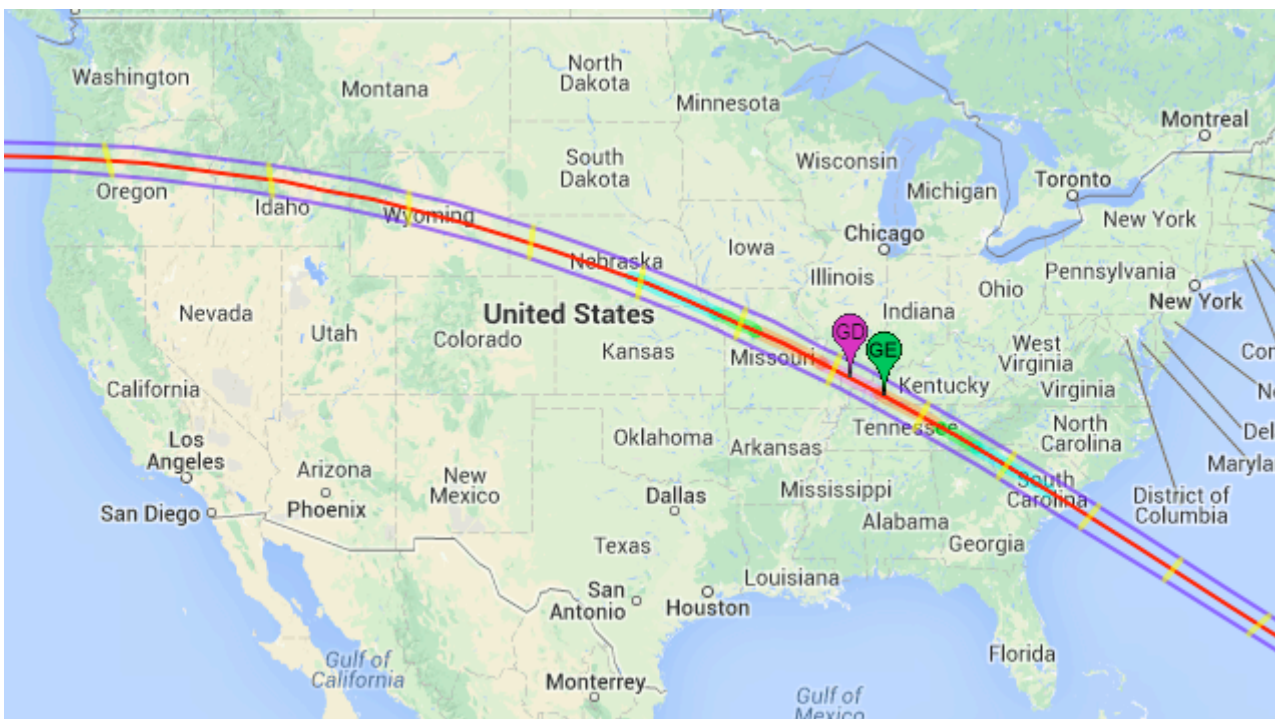
**August 21, 2017**

**TOTAL SOLAR ECLIPSE  
Jackson Hole, Wyoming  
(Teton Mountains)**

The San Francisco Amateur Astronomers is organizing an expedition to witness the August 21, 2017 Total Solar Eclipse. The eclipse will be visible across a broad swath of the USA, and club members will gather near Jackson Hole, Wyoming, to witness this spectacle high in the Teton Mountains. The trip is an opportunity for club members to gather in one place along the path of totality and journey together up the mountains for viewing of this spectacular astronomical phenomenon.

The club has arranged with a hotel in Teton Village, Wyoming, to enable advance bookings (2 years in advance!) with a special club rate of 10% discount. If you are a member of the SFAA and are interested in this, send an email to [2017eclipse@sfaa-astronomy.org](mailto:2017eclipse@sfaa-astronomy.org) and you'll be provided with additional details on the hotel and booking code. In the coming months the club will organize additional talks and events that will take place at the hotel on and before the date of totality. At this time, the most important thing is to book your hotel room so if you are at all considering this eclipse, get in touch and get your reservation in today. SFAA is not organizing air or ground transportation; that is left to each individual group or attendee.

If you have any other questions, send to [2017eclipse@sfaa-astronomy.org](mailto:2017eclipse@sfaa-astronomy.org).





# 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.

Chabot's TMW is one of only a handful of regularly scheduled telescope making workshops in the U.S., and probably the world; it meets every Friday evening throughout the year, except Memorial Day weekend. It has been in operation since December of 1930, founded by Franklin B. Wright, and is currently run by Eastbay Astronomical Society member Rich Ozer, with help from other EAS members, Dave Barosso, Barry Leska, and others. The price of admission is FREE. All you have to do is show up, buy a mirror blank and a "tool" (typically around \$100 - \$200 depending on the size of the mirror) and start "pushin' glass!" We supply you with instruction, the various grits you'll need to first grind, and then polish and figure your mirror, and all the testing equipment needed. With a small bit of luck, you could wind up with a telescope that costs 1/3 or 1/4 the cost of a store-bought telescope, that is yet optically superior! It does take time - depending on how much time you put in on it, and other factors, it could take a few months or several months. But, it's a fun project, great for kids, and at the end you get a great telescope!

For more information call or email Richard Ozer at [rozer@pacbell.net](mailto:rozer@pacbell.net) or phone (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.chabot.space.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

<p><b>Sunset – 5:11 PM (TWICE MONTHLY)</b></p> <p><b>Inclement weather (clouds, excessive wind and showers) will cause the event to be canceled without notice.</b></p> <p><b>SAN MATEO COUNTY ASTRONOMICAL SOCIETY STAR PARTY</b></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, <b>(650)592-2166</b>, or send an email to <a href="mailto:SMCAS@live.com">SMCAS@live.com</a> or call Ed Pieret at <b>(650)862-9602</b>.</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><b>Cautions</b></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.</p> <p>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><b>Schedule Time</b></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. 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 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>
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## **BAY AREA EVENTS – AUGUST 2015**

<p><b>MONDAY, 8/10</b>  <b>7:30 PM</b></p> <p><b>LONG NOW FOUNDATION</b>  <b>SF JAZZ CENTER</b>  <b>201 Franklin Street</b>  <b>San Francisco 94102</b></p> <p><b>Cost: \$16.52 General</b>  <b>Free for members</b></p>	<p>We are one tool away from learning which distant planets already have life on them and which might be welcoming to life.</p> <p>MIT Planetary Scientist Sara Seager is working on the tool. She is chair of the NASA team developing a "Starshade" that would allow a relatively rudimentary space telescope to observe Earth-size planets directly, which would yield atmospheric analysis, which would determine a planet's life-worthiness.</p> <p>Despite 1,000-plus exoplanet discoveries by the Kepler spacecraft and the hundreds more expected from the Transiting Exoplanet Survey Satellite after 2017, neither instrument can make detailed observation of the atmosphere of small rocky planets, because each star's brilliance overwhelms direct study of the rocky notes that might harbor life. A Starshade cures that.</p> <p>A former MacArthur Fellow, Seager is author of Exoplanet Atmospheres (02010) and an astrophysics professor at MIT. Her maxim: "For exoplanets, anything is possible under the laws of physics and chemistry."</p> <p>Contact:  Website:<a href="http://longnow.org/seminars/02015/aug/10/other-earths-other-life/">http://longnow.org/seminars/02015/aug/10/other-earths-other-life/</a></p>
<p><b>TUESDAY, 8/11</b>  <b>12:00 NOON</b></p> <p><b>SETI INSTITUTE COLLOQUIUM SERIES</b>  <b>189 Bernardo Avenue</b>  <b>Mountain View 94043</b></p>	<p><b>HOWARD ZEBKER</b>  <b>STANFORD UNIVERSITY</b></p> <p><b>TITAN'S OCEANS OBSERVED BY CASSINI RADAR</b></p>

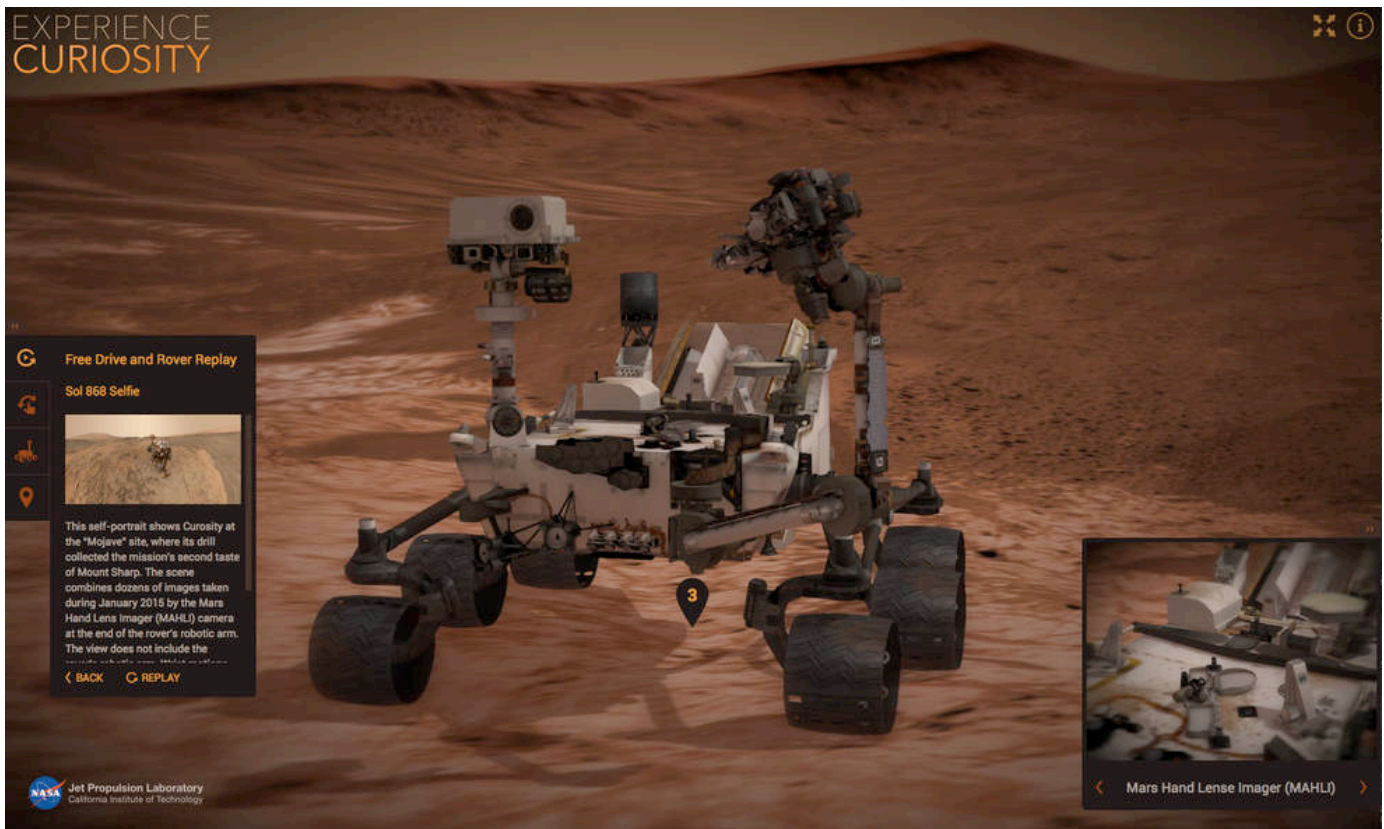


<p>WEDNESDAY 8/12 7:00 PM - 10:00 PM</p> <p><b>OREGANO'S WOOD-FIRED PIZZA</b> <b>4546 El Camino Real</b> <b>Los Altos, CA 94022</b></p> <p>Cost: Free</p>	<p><b>POWERING A MOON BASE THROUGH THE LUNAR NIGHT</b></p> <p>How can we economically supply power to a Moon Base for humans, robots and equipment when there is no available sunlight during the 2-week lunar night? Join experts Michael Abramson, Roger Arnold and Joseph Bland for the results of their detailed analysis. Learn about new power technologies that can colonize the Moon and economically extract its valuable ores and materials.</p> <p>Website: <a href="http://spacesociety-sv.org/events.html">http://spacesociety-sv.org/events.html</a></p>

## NASA SCIENCE NEWS

Aug. 5, 2015  
15-164

### New Online Exploring Tools Bring NASA's Journey to Mars to New Generation



A screen capture from NASA's new Experience Curiosity website shows the rover in the process of taking its own self-portrait. Users can view Mars through the eyes of the rover, using the window in the lower, right corner. The control panel at left helps users navigate the rover itself, and relive some of its actual expeditions on Mars. Visit the website online at: <http://eyes.nasa.gov/curiosity/>.

**Credits: NASA/JPL-Caltech**

On the three-year anniversary of the Mars landing of NASA's Curiosity rover, NASA is unveiling two new online tools that open the mysterious terrain of the Red Planet to a new generation of explorers, inviting the public to help with its [journey to Mars](#).

[Mars Trek](#) is a free, web-based application that provides high-quality, detailed visualizations of the planet using real data from 50 years of NASA exploration and allowing astronomers, citizen scientists and students to study the Red Planet's features.



A panorama combining images from both cameras of the Mastcam on NASA's Curiosity Mars Rover shows diverse geological textures on Mount Sharp. Three years after landing on Mars, the mission is investigating this layered mountain for evidence about changes in Martian environmental conditions.

**Credits: NASA/JPL-Caltech/MSSS**

[Experience Curiosity](#) allows viewers to journey along with the one-ton rover on its Martian expeditions. The program simulates Mars in 3-D based on actual data from Curiosity and NASA's Mars Reconnaissance Orbiter (MRO), giving users first-hand experience in a day in the life of a Mars rover.

A NASA team already is using Mars Trek to aid in the selection of possible landing sites for the agency's [Mars 2020 rover](#), and the application will be used as part of NASA's newly-announced process to examine and select candidate sites for the first human exploration mission to Mars in the 2030s.

"This tool has opened my eyes as to how we should first approach roaming on another world, and now the public can join in on the fun," said Jim Green, director of NASA's Planetary Science Division in Washington. "Our robotic scientific explorers are paving the way, making great progress on the journey to Mars. Together, humans and robots will pioneer Mars and the solar system."

Mars Trek has interactive maps, which include the ability to overlay a range of data sets generated from instruments aboard spacecraft orbiting Mars, and analysis tools for measuring surface features. Standard keyboard gaming controls are used to maneuver the users across Mars' surface and 3-D printer-exportable topography allows users to print physical models of surface features.

Mars Trek was developed by NASA's [Lunar Mapping and Modeling Project](#), which provides mission planners, lunar scientists and the public with analysis and data visualization tools for our moon. LMMP is managed by NASA's Solar System Exploration Research Virtual Institute at NASA's [Ames Research Center](#) in Moffett Field, California.



[Experience Curiosity](#) also uses real science data to create a realistic and game-ready rover model based entirely on real mechanisms and executed commands. Users can manipulate the rover's tools and view Mars through each of its cameras.

NASA's Curiosity Mars Rover drilled this hole to collect sample material from a rock target called "Buckskin" on July 30, 2015, about a week prior to the third anniversary of the rover's landing on Mars. The diameter is slightly smaller than a U.S. dime.

**Credits: NASA/JPL-Caltech/MSSS**

"We've done a lot of heavy 3-D processing to make Experience Curiosity work in a browser. Anybody with access to the web can take a journey to Mars," said Kevin Hussey, manager of the Visualization Applications and Development group at NASA's [Jet Propulsion Laboratory](#) (JPL) in Pasadena, California, which manages and operates the Curiosity rover.

Curiosity's adventures on the Red Planet began in the early morning hours of Aug. 6, 2012, Eastern time (evening of Aug. 5, Pacific time), when a landing technique called the sky-crane maneuver deposited the rover in the 96-mile-wide Gale Crater. From there, the rover began investigating its new home, discovering it had landed near an ancient lakebed sprinkled with organic material. Billions of years ago, fresh water would have flowed into this lake, offering conditions favorable for microbial life.

"At three years old, Curiosity already has had a rich and fascinating life. This new program lets the public experience some of the rover's adventures first-hand," said Jim Erickson, the project manager for the mission at JPL.

NASA has been on Mars for five decades with robotic explorers, and August traditionally has been a busy month for exploration of the planet. Viking 2 was put into orbit around Mars 39 years ago on Aug. 7, 1976, making NASA's second successful landing on the Martian surface weeks later. MRO was launched on Aug. 12, 2005 and still is in operation orbiting Mars. And, Tuesday, Aug. 4 marked the eight-year anniversary of the launch of the Phoenix mission to the north polar region of the Red Planet.

NASA's orbiters and rovers have changed the way we look at Mars and enable continued scientific discoveries that one day will pave the way for astronauts to explore the Red Planet.

More information about NASA's journey to Mars is available online at:

<https://www.nasa.gov/topics/journeymars>

For more information about Curiosity, visit:

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

To download and print a 3-D model of Curiosity, go to:

<http://nasa3d.arc.nasa.gov/detail/mars-rover-curiosity>

-end-

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*Last Updated: Aug. 5, 2015*  
*Editor: Gina Anderson*



# San Francisco Amateur Astronomers

PO Box 15097  
San Francisco, CA 94115

## 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 -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.