ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 63, No. 9 – September 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 3rd TUESDAY of each month (except January)

SEPTEMBER 15, 2015
ELISA QUINTANA, SETI INSTITUTE
EARTH-SIZED PLANETS IN THE HABITABLE ZONES OF COOL STARS

This year marks the 20th anniversary of the first exoplanet discovered to orbit another star like our Sun. The field of exoplanets has since progressed dramatically, with a large part due to the success of NASA's Kepler Mission, which has discovered and confirmed over 1,000 planets in our galaxy to date. Kepler's primary goal is to determine the frequency of Earth-sized planets in the habitable zones (HZ) of other stars, regions within which a planet could sustain liquid water on its surface. In April 2014, we announced the discovery of Kepler-186f, the first Earth-sized planet found to orbit in the HZ of a star other than our Sun. While Kepler-186f is comparable to Earth in terms of size and the amount of starlight it receives, it orbits an M dwarf, a star that is smaller and cooler than the Sun. I will present our work on the discovery and confirmation of Kepler-186f and will present new models on how these planets may have formed. M dwarfs present a new set of challenges for planetary habitability, as planets orbiting in their HZs are subject to stellar flares, high speed impacts, and they orbit close enough to their star that they may become tidally locked.

I will discuss our current knowledge on the potential habitability of planets around M dwarfs, and will compare their challenges to those faced by other HZ planets that have since been discovered around other stars that are more like our Sun. More than 70% of the stars in our galaxy are M dwarfs and therefore finding and characterizing Earth-size planets orbiting in their HZ has big implications for determining the frequency of other Earths.

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

Scott Miller

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

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

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

Oct 17
7:30pm

Dr. Geoff Marcy, UC Berkeley, Professor of Astronomy
astro.berkeley.edu/people/faculty/marcy.html
"Prospects and Hunting for Intelligent Life in the Universe"
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

April 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 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.

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! Itdoes 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 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.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 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. 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. Please respect the telescopes and ask permission from the owner if you wish to touch. Parents, please watch your children. The park is residential, and adjacent to homes and backyards, please keep noise to a minimum. Schedule Time Astronomers arrive to set up at around sunset. Observing starts at about one hour after sunset and continues for two to three hours.
EVERY CLEAR SATURDAY MORNING OBSERVATORY **10:00 AM – 12:00 PM** **FOOTHILL COMMUNITY COLLEGE** **12345 Moody Road** **Los Altos Hills** **Cost: Free**	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. 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.

EVERY CLEAR FRIDAY EVENING **9:00 PM – 11:00 PM** **FOOTHILL COMMUNITY COLLEGE OBSERVATORY** **12345 Moody Road** **Los Altos Hills** **Cost: Free**	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. 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. Come to Foothill Observatory and join us in the exploration of our Universe! 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.

BAY AREA EVENTS – AUGUST 2015

MONDAY, 09/14 **7:30 PM - 9:00 PM** **CALIFORNIA ACADEMY OF SCIENCES** **55 Music Concourse Dr.** **San Francisco, CA 94118** **Cost: $12 General** **$8 Members**	**DR. THOMAS BARCLAY, DIRECTOR, KEPLER/K2 GUEST OBSERVER OFFICE, NASA AMES RESEARCH CENTER** **THE NASA K2 MISSION: EXTENDING KEPLER'S LEGACY** The NASA K2 mission makes use of the Kepler spacecraft to expand upon Kepler's groundbreaking discoveries in the fields of exoplanets and astrophysics. Its observations fill the gaps between the Kepler and Transiting Exoplanet Survey Satellite missions and offer exoplanet target identification for the upcoming James Webb Space Telescope. Astrophysics observations with K2 include studies of young open clusters such as the Pleiades and Hyades, galaxies, supernovae, and galactic archeology. Website: http://www.calacademy.org/events/benjamin-dean-astronomy-lectures/the-nasa-k2-mission-extending-kepler's-legacy
TUESDAY, 9/15 2015 **12:00 NOON** **SETI INSTITUTE COLLOQUIUM SERIES** **189 Bernardo Ave** **Mountain View, CA 94043**	**MARGARET RACE, SETI INSTITUTE** **VERY LONG TERM PLANNING: INTEGRATING PLANETARY PROTECTION IN HUMAN MISSIONS** Despite decades of experience with human missions in low Earth orbit (LEO), we have only scant, outdated information applicable to human missions to planetary surfaces, where contamination concerns and planetary protection requirements raise unusual challenges. It has been over 40 years since the Apollo program dealt with the challenges of humans living, exploring and returning from the surfaces of celestial bodies. Join us for a forward looking discussion on how changes in science, technology and policies are impacting future human exploration plans. Developing the necessary infrastructure, habitats, spacesuits, rovers, operations and plans for human missions beyond

	LEO is a very long term process, and the identification of strategic knowledge gaps in science and technology is an important part of the incremental path forward.
THURSDAY, 9/17 **4:00PM** **LOCKHEED MARTIN COLLOQUIA** **3251 Hanover St** **Building 202** **Auditorium** **Palo Alto, CA 94304**	**DR. KEVIN REYNOLDS, STANFORD UNIVERSITY** **AFFORDABLE AIRPLANES: MODULAR DESIGN AND ADDITIVE MANUFACTURING**
Saturday, 09/19 **11:00 AM - 12:00 PM** **GENETICS AND PLANT BIOLOGY BUILDING** **UC BERKELEY** **Room 100** **Berkeley, CA 94720** **Cost: Free**	**KEN SHEN, UC BERKELEY** **REVEALING THE IDENTITY OF TYPE IA SUPERNOVAE** Type Ia supernovae are famous for the role they play in determining the accelerating expansion of the Universe, which led to the 2011 Nobel Prize in Physics. In addition, they spread their nuclear burning ashes throughout galaxies, over time producing a large fraction of the heavy elements in the Universe. However, while we are fairly confident that Type Ia supernovae are the thermonuclear explosions of white dwarfs in binary stellar systems, the debate rages as to the precise nature of their companions and how the explosions are ignited. In this talk, I will review our basic understanding of Type Ia supernovae and show how recent advances are giving us hope that we will soon uncover the fundamental nature of these cosmic beacons.
SATURDAY, 10/10, 2015 (ALL DAY: 10 AM TO 5 PM; AND INTO THE NIGHT) **CHABOT SPACE AND SCIENCE CENTER IN OAKLAND**	UNIVERSE 2015: THE ANNUAL MEETING OF THE ASTRONOMICAL SOCIETY OF THE PACIFIC You are invited to attend a full-day family astronomy festival, *Universe 2015*, to be held at Chabot. The cost of admission is only the regular entry fee for the Center, $18 for adults, $15 for seniors/students. No pre-registration required from 10 - 5. Featuring: Public talks by noted astronomers in Chabot's Megadome Theater: Dr. Mark Showalter on the New Horizon mission at Pluto, Dr. Natalie Batalha with the latest on exoplanet discoveries, Dr. David Morrison on how we can deal with asteroid impacts, and Dr. Gibor Basri on what the astronomical definition of a planet is these days. ·Hourly planetarium shows at no extra cost. ·*Children's Discovery Lab* with scheduled activities designed for pre-school and early learners. ·Hobbyists showcase of projects and programs. ·Informal discussions with professional & amateur astronomers in the outdoor amphitheater. ·Exhibits, a raffle, and information tables ·Evening observing through the large Chabot telescopes at no additional cost.

·The chance to mingle with people who share your interest in astronomy

Come early that day to get (free) tickets to the science lectures and planetarium shows; all programs will be first come, first served until all seats are filled.

**** Special Evening Programs****

1) The ASP Astronomy Awards Ceremony, (5:30pm – 7:00pm). ***Free***, but with a suggested donation of $20 to support the good work of the ASP. Applaud as the 2015 award recipients receive their honors, including

·The Bruce Gold Medal to Prof. Douglas Lin (University of California, Santa Cruz)
·The Emmons Teaching Award to Dr. Ed Prather (University of Arizona)
·The Klumpke-Roberts Prize for Popularization of Astronomy to the creators of the *Astronomy Picture of the Day* website (Dr. Robert Nemiroff and Dr. Jerry Bonnell)
·And a number of other prizes.

The Ceremony will include a talk by Robert Nemiroff and Jerry Bonnell who will showcase the very best Astronomy Pictures of the Day on the huge Megadome screen!

Reservations available at: http://www.astrosociety.org/education/asp-annual-meeting/

2) The 2015 ASP Awards Buffet Banquet (7:00pm to 10pm). Attend a limited-seating, gourmet buffet banquet for the award winners, where you can mix and mingle with them, the speakers, and noted local astronomers and amateur astronomers (including the officers and board of the ASP). Participants will receive a special gift bag of astronomical items (including the ASP's "hot-off-the-press" book, *The Total Skywatcher's Manual.)* Chabot's telescopes will also be open for viewing. Cost $100 for ASP members; $125 for others.

Reservations available at: http://www.astrosociety.org/education/asp-annual-meeting/

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San Francisco Amateur Astronomers
Application for New or Renewing Membership

1. Memberships, with dues payment, are for one yea tandard renewal dates of 1 July to 30 June and 1 January to 31 December.

2. Submitting appropriate dues in April, May, June, Ju ember, membership will run to 30 June of the next year.

3. Submitting appropriate dues in October, Novembe., D ..embership 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.