

ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 63, No. 12 - December 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

*SFAA's General Meetings occur on the 3rd **TUESDAY** of each month (except January)*

**SEE GENERAL ELECTION BALLOT (VOTING DEADLINE DECEMBER 30) AND
JANUARY 22 ANNUAL DINNER INFORMATION IN THIS ISSUE**

December 15, 2015

**GREGORY T. DELORY, SR. FELLOW, SPACE SCIENCES LAB, UC BERKELEY
PRINCIPAL INVESTIGATOR, NASA MARS INSTRUMENT DEVELOPMENT**

**WATER, WATER EVERYWHERE - FROM THE EARTH, THE MOON,
MARS AND BEYOND**



Water, essential for life as we know it, is an important indicator of the conditions present on other planets and moons throughout recent history and in the distant past. The presence and state of water and other similar volatile compounds throughout our own solar system provides insight into its formation, and the origin of the life-sustaining environments that it supports.

The fact that water is found in otherwise extreme environments on other planets and moons may indicate the presence of active, dynamic processes at work that serve to replenish this otherwise fragile, volatile resource. Water is also a potential resource that future human space missions can utilize in order to engage in the sustainable exploration of our solar system.

In this talk, Delory will discuss the significance of recent discoveries of water in the most unlikely of places - our own Moon - and what this means for our understanding of how both the Moon and our solar system have evolved over time. Mars represents the converse case - whereas it was no great surprise to find water there, it is likely that a significant amount of it was lost over time. The importance and value of observations from recent space missions in addressing these questions will be discussed, as we seek to understand more about our own origins as well as our future destinations beyond Earth.



SAN FRANCISCO AMATEUR ASTRONOMERS
P.O. Box 15097, San Francisco, CA 94115

BALLOT
2016 OFFICERS & BOARD OF DIRECTORS

President (Vote for one)

- Michael Patrick
- _____

Vice-President (Vote for one)

- Matthew Jones
- _____

Secretary (Vote for one)

- Anthony Barriero
- _____

Treasurer (Vote for one)

- Katie Gallinger
- _____

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

- PJ Cabrera
- Anil Chopra
- Brian Kruse
- Scott Miller
- Agnes Pырchla
- Paul Salazar
- Douglas Smith
- Liz Triggs
- _____
- _____

VOTING INSTRUCTIONS

You may cast your ballot at the membership meeting on 15 December 2015, or you may mail it to **SFAA Secretary, PO Box 15097, San Francisco, CA 94115**. Ballots must be received no later than December 30, 2015. Each club member may submit only one ballot; family memberships may submit a separate ballot for each voting family member.

The club members listed above are candidates for officers and board of directors of SFAA for the year 2013. Please vote for one candidate for each officer position and nine candidates for the board of directors including write-ins. Voting for more than one candidate for any officer position or for more than nine candidates for the board of directors will invalidate the entire ballot.

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

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

SFAA ANNUAL AWARDS AND MEMBERSHIP DINNER

FRIDAY, JANUARY 22, 2015

5:00 pm – 9:00 pm

MARIPOSA HUNTER'S POINT YACHT CLUB

405 Terry A. Francois Blvd

San Francisco

Directions: <http://www.yelp.com/map/mariposa-hunters-point-yacht-club-san-francisco>

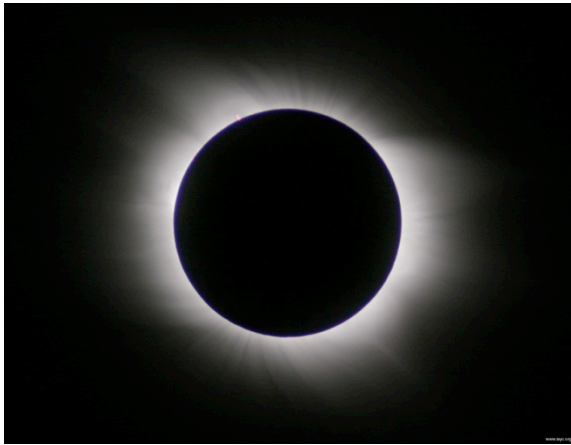


Dear Members, our Annual January get-together will be Friday, January 22nd, 2016 from 5:00 to 9:00 at the Mariposa, Hunter's Point Yacht Club, 405 Terry A Francois Blvd, San Francisco, CA 94158. There are many things to celebrate in this fun atmosphere, with tacos served by El Tonayense, Salads & more, along with a full cash bar. All members are invited and SFAA will be paying for food. Non-members are welcome at a cost of \$25. Telescopes will be set up on the patio, as well as beautiful views of the bay.

We will be celebrating a year when we have made a successful transition to the Presidio, have continued the success of the sharing and viewing we have on Mt Tam, expanded and strengthened our City Star Parties and volunteered at many schools. Our Yosemite trip was very succesful and the opportunity to tour Lick Observatory will not be soon forgotten. We will also be welcoming new members to our board and commending those whose work and commitment, our club could not function without.

We look forward to enjoying the evening with all those who enjoy the night sky with the San Francisco Amatuer Astronomers. There is plenty of parking, as well as easy access from the KT line and the 22 bus.

Please RSVP at aachopra@gmail.com



SAN FRANCISCO AMATEUR ASTRONOMERS EXPEDITION

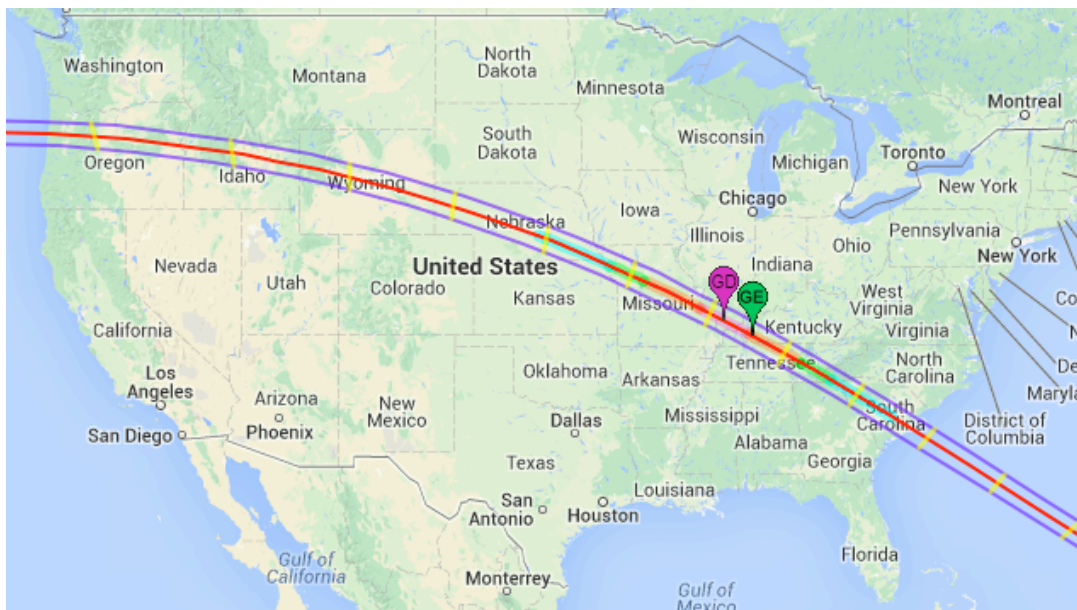
August 21, 2017

**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 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.

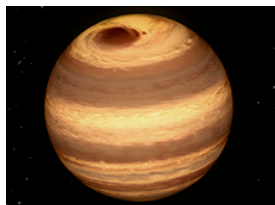


BAY AREA ASTRONOMY EVENTS

Kenneth Lum

Check [here](#) for local astronomy events for astronomy events of December 21 and beyond.

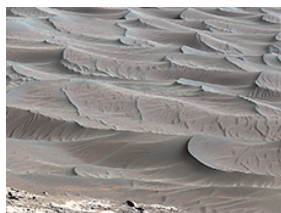
ARTICLES OF INTEREST



[NASA Mars Rover Curiosity Reaches Sand Dunes](#)

The Curiosity rover is examining the first active sand dunes ever studied up close on any planet besides Earth.

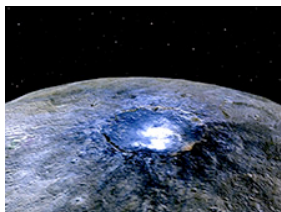
[› Read the full story](#)



[NASA Telescopes Detect Jupiter-Like Storm on Small Star](#)

A star the size of Jupiter has a raging, giant storm

[› Read the full story](#)



[New Clues to Ceres' Bright Spots and Origins](#)

Ceres reveals some of its well-kept secrets in two new studies in the journal Nature, thanks to data from NASA's Dawn spacecraft.

[› Read the full story](#)

NASA SCIENCE NEWS

The "Omics" of Space Travel

Nov. 15, 2015: The human body is incredibly complex. Every part of us—from our bones to our blood cells—is subject to a host of chemical reactions and molecular interactions that, without our conscious effort, keep us alive. But what happens to these processes when we leave the planet?

In Earth orbit and beyond, where gravity is counteracted by a constant state of freefall and cosmic radiation intensifies, the molecular inner-workings of the human body may change. To find out how, NASA has entered a realm of bio-research known as “-omics.”

During an unprecedented 1-year mission to the International Space Station, scientists are studying how astronauts' bodies respond to long-duration space travel.

“Omics” refers to the collection of data on the medley of microcosms that regulate our bodies at a molecular level. Things that work with the metabolism are grouped underneath the term “metabolome.” All of the lipids in the body are called the “lipidome.” All of the proteins? You guessed it—“proteome.”

“We have launched a one-year study to understand the omics of space travel,” says Craig Kundrot, Ph.D. in the Office of the Chief Scientist at NASA Headquarters. “Astronauts are spending a year on the International Space Station, and we are looking at what happens to them on the molecular level.”

This project is really two projects:

First, there is the “Twins Study. NASA has twin astronauts: One of them, Mark Kelly (retired), is staying on Earth while his brother, Scott Kelly, orbits Earth. For one year, Mark and Scott will be poked, prodded, and questioned to learn if the omics of identical twins show more significant differences than normal aging would cause after one of them spends a year in space.

At the same time, Scott Kelly is involved in a separate project called the “One Year Mission.” Unlike previous expeditions to the space station, which lasted only 6 months, Scott Kelly is spending a full year onboard the station alongside Russian cosmonaut Mikhail Kornienko. This One Year Mission has its own battery of tests designed to reveal the physiological effects of long-term space flight.

Why 1 year?

“NASA knows a lot about what happens to astronauts after 6 months in orbit,” says Kundrot. “Deep space missions are going to take much longer than that. A round trip to Mars, for instance, might take thirty months or more. This 1-year experiment is the next, natural step in that direction.”

Kundrot also notes the intangible significance of 1 year to humans.

“When we leave home for 6 months, it’s like a long business trip. Leaving home for a year is a different thing. We are going to miss every birthday, anniversary, graduation and many other milestones. It feels like a big chunk of life—and this could affect the mood or behavior of the space travelers.”

Indeed, some of the studies focus the astronauts’ psychological state. At the same time that blood is drawn and other samples are taken, the astronauts will be filling out questionnaires about their mood, thoughts and dreams. This approach could reveal links between the astronaut’s *mental* state and their *molecular* state.

In total, more than 30 research proposals have been approved for the Twin Study and the One Year Mission—and they are well underway. The experiments began on March 27, 2015, when Kelly and Kornienko blasted off onboard a Russian rocket for their year in space.

For more on studies on the international space station, go to www.nasa.gov/station

Author: Ferris Molina

**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.