

# ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 66, No. 07 – July 2018

## IN THIS ISSUE

1. SFAA PRESIDENT'S NOTE
2. JULY 18 LECTURE: VIEWING THE BEGINNING OF TIME
3. UPCOMING SFAA LECTURES 2018
4. BAY AREA ASTRONOMY EVENTS
5. SFAA NEEDS YOU: VOLUNTEER OPPORTUNITIES
6. SEPT 1 STAR PARTY: ROBERT FERGUSON OBSERVATORY
7. NASA SCIENCE NEWS
8. MEMBERSHIP RENEWAL FORM

\* \* \* \* \*

### \*\*\* Fun Links For Your Night Sky Viewing \*\*\*

**SPOT THE STATION:** see the International Space Station! As the third brightest object in the sky the space station is easy to see if you know when to look up.

#### [Sighting Opportunities](#)

Sighting Opportunities. Find your next opportunity for spotting the station.

#### [Subscribe to Spot The Station Alerts](#)

Subscribe to email or text notifications and get alerts when the space station will be passing overhead in your area

**IRIDIUM FLARES:** Most Iridium satellites are still controlled, so their flares can be predicted. The Iridium communication satellites have a peculiar shape with three polished door-sized antennas, 120° apart and at 40° angles with the main bus. The forward antenna faces the direction the satellite is traveling. Occasionally, an antenna reflects sunlight directly down at Earth, creating a predictable and quickly moving illuminated spot on the surface below of about 10 km (6.2 mi) diameter. To an observer this looks like a bright flash, or flare in the sky, with a duration of a few seconds.

[Iridium Flares Sighting Schedule](#), courtesy of Heavens Above

## SFAA PRESIDENT'S NOTE | SEE ALL THE PLANETS

This month, Earth's nearest neighbors are putting on a great show before dawn and immediately after sunset.

Very shortly after sunset on Saturday, July 14, the 1 day old Moon and Mercury will be paired very close together in the West. Try to catch these two as day turns into twilight, but be quick, as they set soon thereafter.

You can find Venus, nice and bright to the West among the stars of Leo, in the last glimmers of evening twilight. Venus shows as a thin crescent in telescopes, even with modest magnification.

Next in the procession of planets is Jupiter, south-southwest, in the constellation of Libra. Jupiter is a great sight through the telescope, with its 4 Galilean moons in their perpetual dance. Larger apertures show different bands of clouds in its atmosphere, and its menacing red eye.

Saturn is not too far behind, due South in the constellation Sagittarius. Its most obvious feature is the magnificent ring system that surrounds it. Its largest moon, Titan, can be seen a good distance away from the rings.

Mars makes its appearance shortly before midnight to the southeast, in Capricornus. A planet wide sandstorm has disrupted its atmosphere for over 6 weeks, and as of late it is redder and brighter than usual. It is nearly as bright as Jupiter these days.

If you feel adventurous, you can get up just before 5 am, when Neptune due South and is highest in the sky. Try to sight it in the constellation Aquarius. And around the same time, you can find Uranus to the South-East in Aries. These two are harder to spot, as they are much fainter than all the others, but you can spot them by process of elimination, armed with a good, detailed star chart.

I will not include Pluto in this list, as I do not wish to be defrocked by my own flock in the ensuing debate over its planetiness. But if you so wished to find it, it is also in Sagittarius with Saturn, and can be seen best after midnight.

Clear skies,

**P.J. Cabrera**  
President, SFAA

### **SFAA Board Officers and Directors:**

President	P.J. Cabrera	president@sfaa-astronomy.org
Vice President	Liz Triggs	vice-president@sfaa-astronomy.org
Treasurer	Scott Miller	treasurer@sfaa-astronomy.org
Secretary	Anthony Barreiro	secretary@sfaa-astronomy.org
Directors:	Matthew Jones, Tom Kellogg, Brian Kruse, Jessica Miller, Will Silberman, and Douglas Smith	

**SFAA LECTURE SCHEDULE 2018**

7:00 pm Doors Open & Light Refreshments | 7:30 pm Club Announcements | 7:45 pm Speaker

**THE RANDALL MUSEUM  
199 MUSEUM WAY, SAN FRANCISCO**

**JULY 18TH | DR. ZEESHAN AHMED, SLAC, KAVLI INSTITUTE**



**“VIEWING THE BEGINNING OF TIME FROM THE MOST REMOTE PLACES ON EARTH”**

Shortly after the birth of the universe, space was filled by a plasma that was literally red-hot. The light radiated by that plasma has traveled the vast emptiness of space for billions of years, with the expansion of the universe slowly stretching its waves until today it appears as microwave radiation. This is the Cosmic Microwave Background (CMB), a glow still visible in the night sky. This glow is almost uniform, but small variations from point to point hold information about the conditions of the universe 13.8 billion years ago.

This lecture will introduce the CMB, present the sophisticated cameras we build to observe it, and describe the remote outposts of our planet where we deploy these cameras to take pictures of this faint radiation. As we image the CMB in finer and finer detail, we hope to improve our understanding of the beginning of the universe and perhaps of time itself.

**Brief Bio**

*Zeeshan Ahmed is an observational cosmologist at the Kavli Institute for Particle Astrophysics and Cosmology and SLAC National Accelerator Laboratory. He received his PhD from Caltech in 2012 and held a postdoctoral position at Stanford University before being appointed a Panofsky Fellow at SLAC in 2015. Ahmed is a member of several scientific teams imaging the Cosmic Microwave Background (CMB) from the South Pole and the Atacama Desert in Chile. He spends his time poring over data from these cameras and devising tricks to build more powerful CMB cameras. This year, Ahmed was a recipient of the U.S. Department of Energy's prestigious Early Career Award.*

**UPCOMING SFAA LECTURES 2018**

7:00 pm Doors Open & Light Refreshments | 7:30 pm Club Announcements | 7:45 pm Speaker

**THE RANDALL MUSEUM  
199 MUSEUM WAY, SAN FRANCISCO**

**AUGUST 15TH | DR. ELI RYKOFF, SLAC RESEARCH SCIENTIST**



**“GALAXY CLUSTERS AND THE LIFE AND DEATH OF THE UNIVERSE”**

The distribution of galaxies in the universe is patchy. Galaxies are bound together in clusters made of stars, hot gas and invisible dark matter. These galaxy clusters are part of a cosmic web of filaments, nodes and empty voids that has been building up over 13 billion years. How do we observe this structure, and how do we use gravitational lensing and satellite X-ray observations to measure its mass? How do galaxy clusters trace the past expansion of the universe and reveal our future? This lecture will highlight data from the Dark Energy Survey, today’s largest cosmic survey, to answer these questions.

\* \* \* \* \*

**\* \* \* Fun Links For Your Night Sky Viewing \* \* \***

**SPOT THE STATION:** see the International Space Station! As the third brightest object in the sky the space station is easy to see if you know when to look up.

**Sighting Opportunities**

Sighting Opportunities. Find your next opportunity for spotting the station.

**Subscribe to Spot The Station Alerts**

Subscribe to email or text notifications and get alerts when the space station will be passing overhead in your area

**IRIDIUM FLARES:** Most Iridium satellites are still controlled, so their flares can be predicted. The Iridium communication satellites have a peculiar shape with three polished door-sized antennas, 120° apart and at 40° angles with the main bus. The forward antenna faces the direction the satellite is traveling. Occasionally, an antenna reflects sunlight directly down at Earth, creating a predictable and quickly moving illuminated spot on the surface below of about 10 km (6.2 mi) diameter. To an observer this looks like a bright flash, or flare in the sky, with a duration of a few seconds.

**Iridium Flares Sighting Schedule**, courtesy of Heavens Above

## ASTRONOMY EVENTS



### SAN FRANCISCO AMATEUR ASTRONOMERS EVENTS JULY – SEPTEMBER 2018

Details at: <http://www.sfaa-astronomy.org>

**Saturday, July 7, 8:30 pm – 2:00 am**  
Mt. Tam Members Night

**Saturday, July 14, 8:30 pm – 11:00 pm**  
Mt. Tam Public Star Party

**Wednesday, July 18, 7:30 pm – 9:15 pm**  
Meeting and Lecture, **\*new venue\* Randall Museum**

**Sunday, July 21, 8:00 pm – 11:00 pm**  
City Star Party, Point Lobos – Land's End

**Friday August 3 – Sunday August 5**  
2018 Yosemite Star Party @ Glacier Point, Yosemite

**Saturday August 11, 7:05 pm – 2:00 am**  
Mt. Tam Members Night

**Wednesday August 15, 7:00 pm - 9:15 pm**  
Meeting and Lecture, **\* new venue\* Randall Museum**

**Saturday, August 18, 8:30 pm – 11:00 pm**  
Mt. Tam Public Star Party

**Sunday, August 19, 8:00 pm – 11:00 pm**  
City Star Party, Point Lobos – Land's End

**Saturday/Sunday September 1-2 <All-day Event>**  
Robert Ferguson Observatory, Sugarloaf Ridge State Park,  
Members Only Picnic and Star Party

**Saturday, September 15, 8:30 pm – 11:00 pm**  
Mt. Tam Public Star Party

### BAY AREA ASTRONOMY EVENTS

Each month, long-time SFAA member Kenneth Lum assembles and sends out a list of Bay Area Astronomy events.

As each month unfolds, check the following link for information regarding additional events:

<http://tech.groups.yahoo.com/group/bayastro/?v=1&t=directory&ch=web&pub=groups&sec=dir&slk=94>

\* \* \* \* \*  
**GET REAL, LIVE HELP  
WITH YOUR TELESCOPE!**  
\* \* \* \* \*

Are you a new telescope owner?

Or perhaps you could use some help with alignment, collimation or other adjustments?

Collimating a reflector, like playing guitar or dancing the tango, can, with great effort, be learned from reading, but it is much easier and more enjoyable to learn hands-on from somebody who already knows how to do it.

Bring your telescope to a Star Party – we'll be happy to help!

# 05.

## **SFAA NEEDS YOU: VOLUNTEER OPPORTUNITIES | ANTHONY BARREIRO AND PJ CABRERA**

### Volunteer Opportunities in May and June

SFAA depends on our members to provide people of all ages a first-hand experience of the wonders of the universe. Outreach activities are often centered around telescope observing, but there are many ways to teach people about astronomy, and there are always roles for members at all levels of expertise, including beginners, whether or not you bring a telescope. Here are some upcoming outreach opportunities. Please help out as you're able.

### **Snack Volunteers Needed**

SFAA also needs members to volunteer to bring **light refreshments** to our monthly **meetings and lectures** at the Presidio Officers Club, on the **Third Tuesday of Each Month**. Refreshments help to create a welcoming, sociable atmosphere for members and guests. If a few members each bring something, there's less burden on any one member, and we'll have a good variety of snacks and beverages. You may donate snack items or simply provide receipts to be reimbursed for your expenses, and your fellow members will be grateful to you! If you can bring refreshments, please send an email to Linda Mahan, [speakerchair@sfaa-astronomy.org](mailto:speakerchair@sfaa-astronomy.org)

Let Linda know which month or months you can help with, and what you would like to bring.

### **Ongoing Opportunities to Participate in our SFAA Club**

SFAA is also looking for volunteers to help in these areas:

- **Marketing** – we can use help posting SFAA event updates to SFGate, SF FunCheap, Eventful, Bay Area Science, etc.
- **Above The Fog** – submit an occasional article, astrophoto and/or serve as a member of the editorial team.

Please send an email to [volunteer@sfaa-astronomy.org](mailto:volunteer@sfaa-astronomy.org) if you're interested.

### **Outreach Opportunities at Star Parties**

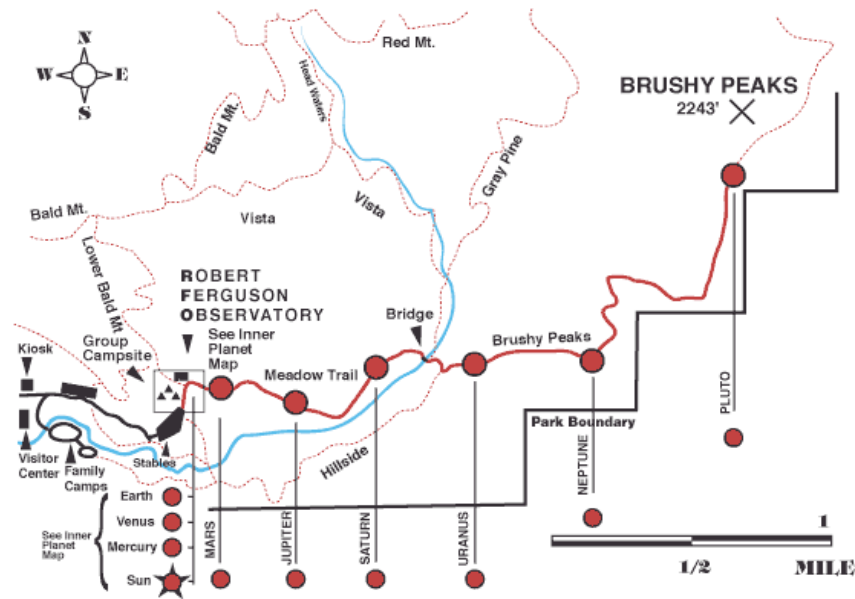
SFAA is also looking for volunteers to help bring and operate telescopes at our monthly star parties. We also need contact people to greet observers and visitors, and direct traffic in the parking area at Mt. Tam and city star party locations.

Please send an email to [volunteer@sfaa-astronomy.org](mailto:volunteer@sfaa-astronomy.org) if you're interested, or if you have any questions about the responsibilities of contact people and telescope operators.

**On behalf of the board of directors and your fellow SFAA members, thank you for your willingness to help out!**

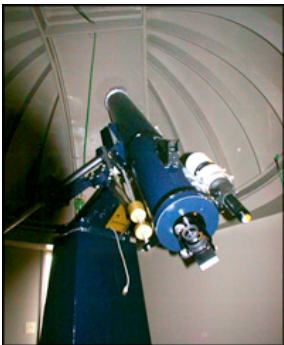


## **ROBERT FERGUSON OBSERVATORY STAR PARTY: 2018 SEPTEMBER 1<sup>ST</sup> TO SEPTEMBER 2<sup>ND</sup>**



On Saturday September 1, the SFAA will be having an afternoon picnic and overnight star party and tour of [Robert Ferguson Observatory](#) in Santa Rosa. This will be a fantastic event, a chance to explore & learn about RFO and a way to support our neighboring local astronomy club.

Robert Ferguson Observatory is a beautiful spot nestled among the trees and rolling hills of Sugarloaf Ridge State Park near [Kenwood, CA](#). The Observatory is named in honor of Robert Ferguson, an amateur astronomer who built telescopes. The observatory was built in multiple phases by volunteer labor and is still run by volunteers.



Hopefully by the time we have our event, the Planet Walk will be fully restored. (Much of it was damaged in the wild fires last year, and is currently being restored by a local Boy Scout troop.) The campground opens to us at 2pm. Feel free to arrive early and walk the Planet Walk or take a hike in the beautiful State Park.

This event is only open to SFAA members in good standing (both at the time of sign up and at time of event). Individual members are only allowed to bring themselves. Family memberships are allowed to bring two adults and minors. We also encourage each party attending to bring a telescope as this is a not just a tour but also a star party. This is a free event for SFAA members.



## **ROBERT FERGUSON OBSERVATORY STAR PARTY (CONTINUED)**



Everyone attending must arrive by 5pm at the latest. There will be a BBQ potluck to start, starting by 4 pm, with all attendees being asked to bring a side, salad, or dessert that would feed 10 people. SFAA is providing some drinks, hamburgers, veggie burgers and accessories.

Our tour of the observatory will start at 7:30pm. Just like on Tam during a star party, white light is not allowed at RFO after dark. That is part of why we are asking members to arrive at 5pm at the latest, so your camping spot can be fully setup before the tour/star party starts. There is also no cell phone service at the observatory, so plan accordingly.

### **How to Sign Up:**

To sign up for this event, please visit the [SFAA](https://www.sfaa.org/) website or follow this link:  
<https://goo.gl/7VSvt5>.

**Remember, the trip is available to MEMBERS ONLY**





## **NASA Seeks New Ways to Handle Trash for Deep Space Missions**

Life aboard the International Space Station requires extreme measures in efficiency to preserve resources, reduce waste, repurpose materials, and recycle water and breathable air. Regular cargo resupply missions deliver approximately 12 metric tons of supplies each year, which can lead to significant storage challenges aboard the orbiting laboratory. When trash accumulates, astronauts manually squeeze it into trash bags, temporarily storing almost two metric tons of it for relatively short durations, and then send it away in a departing commercial supply vehicle, which either returns it to Earth or incinerates it during reentry through the atmosphere.

Future spacecraft, much farther from Earth, likely will not have the regular cadence of visiting commercial ships that can remove trash, so NASA is turning to U.S. industry to advance concepts for trash compaction and processing systems. The agency has issued a call for prototypes, and eventually, flight demonstrations to fly on the space station. The solicitation was issued through Next Space Technologies for Exploration Partnerships (NextSTEP) Broad Agency Announcement, Appendix F: Logistics Reduction in Space by Trash Compaction and Processing System.

Storing trash inside a spacecraft not only consumes precious volume, but also can create physical and biological hazards for the crew. Storage also removes the option to extract valuable leftover resources that could be recycled or repurposed. The solicitation seeks solutions that compact trash, remove biological and physical safety concerns, and recover trapped resources for potential reuse or repurposing. Proposing companies won't have to start from ground zero, however. NASA has been developing waste management systems since the 1980s, including recent developments such as the Heat Melt Compactor and "trash to gas" technologies.

The development will occur in two phases. In Phase A, selected companies will create a concept trash compaction and processing system, conduct design reviews with NASA, and validate concepts through prototype ground demonstrations. Throughout this phase, the companies may request use of NASA facilities to conduct subsystem tests. In Phase B, a flight unit will be developed to demonstrate a system aboard the space station as early as 2022.

Inherent with the NextSTEP partnership model, private companies must contribute their own corporate resources toward the development of their trash compaction and processing systems. In this case, responders are required to show a minimum of 20 percent contribution toward the overall development cost, or 10 percent for small businesses. Proposals are due August 22, 2018. NASA plans to host an industry day on July 24, to share details about the solicitation, describe available NASA facilities, and answer questions from potential respondents.

NASA's Exploration Campaign will usher in a new era of human exploration, taking humans farther in space than ever before. Operations aboard the Gateway in lunar orbit, as well as on the surface of the Moon, will require innovative approaches to live and work more independently from Earth. Logistical efficiencies afforded by new innovations like trash compaction and processing systems will make human exploration safer and more sustainable.

NASA Science News Editor: Erin Mahoney



## Application for New or Renewing Membership

1. Memberships, with dues payment, are for one year running from the member's join or renewal date.
2. New or renewal memberships sent in via USPS mail will have membership start date based on postmark date.
3. SFAA is a 501(c)(3) nonprofit organization. Membership dues are tax-deductible, as allowed by law.

**This application is for:**

**New**

**Renewing**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Email: \_\_\_\_\_

Contact phone (optional): \_\_\_\_\_

**Membership Type:**     Individual \$25.00     Family \$30.00     Student \$10.00

Supporting \$75.00     Institutional \$40.00

**(All dues tax-deductible as allowed by law.)**

**Please mail to me a Mt. Tamalpais Parking Permit (1 per membership)**

**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**

Both new and renewing members will receive a verifying email from the SFAA upon completion of the membership process.