

# ★ ABOVE THE FOG

• BULLETIN OF THE SAN FRANCISCO AMATEUR ASTRONOMERS •

Vol. 69, No. 03 – March 2020

## IN THIS ISSUE

01. SFAA PRESIDENT'S NOTE
02. SFAA & BAY AREA ASTRONOMY EVENTS
03. SFAA VOLUNTEER OPPORTUNITIES
04. UPCOMING SFAA LECTURES 2020
05. SF CITY STAR PARTY @ LANDS END & BEYOND
06. NASA JPL NEWS: PALE BLUE DOT REVISITED & MARS ROVER SNAPS PANORAMA PHOTO
07. MEMBERSHIP RENEWAL FORM

Due to ongoing developments regarding the spread of the COVID-19 virus and recommendations by the city and state regarding event hosting, the events listed below may be subject to change. Please see important updates reflected in our schedule or check for announcements via the SFAA website, e-mail, or on social media. If you have any further questions, please feel free to e-mail members of the board for information.

# 01. SFAA PRESIDENT'S NOTE | MARCH SKIES

Hi SFAA Members,

The COVID-19 virus has had an impact on everyone's lives, the whole world over. The SFAA is well aware of COVID-19 and the local, state, and federal mandates that are coming out. We, as a board, are continuing to monitor the situation and how it relates to SFAA events in the next couple of weeks and months. This month's lecture has been postponed to later in the year. We just heard from the CA State Parks informing us that all special events, which include our members' only star party next weekend March 21st, have been cancelled. While we won't have access to Tam to view the stars, hopefully you are able to still look up during these times of recommended social distancing. We will keep members up to date for future events, including the city star party on April 5<sup>th</sup>. Below are a few encouraged tips to keep our membership healthy going forward. Thank you for your understanding.

## Protect, Prepare, and Know the Facts

- Wash hands with soap and water for at least 20 seconds.
- Cover your cough or sneeze.
- Stay home if you are sick.
- Avoid touching your face.
- Try alternatives to shaking hands, like an elbow bump or wave.
- If you have recently returned from a country, state or region with ongoing COVID-19 infections, monitor your health and follow the instructions of public health officials.
- Vulnerable individuals, which is defined as 60+ years or who have health conditions such as heart disease, lung disease, diabetes, kidney disease and weakened immune systems, are recommended to limit outings, avoid large gatherings, telecommute if possible, stay home if they are sick and avoid people who are sick.
- There is no recommendation to wear masks at this time to prevent yourself from getting sick.
- Please refer to the Centers for Disease Control and Prevention website for frequently asked questions.

For official updates about the coronavirus text COVID19SF to 888-777. You can also stay informed by visiting SF72.org.

Clear skies,

**Jessica Miller**

**Vice President, SFAA**

## SFAA BOARD OFFICERS AND DIRECTORS

<b>President</b>	PJ Cabrera	<a href="mailto:president@sfaa-astronomy.org">president@sfaa-astronomy.org</a>
<b>Vice President</b>	Jessica Miller	<a href="mailto:vice-president@sfaa-astronomy.org">vice-president@sfaa-astronomy.org</a>
<b>Treasurer</b>	Jim Burke	<a href="mailto:treasurer@sfaa-astronomy.org">treasurer@sfaa-astronomy.org</a>
<b>Secretary</b>	Bill Kircher	<a href="mailto:secretary@sfaa-astronomy.org">secretary@sfaa-astronomy.org</a>
<b>Directors</b>	Vanessa Anderson, Evan Ryder, Michael Wingerath, Ben Max Rubinstein, Liz Triggs, Douglas Smith, Thomas Perfumo	

## 02. SFAA & BAY AREA ASTRONOMY EVENTS



**MARCH 2020 – JUNE 2020**

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

**PLEASE CHECK THE SFAA WEBSITE REGULARLY FOR IMPORTANT UPDATES REGARDING THE IMPACT OF THE COVID-2019 VIRUS ON SCHEDULED EVENTS**

**WEDNESDAY, MARCH 18<sup>TH</sup> LECTURE HAS BEEN POSTPONED UNTIL FURTHER NOTICE**

**SATURDAY, MARCH 21<sup>ST</sup> MT. TAM MEMBERS' NIGHT HAS BEEN CANCELLED**

---

**Sunday, April 5, 7:30 pm – 10:30 pm**  
City Star Party, [Presidio at Parade Grounds](#) in San Francisco

---

**Wednesday, April 15, 7:30 pm – 9:15 pm**  
Meeting and Lecture, [Randall Museum](#)

---

**Saturday, April 25, 6:30 pm – 2:00 am**  
[Mt. Tam](#) Members Night (arrive BEFORE sunset)

---

**Sunday, May 3, 8:00 pm – 11:00 pm**  
City Star Party, [Lands End at Point Lobos](#) in San Francisco

---

**Wednesday, May 20, 7:30 pm – 9:15 pm**  
Meeting and Lecture, [Randall Museum](#)

---

**Saturday, May 23, 7:00 pm – 2:00 am**  
[Mt. Tam](#) Members Night (arrive BEFORE sunset)

---

**Thursday, June 4, 8:00 pm – 11:00 pm**  
City Star Party, [Presidio at Parade Grounds](#) in San Francisco

---

**Wednesday, June 17, 7:30 pm – 9:15 pm**  
Meeting and Lecture, [Randall Museum](#)

---

**Saturday, June 20, 7:30 pm – 2:00 am**  
[Mt. Tam](#) Members Night (arrive BEFORE sunset)

### GET LIVE HELP WITH YOUR TELESCOPE!

\* \* \* \* \*

Are you a new telescope owner?

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

Like playing guitar or dancing the tango, learning to operate a telescope can, with great effort, be learned on your own.

However, it's much easier and more enjoyable to learn hands-on with experienced individuals.

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

### BAY AREA ASTRONOMY EVENTS

\* \* \* \* \*

Long-time SFAA member, Kenneth Lum, assembles and reports a list of Bay Area Astronomy events. Check the following link for information and additional events:

<https://groups.yahoo.com/neo/groups/bayastro/info>

# 03. SFAA VOLUNTEER OPPORTUNITIES

## VOLUNTEER OPPORTUNITIES

Contact: SFAA Board ([volunteer@sfaa-astronomy.org](mailto:volunteer@sfaa-astronomy.org))

### Star Party Volunteers

- City Star Parties SFAA Board ([volunteer@sfaa-astronomy.org](mailto:volunteer@sfaa-astronomy.org))
- Mt. Tam Star Parties

---

**Snack Volunteers** Linda Mahan ([speakerchair@sfaa-astronomy.org](mailto:speakerchair@sfaa-astronomy.org))

---

**Marketing Volunteers** PJ Cabrera ([president@sfaa-astronomy.org](mailto:president@sfaa-astronomy.org))

---

**Above the Fog Volunteers** PJ Cabrera ([president@sfaa-astronomy.org](mailto:president@sfaa-astronomy.org))

### Star Party Volunteers

SFAA hosts 2 to 3 star parties every month throughout the year, including City Star Parties in San Francisco and observation nights on Mount Tamalpais. We need **experienced SFAA members to serve as volunteers for these events**. If you've been to a few star parties, you're familiar with the procedures, and you're able to commit to attending these events, **we can use your help!**

Volunteers are responsible for: checking weather forecasts prior to scheduled events, coordinating with other volunteers, providing cancellation notice due to inclement weather or dangerous conditions (e.g. forest fires). Volunteers are expected to arrive to events early, welcome and orient members, and hold a brief huddle for all telescope operators to review procedures and answer questions.

For Mt. Tam events, volunteers are tasked with:

- members night: ensuring every vehicle belongs to an SFAA member and has a parking pass; at the end of the night, volunteers make sure members understand how to lock the gate on the way out; and
- public astronomy program: coordinating with Friends of Mt. Tam volunteers to manage visitor parking.

Volunteers receive an e-mail once a month to coordinate on upcoming star parties. If you're interested in volunteering, or if you have questions, please contact the SFAA board at [volunteer@sfaa-astronomy.org](mailto:volunteer@sfaa-astronomy.org).

### Snack Volunteers

SFAA needs volunteers to bring light refreshments to our monthly meetings and lectures at the Randall Museum, on the **third Wednesday of each month**. Refreshments create a welcoming atmosphere for members and guests. Volunteers can donate snacks or provide receipts for expense reimbursement.

If you're interested in bringing refreshments, please send an e-mail to Linda Mahan at [speakerchair@sfaa-astronomy.org](mailto:speakerchair@sfaa-astronomy.org) and indicate which month(s) you can help with and what you'd like to bring.

### Marketing Volunteers

SFAA needs volunteers to help post SFAA event updates to groups such as SFGate, SF FunCheap, Eventful, Bay Area Science, etc. If you're interested in marketing opportunities, please send an e-mail to PJ Cabrera at [president@sfaa-astronomy.org](mailto:president@sfaa-astronomy.org).

### Above the Fog Volunteers

SFAA distributes a monthly newsletter, *Above the Fog*. Volunteers are asked to submit an occasional article, astrophoto, and/or to serve as a member of the editorial team. If you're interested in contributing to these monthly newsletters, please send an e-mail to PJ Cabrera at [president@sfaa-astronomy.org](mailto:president@sfaa-astronomy.org).

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

## 04. UPCOMING SFAA LECTURES 2020

**PLEASE CHECK THE SFAA WEBSITE REGULARLY FOR IMPORTANT UPDATES REGARDING THE IMPACT OF THE COVID-2019 VIRUS ON SCHEDULED EVENTS**

**APRIL 15<sup>TH</sup> | KEVIN BUNDY, PHD**

### **Why Do Galaxies Die? How Silicon Valley's "Spectral Revolution" will Solve a 100 Year Old Mystery**

Over one hundred years ago, Edwin Hubble noticed two distinct classes of galaxies; youthful spirals with ongoing star formation, and "red and dead" smooth, faded and barren Ellipticals. The MaNGA Survey, which is mapping 10,000 nearby galaxies, will help us understand how all types of galaxies formed in the early universe. We are on the verge of a "spectral revolution", enabled by nanotechnology and photonics that will transform astronomical instruments.

---

**MAY 20<sup>TH</sup> | EKTA PATEL, PHD**

### **Satellite Galaxies in the Local Group**

Our Local Group of galaxies is composed of our Milky Way, its twin galaxy, Andromeda (M31) and the dozens of small "satellite" galaxies orbiting around each of them. Dr. Patel will demonstrate how the collective motions of these systems of satellite galaxies can reveal important characteristics of their host galaxies, including properties of their dark matter halos.

---

**JUNE 17<sup>TH</sup> | MARIA ELENA MONZANI, PHD**

### **Sparkle in the Dark: The Outlandish Quest for Dark Matter**

The nature and origin of dark matter are among the most compelling of mysteries of modern science. For over 30 years physicists have been trying to detect dark matter particles, with little success. The next stage in the search is the LZ detector. It consists of 10 tons of liquified xenon gas, stored in a refrigerated titanium cylinder a mile underground, in a former gold mine.

### **Randall Museum**

199 Museum Way, San Francisco, CA 94114

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

**SFAA'S GENERAL MEETINGS OCCUR ON THE 3<sup>RD</sup> WEDNESDAY OF EACH MONTH**

## 05. SF CITY STAR PARTY @ LANDS END & BEYOND

### LIZ TRIGGS, BOARD MEMBER

On Saturday 7 March 2020, George Teiber, Thomas Perfumo, and Liz Triggs represented the San Francisco Amateur Astronomers at the city star party in San Francisco. The scheduled location was Lands End at Point Lobos, which is a great spot for escaping the lights of the city. Of course, it can also be foggy and that was the case on this night. We had a great view of Venus, but not much more. We decided to try a different location just off the Great Highway, which is often clear, but could not escape the cloud cover.

Just before throwing in the towel for the night, George made a call to his wife who reported clear skies in Noe Valley. Third time is always a charm! We caravanned over to Noe Valley and set up on 24th Street with George's telescope which has a 72" focal length and an 8" mirror. When you're in the middle of the sidewalk with a giant, arresting telescope plus an almost full moon, most people can't help but stop to get a glimpse. It's a great planetary and lunar scope and it delivered the views! One woman asked if we would be there for a bit longer so that she could bring her daughter over for a look and sure enough, she came right back, with her two children and husband in tow.

It's easy to imagine the big toothy grin on a kid's face when they see the moon through a telescope for the first time. And the thing that I notice every time I go to a star party is that universal look of wonder and glee on every single face, whether it's a kid or a kid at heart.

Over the course of the evening, we had upwards of about 60 people stop by to enjoy the views and learn a little about the SFAA.

Looking forward to seeing you at the next SFAA event!

## 'Pale Blue Dot' Revisited



*This updated version of the iconic "Pale Blue Dot" image taken by the Voyager 1 spacecraft uses modern image-processing software and techniques to revisit the well-known Voyager view while attempting to respect the original data and intent of those who planned the images.*

*Credit: NASA/JPL-Caltech*

For the 30th anniversary of one of the most iconic views from the Voyager mission, NASA's Jet Propulsion Laboratory in Pasadena, California, is publishing a new version of the image known as the "Pale Blue Dot."

The updated image uses modern image-processing software and techniques while respecting the intent of those who planned the image. Like the original, the new color view shows Planet Earth as a single, bright blue pixel in the vastness of space. Rays of sunlight scattered within the camera optics stretch across the scene, one of which happens to have intersected dramatically with Earth.

The view was obtained on Feb. 14, 1990, just minutes before Voyager 1's cameras were intentionally powered off to conserve power and because the probe - along with its sibling, Voyager 2 - would not make close flybys of any other objects during their lifetimes. Shutting down instruments and other systems on the two Voyager spacecraft has been a gradual and ongoing process that has helped enable their longevity.

This celebrated Voyager 1 view was part of a series of 60 images designed to produce what the mission called the "Family Portrait of the Solar System." This sequence of camera-pointing commands returned images of six of the solar system's planets, as well as the Sun. The Pale Blue Dot view was created using the color images Voyager took of Earth.

The popular name of this view is traced to the title of the 1994 book by Voyager imaging scientist Carl Sagan, who originated the idea of using Voyager's cameras to image the distant Earth and played a critical role in enabling the family portrait images to be taken.

Additional information about the Pale Blue Dot image: <https://solarsystem.nasa.gov/resources/536/voyager-1s-pale-blue-dot/>

Original Pale Blue Dot and Family Portrait images:

- <https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA00452>

- <https://www.jpl.nasa.gov/spaceimages/details.php?id=PIA00451>

The Voyager spacecraft were built by JPL, which continues to operate both. JPL is a division of Caltech in Pasadena. The Voyager missions are a part of the NASA Heliophysics System Observatory, sponsored by the Heliophysics Division of the Science Mission Directorate in Washington. For more information about the Voyager spacecraft, visit: <https://www.nasa.gov/voyager> or <https://voyager.jpl.nasa.gov>.

## **News Media Contact**

Calla Cofield

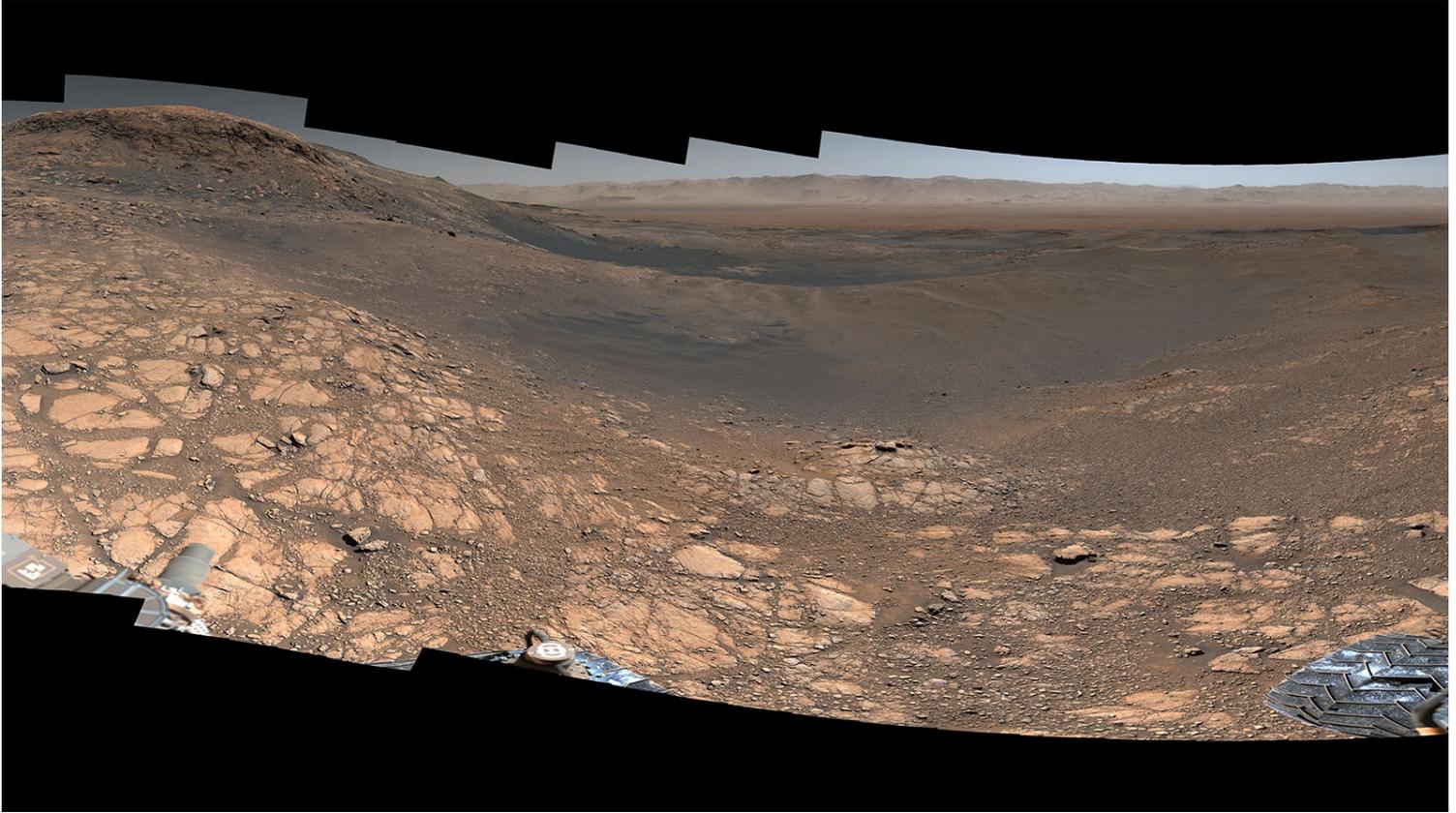
Jet Propulsion Laboratory, Pasadena, Calif.

626-808-2469

[calla.e.cofield@jpl.nasa.gov](mailto:calla.e.cofield@jpl.nasa.gov)

Written by Preston Dyches

# NASA's Curiosity Mars Rover Snaps Its Highest-Resolution Panorama



*NASA's Curiosity rover captured its highest-resolution panorama of the Martian surface between Nov. 24 and Dec. 1, 2019.*

*Credit: NASA/JPL-Caltech/MSSS*

To go along with the stunning 1.8-billion-pixel image, a new video offers a sweeping view of the Red Planet.

NASA's Curiosity rover has captured its highest-resolution panorama yet of the Martian surface. Composed of more than 1,000 images taken during the 2019 Thanksgiving holiday and carefully assembled over the ensuing months, the composite contains 1.8 billion pixels of Martian landscape. The rover's Mast Camera, or Mastcam, used its telephoto lens to produce the panorama; meanwhile, it relied on its medium-angle lens to produce a lower-resolution, nearly 650-million-pixel panorama that includes the rover's deck and robotic arm. Along with an almost 1.8-billion-pixel panorama that doesn't feature the rover, NASA's Curiosity captured a 650-million-pixel panorama that features the rover itself.

Both panoramas showcase "Glen Torridon," a region on the side of Mount Sharp that Curiosity is exploring. They were taken between Nov. 24 and Dec. 1, when the mission team was out for the Thanksgiving holiday. Sitting still with few tasks to do while awaiting the team to return and provide its next commands, the rover had a rare chance to image its surroundings from the same vantage point several days in a row.

It required more than 6 1/2 hours over the four days for Curiosity to capture the individual shots. Mastcam operators programmed the complex task list, which included pointing the rover's mast and making sure the images were in focus. To ensure consistent lighting, they confined imaging to between noon and 2 p.m. local Mars time each day.

A video guide produced by NASA Curiosity Project Scientist Ashwin Vasavada discusses the rover's view of the Martian surface: <https://www.youtube.com/watch?v=X2UaFuJsqxk>

"While many on our team were at home enjoying turkey, Curiosity produced this feast for the eyes," said Ashwin Vasavada, Curiosity's project scientist at NASA's Jet Propulsion Laboratory, which leads the Curiosity rover mission. "This is the first time during the mission we've dedicated our operations to a stereo 360-degree panorama."

In 2013, Curiosity produced a 1.3-billion-pixel panorama using both Mastcam cameras; its black-and-white Navigation Cameras, or Navcams, provided images of the rover itself. Imaging specialists carefully assemble Mars panoramas by creating mosaics composed of individual pictures and blending their edges to create a seamless look.

Malin Space Science Systems in San Diego built and operates Curiosity's Mastcam. JPL, a division of Caltech in Pasadena, manages the project for NASA's Science Mission Directorate in Washington and built the Navigation Cameras and the rover.

## **News Media Contact**

Andrew Good  
Jet Propulsion Laboratory, Pasadena, Calif.  
818-393-2433  
[andrew.c.good@jpl.nasa.gov](mailto:andrew.c.good@jpl.nasa.gov)

Alana Johnson  
NASA Headquarters, Washington  
202-358-1501  
[alana.r.johnson@nasa.gov](mailto:alana.r.johnson@nasa.gov)



### 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: \_\_\_\_\_

\_\_\_\_\_

E-mail: \_\_\_\_\_

Phone  
(optional): \_\_\_\_\_

- Membership Type:**     Individual - \$30.00     Family - \$35.00     Student - \$10.00  
 Supporting - \$80.00     Institutional - \$40.00

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

- Please mail me a Mount 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.