



Vol. 66, No. 03 – March 2018

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*** * * SFAA Hoodie Design Submissions Due by March 15 * * ***

Calling all Designers! The SFAA Board is excited to announce that we are looking to create SFAA Hoodies; the exact item that all well-dressed night sky watchers need! Just three simple steps:

1. Think up a great design idea
2. Draw it
3. Submit it to president@sfaa-astronomy.org by March 15, 2018

We will vote for the winning design submissions at the March 20 meeting and lecture.

Got more than 1 idea? Fantastic! Repeat steps 1 – 3.

Your design might be the winner. What are you waiting for? The sky's the limit!

01. SFAA PRESIDENT'S NOTE | SPRING EQUINOX

The Spring Equinox signals the beginning of Spring. The nights get shorter each day, and the days longer. While this means less time for observing “faint fuzzies”, it heralds a phenomenon of celestial importance. On the Spring Equinox, the Sun’s coordinates on the celestial sphere are, for a brief moment, exactly 0 hour Right Ascension, and 0 degrees Declination. So while our calendar year begins on January 1st, the yearly cycle of the Sun’s motion in the sky begins with Spring, marked by the integer counting of the Hour Angle and the movement of the subsolar point across the celestial equator into the Northern Hemisphere.

In ancient times, Spring marked the start of events celebrating renewal, new life and new beginnings. Ancient shamans observed the sunrise from mid- to late March and announced when the Sun finally rose from due East. In our modern times, calendars, clocks, and smart phones shield us from knowing this pattern of the Sun’s motion, yet it’s so significant in astronomical terms: the celestial sphere is marked at 0:0 because of this event.

So take this opportunity to reset your clock to the Sun’s.

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	

***** Note: SFAA Membership Process Has Changed! *****

Starting immediately, current SFAA members can create a login account to the SFAA website to edit personal profile information, view membership status, and renew membership. Members will need the email address that was used to join SFAA as the login username, and members will need to create a password the first time they login.

Instead of staggered June 30 and December 31 renewal dates that were used in the past, memberships will expire one year from the member’s join or renewal date.

An auto-renewal process is also in the works to make annual renewals easier and effortless.

The process to join SFAA will also change slightly with new members prompted for their personal profile information in addition to payment details.

In the next few weeks, look for an email that will include your profile information, email address/login, and membership status.

02. ASTRONOMY EVENTS



SAN FRANCISCO AMATEUR ASTRONOMERS EVENTS MARCH 17, 2017 – MAY 24, 2018

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

Saturday, March 17, 6:00 pm – 2:00 am
Mt. Tam Members Night

Tuesday, March 20, 7:30 pm – 9:15 pm
Meeting and Lecture, Presidio Observation Post

Wednesday, March 21, 7:00 pm – 10:00 pm
City Star Party, South San Francisco Public Library

Saturday, March 24, 7:00 pm – 10:00 pm
City Star Party, Point Lobos

Saturday, April 14, 7:30 pm – 2:00 am
Mt. Tam Members Night

Tuesday, April 17, 7:30 pm – 9:15 pm
Meeting and Lecture, Presidio Observation Post

Saturday, April 21, 7:30 pm – 11:00 pm
Mt. Tam Public Star Party

Sunday, April 22, 7:00 pm – 10:00 pm
City Star Party, Presidio Parade Ground

Saturday, May 12, 7:30 pm – 2:00 am
Mt. Tam Members Night

Tuesday, May 15, 7:30 pm – 9:15 pm
Meeting and Lecture, Presidio Observation Post

Saturday, May 19, 7:30 pm – 11:00 pm
Mt. Tam Public Star Party

Sunday, May 24, 7:30 pm – 10:30 pm
City Star Party, Pier 17 Embarcadero

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!

03.

SFAA NEEDS YOU: VOLUNTEER OPPORTUNITIES | ANTHONY BARREIRO

Volunteer Opportunities In March And April

SFAA has been invited to present a star party at the South San Francisco Public Library. Our Mount Tamalpais members nights, city star parties, and general meetings and lectures continue every month. And we're getting ready to help the Friends of Mount Tam with their monthly public astronomy program in April through October. There are lots of opportunities for you as an SFAA member, with or without a telescope, to fulfill our mission of promoting and popularizing astronomy.

South San Francisco Public Library Star Party --

Wednesday March 21, 7:00 pm to 9:30 pm. 306 Walnut Avenue, between Grand Avenue and Miller Avenue. SFAA Vice President Liz Triggs is coordinating this event. We're expecting families with children, teens and adults. We need telescope operators. Members without telescopes can also help by presenting kid-friendly educational material -- explaining the orbit of the Moon, pointing out constellations, teaching people how to use a sky map or planisphere, etc. If you're able to help, please send an email to volunteer@sfaa-astronomy.org.

City Star Parties --

Saturday March 24, 7:00 pm to 10:00 pm, Point Lobos / Land's End.

Sunday April 22, 7:00 pm to 10:00 pm, Presidio Main Parade Ground.

Sunday May 24, 7:30 pm to 10:00 pm, Pier 17, Embarcadero.

Public outreach in the sidewalk astronomy tradition, in the darker corners of San Francisco. We tend to get more visitors at Presidio star parties, because the Presidio promotes them. If you're planning to attend, please send an email to volunteer@sfaa-astronomy.org.

Mount Tamalpais Member Nights --

Saturday March 17, arrive before 7:00 pm

Saturday April 14, arrive before 7:30 pm

Saturday May 12, arrive before 7:30 pm

Please be aware that the gate is closed at sunset and the rangers have started issuing citations to SFAA members who try to drive in after sunset. Member nights provide a relaxed opportunity to meet other members, check out their telescopes, and observe from a relatively dark location.

SFAA President PJ Cabrera will be a contact person for the March members night. We need at least one more contact person for March, and a couple of contact people for April. If you've been to at least a few Mt. Tam member nights and you're willing to serve as a contact person for one of these events, or if you want more information about the responsibilities of a contact person, please email volunteer@sfaa-astronomy.org

SFAA NEEDS YOU: VOLUNTEER OPPORTUNITIES (CONTINUED)

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
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 if you're interested.

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

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*** * * 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

04.

ABOVE THE FOG OPENING FOR NEW EDITOR | PJ CABRERA

After almost 2 years of publishing *Above the Fog*, as the Acting Editor, SFAA Vice President Liz Triggs has stepped down due to schedule and travel conflicts. SFAA President PJ Cabrera will be filling the role of Acting Editor, starting with the March issue.

Editing *Above the Fog* is a fun way to channel a little creative energy, bringing informative and interesting content to SFAA members. Never edited a club newsletter before? Not to worry—managing the newsletter is actually a pretty easy task plus it's a great way to get involved and meet SFAA members!

Please consider taking over at the helm so that the SFAA membership will be able to continue to get important program updates through our established monthly cadence. If you have been thinking about getting more involved with the club and have a little time each month, this is for you!

Liz and I will be available to introduce the new Editor to the well-documented process and newsletter template. If you are interested, please contact P.J. Cabrera at president@sfaa-astronomy.org or Liz Triggs at vice-president@sfaa-astronomy.org.

* * * * *

*** * * Editor's Note: Introducing a New Above The Fog Feature * * ***

SFAA Members have some AMAZING telescopes. This new feature puts the spotlight on our Members and their telescopes.

Please share the story of your telescope with other Members—you know they will be interested! Here are a couple of suggestions that might be helpful in putting your submission together:

- History of telescope, i.e. Did you make it?, Who did you get it from?, How long have you had it?
- Size and type of telescope, including magnification
- Noteworthy or favorite objects to view, including the first object you saw through your scope
- Members' own astrophotos are welcome, too
- Include photos of your scopes and a photo of yourself with your scope

Submit your articles and photos to newslettereditor@sfaa-astronomy.org

*** * * SFAA Hoodie Design Submissions Due by March 15 * * ***

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2. Draw it
3. Submit it to president@sfaa-astronomy.org by March 15, 2018

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Got more than 1 idea? Fantastic! Repeat steps 1 – 3.

Your design might be the winner. What are you waiting for? The sky's the limit!

05.

2018 SFAA STAR PARTY SCHEDULE | **ANTHONY BARREIRO AND SCOTT MILLER**

The Each year SFAA presents 31 star parties -- a monthly members night on Mount Tamalpais, a monthly public star party at different locations in San Francisco, and, in association with the Friends of Mount Tamalpais and Wonderfest, we provide public telescope viewing at the Mount Tamalpais Public Astronomy Program. The dates of our 2018 star parties are listed below.

Mt. Tam Members nights are held at the Rock Springs parking area and are open only to current members of SFAA and their guests. Each vehicle must have a State Parks parking pass. When you renew your SFAA membership, be sure to request a parking pass and provide your current mailing address. The Treasurer will send you a parking pass valid for one year. We schedule Members nights on the Saturday closest to the new Moon, to provide the darkest possible deep sky viewing.

City star parties are open to the public. We move around among the Presidio Main Parade Ground, Land's End, and the Embarcadero at Pier 17 (outside the Exploratorium). To make sure there will be at least one object visible through urban light pollution, the Moon is always up during City star parties. Start and end times are determined by when the Moon will be high enough for good viewing.

The Mount Tam Public Astronomy Programs are held monthly from April through October. There's a lecture by a professional astronomer in the Mountain Theater followed by telescope viewing in the Rock Springs parking area. Visitors need to leave by 11:00 pm. SFAA members with parking passes can stay as late as we like. The speakers and their topics will be announced on the Friends of Mt. Tam website, <http://www.friendsofmontam.org/astronomy.html> .

You don't need to have a telescope to come to a star party. Other members will be happy to let you look through theirs. If you're considering getting a telescope (or another telescope) star parties are a great opportunity to check out other members' scopes and get their opinions and advice. At public star parties, even if you don't have any equipment, if you know the sky you can help visitors get oriented, show them some constellations, and tell them about what they'll be looking at through the telescopes.

Star parties may be cancelled because of weather -- clouds, rain, or, on Mt. Tam, high fire danger. Please check the SFAA website at <http://www.sfaa-astronomy.org/> before you leave home! Cancellations will be announced on the main page.

Please plan to arrive at a star party before sunset. If you're bringing a telescope you'll have time to set up in the light of day and be ready to observe when the sky gets dark, rather than struggling with and cursing at your equipment in the dark. Whether or not you have a telescope, driving into a star party after dark with your headlights on will obliterate everyone else's night vision. And if you try to drive in with your lights off you're liable to run over somebody. Just arrive before sunset and everybody will be safe and happy.

In order to maintain dark-adapted vision, please be very careful with any lights. Turn off the lights inside your car. Use a dim red flashlight only when needed. If you're not used to being outside in the dark, you may be surprised at how well you can see once your eyes are fully adapted to the dark. And please be careful with laser pointers -- don't shine them in people's faces or near airplanes. If other members are taking astrophotographs they may ask you not to use your laser pointer at all, to prevent green streaks in their images.

When you're ready to leave, please let the other members know before you start packing up. Try to leave in groups, rather than one by one. Especially on Mt. Tam, that's safer for everybody, and minimizes the disruption caused by people turning on their car lights.

If you've been to a few star parties and you're interested in serving as a contact person for one or more upcoming star parties, please send an email to volunteer@sfaa-astronomy.org. You'll get a monthly email asking for volunteers for the upcoming events.

Without further ado, here are the dates for our 2018 star parties, with Moon phase and sunset time, plus starting and ending times for City star parties.

- Saturday March 17, Mt. Tam members night, new Moon, sunset 7:20 pm PDT
- Wednesday March 21, 7:00 to 9:30 pm, South SF Public Library, waxing quarter Moon
- Saturday March 24, 7:00 to 10:00 pm, City star party, Land's End, waxing quarter Moon
- Saturday April 14, Mt. Tam members night, new Moon, sunset 7:45 pm
- Saturday April 21, Mt. Tam public program, waxing quarter Moon, sunset 7:50 pm
- Sunday April 22, 7:00 to 10:00 pm, City star party, Presidio, waxing quarter Moon
- Saturday May 12, Mt. Tam members night, waning crescent Moon, sunset 8:10 pm
- Saturday May 19, Mt. Tam public program, waxing crescent Moon, sunset 8:15 pm
- Thursday May 24, 7:30 to 10:30 pm, City star party, Embarcadero, waxing gibbous Moon
- Saturday June 9, Mt. Tam members night, waning crescent Moon, sunset 8:30 pm
- Saturday June 16, Mt. Tam public program, waxing crescent Moon, sunset 8:35 pm
- Thursday June 21, 8:00 to 11:00 pm, City star party, Presidio, waxing gibbous Moon
- Saturday July 7, Mt. Tam members night, waning crescent Moon, sunset 8:35 pm
- Saturday July 14, Mt. Tam public program, waxing crescent Moon, sunset 8:30 pm
- Saturday July 21, 8:00 to 11:00 pm, City Star Party, Land's End, waxing gibbous Moon
- Saturday August 11, members night, new Moon, sunset 8:05 pm
- Saturday August 18, Mt. Tam public program, waxing quarter Moon, sunset 8:00 pm
- Sunday August 19, 8:00 to 11:00 pm, City star party, Land's End, waxing quarter Moon
- Saturday September 15, Mt. Tam public program, waxing quarter Moon, sunset 7:15 pm
- Thursday September 20, 7:30 to 10:30 pm, City star party, Presidio, waxing gibbous Moon
- Saturday October 6, Mt. Tam members night, waning crescent Moon, sunset 6:45 pm
- Saturday October 13, Mt. Tam public program, waxing crescent Moon, sunset 6:35 pm
- Saturday October 20, 7:30 to 10:30 pm, City star party, Embarcadero, waxing gibbous Moon
- Saturday November 3, Mt. Tam members night, waning crescent Moon, sunset 6:10 pm
- Saturday November 17, 7:00 to 10:00 pm, City star party, Land's End, waxing gibbous Moon
- Saturday December 8, Mt. Tam members night, waxing crescent Moon, sunset 4:50 pm
- Saturday December 15, 7:00 to 10:00 pm, City star party, Presidio, waxing quarter moon

06. SFAA LECTURE SCHEDULE 2018

MARCH 20TH LECTURE | “IT RAINS DIAMONDS ON ‘ICE GIANT’ PLANETS”

THE PRESIDIO . OBSERVATION POST, BUILDING 211

211 Lincoln Boulevard, San Francisco

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

SFAA'S GENERAL MEETINGS OCCUR ON THE 3RD TUESDAY OF EACH MONTH

“IT RAINS DIAMONDS ON ‘ICE GIANT’ PLANETS”



SIEGRIED GLENZER, DIRECTOR, HIGH ENERGY DENSITY SCIENCE DIVISION, SLAC

A new experiment at SLAC National Accelerator Laboratory reveals how large diamonds may be formed with just hydrogen and carbon, in the deep interior of ice giant planets such as Uranus and Neptune. Experimental simulations using high-powered optical lasers revealed “diamond rain” forming in real time.

Scientists predict that diamond crystals would be much larger, and likely to slowly sink down to the planet core over thousands of years. Professor Glenzer said, “For this experiment we had LCLS, the brightest X-ray source in the world, and intense, fast pulses of X-rays are needed to unambiguously see the structure of these diamond”.

These experiments help provide us with better insight into the structure of exoplanets.

Brief Bio

Siegfried Glenzer, who is the recipient of the recent E O Lawrence award, is Professor and High-Energy-Density division director at the SLAC National Accelerator Lab. He joined SLAC as a distinguished scientist to build a new discovery class program to explore matter in extreme conditions.

07. UPCOMING SFAA LECTURES 2018

THE PRESIDIO . OBSERVATION POST, BUILDING 211

211 Lincoln Boulevard, San Francisco

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

SFAA'S GENERAL MEETINGS OCCUR ON THE 3RD TUESDAY OF EACH MONTH

APRIL 17TH | GIBOR BASRI, PH.D.,

UNIVERSITY OF CALIFORNIA, BERKELEY

CO-INVESTIGATOR ON THE KEPLER MISSION



"ARE RED DWARF PLANETS HABITABLE?"

Most of the news about exoplanets this past year has revolved around the discovery of "Earth-sized" planets in the "habitable zone" of "red dwarf" stars. This is partly due to the fact that such planets are more easily found, partly because most stars are red dwarfs (cooler and smaller than the Sun), and partly because smaller stars apparently tend to have smaller planets. Basri will talk about these discoveries, give a background on red dwarfs, and concentrate on the current thinking about whether a planet around 2027, a red dwarf, could in fact actually harbor life. This question is still a very active one; 15 years ago most astronomers would have just answered "no". He will explain why, and how our thinking is evolving.

MAY 15TH | MATTHEW TISCARENO, PLANETARY SCIENTIST, SETI



"CASSINI'S SPECTACULAR FINAL YEAR AT SATURN"

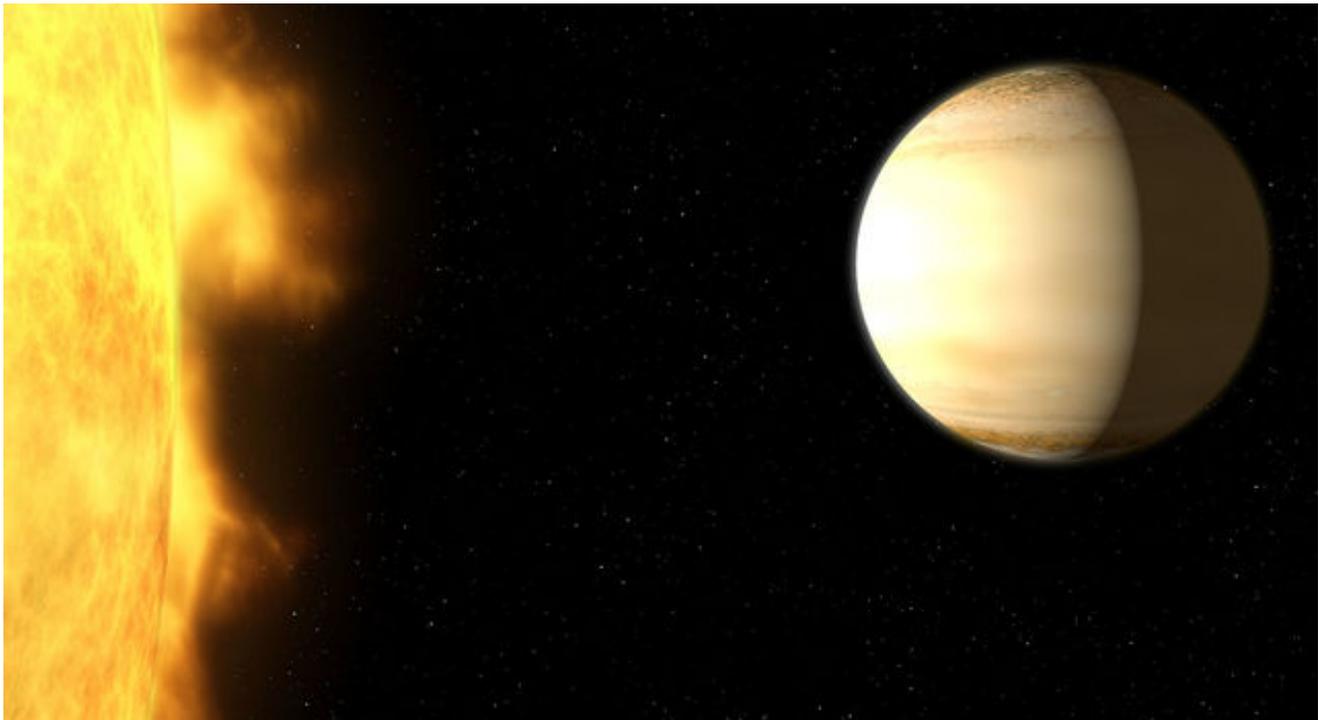
With its 13-year mission at Saturn now complete, Cassini takes its place as the most spectacularly successful interplanetary mission in the history of NASA. In its final 10 months (from December 2016 to September 2017), Cassini has transformed itself into a whole new mission with its Grand Finale, including 20 close flybys off the outer edge of Saturn's rings and 22 passes between the rings and the cloud-tops of the planet, culminating into a final plunge into the depths of Saturn. The detailed new data obtained during these maneuvers has brought Saturn's rings, its clouds, its small inner moons, and more, into sharper focus than ever before. In this lecture, Cassini rings scientist Matthew Tiscareno will review the rich harvest of the Cassini mission.

NASA FINDS A LARGE AMOUNT OF WATER IN AN EXOPLANET'S ATMOSPHERE

Much like detectives who study fingerprints to identify the culprit, scientists used NASA's Hubble and Spitzer space telescopes to find the "fingerprints" of water in the atmosphere of a hot, bloated, Saturn-mass exoplanet some 700 light-years away. And, they found a lot of water. In fact, the planet, known as WASP-39b, has three times as much water as Saturn does.

Though no planet like this resides in our solar system, WASP-39b can provide new insights into how and where planets form around a star, say researchers. This exoplanet is so unique, it underscores the fact that the more astronomers learn about the complexity of other worlds, the more there is to learn about their origins. This latest observation is a significant step toward characterizing these worlds.

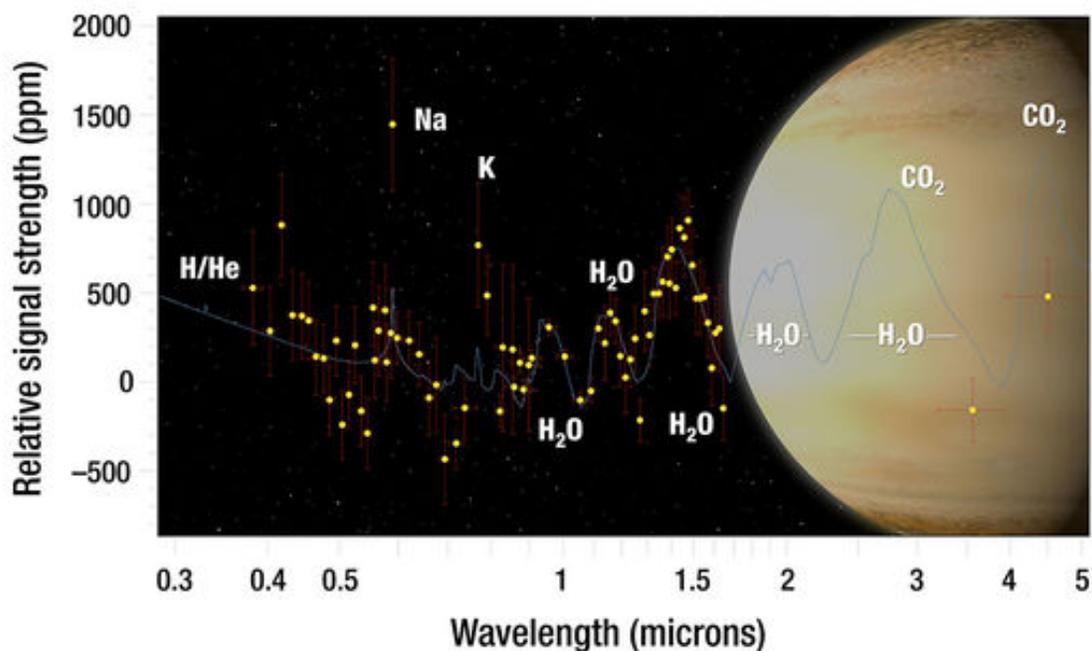
Although the researchers predicted they'd see water, they were surprised by how much water they found in this "hot Saturn." Because WASP-39b has so much more water than our famously ringed neighbor, it must have formed differently. The amount of water suggests that the planet actually developed far away from the star, where it was bombarded by a lot of icy material. WASP-39b likely had an interesting evolutionary history as it migrated in, taking an epic journey across its planetary system and perhaps obliterating planetary objects in its path.



"We need to look outward so we can understand our own solar system," explained lead investigator Hannah Wakeford of the Space Telescope Science Institute in Baltimore, and the University of Exeter in Devon, United Kingdom. "But exoplanets are showing us that planet formation is more complicated and more confusing than we thought it was. And that's fantastic!"

Wakeford and her team were able to analyze the atmospheric components of this exoplanet, which is similar in mass to Saturn but profoundly different in many other ways. By dissecting starlight filtering through the planet's atmosphere into its component colors, the team found clear evidence for water. This water is detected as vapor in the atmosphere.

Comprehensive spectrum of WASP-39b



Using Hubble and Spitzer, the team has captured the most complete spectrum of an exoplanet's atmosphere possible with present-day technology. "This spectrum is thus far the most beautiful example we have of what a clear exoplanet atmosphere looks like," said Wakeford.

"WASP-39b shows exoplanets can have much different compositions than those of our solar system," said co-author David Sing of the University of Exeter. "Hopefully, this diversity we see in exoplanets will give us clues in figuring out all the different ways a planet can form and evolve."

Located in the constellation Virgo, WASP-39b whips around a quiet, Sun-like star, called WASP-39, once every four days. The exoplanet is currently positioned more than 20 times closer to its star than Earth is to the Sun. It is tidally locked, meaning it always shows the same face to its star.

Its day-side temperature is a scorching 1,430 degrees Fahrenheit (776.7 degrees Celsius). Powerful winds transport heat from the dayside around the planet, keeping the permanent nightside almost as hot. Although it is called a "hot Saturn," WASP-39b is not known to have rings. Instead, it has a puffy atmosphere that is free of high-altitude clouds, allowing Wakeford and her team to peer down into its depths.

Looking ahead, Wakeford hopes to use NASA's James Webb Space Telescope - scheduled to launch in 2019 - to get an even more complete spectrum of the exoplanet. Webb will be able to give information about the planet's atmospheric carbon, which absorbs light at longer infrared wavelengths than Hubble can see. By understanding the amount of carbon and oxygen in the atmosphere, scientists can learn even more about where and how this planet formed.

The Hubble Space Telescope is a project of international cooperation between NASA and ESA (European Space Agency). NASA's Goddard Space Flight Center in Greenbelt, Maryland, manages the telescope. The Space Telescope Science Institute (STScI) in Baltimore conducts Hubble science operations. STScI is operated for NASA by the Association of Universities for Research in Astronomy, Inc., in Washington.

NASA's Jet Propulsion Laboratory, Pasadena, California, manages the Spitzer Space Telescope mission for NASA's Science Mission Directorate, Washington. Science operations are conducted at the Spitzer Science Center at Caltech in Pasadena. Spacecraft operations are based at Lockheed Martin Space Systems Company, Littleton, Colorado. Data are archived at the Infrared Science Archive housed at IPAC at Caltech. Caltech manages JPL for NASA.

For more information about NASA's Hubble Space Telescope, visit:
<https://www.nasa.gov/hubble>

For more information about NASA's Spitzer Space Telescope, visit:
<https://www.nasa.gov/spitzer>

News Media Contact

Calla Cofield

Jet Propulsion Laboratory, Pasadena, Calif.

818-354-5011

calla.e.cofield@jpl.nasa.gov

Ann Jenkins / Ray Villard

Space Telescope Science Institute, Baltimore, Maryland

410-338-4488 / 410-338-4514

jenkins@stsci.edu / villard@stsci.edu

2018-041



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.