



# The Observer

SAN BERNARDINO VALLEY AMATEUR ASTRONOMERS  
Member of The Astronomical League  
<http://sbvaa.org/>



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Since 1958

June 2019

## Meeting:

June 15, 2019

## Location:

**First Christian Church**  
**2102 E. Foothill Dr.**  
**San Bernardino, CA**

**7:00 p.m.**

**Pre-meeting Dinner,**  
**5:00 to 6:30 p.m.,**

**Jenny's Family**  
**Resturant**  
**7750 Palm Ave.**  
**Highland, CA**

After the meeting telescopes will be set up for viewing and members will be available to answer questions. Bring your telescope to observe with us.

*No telescope is too humble,  
and beginners are always  
made welcome!*

## Program Summer Skies Over Grandview

June's club meeting program will be given by our own Chris & Martin.

“Summer Skies Over Grandview” will give us a preview of what we can expect to see during our semi-annual trip to the dark skies of the White Mountains. It will also be of interest to those who are unable to make the trip north. With good weather, the June skies are full of beautiful DSOs plus Jupiter and Saturn will be making their appearance.



## SBVAA Officers

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## Calendar of Upcoming Events

June 15, Club Meeting

June 27-30, **GRANDVIEW**

July 20, Summer Social at Sizzlers

July 27, Star Party, Oak Glen

Aug. 17, Club BBQ

Aug. 22-25, Grandview

Sept. 14, Club Meeting

Sept. 28, Star Party/Outreach. Oak Glen

Oct. 5, Star Party/Outreach Pioneer Tn.

## NASA Invites Public to Submit Names to Fly Aboard the Next Mars Rover

Although it will be years before the first humans set foot on Mars, NASA is giving the public an opportunity to send their names - stenciled on chips - to the Red Planet with NASA's Mars 2020 rover, which represents the initial leg of humanity's first round trip to another planet. The rover is scheduled to launch as early as July 2020, with the spacecraft expected to touch down on Mars in February 2021.

The opportunity to send your name to Mars comes with a souvenir boarding pass and "frequent flyer" points. This is part of a public engagement campaign to highlight missions involved with NASA's journey from the Moon to Mars. Miles (or kilometers) are awarded for each "flight," with corresponding digital mission patches available for download. More than 2 million names flew on NASA's InSight mission to Mars, giving each "flyer" about 300 million frequent flyer miles (nearly 500 million frequent flier kilometers).

From now until Sept. 30, 2019, you can add your name to the list and obtain a souvenir boarding pass to Mars here: <https://go.nasa.gov/Mars2020Pass>.

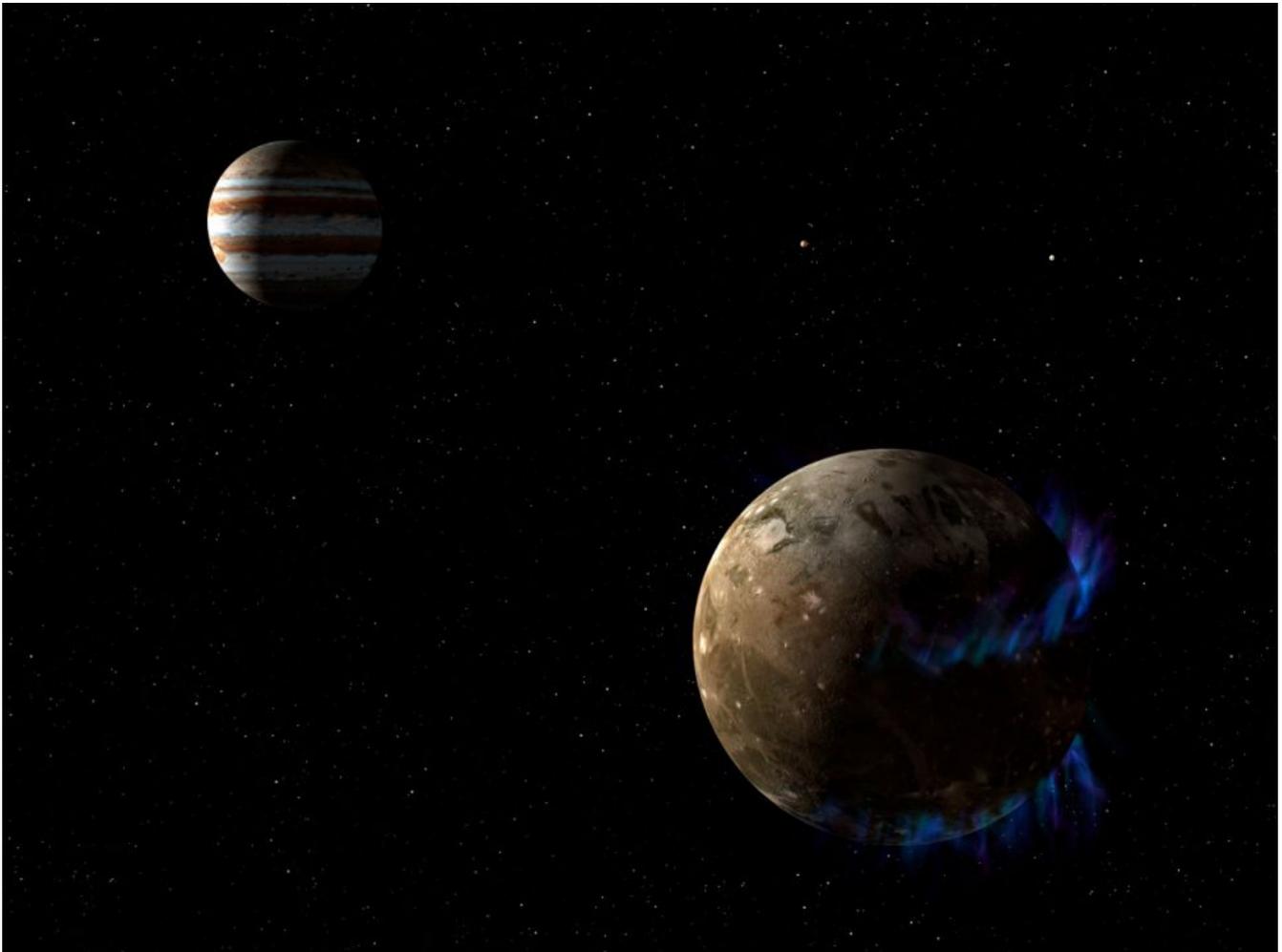


# Ganymede Has Ocean with More Water than Earth

A salty ocean is lurking beneath the surface of Jupiter's largest moon, Ganymede, scientists using the Hubble Space Telescope have found.

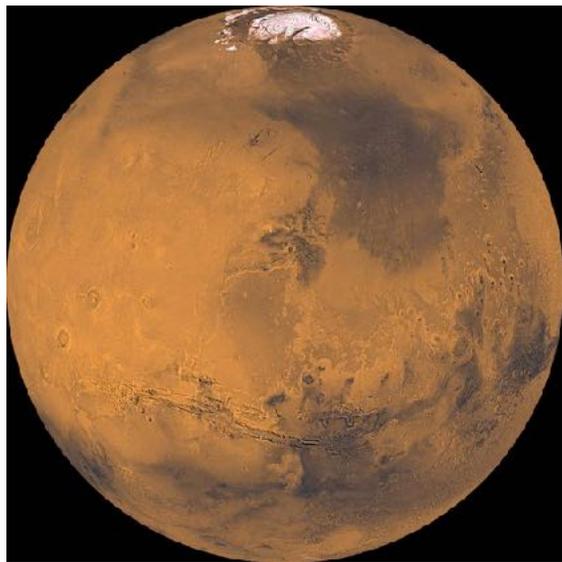
The ocean on [Ganymede](#) — which is buried under a thick crust of ice — could actually harbor more water than all of Earth's surface water combined, according to NASA officials. Scientists think the ocean is about 60 miles (100 kilometers) thick, 10 times the depth of Earth's oceans, NASA added. The new Hubble Space Telescope finding could also help scientists learn more about the plethora of potentially watery worlds that exist in the solar system and beyond.

Scientists have long suspected that there was an [ocean of liquid water on Ganymede](#) — the largest moon in the solar system, at about 3,273 miles (5,268 kilometers) across — has an ocean of liquid water beneath its surface. The Galileo probe measured Ganymede's magnetic field in 2002, providing some data supporting the theory that the moon has an ocean. The newly announced evidence from the Hubble telescope is the most convincing data supporting the subsurface ocean theory yet, according to NASA.



*(For more details, go to [space.com](http://space.com))*

## Scientists Cook Up a New Way to Make Breathable Oxygen on Mars



Scientists have found a new way that [future Mars explorers](#) could potentially generate their own oxygen.

Molecular oxygen can be produced through carbon dioxide reactions. (Carbon dioxide contains a single carbon atom and two oxygen atoms.) Former Caltech postdoctoral fellow Yunxi Yao and current Caltech chemical engineering professor Konstantinos Giapis simulated this reaction by crashing carbon dioxide into gold foil. Since gold foil cannot be oxidized, by itself it should not produce any molecular oxygen. But when carbon dioxide careens into the foil at high speed, the gold surface emits molecular oxygen.

Researchers believe that this gold foil reactor could be modified one day to create breathable air for astronauts on Mars. And on Earth, the reactor may be useful to pull carbon dioxide (which is also a potent greenhouse gas, and the main driver of [global warming](#)) out of the atmosphere and convert it into oxygen.

(For more details, go to [space.com](#))

## Observatories You Should Know: Mt. Lemmon Sky Center

Since 1970 Steward Observatory has operated astronomical facilities on Mt. Lemmon and Mt. Bigelow that have participated in the birth of infrared astronomy, the survey of the Moon for Apollo lunar landings and the search for near-Earth asteroids. The 61-inch telescope, the largest in the Catalina mountains, is operated by Steward Observatory and was built in the early 1960s to survey the Moon in preparation for the upcoming lunar spacecraft missions. *Sky & Telescope* called the Atlas of the Moon thus produced "the finest ground-based photographic lunar survey ever done".

Following on the groundbreaking infrared work at Mt. Lemmon, today the University of Minnesota continues to operate the Mt. Lemmon Observing Facility (MLOF), a 60 inch, f/15, infrared-optimized, Cassegrain (Dahl-Kirkham) telescope, which opened in December 1970. The University of Minnesota uses the 60-inch primarily to support observations at national facilities (*Chandra*, Gemini, NASA IRTF, *Spitzer*) and long-term monitoring of transient objects (typically comets and classical novae).

The Catalina Sky Survey of the University of Arizona's Lunar and Planetary Lab detects asteroids - especially those near-Earth bodies that are potentially hazardous to us! This telescope scans over 800 square degrees of sky and detects well over 1,000 asteroids every night. The telescope is the second largest of its kind in the United States.

The public can buy tickets to use the 32-inch Schulman and 24-inch Phillips Telescopes... Arizona's largest dedicated public viewing telescopes!

(See more at [Mt. Lemmon's web site.](#))