



# The Observer

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



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Since 1958

September, 2018

Meeting:

September 1, 2018

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  
Restaurant  
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 Auroras: Fire In The Sky

Auroras are a natural electrical phenomenon characterized by the appearance of streamers of reddish or greenish light in the sky, usually near the northern or southern magnetic pole.



The dancing lights of the auroras provide spectacular views on the ground, but also capture the imagination of scientists who study incoming energy and particles from the sun. Auroras are one effect of such energetic particles, which can speed out from the sun both in a steady stream called the solar wind and due to giant eruptions known as coronal mass ejections or CMEs. After a trip toward Earth that can last two to three days, the solar particles and magnetic fields cause the release of particles already trapped near Earth, which in turn trigger reactions in the upper atmosphere in which oxygen and nitrogen molecules release photons of light. The result: the Northern and Southern lights.

## SBVAA Officers

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## Calendar of Upcoming Events

**Sept. 7-9, GRANDVIEW**

Sept. 18, Outreach, Dominguez School,  
San Bernardino

Sept. 21, Outreach, San Bernardino  
County Museum, Redlands

Oct. 6, Club Meeting

Oct. 13, Outreach, Oak Glen

Oct. 20, Outreach, White Water

Nov. 3, Club Meeting

Nov. 10, Star Party, Pioneer Tonw

Dec 1, Annual Holiday Party

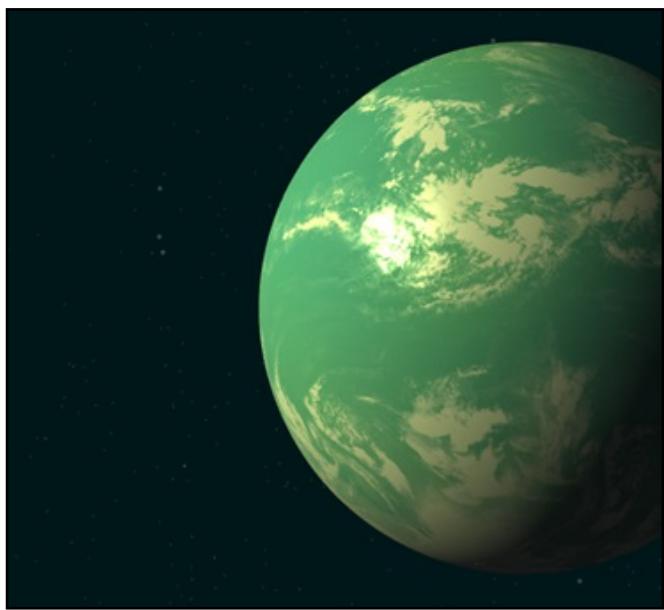
## Annual Club Picnic & BBQ, Aug; 4, 2018



## Water Water Everywhere?

Water is a key ingredient for life — and new research suggests we might find it all over the galaxy.

Scientists looked at the mass of super-Earths, a kind of planet common across the cosmos but not present in our own solar system. These rocky worlds are several times larger than Earth, but the team's analysis of known super-Earths reveals something astounding: Many of them may be literal water worlds.



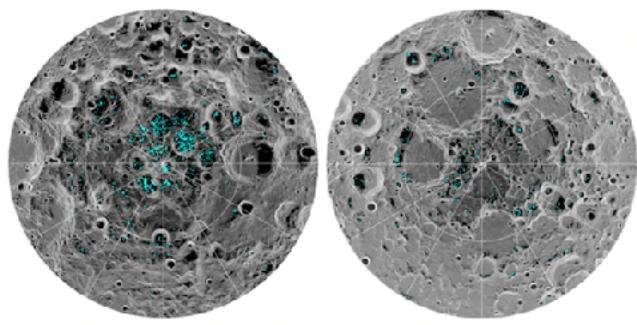
Li Zeng of Harvard University, the research leader said “one has to realize that, although water appears to be precious and rarer on Earth and other inner solar system terrestrial planets, it is in fact one of the most abundant substance in the universe, since oxygen is the third most abundant element after hydrogen and helium.”

And based on the team's modeling, up to 35 percent of known planets might be water worlds. That could mean the coming years will lead to the discovery of a whole lot of exo-oceans — and a whole host of new questions.

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

## Proven: There is Water on the Moon

[Research](#) published on August 20 in the *Proceedings of the National Academy of Sciences* shows that specific signatures of water ice exist atop the cold, dark craters near the Moon's poles — proving the existence of lunar surface ice for the first time



To finally get some hard evidence, a group of scientists looked back at data from NASA's Moon Mineralogy Mapper (M3), a visible and infrared spectrometer that rode aboard India's Chandrayaan-1 orbiter during its 2008-2009 tour. M3 was capable of directly measuring how molecules on the Moon's surface absorb infrared light, which distinguishes surface ice from liquid water, water that's held in minerals and water that's hidden under the surface. It was also able to detect the specific reflective properties that are often given off by surface ice.

When they combined these two factors, they found reflective properties, as well as definitive interactions between molecules and infrared light, that indicate the presence of water ice on the lunar surface. The Moon's south pole showed high concentrations of ice in lunar craters, whereas the north pole's ice was more spread out across the surface.

(For more details including what this could mean for future Moon bases, go to [astronomy.com](http://astronomy.com))

## NASA/JPL Mars Report

Mars is still very much with us in the evening sky and will remain so for another month or two. Exploration of Mars has greatly exceeded much of our scientific expectations. If you go to [JPL.NASA.gov](http://JPL.NASA.gov) you will be able to watch a very informative video which recaps our activity on the Red Planet.

The following are some of the points covered:

Mars remains bright in the sky after its closest approach to Earth since 2003.

Through a telescope, surface features remain obscured by a dust storm that continues to envelop the planet.

The Curiosity Rover celebrated six years on the surface of Mars!

Curiosity obtained a new drill sample in an area called Vera Rubin Ridge.

The rocks in this area have proven surprisingly hard.

New science results are on the way!

### InSight

The InSight spacecraft is more than halfway to Mars.

It recently conducted its second successful trajectory correction maneuver to steer toward the planet.

The team also tested its onboard instruments and cameras.

A selfie taken from inside the spacecraft backshell.

Glimpsing these spacecraft components is a reassuring sight for mission engineers.

Camera image on the surface of Mars.

## Spitzer Space Telescope: A Brilliant Success

Initially scheduled for a minimum 2.5-year primary mission, NASA's Spitzer Space Telescope has gone far beyond its expected lifetime -- and is still going strong after 15 years.



Launched into a solar orbit on Aug. 25, 2003, Spitzer was the final of NASA's four Great Observatories to reach space. The space telescope has illuminated some of the oldest galaxies in the universe, revealed a new ring around Saturn, and peered through shrouds of dust to study newborn stars and black holes. Spitzer assisted in the discovery of planets beyond our solar system, including the detection of seven Earth-size planets orbiting the star TRAPPIST-1, among other accomplishments.

Spitzer's discoveries extend from our own planetary backyard, to planets around other stars, to the far reaches of the universe. And by working in collaboration with NASA's other Great Observatories, Spitzer has helped scientists gain a more complete picture of many cosmic phenomena.