
Newsletter of the Pomona Valley Amateur Astronomers

The treasures hidden in the heavens are so rich that the human mind shall never be lacking in fresh nourishment.

***Johannes Kepler***

**Volume 38 Number 02** ***nightwatch*** **February 2018**

## President's Message

There's a lot going on up there - but when is that not the case?

Around this time of year I like to remind people that the rover Opportunity landed on Mars on January 25, 2004. So it just passed the 14th anniversary of its landing (at least in Earth years), and it's still going strong. Amazing.

I hope you caught at least a little bit of the total lunar eclipse early Wednesday morning. We'll have another total eclipse of the moon about this time next year, and then none in 2020. But in 2021 and 2022 we'll get two lunar events each year, either total or very deep partial eclipses.

Speaking of solar system happenings, our own Cori Charles applied last year to be a NASA/JPL Solar System Ambassador, and at the end of the December she learned that her application had been approved. Congratulations, Cori!

We have a couple of education and outreach opportunities coming up. On Friday, February 23, from 6-9 pm the Foothill Knolls STEM Academy of Innovation in Upland is hosting their annual StarPalooza event, and they welcome astronomers with telescopes to show off the wonders of the universe. I'm free that evening and hopefully some of you will also be available. If you're interested in attending, please let me know.

Saturday, April 28, from 1-4 pm will be the Children's Book Festival at the Claremont Public Library. We've been invited to host a table again, as we have for the past several years. It's a fun event that gives some community visibility to the club and to our library telescope program.

Our speaker for the upcoming meeting will be David Nakamoto from LAAS. The title of his talk is, "The strange case of BL Lac". We'll meet at 7:30 on Friday, Feb. 2, in Shanahan B460 on the Harvey Mudd campus. I hope to see you there.

***Matt Wedel***

## PVAA Officers and Board

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| Ron Hoekwater (2019)..... | 909-706-7453 |
| Cori Charles (2019) ……. | 909-646-0275 |

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| Programs ..... | Ron Hoekwater ..... | 909-391-1943 |
| Nightwatch ..... | John Stover …..... | |

2018-01-31 full moon Matt Wedel

At Very Start of Total Eclipse

## Club Events Calendar

**February 2 General Meeting**
**February 10 Star Party**
**February 21 Board Meeting**
**February 23 Foothill Knolls Star Party**

**March 2 General Meeting**
**March 10 Star Party**

**April 14 Star Party**
**April 18 Board Meeting**
**April 27 General Meeting**
**April 28 Claremont Public Library, Children's Book Festival**

**May 16 Board Meeting**
**May 24 – 28 RTMC**

**June 1 General Meeting**

## Speaker Announcement

Our speaker on February 2 will be David Nakamoto from the Los Angeles Astronomical Society. The title of his talk is, "The Strange Case of BL Lac".

## Club Public Events

On Friday, February 23, from 6-9 pm the Foothill Knolls STEM Academy of Innovation in Upland is hosting their annual Star Palooza event, and they welcome astronomers with telescopes. Matt plans to attend and will announce it to the club in hopes more of you can attend.

Saturday, April 28, from 1-4 pm will be the Children's Book Festival at the Claremont Public Library. The Club has been invited to host a table again, as we have for the past several years.

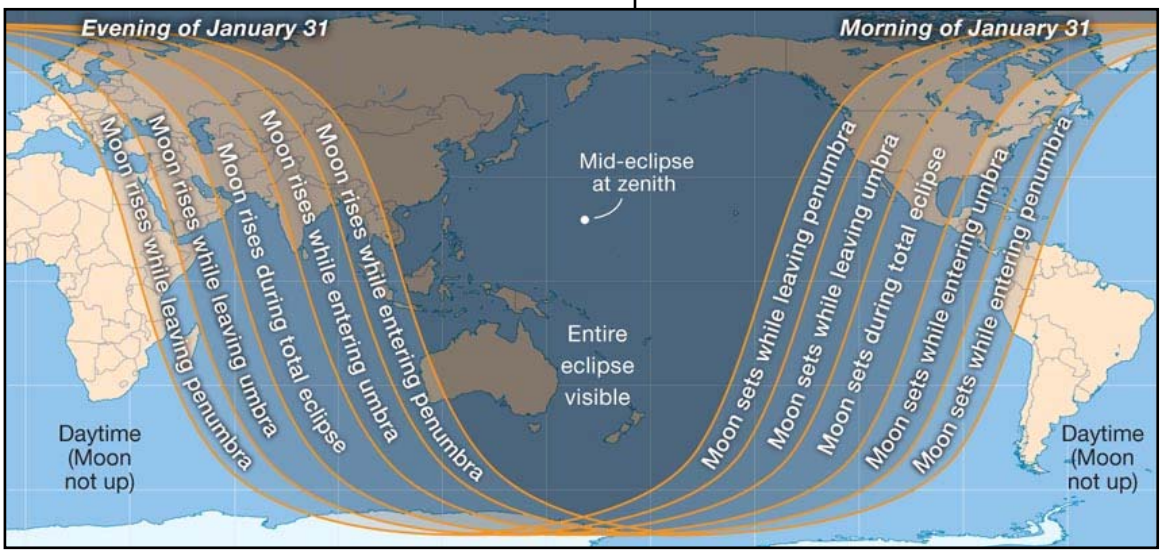
## What's Up? - Blood Moon Eclipse

Visible in the western U.S. in the early hours of January 31, a full moon will turn into a reddish blood moon total eclipse. It will be a close super moon size in the elliptical lunar orbit and will also be a blue moon. The term blue moon means a rare two full moons within one calendar month. So, the phrase "once in a blue moon" means unusual. The total combination of all three hasn't occurred in North America since 1866.

A lunar eclipse happens when our Moon passes right behind our Earth into its shadow (umbra). It happens only when Sun, Earth and Moon are aligned in a syzygy with the Earth in the middle. So a lunar eclipse occurs only on a night of the full moon. The only light shining on the full moon is refracted through Earth's atmospheric shadow. So it looks red like a sunset because of Reyleigh scattering of any blue light. This creates the blood moon effect.

Unlike the solar eclipse which is only seen from a small area of the Earth for only a few minutes, a lunar eclipse can be seen anywhere on the night side of Earth. It can last from a few hours up to four hours depending on how it's centered. The Earth's shadow is divided into the darkest umbra and the outer less dark penumbra. A partial lunar eclipse can occur when the Moon only passes through the lighter penumbra.

Stories involving the knowledge of lunar eclipses include one from 1504 when Christopher Columbus came to the New World and landed in Jamaica. Wanting to seem god-like since his crew had been eating so much of the native's food he announced he would make the Moon turn dark red. Since he had knowledge of astronomical tables he was right in his prediction. The natives were impressed and continued to feed Columbus's crew. This device has been used in novels by authors like Mark Twain.




Less scientific cultures tended to see bloody lunar eclipses as bad omens. Usually a demon was seen as eating the moon and a noisy ceremony was conducted to get the creature to release it. The Egyptian imagined a sow swallowing it. The Mayans felt a jaguar was eating it. China had a three-legged toad or a hungry dragon. Only the classical Greeks and Romans were first to see the Earth as round and were able to realize that the shadow of the Earth was passing over the Moon.

***Lee Collins***

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## Sixty Years of Observing Our Earth

Satellites are a part of our everyday life. We use global positioning system (GPS) satellites to help us find directions. Satellite television and telephones bring us entertainment, and they connect people all over the world. Weather satellites help us create forecasts, and if there's a disaster—such as a hurricane or a large fire—they can help track what's happening. Then, communication satellites can help us warn people in harm's way.

There are many different types of satellites. Some are smaller than a shoebox, while others are bigger than a school bus. In all, there are more than 1,000 satellites orbiting Earth. With that many always around, it can be easy to take them for granted. However, we haven't always had these helpful eyes in the sky.

The United States launched its first satellite on Jan. 31, 1958. It was called Explorer 1, and it weighed in at only about 30 pounds. This little satellite carried America's first scientific instruments into space: temperature sensors, a microphone, radiation detectors and more.

Explorer 1 sent back data for four months, but remained in orbit for more than 10 years. This small, relatively simple satellite kicked off the American space age. Now, just 60 years later, we depend on satellites every day. Through these satellites, scientists have learned all sorts of things about our planet.

For example, we can now use satellites to measure the height of the land and sea with instruments called altimeters. Altimeters bounce a microwave or laser pulse off Earth and measure how long it takes to come back. Since the speed of light is known very accurately, scientists can use that measurement to calculate the height of a mountain, for example, or the changing levels of Earth's seas.

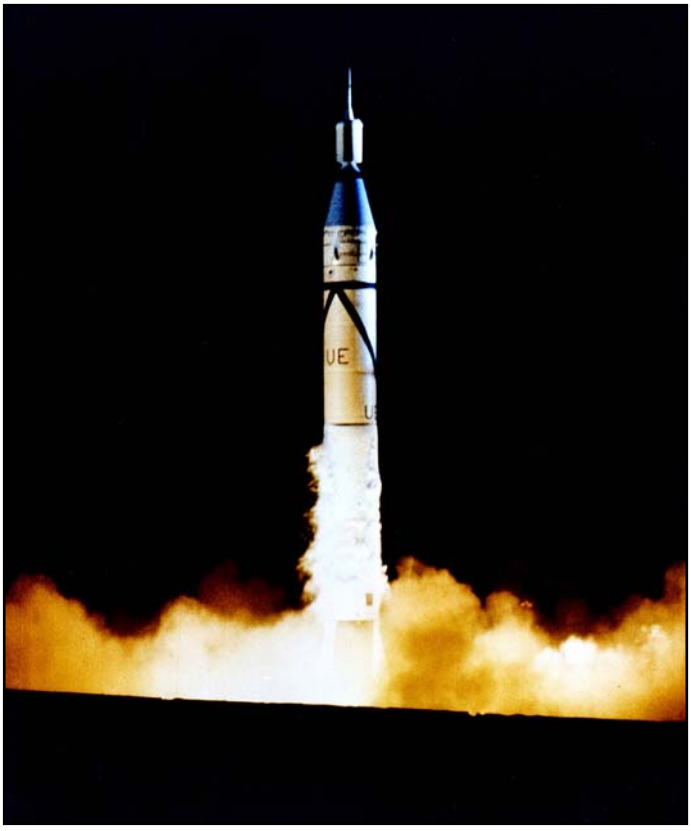
Satellites also help us to study Earth's atmosphere. The atmosphere is made up of layers of gases that surround Earth. Before satellites, we had very little information about these layers. However, with satellites' view from space, NASA scientists can study how the atmosphere's layers interact with light. This tells us which gases are in the air and how much of each gas can be found in the atmosphere. Satellites also help us learn about the clouds and small particles in the atmosphere, too.

When there's an earthquake, we can use radar in satellites to figure out how much Earth has moved during a quake. In fact, satellites allow NASA scientists to observe all kinds of changes in Earth over months, years or even decades.

Satellites have also allowed us—for the first time in civilization—to have pictures of our home planet from space. Earth is big, so to take a picture of the whole thing, you need to be far away. Apollo 17 astronauts took the first photo of the whole Earth in 1972. Today, we're able to capture new pictures of our planet many times every day.

Today, many satellites are buzzing around Earth, and each one plays an important part in how we understand our planet and live life here. These satellite explorers are possible because of what we learned from our first voyage into space with Explorer.1—and the decades of hard work and scientific advances since then.

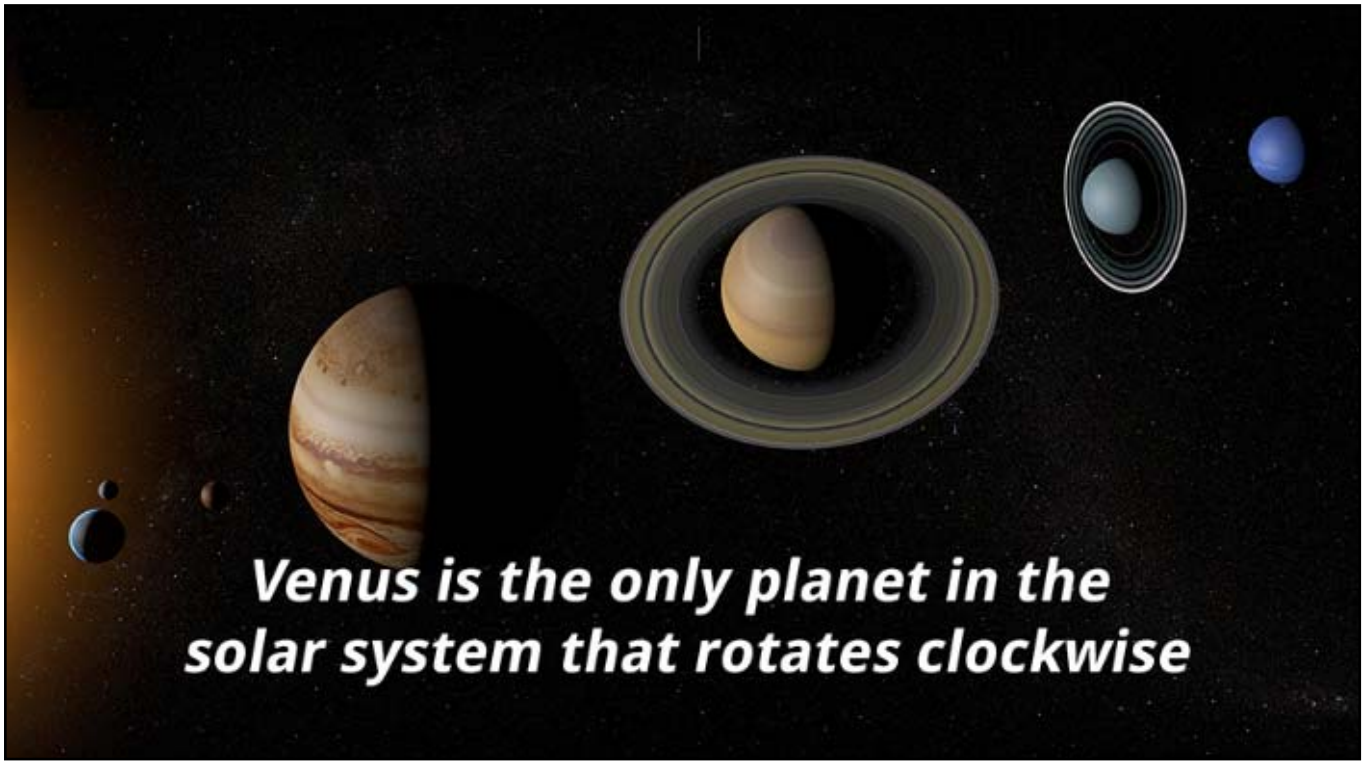
***Teagan Wall***



This photo shows the launch of Explorer 1 from Cape Canaveral, Fla., on Jan. 31, 1958. Explorer 1 is the small section on top of the large Jupiter-C rocket that blasted it into orbit. With the launch of Explorer 1, the United States officially entered the space age. Image credit: NASA

To learn more about satellites, including where they go when they die, check out NASA Space Place: https://spaceplace.nasa.gov/spacecraft-graveyard

## Amazing Facts




While Venus is a similar size to Earth, it rotates much more slowly. A single day on Venus lasts for 243 days on Earth. This makes a Venusian day longer than a Venusian year, as Venus spends 225 Earth days to complete an orbit around the Sun. Scientists are not sure why Venus has such a distinct clockwise rotation, but speculation that it might be due to an interaction with another planet during the formation of the solar system.

***wiseGEEK***