



Astronomy's much more fun when you're not an astronomer.
Brian May

Newsletter of the Pomona Valley Amateur Astronomers

Volume 35 Number 7

nightwatch

July 2015

President's Message

Hi folks, I'm writing with mostly housekeeping updates this time. First, the upcoming general meeting on Friday, July 31, is going to be PVAA members show-and-tell. We have several people lined up to give short talks, on everything from recent club outreaches, to getting started in video astronomy, to the naming of the Kuiper Belt Object and possible dwarf planet Qaoar. Don't be intimidated, though, there's still room for more people to participate. You don't have to give a slideshow, you could bring in your favorite telescope or a treasured astronomy

book. Share whatever you have, I promise people will be interested to hear about it. If you do have a slide show, please bring it on a thumb drive or otherwise coordinate with Ron Hoekwater (astro4ron@gmail.com).

Second, the very next night after the general meeting (Saturday, Aug. 1) is the annual Girl Scouts "Nature at Night" outreach, which the PVAA has supported for more than 20 years. The site is Skyland Ranch on Hwy 243 in the mountains south of Banning. Scouts provide dinner for us and sleeping facilities and breakfast for those staying overnight. Plan on arriving by 6:00 or 6:30 if you want dinner, and bring a sleeping bag. Please RSVP with Ron if you're planning to attend, so he can let our hosts know how many people to expect.

Finally, our September 13 trip to Mt. Wilson is coming up quickly. The price for an evening of observing with the historic 100-inch Hooker telescope is \$390 per person. We have to send the money in by the second week of August, so we need to finalize the list of attendees as soon as possible. If you're interested in attending (can you guess what I'm about to say?) please let Ron Hoekwater know, even if you're already on the list of prospective attendees—we need to confirm our list. Also, if you're on the list to attend but haven't paid yet, the upcoming meeting would be the perfect time. Clear skies!

Matt Wedel

PVAA Officers and Board

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- President Mathew Wedel 909-767-9851
- Vice President .. Joe Hillberg 909-949-3650
- Secretary Howard Maculsay 909-624-1667
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- Outreach Jeff Schroeder 909-758-1840
- Programs Ron Hoekwater 909-391-1943
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July 31st General Meeting reserved for Members 10 to 15 minute "Show and Tell" presentations.

Venus / Jupiter Conjunction

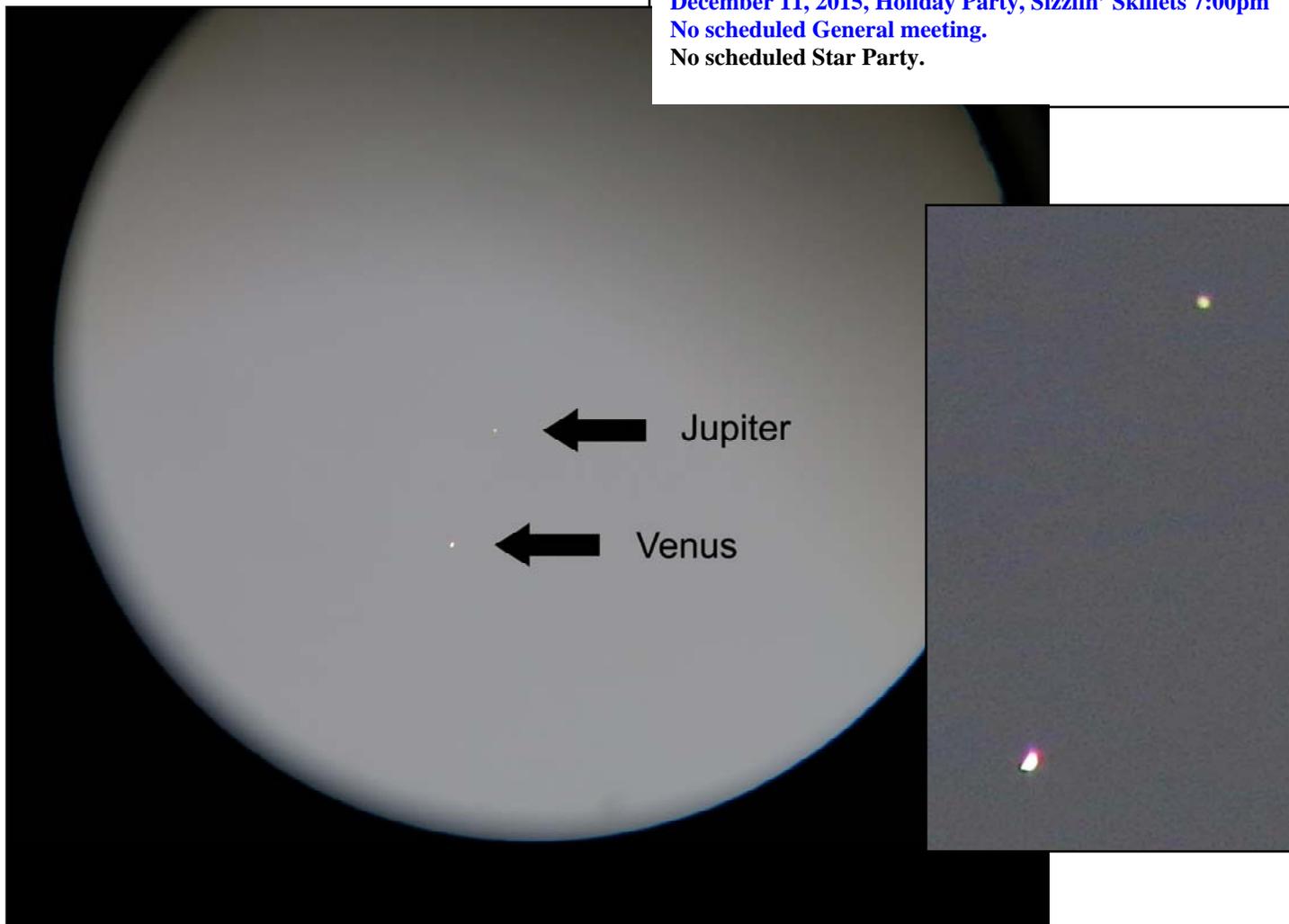
Here are a couple of images of the conjunction last Tuesday, June 30, of the conjunction. I was in Mendocino County and took the photo about 8:30 p.m. or so.

The first is the raw photo through the eyepiece of 25x100 binoculars. The round aperture is the 4mm exit pupil and though the binoculars advertise 3 degree field of view, it might be nearer 2.5 degrees. The planets are pretty small in the image, but they were clearly visible.

The second picture is a blowup of the planets in the first. You can clearly see the disc of Jupiter and the crescent of Venus. The colored flare is from the chromatic aberration in the binocular lenses and the fact that this was a grab shot where I let the camera decide the exposure and Venus was kind of over-exposed. Venus was visually slightly more of a crescent than the photo shows.

A little later the four visible Jovian moons made their appearance, one on the left and three on the right.

Ludd Trozpek



Club Events Calendar

July 31, 2015, General meeting – Member Show-and-Tell

August 1, 2015, Girl Scout Star Party at Skyland Ranch

August 14-16, 2015, Joint Star Party with RAS at GMARS

August 20, 2015, Board meeting, 6:15

August 28, 2015, General meeting

September 13, 2015, Annual Mt. Wilson Telescope viewing

Sept 11-13, 2015, Joint Star Party with RAS at GMARS

September 17, 2015, Board meeting, 6:15

September 25, 2015, General meeting

Oct. 9-11, 2015, Joint Star Party with RAS at GMARS

October 22, 2015, Board meeting 6:15

October 30, 2015, General meeting

Nov. 5-8, 2015, Joint Star Party with RAS, Night Fall at Borrego Springs

November 12, 2015, Board meeting, 6:15

November 20, 2015, General meeting

December 3, 2015, Board meeting, 6:15

December 11, 2015, Holiday Party, Sizzlin' Skillets 7:00pm

No scheduled General meeting.

No scheduled Star Party.

What's Up? - Pluto, Mysterious Dwarf

Although Pluto has been demoted to dwarf planet status it still seems as mythically mysterious as Mars. Perhaps it's that crazy orange Disney dog, or being the first planet to be discovered by an American and during the Great Depression too. It's mysterious that Pluto has an eccentric orbit passing inside the orbit of Neptune for several years. During this warmer period it develops a thin atmosphere. Perhaps it's because astronomer James Christy (in 1978) discovered Pluto's odd companion which he named Charon (boatman of the River Styx). They have a close locked synchronous orbit around a common center. So they're our solar system's only binary double planet system. Charon is two thirds the size of Pluto. Only 12,160 miles apart, Pluto is 1,473 miles in diameter, Charon is 751. Also there's the mysterious fact that Pluto rolls on its side in its orbital plane.

The original daring search for Pluto as Planet X was privately funded at the Lowell Observatory on Mars Hill in Arizona. Here Percival Lowell visualized live Martians constructing canals on Mars. No one else saw these aqueducts, but newspapers loved the idea of canal digging Martians. It was an observation of imaginary importance. Also Percival set up his plan to search for an unknown Planet X. He really didn't want to go back to run the family textile mills.

When Percy died of a sudden heart attack, his widow Constance Lowell tried to wrest away the Lowell money for herself. Still, the search for Planet X beyond Neptune continued. Cash strapped director Vesto Slipher hired a young farm boy Clyde Tombaugh to search for the illusive X. After over a year of comparing photos he found that distant planet in February, 1930. As the first American to discover a planet the newspapers, tired of Martian canals, instantly made Clyde famous.

When the new planet was discovered, Constance became interested in the observatory again insisting they name the new planet Constance. Naturally, after nearly bankrupting them, her suggestions were ignored. Constance tended to pretend hysterical blindness when things didn't go her way. She did finally build a marble tomb for Percival at Mars Hill. It stands next to the observatory and cost twice as much. But back to Pluto.

The name Pluto (ruler of Hade's dark underworld) came from an eleven year old daughter of a University of Oxford librarian. The first letters of Pluto being P.L. came to represent Percival Lowell. Disney cashed in on the publicity by naming a cute dog after the ruler of Hell. Planet Pluto also gave its name to the element plutonium, a radiantly deadly substance used to power the New Horizons spacecraft.

Now mysterious Pluto has finally been reached by the New Horizons probe after a nine year journey. The first pictures show Pluto's side that's gravity locked toward Charon. It has an oddly straight line of crater-like circles and dark spiky polar markings. The other side that's always turned away from Charon displays a lighter heart-shaped

area (pictured) This is probably a depression where whiter ice has collected. Pluto is composed of several different ices. There's methane, nitrogen, carbon monoxide, and a lot of water ice on a rocky core. There's enough frozen (-400 degrees) water to fill the oceans of Earth. But none of these ices explain newly photographed high mountain ranges on Pluto.

Pluto's surface features will be named from underworld tales. Suggestions include horror writer H.P. Lovecraft's hellish Cthulu as well as J.R.R. Tolkien's Balrog. The valentine-like heart will be Tombaugh Regio.

Charon, which orbits Pluto every 6.3 days in its gravity locked orbit, shows signs of ammonia hydrates and freshly deposited water crystals on its surface. It's brisk orbit may cause internal heating and cryogeysers. Charon is different from Pluto. Mostly made of water ice, it's poles are reddish which suggests molecular material being deposited from nearby Pluto's ruddy surface. Giant chasms larger than our Grand Canyon can be seen on the surface. Also a great impact crater surrounded by rays of ejected material.

Pluto is also orbited by four small moons. There's Hydra (30 miles dia) the many-headed serpent, Nix (20 miles dia) the goddess of night, also tiny Styx (Hell's river), and Kerberos (three-headed guardian dog which translates as "Spot").

Now that we've found out that Pluto has a heart, I'll close by adding that some of discoverer Clyde Tombaugh's ashes are on the New Horizon probe. This will make him the first human (sort of) to leave the solar system for interstellar space.

Lee Collins



On The Brightness Of Venus

Throughout the past few months, Venus and Jupiter have been consistently the brightest two objects visible in the night sky (besides the moon) appearing in the west shortly after sunset. Jupiter is the largest and most massive planet in the solar system, yet Venus is the planet that comes closest to our world. On June 30th, Venus and Jupiter made their closest approach to one another as seen from Earth—a conjunction—coming within just 0.4° of one another, making this the closest conjunction of these two worlds in over 2,000 years.

And yet throughout all this time, and especially notable near its closest approach, Venus far outshines Jupiter by 2.7 astronomical magnitudes, or a factor of 12 in apparent brightness. You might initially think that Venus's proximity to Earth would explain this, as a cursory check would seem to show. On June 30th Venus was 0.5 astronomical units (AU) away from Earth, while Jupiter was six AU away. This appears to be exactly the factor of 12 that you need.

Only this doesn't explain things at all! Brightness falls off as the inverse square of the distance, meaning that if all things were equal, Venus ought to seem not 12 but 144 times brighter than Jupiter. There are three factors in play that set things back on the right path: size, albedo, and illumination. Jupiter is 11.6 times the diameter of Venus, meaning that despite the great difference

in distance, the two worlds spanned almost exactly the same angular diameter in the sky on the date of the conjunction. Moreover, while Venus is covered in thick, sulfuric acid clouds, Jupiter is a reflective, cloudy world, too. All told, Venus possesses only a somewhat greater visual geometric albedo (or amount of reflected visible light) than Jupiter: 67 percent and 52 percent, respectively. Finally, while Venus and Jupiter both reflect sunlight toward Earth, Jupiter is always in the full (or almost full) phase, while Venus (on June 30th) appeared as a thick crescent.

All told, it's a combination of these four factors—distance, size, albedo, and the phase-determined illuminated area—that determine how bright a planet appears to us, and all four need to be taken into account to explain our observations.

Don't fret if you missed the Venus-Jupiter conjunction; three more big, bright, close ones are coming up later this year in the eastern pre-dawn sky: Mars-Jupiter on October 17, Venus-Jupiter on October 26, and Venus-Mars on November 3.

Keep watching the skies, and enjoy the spectacular dance of the planets!

Dr. Ethan Siegel

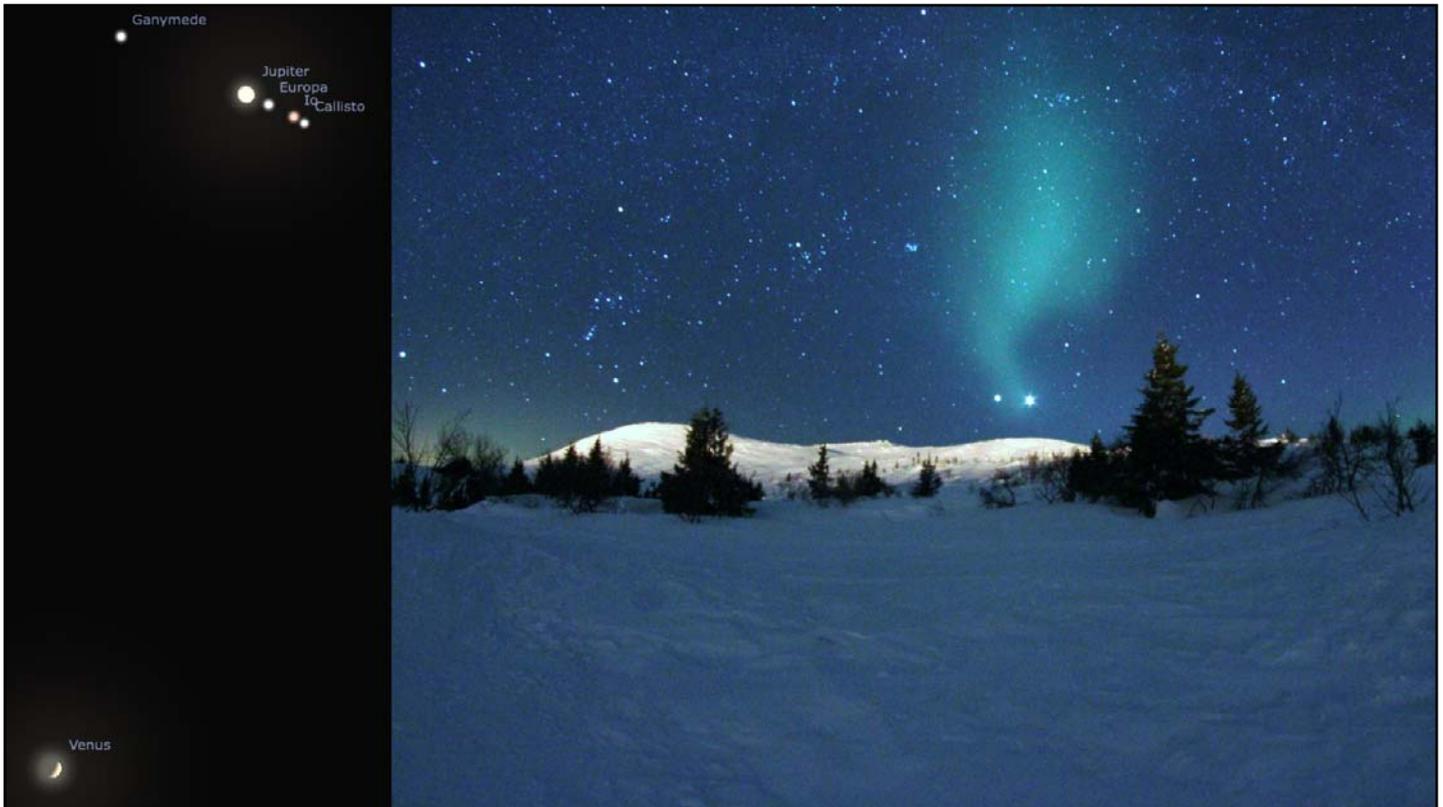


Image credit: E. Siegel, using the free software Stellarium (L); Wikimedia Commons user TimothyBoocock, under a c.c.-share alike 3.0 license (R). The June 30th conjunction (L) saw Venus and Jupiter pass within 0.4° of one another, yet Venus always appears much brighter (R), as it did in this image from an earlier conjunction.