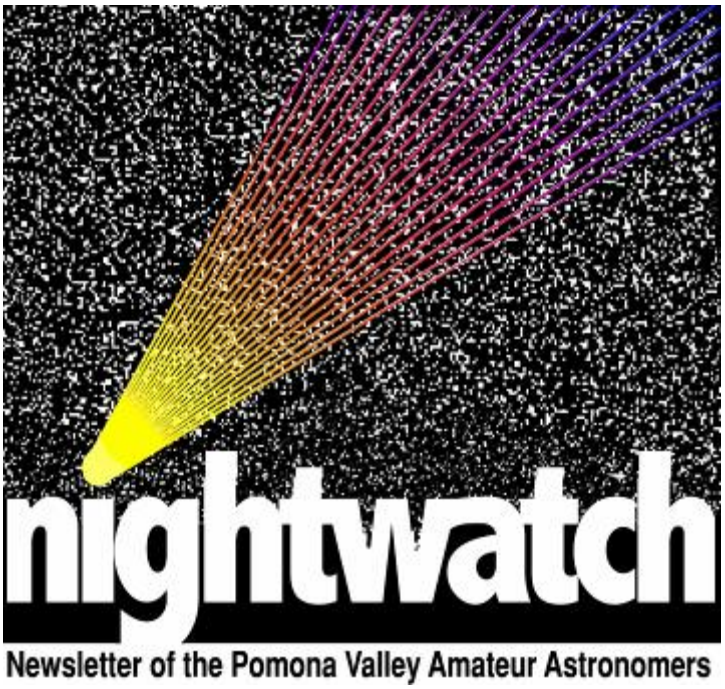
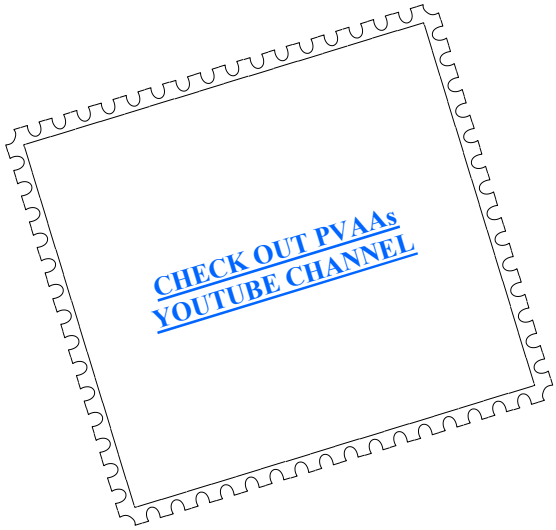


The most remarkable discovery in all of astronomy is that the stars are made of atoms of the same kind as those on the earth.
Richard P. Feynman



Volume 44 Number 12 ***nightwatch*** **December 2024**

Club Events Calendar

Dec 7	**Holiday Party 6:00pm IHOP on Euclid Ave in Upland**
2025	
Jan 8	**Board Meeting 6:15 PM**
Jan 17	**General Meeting 7:30 PM**
Jan 25	**Star Party – Salton Sea Mecca Beach**
Feb 7	**General Meeting 7:30 PM**
Feb 22	**Star Party – Anza Borrego**
Feb 29	**Board Meeting 6:15 PM**
Mar 5	**Board Meeting 6:15 PM**
Mar 14	**General Meeting 7:30 PM**
Mar 29	**Star Party – Salton Sea Mecca Beach**
Apr 2	**Board Meeting 6:15 PM**
Apr 5	**Cahuilla/Joat Park in Claremont**
Apr 11	**General Meeting 7:30 PM**
Apr 26	**Star Party–GMARS**
Apr 30	**Board Meeting 6:15 PM**
May 9	**General Meeting 7:30 PM**
May 24	**Star Party – GMARS**
Jun 4	**Board Meeting 6:15 PM**
Jun 13	**General Meeting 7:30 PM**
Jun 21	**Star Party – White Mountain**
July 2	**Board Meeting 6:15 PM**
July 11	**General Meeting 7:30 PM**
July 26	**Star Party – TBD**
July 30	**Board Meeting**
Aug 8	**General Meeting 7:30 PM**
Aug 23	**Star Party – TBD**
Aug 27	**Board Meeting**
Sep 5	**General Meeting 7:30 PM**
Sept 20	**Star Party – TBD**

PVAA Officers and Board

Officers

President ….....	Mathew Wedel	909-767-9851
Vice President ..	Joe Hillberg	909-949-3650
Secretary	position is currently open	
Treasurer	Gary Thompson	909-935-5509

Board

Jim Bridgewater (2026).....	909-599-7123
Richard Wismer(2026)	
Ron Hoekwater (2025).....	909-706-7453
Howard Maculsay (2025)……	909-913-1195

Directors

Membership / Publicity....	Gary Thompson .	909-935-5509
Outreach	Jeff Schroeder	909-758-1840
Programs	Ron Hoekwater	909-391-1943

PVAA General Meeting 11-15-24

The November PVAA meeting started out smoothly with our President, Matt Wedel as our speaker for the night. His topic was "My telescopes, and what they taught me." He started out with a picture of himself with 7 different telescopes. When he was a kid living in Oklahoma, a friend brought a Celestron catalog to school. He was amazed by all the different telescopes there were. He also realized that the cheapest one was about 3 years' worth of his allowance, and therefore telescopes were too expensive for him. Later, in his early adult life, he was teaching at UC Merced and chaperoned a field trip to Lick Observatory. This rekindled his interest in astronomy, and on a whim went into the gift shop and bought an issue of Sky and Telescope magazine. Going through it he realized that all the telescopes that were out of reach when he was a kid were now within reach. He did a lot of research and narrowed it down to a 6-inch Dobsonian reflector, or a 4.5-inch Dob. He used the website www.scopereviews.com for a lot of his research. He ended up getting an Orion XT6 Dobsonian reflector for $279 as his first telescope.

Matt immediately started looking into a 'travel telescope' that he could easily take with him on his travels. His second telescope was a $30 Walmart special that had a rickety mount and plastic eyepieces. – But the mirrors were of good quality, and he rebuilt it as a travel telescope. While he did learn a lot from the experience, he never traveled with it. Only using it at home, it soon became obsolete. He decided he would rather purchase a telescope than build his own. He then fell in love with Maksutovs – an exceedingly compact reflector that is rugged and very portable. Matt then bought an Orion Apex 102 (4-inch) Mak. Here he learned the lesson that a good solid mount makes any telescope better. – A mount that is wobbly ruins the viewing experience. He got rid of that scope and got a good tripod and an Orion Apex 90 (3.5-inch) Mak, which he was very pleased with.

When he got 'aperture fever' he bought a used Orion XT10 and bought a used XT12 which he only had for a short time. The XT10 also 'killed' his XT6, so he sold the XT6. When he moved to his new residence, he sold the XT10 to a club member, and his current 'big scope' is a Celestron Nexstar C8.

For traveling with a 'travel telescope' he bought an Edmond AstroScan that he really liked. He also got a StellarVue SV50, which is very portable. He then got a Kasai Pico-6 60mm Mak, which with mount and star atlas and eyepieces – it came to about 10 pounds.

Then Matt got 'refractoritis' He got an Orion TravelScope 70 which he disassembled and painted the inside tube black with a few other modifications, and it really 'sang.' This scope has gone on many trips. On his way to a 'dig,' he forgot his telescope and bought an Orion SkyScanner 100 along the way. This turned out to be a great buy. He loves this scope abd has modified it to make it more 'user friendly' and enjoys it immensely.

Matt then got 'reflactoritis.' This is a lens-based telescope with mirrors. He got a Bresser Messier AR102s Comet Edition telescope that works great and came with some binoculars that he uses for his articles in Sky and Telescope magazine.

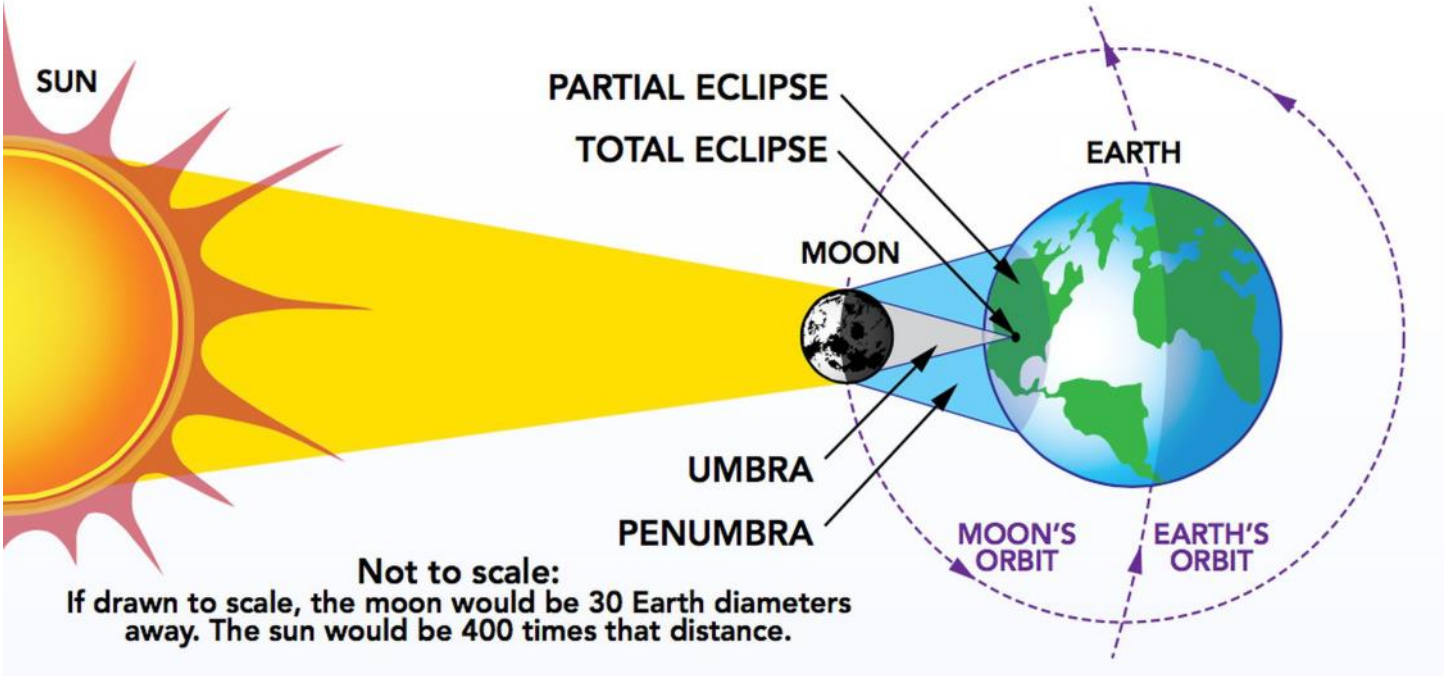
This is what he has learned: Scopes hold their value pretty well. He will always have a "big gun" telescope. He will always have a scope he can fly with. He will always own a Mak and a reflactor for obsessive fascination. He will always own too many small scopes for the same reason. But if he had to pick just one scope: It would be the Orion SkyScanner 100.

Gary Thompson

National Geographic 3" reflector, rebuilt as a travel telescope

My first telescope, an Orion XT6 dobsonian reflector


Matt Wedel
C90
SV50
XT12
XT10
2nd AstroScan
XT6
"XT5"


SUN
PARTIAL ECLIPSE
TOTAL ECLIPSE
EARTH
MOON
UMBRA
PENUMBRA
MOON'S ORBIT
EARTH'S ORBIT
Not to scale:
If drawn to scale, the moon would be 30 Earth diameters away. The sun would be 400 times that distance.

Edmond Halley 11/8/2024

Today is the 368th birthday for English mathematician, scientist & natural philosopher Edmond (or Edmund) Halley [1656-1742]. He is certainly most widely known for his eponymous Halley's Comet, officially known as 1P/Halley, reflecting its status as the first comet known to be periodic.

The comet is named after him because he is the one who discovered its periodicity. In 1705 Halley published "Synopsis of the Astronomy of Comets", in which he used the relatively new law of gravitation, which had been published by Isaac Newton [1643-1727] in his “Principia” (1687), to argue that comets observed in 1531, 1607 and 1682, were all in fact the same comet, returning on a periodic journey around the sun. After estimating the perturbing effects of Jupiter, and other planets, he predicted that the comet would return in 1758. His prediction was verified when Johann Palitzsch [1723-1788] discovered the comet on Christmas Day, 1758. The effect of Jupiter had been a bit stronger than Halley thought, and the comet was delayed compared to Halley's expectations, but although late in the year, it was still found in 1758.

Meanwhile, by 1682 mathematician Halley had shown that Kepler’s 3rd law implied an attractive force with an inverse square law for the distance. But, in collaboration with other well -known mathematicians, they were unable to prove that an inverse square law also explained elliptical orbits. So, again in 1682, Halley visited the aforementioned Issac Newton [1643-1727] and posed the problem to him, only to discover that Newton had already solved the problem, but was evidently not motivated to publish it. This meeting resulted in Newton eventually publishing his magnum opus, Philosophiæ Naturalis Principia Mathematica (Mathematical Principles of Natural Philosophy) in 1687. Halley paid for the publication out of his own pocket, and proof-read the pre-print copies.

It is distinctly possible that one of the most important books in the history of science would not have been published at all without Halley pressuring Newton to do so, and doing much of the publishing work for Newton. So it was largely Halley who masterminded the publication of Newton's Principia, whereby Halley was able to discover the periodicity of his eponymous comet.

Halley had become assistant to the first Astronomer Royal (1675-1719) John Flamsteed [1646-1719] in 1675, and followed Flamsteed as the second Astronomer Royal (1720-1742).

Although most widely known as an astronomer, Halley was also one of the founders of the modern science of geomagnetism. Over the period 1698-1700 Halley explored the magnetic variations of compasses in the North Atlantic, as an aid to navigation, which he published in 1700 & 1701. But Halley had already published a map of the world, showing winds on the global ocean, in 1686. It was in fact, the first meteorological chart ever published. So he had a hand in the early days of geophysics & meteorology, as well as astronomy.

And on the side, in 1693, Halley published mortality tables for the City of Breslau, in Silesia (now the city of Wrocław in Poland). This may not have been the first study of age-related mortality, but it certainly was an early effort. Halley’s tables formed the basis for later actuarial tables in the life insurance business, and landed Halley a spot in the Insurance Hall of Fame.

There is some question as to the proper pronunciation of his name. In fact, Halley himself changed the pronunciation between "Hay-lee", "Haw-lee" and "Hal-lee" in some unpredictable fashion. So pick your favorite.

https://en.wikipedia.org/wiki/Edmond_Halley (Wikipedia)

https://mathshistory.st-andrews.ac.uk/Biographies/Halley/ (Mathematical biography - University of St. Andrews, Scotland)

https://www.newworldencyclopedia.org/entry/Edmond_Halley (New World Encyclopedia)

https://www.westminster-abbey.org/.../comme.../edmond-halley (Westminster Abbey)

https://www.rmg.co.uk/stories/topics/magnetic-mr-halley (“The Magnetic Mr. Halley” - Royal Museums, Greenwich)

https://www.insurancehalloffame.org/edmond-halley-simple (Insurance Hall of Fame)

https://www.worldhistory.org/Edmond_Halley/ (World History Encyclopedia)

https://en.wikipedia.org/wiki/Halley's_Comet (Halley’s comet - Wikipedia)

https://en.wikipedia.org/wiki/Astronomer_Royal (Astronomer Royal - Wikipedia)

https://www.npg.org.uk/.../portrait/mw09662/Edmond-Halley (Portrait of Halley - National Portrait Gallery, London)

The portrait of Halley shown here comes from the National Portrait Gallery in London. Dated circa 1720, it is oil on canvas credited to British portrait artist Isaac Whood [1688-1752].

The description from the NPG reads: “Halley is depicted in this portrait by Whood with a volume marked 'Newton' and a chart showing the path across southern England which he predicted for the total solar eclipse of 22 April 1715.”

Tim Thompson – Facebook post 11/8/24

NASA Night Sky Notes December 2024

This article is distributed by NASA's Night Sky Network (NSN).
The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

December's Night Sky Notes: Spot the King of Planets

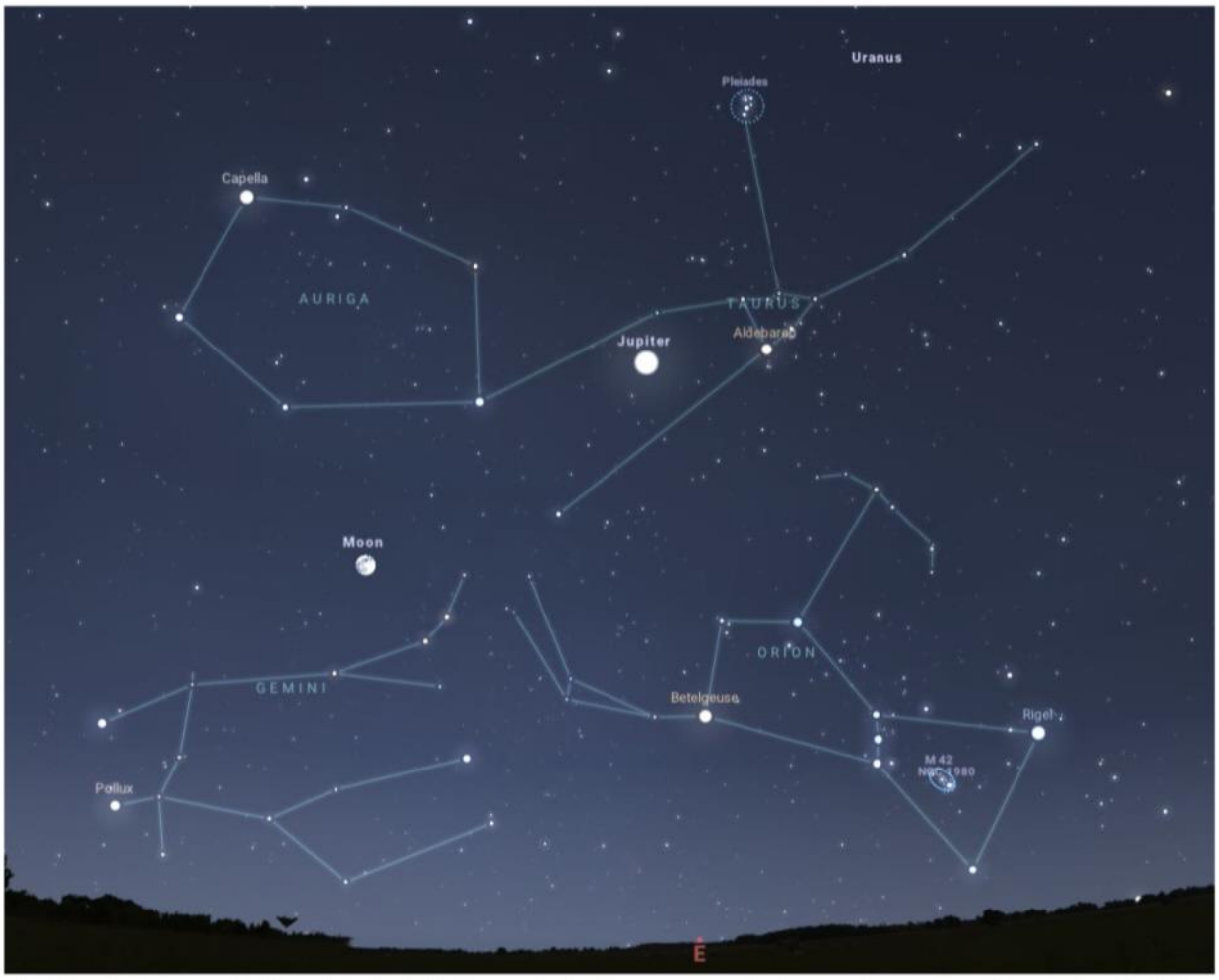
By Dave Prosper
Updated by Kat Troche

Jupiter is our solar system's undisputed king of the planets! Jupiter is bright and easy to spot from our vantage point on Earth, helped by its massive size and banded, reflective cloud tops. Jupiter even possesses moons the size of planets: Ganymede, its largest, is bigger than the planet Mercury. What's more, you can easily observe Jupiter and its moons with a modest instrument, just like Galileo did over 400 years ago.

NASA's Juno mission captured this look at the southern hemisphere of Jupiter on Feb. 17, 2020, during one of the spacecraft's close approaches to the giant planet. This high-resolution view is a composite of four images captured by the JunoCam imager and assembled by citizen scientist Kevin M. Gill. Credit: NASA, JPL-Caltech, SwRI, MSSS | Image processing by Kevin M. Gill, © CC BY

Jupiter's position as our solar system's largest planet is truly earned; you could fit 11 Earths along Jupiter's diameter, and in case you were looking to fill up Jupiter with some Earth-size marbles, you would need over 1300 Earths to fill it up – and that would still not be quite enough! However, despite its formidable size, Jupiter's true rule over the outer solar system comes from its enormous mass. If you took all of the planets in our solar system and put them together, they would still only be half as

massive as Jupiter all by itself. Jupiter's mighty mass has shaped the orbits of countless comets and asteroids. Its gravity can fling these tiny objects towards our inner solar system and also draw them into itself, as famously observed in 1994 when Comet Shoemaker-Levy 9, drawn towards Jupiter in previous orbits, smashed into the gas giant's atmosphere. Its multiple fragments slammed into Jupiter's cloud tops with such violence that the fireballs and dark impact spots were not only seen by NASA's orbiting Galileo probe but also by observers back on Earth!



Look for Jupiter near the Eye of the Bull, Aldebaran, in the Taurus constellation on the evening of December 15, 2024. Binoculars may help you spot Jupiter's moons as small bright star-like objects on either side of the planet. A small telescope will show them easily, along with Jupiter's famed cloud bands. How many can you count? Credit: Stellarium Web

Jupiter is easy to observe at night with our unaided eyes, as well-documented by the ancient astronomers who carefully recorded its slow movements from night to night. It can be one of the brightest objects in our nighttime skies, bested only by the Moon, Venus, and occasionally Mars, when the red planet is at opposition. That's impressive for a planet that, at its closest to Earth, is still over 365 million miles (587 million km) away. It's even more impressive that the giant world remains very bright to Earthbound observers at its furthest distance: 600 million miles (968 million

km)! While the King of Planets has a coterie of 95 known moons, only the four large moons that Galileo originally observed in 1610 – Io, Europa, Ganymede, and Calisto – can be easily observed by Earth-based observers with very modest equipment. These are called, appropriately enough, the Galilean moons. Most telescopes will show the moons as faint star-like objects neatly lined up close to bright Jupiter. Most binoculars will show at least one or two moons orbiting the planet. Small telescopes will show all four of the Galilean moons if they are all visible, but sometimes they can pass behind or in front of Jupiter or even each other. Telescopes will also show details like Jupiter's cloud bands and, if powerful enough, large storms like its famous Great Red Spot, and the shadows of the Galilean moons passing between the Sun and Jupiter. Sketching the positions of Jupiter's moons during the course of an evening – and night to night – can be a rewarding project! You can download an activity guide from the Astronomical Society of the Pacific at bit.ly/drawjupitermoons

Now in its eighth year, NASA's Juno mission is one of just nine spacecraft to have visited this impressive world. Juno entered Jupiter's orbit in 2016 to begin its initial mission to study this giant world's mysterious interior. The years have proven Juno's mission a success, with data from the probe revolutionizing our understanding of this gassy world's guts. Juno's mission has since been extended to include the study of its large moons, and since 2021 the plucky probe, increasingly battered by Jupiter's powerful radiation belts, has made close flybys of the icy moons Ganymede and Europa, along with volcanic Io. What else will we potentially learn in 2030 with the Europa Clipper mission?

Find the latest discoveries from Juno and NASA's missions to Jupiter at science.nasa.gov/jupiter/

Originally posted by Dave Prosper: February 2023
Last Updated by Kat Troche: November 2024