Newsletter of the Pomona Valley Amateur Astronomers

Stretching his hand up to reach the stars,
too often man forgets the flowers at his feet.
Jeremy Bentham

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Volume 45 Number 9 ***nightwatch*** **September 2025**

Club Events Calendar

Sep 5	**General Meeting 6:30 PM - Dave Nakamoto "The Comet that Wouldn't Die - Comet Biela"**	**Oct 29**	**Board Meeting 6:15 PM**
		Nov 7	**General Meeting 7:30 PM**
Sept 20	**Star Party – GMARS**	**Nov 22**	**Star Party – GMARS**
Oct 1	**Board Meeting 6:15 PM**	**Dec 3**	**Board Meeting 6:15 PM**
Oct 10	**General Meeting 7:30 PM**	**Dec 6**	**Holiday Party**
Oct 18	**Star Party – GMARS**		

Upcoming Celestial Events

events visible in southern California highlighted in yellow

PST = UTC – 8 hrs
PDT = UTC – 7 hrs
PDT = PST + 1 hr

Date	Day	Visibility (LA Time)	Event	Direction	Altitude (deg)	Moon Phase/ Illumination
Sept. 7	Sun	All Night (Full at 11:09 am)	Full Moon	E-S-W	5 – 53 - 5	Full Moon 100%
Sept. 16	Tue	5:18 am	Moon near Jupiter sep = 4.5 deg	E	54	Waning Crescent 29%
Sept. 19	Fri	1:57 am (rises @ 4:00 am)	Venus-Regulus Appulse sep = 0.4 deg	E	5	Waning Crescent 7%
Sept. 19	Fri	5:21 am	Moon-Venus Appulse sep = 0.75 deg	E	5	Waning Crescent 6%
Sept. 20	Sat	10:37 pm (visible all night)	Saturn at Opposition	E-S-W	5 – 53 - 5	Waning Crescent
Sept. 21	Sun	12:54 am Not visible	New Moon	------	------	New Moon 0%
Sept. 22	Mon	11:20 am	Autumnal Equinox (North) Spring Equinox (South)	------	------	Waxing Crescent 3%
Sept. 24	Wed	4:56 am Not visible	Moon near Mars sep = 3.6 deg	------	------	Waxing Crescent 7%
Oct. 5	Sun	5:30 pm (visible @ 5:50 pm)	Moon near Saturn sep = 3.35 deg	E	13	Waxing Gibbous 98%
Oct. 6	Mon	All Night (Full at 8:47 pm)	Full Moon (Supermoon)	E-S-W	5 – 64 - 5	Full Moon 100%

Lunarium No. 1270

PVAA Officers and Board

Officers

President …..... Ken Elchert ..... thespaceshuttle@aol,com
Vice President .. Open position
Secretary(acting) .....Ken Elchert 626-541-8679
Treasurer ..... Gary Thompson 909-935-5509

Board

Jim Bridgewater (2026)..... 909-599-7123
Claire Stover(2026) .....pvaanightwatch@gmail.com
Ron Hoekwater (2027)..... 909-445-9282
Howard Maculsay (2027)…….909-913-1195

Directors

Membership / Publicity....Gary Thompson .909-935-5509
Outreach ..... Jeff Schroeder 909-758-1840
Programs ..... Ron Hoekwater 909-445-9282

August 8 2025 General Meeting

The meeting started with PVAA president Ken Elchert welcoming everyone and then went into his monthly presentation of Astronomical and Aerospace events. We will be having an informal star party at Joat (formally Cahuilla) Park in Claremont starting at sunset on August 23rd and August 30th. Ken talked a little about the Perseid Meteor Shower, and Titan's shadow being visible on Saturn. You can get a beautiful view of the shadow's transit across Saturn on Sept 3-4 from 10:25pm to 12:09am.

In other news, it was confirmed that LIGO detected the merger of two massive black holes back on November 23rd, 2023. The reason it took so long was that the data was so out-of-range that they had to run over 600 simulations to confirm the data. The two black holes were 103 and 137 times the mass of the sun and created one black hole 225 times the mass of the sun.

On the Aerospace side, the Axiom 4 crewed mission to the International Space Station safely returned to Earth, splashing down off the coast of San Diego. The crew consisted of four astronauts, all from different countries. The Commander was former NASA astronaut Peggy Whitson. Shubhanshu Shukla of India was the Pilot. Sławosz Uznański-Wiśniewski – an ESA astronaut from Poland, and Tibor Kapu of Hungary. Except for Peggy Whitson, this was their first spaceflight.

SpaceX will try to launch their Starship from Texas on August 24th. They really need a win here, as the last 3 test flights did not go well, and then they had a Starship explode on the test stand June 18th.

Our speaker of the night was Dr. Dave Kary of Citrus Community College. Dr. Kary has been a member of the PVAA club for years. He gave his presentation from Santa Barbara using Zoom. His topic for the night was 'Atlas and the Hyperbolics.'

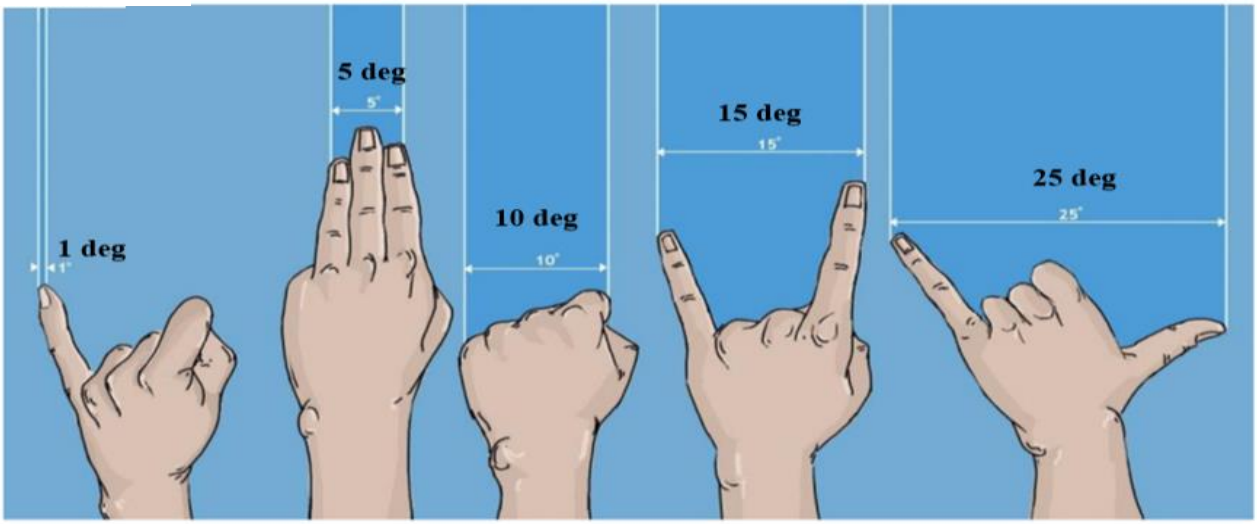
Starting with orbits, he explained the difference in elliptical orbits that many comets have, parabolic and hyperbolic paths. Eccentricity is a measure of how non-circular the orbit of a body is. An orbit with an eccentricity of zero is a circle. Between 0 and 1 is elliptical, while one or greater than one is parabolic. The difference between parabolic and hyperbolic is that an object traveling around the sun picks up enough speed to leave the sun's gravity and orbit is parabolic. Hyperbolic is something entering the solar system with a speed already fast enough to escape the sun's gravity.

As of 2025 only three **I**nter**s**tellar **O**bjects (ISOs) have been discovered traveling through the solar system: 1I/'Oumuamua in 2017, 2I/Borisov in 2019, and 3I/ATLAS in 2025; the prefix "3I", for example, in its designation identifies an object as the third confirmed interstellar object. There was a comet - C/1980 E1, initially gravitationally bound to the Sun, passed near Jupiter and was accelerated sufficiently to reach escape velocity from the Solar System. This changed its orbit from elliptical to hyperbolic and made it the most eccentric known object at the time, with an eccentricity of 1.057. It is heading for interstellar space. The reason we even notice interstellar visitors is because of the massive sky surveys we are conducting which were able to notice the movement of the very dim objects. 1/'Oumuamua had an eccentricity of 1.199 while 2I/Borisov eccentricity was 3.3565. 3I/Atlas has an eccentricity of 6.141. It was discovered on July 1st, 2025, when it was 4.5 AU from the Sun. (An AU – Astronomical Unit is the distance from the Earth to the Sun.) It was discovered by the ATLAS - Asteroid Terrestrial-impact Last Alert System (ATLAS) station at Río Hurtado, Chile. This system is funded by NASA and run by the University of Hawaii. It was imaged back on May 7th, at 6.4 AU, by the TESS (Transiting Exoplanet Survey Satellite) – also funded by NASA.

What else can we say about ISOs? – Over time they increase their eccentricity and angle compared to the galactic plane. Trying to determine the ages of ISOs have huge error bars – from 3.5 to 12 billion years. We should start finding more ISOs, as large sky surveys are new. Scientists have theorized that ISOs are created during the planet forming stage of the star.

Gary Thompson

Estimating Angular Distances Using Your Hand



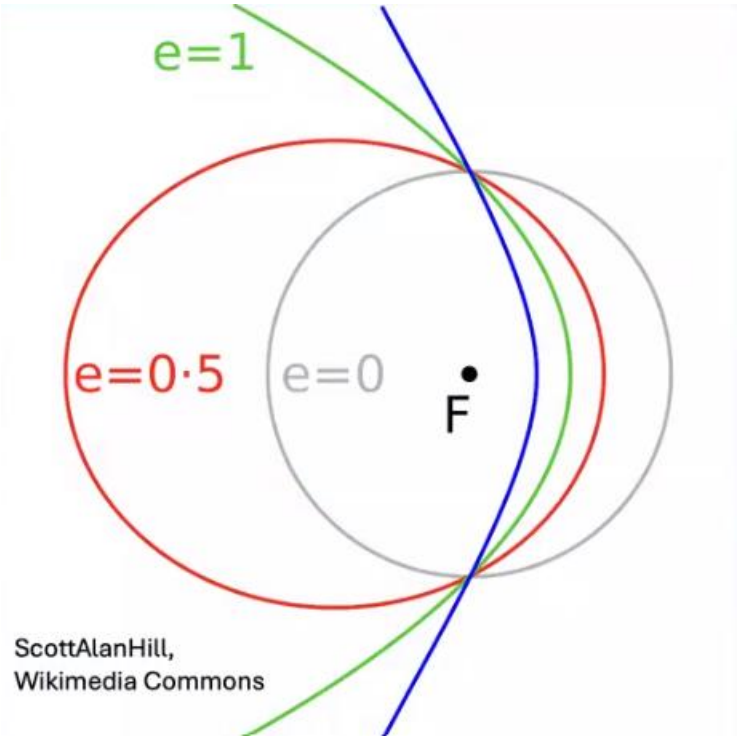
http://alexdoppelganger.com/wp-content/uploads/2017/06/Hand-angles-for-astronomers-reduced-size.jpg

Astronomy Glossary

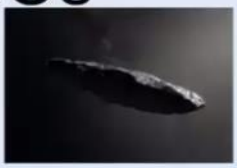
am	ante meridiem; “before midday” -- the Sun has not yet reached the local meridian (morning)
appulse	a very close approach between two celestial objects as seen from Earth (< 1°)
ascending node	the ascending node (or north node) is where the orbiting object moves north through the plane of reference
celestial equator	the great circle of the imaginary celestial sphere on the same plane as the Earth’s equator
celestial sphere	an imaginary sphere centered on the Earth. All objects in the sky can be conceived as being projected on its surface.
conjunction	the occurrence of two celestial objects (Moon-planet, Moon-star, planet-planet, planet-star) having the same right ascension
declination	the angular distance of a body north or south of the celestial equator.
descending node	the descending node (or south node) is where it moves south through the plane.
E	east
great circle	the circular intersection of the celestial sphere and a plane passing through the sphere’s center point.
hour circle	the great circle through a given object and the two celestial poles
local meridian	an imaginary great circle on the celestial sphere that is perpendicular to the local horizon
lunar eclipse	the passage of the Moon through the Earth’s shadow
March equinox	the equinox associated with the Sun’s ascending node is used as the conventional origin of celestial coordinate systems and referred to simply as "the equinox". It is a direction in space rather than a moment in time
meridian	the great circle passing through the celestial poles, as well as the zenith and nadir of an observer’s location. Consequently, it contains also the north and south points on the horizon, and it is perpendicular to the celestial equator and horizon
N	north
nadir	the direction pointing directly *below* a particular location
pm	post meridiem; “after midday” -- the Sun has passed the local meridian (afternoon)
PDT	Pacific Daylight Savings Time
prime meridian	a line of longitude in a geographic coordinate system defined to be 0° ; Earth's current international standard prime meridian is the International Earth Rotation and Reference System (IERS) Reference Meridian
PST	Pacific Standard Time
radiant	the point in the sky from which the paths of meteors appear to originate
right ascension	the angular distance of a particular point measured eastward along the celestial equator from the Sun at the March equinox to the hour circle of the point in question
S	south
sep	short for “separation” – the angular distance between the centers of two objects as seen from Earth
solar eclipse	the passage of the Moon across the Sun as seen from Earth
transit	the movement of Mercury or Venus across the Sun as seen from Earth or the movement of a moon or its shadow across the surface of a planet
UTC	Coordinated Universal Time, the primary time standard globally used to regulate clocks and time
W	west
Waning Moon	the illumination of the surface of the Moon by the Sun as seen from Earth is decreasing
Waxing Moon	the illumination of the surface of the Moon by the Sun as seen from Earth is increasing
zenith	the imaginary point on the celestial sphere directly "above" a particular location.

Symbols

°	degrees
’	arcminutes
”	arcseconds



Comparing ISOs



Artist Impression
ESO/M. Kornmesser

NASA/STSci/D. Jewitt

NASA/STSci/D. Jewitt

	1I/'Oumuamua	2I/Borisov	3I/Atlas
Speed at Infinity	26.33 km/s	32.3 km/s	58 km/s
Dimensions	Approx 100 x 35 m	Approx 500 m	1000-6000 m
Perihelion	0.26 AU	2.00 AU	1.36 AU
Composition	Surface similar to comet nuclei or D-type asteroids Lack of coma - few volatiles Fast spin – strong materials	Surface similar to long-period comets. Evidence for water, C compounds in coma	Surface similar to D-type asteroids. Coma with H2O Possible CO/CO2 based on activity at large distance

Sharing Sharpless 135

FINALLY!! I got out to the dark site from July 24 to July 27. It had been so long, we nearly forgot how to operate the RV! Thursday and Friday nights were very nice for imaging, but Saturday was cloudy until about 12:30 am. Fortunately, there were enough breaks in the clouds that I could get everything set and running Saturday so that when the clouds finally left, good pictures were coming in.

TARGETS

My original target was Sharpless 91 (SH2-91) in Cygnus. The nebula looks like an artist dipped a paintbrush in red and blue paint and drew a slash across the sky. It looks a lot like the Veil Nebula, if you're familiar with that. I practiced at home and the target was very faint, but visible. I figured in dark skies it would be easier to capture since there would be less light pollution. I was mistaken – I still could barely see it in a one-night stack and even tried increasing the gain on the camera without success, so I bailed on it. I did have a back-up target, though, Sharpless 135 (SH2-135), in Cepheus, which is the image I'm sharing here.

Sh2-135 is the red emission nebula in the lower left corner of the image and appears to be also known as LBN 493. LBN 492 is also a part of the complex. Sh2-135 spans about 8 arcminutes and is about 4,500 light years away, although other reports list it at 6,200 light years or even 10,100 light years. To the right and a little below the center of the image is LBN 486. And even further to the right, along the edge, is an orangish nebula, LBN 485. Above the center of the image is what looks like a bird-in-flight-shaped nebula, which are LBN 489 and 491. None of these nebulae appear to be commonly imaged or studied so there isn't much information that I can easily find.

IMAGING AND PROCESSING

The image is stack of 53 10-minute shots taken from our dark site with the StellarVue SVR90T and the ZWO ASI2600MC Pro one-shot color camera for a total exposure time of 8 hours 50 minutes. The image is cropped from full-size to eliminate several very bright, distracting stars. Being at the dark site, light pollution filters were not needed, but I don't have a photographic LP filter, anyway. Processing was done completely in PixInsight. Calibration, deBayering, and stacking were done using the *WeightedBatchPreprocessing* process. 15 darks were used; however, I forgot to take flats (see what happens when you're out of practice), so I had to deal with vignetting in the image.

I found that the *MultiScaleGradientCorrection* process seems to do a great job removing vignette if used carefully. After gradient/vignette removal, *BlurXterminator* was used to clean up the stars. I don't have the spacing between the focal reducer and camera

exactly right, so the stars toward the corners are not as round as they should be. *BlurXterminator* fixes that. Next was *SpectrophotometricColorCalibration* which compares the image to a known database and corrects colors that are out of balance. *BlurXterminator* was used a second time to shrink the stars a little, remove excess halos around the brighter ones, and sharpen the edges of the nebulae a little. *NoiseXterminator* was then used to reduce some of the background noise.

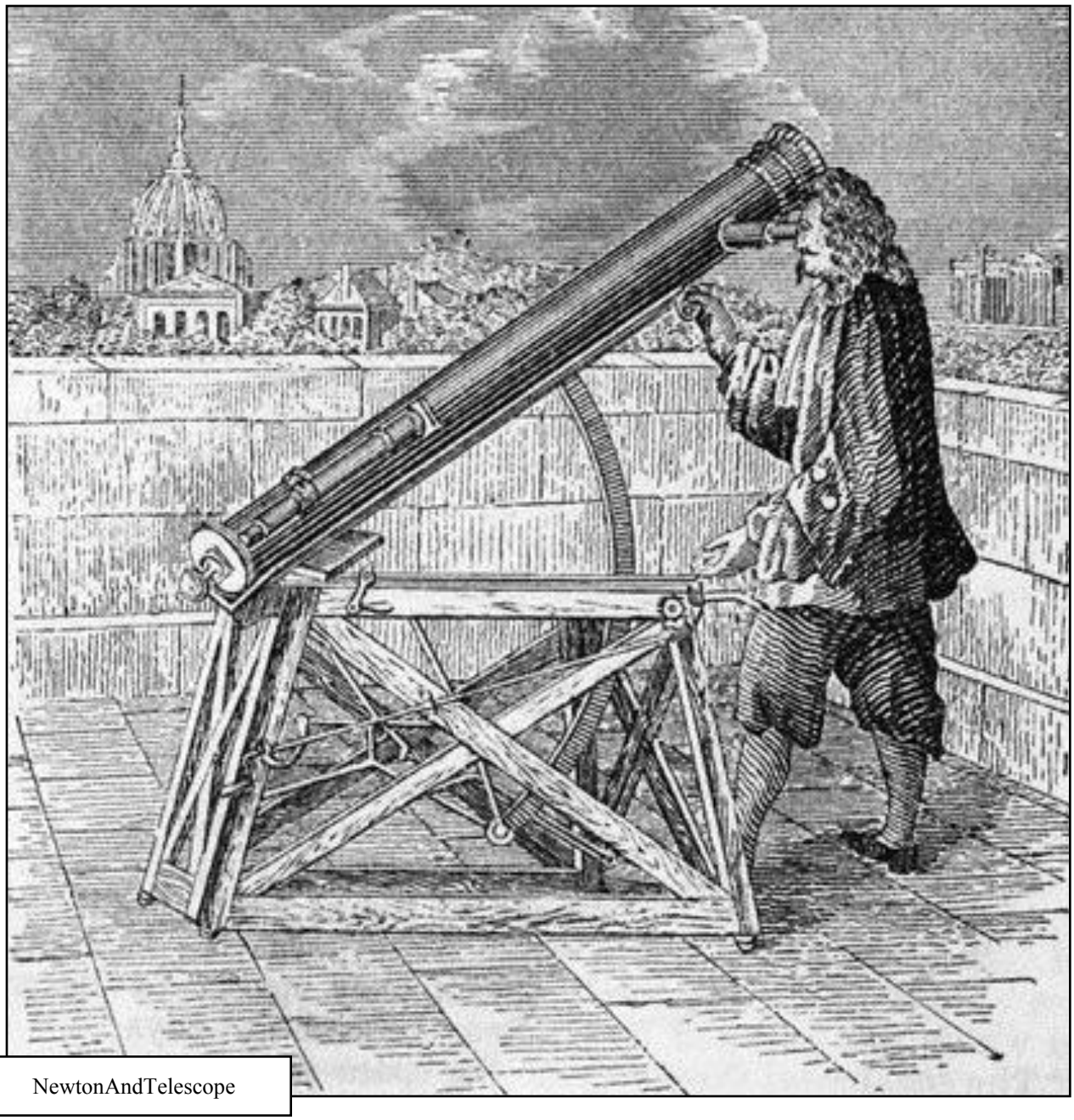
At this point I followed my typical processing for a comparison, before trying a slightly different processing approach. Instead of removing the stars and processing the stars and starless images separately, I stretched the combined image using the arcsinh function in the *GeneralizedHyperbolicStretch* (*GHS*) process until the stars were to my liking. The stars were removed using *StarXterminator* and the starless image was further stretched using *GHS* in the typical manner. I used the *Curves* process to adjust the contrast and saturation of the starless image before adding the stars back using the *ImageBlend* script. The impact of the stars was mitigated before the blended image was produced. I liked this processing procedure better than my previous procedure.

We will miss next month's new moon outing due to travels, but I'm trying to get the original target from home using narrowband filters. It looks like I'm getting usable data, so there will probably be another update soon.

Clear skies,

Ron Ugolick

https://www.astrobin.com/users/ruccdu/



NewtonAndTelescope