



Temecula Valley Astronomer

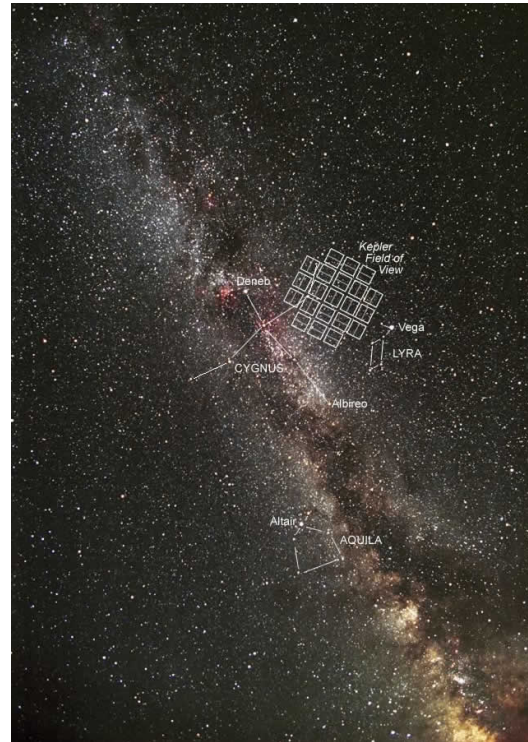
The monthly newsletter of the Temecula Valley Astronomers Sep 2019

Events:

General Meeting :

**No General Meeting this month.
Watch your email for special
events.**

**Now that school has started, the
Star Party season moves into high
gear. Please consider helping out at
one of the many Star Parties
coming up over the next few
months. For the latest schedule,
check the Calendar on the [web
page](#).**



*Kepler's photometer's field of view
in the constellations Cygnus, Lyra
and Draco. Credit: [Carter Roberts](#)*

WHAT'S INSIDE THIS MONTH:

Cosmic Comments

by President Mark Baker

Looking Up Redux

compiled by Clark Williams

Spot the Stars of the Summer Triangle

by David Prosper

Send newsletter submissions to Mark DiVecchio
<markd@silologic.com> by the 20th of the month for
the next month's issue.

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Subscription to the TVA is included in the annual \$25 membership (regular members) donation (\$9 student; \$35 family).

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Cosmic Comments by President Mark Baker

I'm not sure what I'll do when the time comes to "hang up the 'scope" and leave Astronomy behind...hopefully, it's not something to worry about for a long time!!!

But as much as I love the amateur involvement in the Science, I recognize I have a lot to learn and do yet...with imaging looming large in front of me.

However, I found I still have a passion for the professional aspects as well, as I rediscovered just recently by participating in the CalTech Palomar Observatory "Docent in the Dome" activity. Deborah and I were honored to spend the night doing a "ride along" with grad student, Shreyas Vissapragada, who had designed and produced a cutting edge Helium based filter for exoplanetary research. It is so sensitive that it only passes a couple angstroms of wavelengths!!! We vicariously got to experience his initial trepidation and concern over its viability as he set up and initialized the WIRC and polarimeter for the evening...but we took full part in his joy and excitement as first light passed with flying colors, even better than expected. The rest of the night was "just" gathering data from Wasp 69b, but the tone had been set...he was going to hand off the telescope at 3:45am to others doing brown dwarf research but Deborah hung in there until way after 4am, just because...!!!

This experience has only served to validate how important it is what WE do...Space research is burgeoning exponentially so every person we inspire, especially the youth, serves to add much needed minds and imaginations. Every Star Party touches many in this way, regardless of venue or format...and I hope we can turn their awe and wonder into a focus in their lives.

And so, my TVA family, look up, but remember, sharing is required. Thanks for all you do...!!!

Clear, Dark Skies my Friends...





Looking Up Redux compiled by Clark Williams

from these sources:

SeaSky.org

Wikipedia.com

in-the-sky.org

The American Meteor Society, Ltd.

cometwatch.co.uk

NASA.gov

TVA App (2.0.1296)

FullAndNewMoon App (2.0)

Starry Night Pro Plus 7 (7.6.3.1373)

SkySafari 6 Pro (6.1.1)

Stellarium (0.18.2)

timeanddate.com/astronomy



ALL TIMES ARE LOCAL PDT WILDOMAR/MURRIETA/TEMECULA

Times are given in 24-hour time as: (hh is hours, mm minutes, ss seconds)

hh:mm:ss or hhmmss

hhmm+ (time of the next day)

hhmm- (time of the previous day)

hhmm (seconds not shown)

yyymmddThhmmss (Full date as: year month day Time separator hours minutes seconds)

Moon Phases for the month by date:

Thursday the 5th @ **2011** FIRST QTR in Ophiuchus

Friday the 13th @ **2134** FULL in Aquarius

Saturday the 21st @ **1942** THIRD QTR in Taurus

Saturday the 28th @ **1127** NEW in Virgo

Apogee comes on 2019-09-13 @ **0633** – 406, 377 km (252, 512 mi)

Perigee comes on 2019-09-27 @ **1928** – 357, 802 km (222, 328 mi)

2019 has: (13) new moons, (12) 1st Qtr moons, (12) Full moons, (12) 3rd Qtr moons
(0) Blue moons and (1) Black moon

Daylight Savings: Pacific time is Timezone Uniform -8 GMT (-7 GMT PDT)

Luna: Luna is just past NEW on the 1st of the month setting by **2114**, so you should have some dark nights for twelve days of the month. Luna by mid-month is Full and 100% illuminated. Luna is rising by **2006**- and glowing without mercy while insisting on staying up until **0841**. This is a perfect time for some lunar exploring with binoculars, a small scope or just your peepers. All of the Apollo landing sites will be visible; not the detritus of course. The end-of-the-month we're deep into the third-quarter and dark night viewing will be back. In fact on the 30th Luna has hit the pillow by **1836** and you will have a full dark night for viewing.



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Highlights: (distilled from SeaSky.org and Clark's planetary Orrey program[s])

September 1 – The appearance of SOHO (P/2008 Y12). See Comets Section below.

September 9 - Neptune at Opposition. The blue giant planet will be at its closest approach to Earth and its face will be fully illuminated by the Sun. It will be brighter than any other time of the year and will be visible all night long. This is the best time to view and photograph Neptune. Due to its extreme distance from Earth, it will only appear as a tiny blue dot in all but the most powerful telescopes.

September 14 - Full Moon. The Moon will be located on the opposite side of the Earth as the Sun and its face will be fully illuminated. This phase occurs at 04:34 UTC. This full moon was known by early Native American tribes as the Full Corn Moon because the corn is harvested around this time of year. This moon is also known as the Harvest Moon. The Harvest Moon is the full moon that occurs closest to the September equinox each year.

September 23 - September Equinox. The September equinox occurs at 07:50 UTC. The Sun will shine directly on the equator and there will be nearly equal amounts of day and night throughout the world. This is also the first day of fall (autumnal equinox) in the Northern Hemisphere and the first day of spring (vernal equinox) in the Southern Hemisphere.

September 28 - New Moon. The Moon will be located on the same side of the Earth as the Sun and will not be visible in the night sky. This phase occurs at 18:26 UTC. This is the best time of the month to observe faint objects such as galaxies and star clusters because there is no moonlight to interfere.



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Algol minima: (All times PDT)

09/01/19	0528
09/04/19	0217
09/06/19	1105
09/09/19	0754
09/12/19	0443
09/15/19	0131
09/18/19	1020
09/21/19	0708
09/26/19	1151
09/27/19	0046
09/29/19	0934

Sun and Moon Rise/Set Times

		Rise	Transit	Set
09/01/19	Sun	062124	124854	191607
	Moon	085130	150412	211405
09/15/19	Sun	063050	124404	185704
	Moon	200624	022226	084114
09/30/19	Sun	064107	123849	183621
	Moon	084647	143442	202126

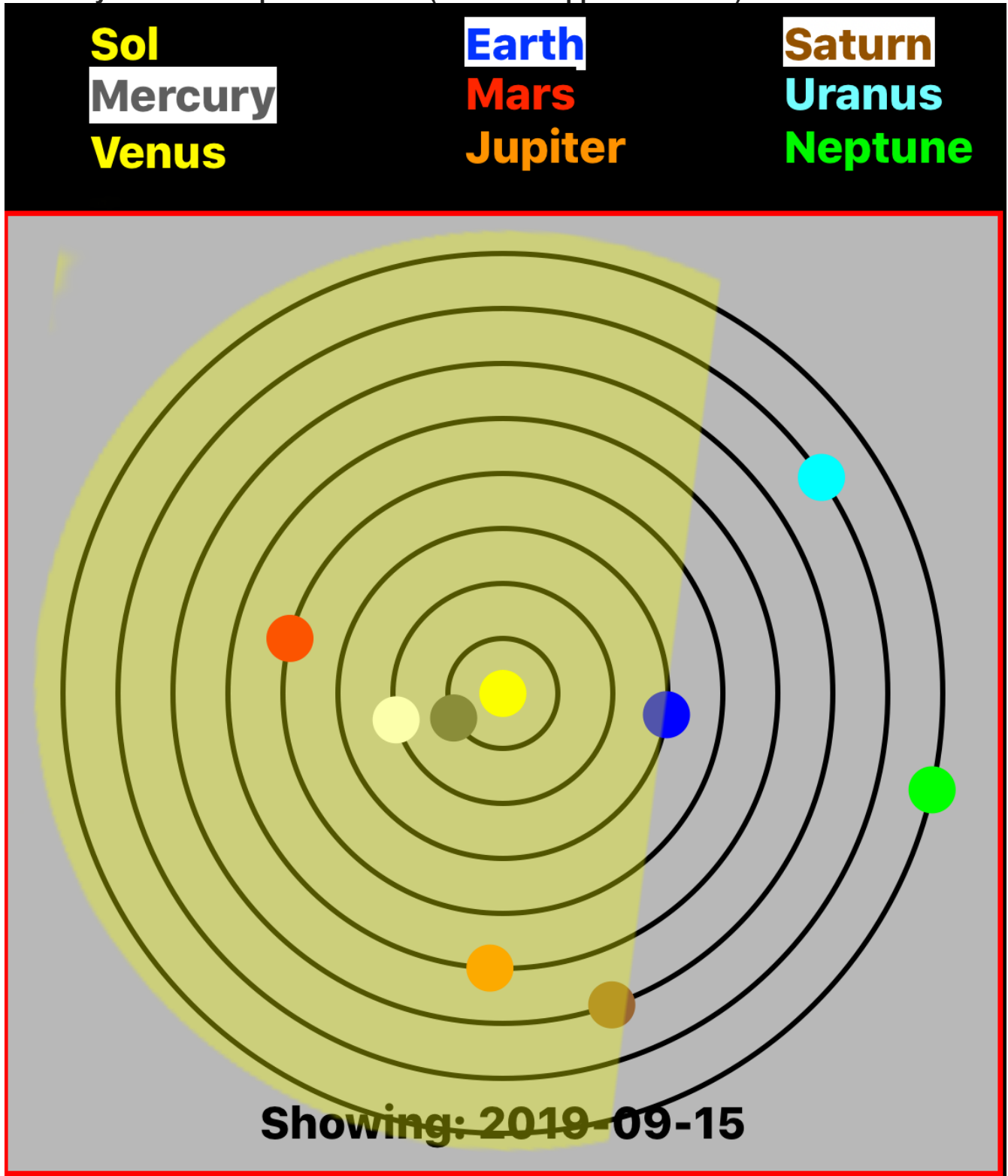


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Planets:

Planetary Positions September 2019: (from TVA App iOS version)





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- **Mercury:** Mercury is a morning object in the beginning of the month. It is way too close to the sun to look at. . However, take a look at the 13th at **1917** you will find Mercury separated from Venus by only about 0°24'. Mercury's set time is about **1925** with Sol preceding at **1859**. Mercury is only about 6° from aphelion by the 31st setting 48 minutes after the sun. Mercury's orbital plane is also appearing to flatten as Mercury appears to approach the ecliptic for the Transit of Mercury that is coming on Veteran's Day, 2019 November 11. This hasn't happened since 2016. **DON'T LOOK DIRECTLY AT THE SUN!**
- **Venus:** Is the Evening Star. Venus sets about 14-minutes after the sun on the first at **1921**. By mid-month Venus is setting about 34-minutes after sunset at **1924**. By the 30th Venus is setting 49-minutes later than the sun at **1913**.
- **Mars:** Mars is a morning object chasing after the SunIt will be lost in the glow of the fiery chariot for the month.
- **Jupiter:** Jupiter is still in the evening sky transiting at **1901** on the first of the month. By mid-month Jove transits by **1811**. The end-of-the-month transit time is **1719**. Jupiter is fading fast.
- **Saturn:** Saturn is trailing Jove transiting about **2106** on the 1st. Saturn is transiting about **2010** by mid month. By the end-of-the-month Saturn transits at **1911**.
- **Uranus:** On the first Uranus rises at **2141**; transits at **0420+**. The apparent magnitude is 5.72 so we're right on the ragged edge of being naked-eye visible. By the ides Uranus is rising at **2045**; transiting at **0324+** however, there is a waning gibbous moon looming only 20° toward the west at 96% illumination. End-of-month finds Uranus rising at **1945** and not transiting until **0223+** and slightly brighter at 5.56. You won't be finding Uranus easily or with a scope less than about 12-inches aperture.
- **Neptune:** Neptune is leading Uranus, rising at **1932** in the Eastern sky at the beginning of the month; transiting about **0119+**. By the 15th Neptune is rising at **1836** and transiting **0023+**. Unfortunately, just 28° separates a 96% illuminated Luna from Neptune. By the end of the month Neptune is transiting at **2323**. This should give you plenty of time to find the blue planet sitting in a perfectly black sky.
- **Pluto:** Pluto is hanging out within 6° of Saturn on the 1st transiting at **2135**. So finding this elusive dot is much easier. Mid-month finds Pluto transiting at **2039**. You will have to contend with a waning gibbous Moon at 96% illumination 80° to the east. Month end finds Pluto transiting at **1940** and setting at **0040+**.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2019 with a reasonable magnitude; say less than or equal to +10 in September there is nothing except the regulars: Juno, Vesta. Hebe, Eros and Herculina. So consult your local planetarium software or try <https://www.asteroidsnear.com/year?year=2019>.

Meteors:

- The annual Perseid meteor shower is on deck and swinging. Since the Perseids peak around the summer months, the Perseids are popular in the Northern Hemisphere. They have also been fairly prolific. The 2019 Perseid meteor shower may well reflect the prolific nature. The greatest number of meteors are expected on the mornings of September 11th through the 13th. Don't put off looking for them as the 2019 Perseid meteor shower has already begun the persistent rise to peak. The moon is just past new in the beginning of the month so the morning hours are , meaning are moon-free. The Perseids are active from September 3rd



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through September 15th with a mini-peak centered on September 30. This early pre-peak shower rarely produces in excess of five meteors per hour. For more information see: [\(American Meteor Society\)](#)

Comets: come in various classifications:

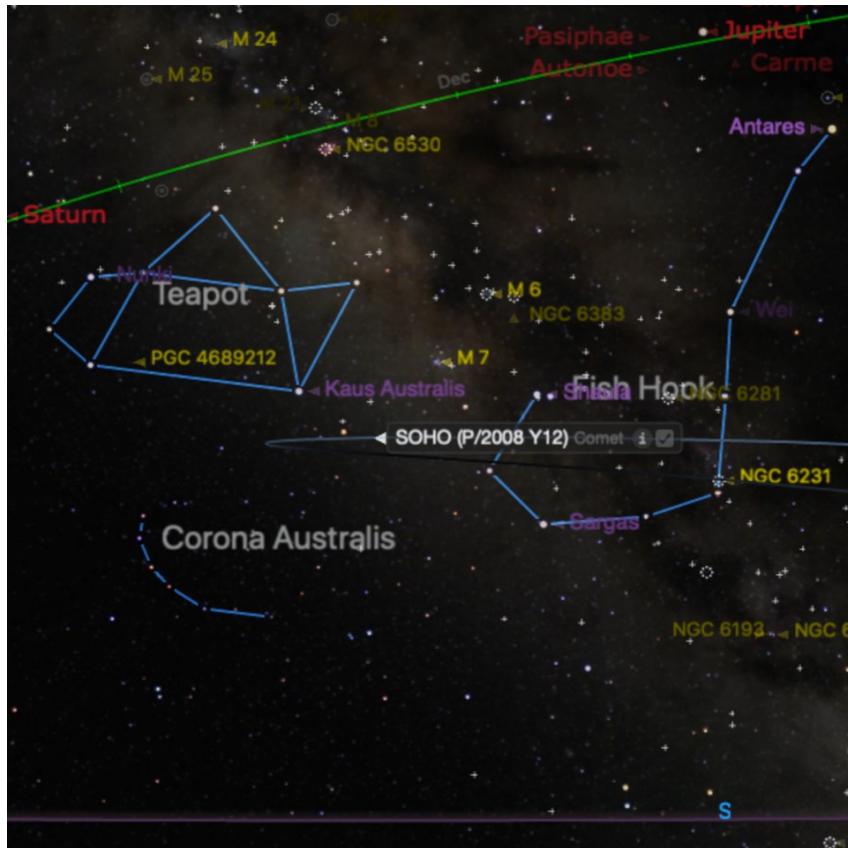
- o 1) Short Period comets – further broken down into:
 - Halley Type: The Halley Types are believe to come from the Kuiper Belt and have periods in excess of 20-years.
 - Jupiter Type: The Jupiter types have a period less than or equal to 20-years.
 - Short period comets September have a near circular orbit or an elliptical orbit. The latter being far more common.
- o 2) Long Period comets – thought to originate from the Oort cloud these comets have periods of over 200 years and have random inclinations around the celestial sphere.

Throughout the ages comets have been believed to be the harbingers of good news, bad news or just pretty lights in the sky. Truth is that they are just big inside-out freezers for all those demons, Olympian and Valkyrien gods to keep their beer cold. And like any cheap-o freezer they need a good defrost every now and again; so why not chuck 'em on down toward the sun for a bit of a meltdown?

- The appearance of SOHO (P/2008 Y12). SOHO, the Solar & Heliospheric Observatory, is a project of international collaboration between ESA and NASA to study the Sun from its deep core to the outer corona and the solar wind. (P/2008 Y12) has the following elements:

q	e	I	P	TJ	Source
P/2008 Y12 (SOHO)	0.067	0.978	23.6	5.4	1.984 MPEC 2014-K54 (= P/2014 K3)

This comet came into view back on August 3rd. Popping up smack-in-the-middle of the *Teapot*, *Fish Hook* and *Corona Australis* constellations.



(P/2008 Y12) is a Jupiter Type comet with a period of 5.4 years.
For a general approximation of the ellipse's circumference lets use

$$P_E = 4(a + b) \times \left(\frac{\pi}{4}\right) \left(\frac{4ab}{(a+b)^2}\right)$$

where P_E is the perimeter of the ellipse
 a is the semi-major axis
 b is the semi-minor axis

The eccentricity (e) of the orbit is given as: **0.978142** (dimensionless)
 The semi-major axis (a) is given as: **3.076443 AU**

The semi-minor axis (b) given a & e is:

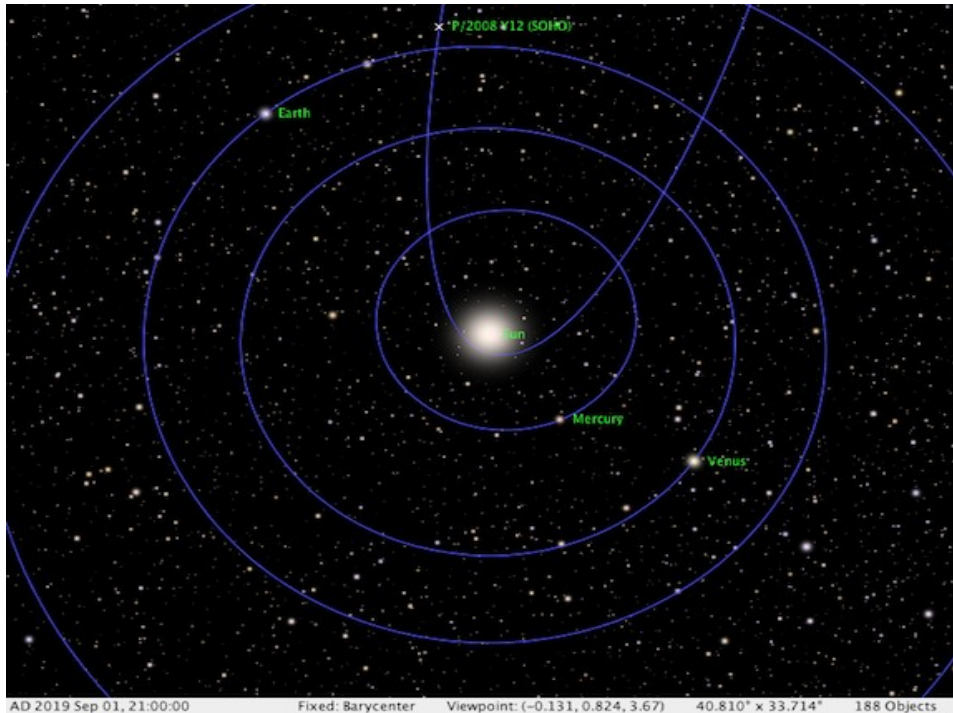
$$b = a \sqrt{1 - e^2}$$

$$3.076443 \times \sqrt{1 - 0.978142^2}$$

$$b = \mathbf{0.63970952283482 \text{ AU}}$$

thus: $P_E \approx 12.95$ AU

so the orbital speed is $P_E / \text{orbital_period}$ and the orbital period is given as **5.40** years so this comet is traveling at about **2.4 AU/year** or about **359,034,890 km/year** or **40,958 km/hr (25,450 mph)**; it is **BOOKIN'!** You should set your sights on imaging this frenetically-flying-freezer-in-need-of-a-good-defrosting as it approaches visible status next month.





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Deep Sky:

Notes:

L/Z abbreviation for ALT/AZ

R/D abbreviation for Right Ascension/Declination

α is right ascension

δ is declination

In each case, unless otherwise noted, you should look for the following on or about the 15th Day of September 2019 at 2100 PDT and you will have about 20 minutes of viewing time total.

Lets look for some familiar objects:

- **Messier 74:**

M74 – AKA NGC 628 and Phantom Galaxy: is a spiral galaxy in the constellation Pisces. It is at a distance of about 32 million light-years away from Earth. The galaxy contains two clearly defined spiral arms and is therefore used as an archetypal example of a grand design spiral galaxy. The galaxy's low surface brightness makes it the most difficult Messier object for amateur astronomers to observe. However, the relatively large angular size of the galaxy and the galaxy's face-on orientation make it an ideal object for professional astronomers who want to study spiral arm structure and spiral density waves. It is estimated that M74 is home to about 100 billion stars. (Wikipedia)



By [ESO/PESSTO/S. Smartt](#)

- **NGC 6888:**

The **Crescent Nebula** (also known as **NGC 6888, Caldwell 27, Sharpless 105**) is an emission nebula in the constellation Cygnus, about 5000 light-years away from Earth. It

was discovered by William Herschel in 1792. It is formed by the fast stellar wind from the Wolf-Rayet star WR 136 (HD 192163) colliding with and energizing the slower moving wind ejected by the star when it became a red giant around 250,000 to 400,000[citation needed] years ago. The result of the collision is a shell and two shock waves, one moving outward and one moving inward. The inward moving shock wave heats the stellar wind to X-ray-emitting temperatures.

It is a rather faint object located about 2 degrees SW of Sadr. For most telescopes it requires a UHC or OIII filter to see. Under favorable circumstances a telescope as small as 8 cm (with filter) can see its nebulosity. Larger telescopes (20 cm or more) reveal the crescent or a Euro sign shape which makes some to call it the "Euro sign nebula".

([Wikipedia](#))



By [Hewholooks](#) - Own work, CC BY-SA 3.0,

September is great for both viewing and imaging. Spend some time outside with your scope. Summer is here.

For now – Keep looking up.



Spot the Stars of the Summer Triangle by David Prosper

September skies are a showcase for the **Summer Triangle**, its three stars gleaming directly overhead after sunset. The **equinox** ushers in the official change of seasons on September 23. **Jupiter** and **Saturn** maintain their vigil over the southern horizon, but set earlier each evening, while the terrestrial planets remain hidden.

The bright three points of the **Summer Triangle** are among the first stars you can see after sunset: Deneb, Vega, and Altair. The Summer Triangle is called an **asterism**, as it's not an official constellation, but still a striking group of stars. However, the Triangle is the key to spotting multiple constellations! Its three stars are themselves the brightest in their respective constellations: Deneb, in Cygnus the Swan; Vega, in Lyra the Harp; and Altair, in Aquila the Eagle. That alone would be impressive, but the Summer Triangle also contains two small constellations inside its lines, Vulpecula the Fox and Sagitta the Arrow. There is even another small constellation just outside its borders: diminutive Delphinus the Dolphin. The Summer Triangle is huge!

The **equinox** occurs on September 23, officially ushering in autumn for folks in the Northern Hemisphere and bringing with it longer nights and shorter days, a change many stargazers appreciate. Right before sunrise on the 23rd, look for Deneb - the Summer Triangle's last visible point - flickering right above the western horizon, almost as if saying goodbye to summer.

The Summer Triangle region is home to many important astronomical discoveries. Cygnus X-1, the first confirmed black hole, was initially detected here by x-ray equipment on board a sounding rocket launched in 1964. NASA's Kepler Mission, which revolutionized our understanding of exoplanets, discovered thousands of planet candidates within its initial field of view in Cygnus. The Dumbbell Nebula (M27), the first planetary nebula discovered, was spotted by Charles Messier in the diminutive constellation Vulpecula way back in 1764!

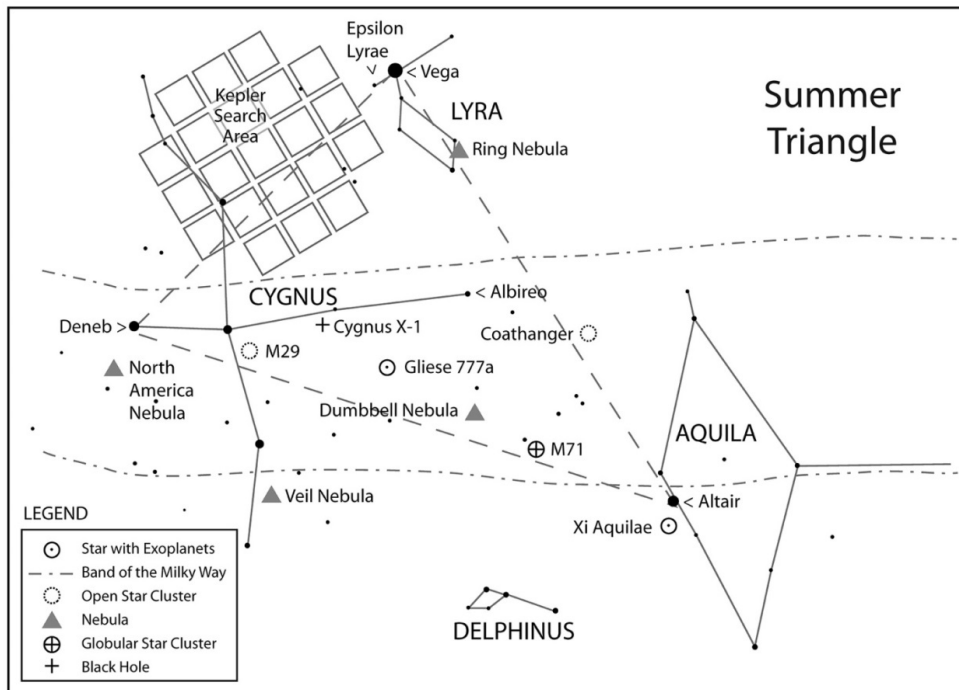
Planet watchers can easily find **Jupiter** and **Saturn** shining in the south after sunset, with Jupiter to the right and brighter than Saturn. At the beginning of September, Jupiter sets shortly after midnight, with Saturn following a couple of hours later, around 2:00am. By month's end the gas giant duo are setting noticeably earlier: Jupiter sets right before 10:30pm, with Saturn following just after midnight. Thankfully for planet watchers, earlier fall sunsets help these giant worlds remain in view for a bit longer. The terrestrial planets, Mars, Venus, and Mercury, remain hidden in the Sun's glare for the entire month.

Discover the latest in space science from the NASA missions studying our universe at [nasa.gov](https://www.nasa.gov)



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Once you spot the Summer Triangle, you can explore the cosmic treasures found in this busy region of the Milky Way. Make sure to “Take a Trip Around the Triangle” before it sets this fall! Find the full handout at bit.ly/TriangleTrip

This article is distributed by NASA Night Sky Network

The Night Sky Network program supports astronomy clubs across the USA dedicated to astronomy outreach.

Visit <https://nightsky.jpl.nasa.org> to find local clubs, events, and more!





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The TVA is a member club of [The Astronomical League](#).

