Temecula Valley Astronomer

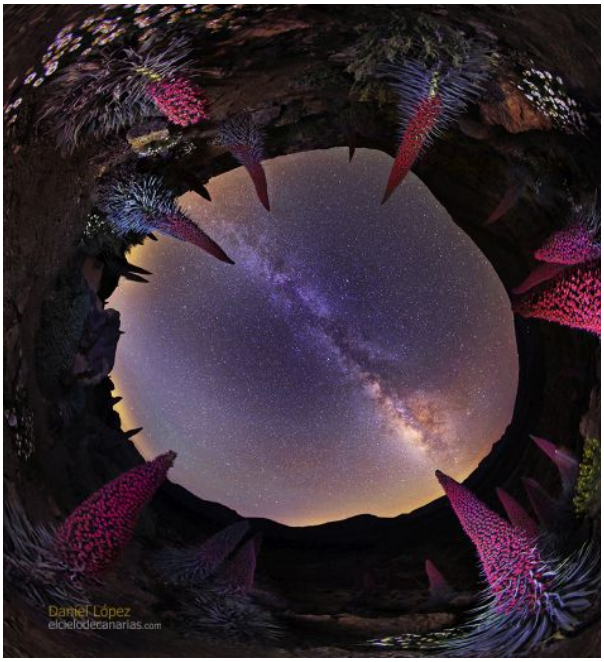
The monthly newsletter of the Temecula Valley Astronomers June 2019

Events:

General Meeting :

Monday, June 3, 2019 at the Ronald H. Roberts Temecula Library, Room B, 30600 Pauba Rd, at 7:00 PM. On the agenda this month is "*What's Up*" by Skip Southwick followed by a presentation topic : "*The Road to Tranquility, part 2 of 3 - From Rendezvous to Roundtrips*" by Sam Pitts.

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.



NASA APOD : Planet of the Tajinastes - Image Credit & Copyright: Daniel Lopez (El Cielo de Canarias)

WHAT'S INSIDE THIS MONTH:

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

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

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Secretary: Deborah Cheong <geedeb@gmail.com>
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Cosmic Comments
by President Mark Baker

As much as I enjoy and am edified by what we at TVA do within the Club and our communities to inspire and educate, I sometimes wonder if the rewards are more inclusive than exclusive. At least until I participate in an event like EXPLORE JPL…to have almost 30,000 people of all ages and demographics demonstrate an excitement to learn and know where mankind is at, and where it is headed, is truly fulfilling and gratifying. And I am honored to have added my voice, even though I lost it in the process!!! But well worth that price…

Every person, regardless of age or education, that we encourage to look up and ponder helps make the world a better place…they will ask questions and seek answers, even if it's just one time and one particular subject. We need to wonder…that is how humanity truly progresses!!!

Again, as I oft repeat ad nauseum perhaps… Science is not stagnant, nor is it dead or dying. Humans continue to press into the nether reaches of understanding, and we TVA members get to be on the front lines…either individually, or as a collective, we have opportunities to share the wealth within our communities and be rewarded with the Ooh's, Aah's, and even AHA's!!! Just because we promote looking up and wondering…

As always, here's to what you do, even if it's only attending meetings, for which I am most thankful indeed!!

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)

ALL TIMES ARE LOCAL PST WILDOMAR/MURRIETA/TEMECULA

Times are given in 24-hour time as: (hh 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)

Moon Phases for the month by date:

Mondaythe 3rd @ 0303 NEW in Aires
Sunday the 9th @ 2300 FIRST QTR in Virgo
Mondaythe 17th @ 0131 FULL in Libra
Tuesday the 25th @ 0247 THIRD QTR in Ophiuchus

Apogee comes on 2019-06-23 @ **0052** – 404 548 km (251, 375 mi)
Perigee comes on 2019-06-17 @ **1623** – 368 506 km (145, 081 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 will be peeking above the horizon about four-thirty-nine in the morning on the first. Luna is heading toward New on the 9th of the month so you should have some dark nights for twelve days of the month. Luna by mid-month is only two days short of Full and 98% illuminated. Luna is rising by six-thirty-seven in the afternoon and glowing without mercy. Insisting on staying up until **0428+**. This is a perfect time for some lunar exploring with binoculars, a small scope or just your peepers. Luna will be Full by the 17th. The end of the month we're deep into the third-quarter and dark night viewing will be back. In fact on the 31st Luna has hit the pillow by **1808** and you will have a full dark night for viewing.

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

03 June: Evening – New Moon. 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. (**http://seasky.org**)

10 June: Night – The 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 Jupiter and its moons. A medium-sized telescope should be able to show you some of the details in Jupiter's cloud bands. A good pair of binoculars should allow you to see Jupiter's four largest moons, appearing as bright dots on either side of the planet. (http://SeaSky.org/)

17 **June: Evening – Full Moon.** The Moon will be located on the opposite side of the Earth as the Sun and its face will be will be fully illuminated. This phase occurs at 08:31 UTC. This full moon was known by early Native American tribes as the Full Strawberry Moon because it signaled the time of year to gather ripening fruit. It also coincides with the peak of the strawberry harvesting season. This moon has also been known as the Full Rose Moon and the Full Honey Moon. (http://SeaSky.org/)

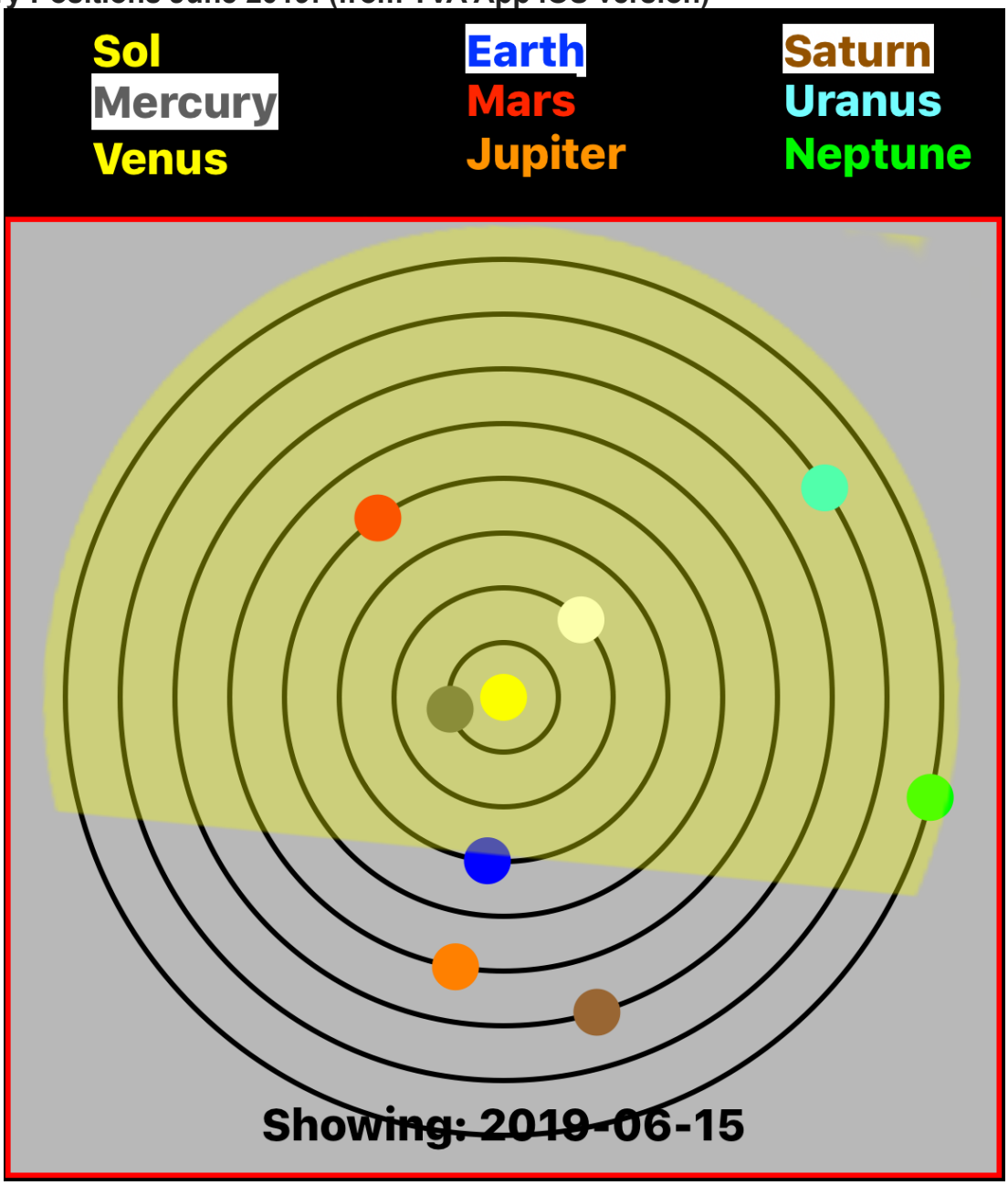
21 June – Solstice – The June solstice occurs at 0854. The North Pole of the earth will be tilted toward the Sun, which will have reached its northernmost position in the sky and will be directly over the Tropic of Cancer at 23.44 degrees north latitude. This is the first day of summer (summer solstice) in the Northern Hemisphere and the first day of winter (winter solstice) in the Southern Hemisphere. (http://SeaSky.org/)

23 June – Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 25.2 degrees from the Sun. This is the best time to view Mercury since it will be at its highest point above the horizon in the evening sky. Look for the planet low in the western sky just after sunset. (http://SeaSky.org/)

Algol minima: (All times PDT)

06/01/19	**1131**
06/04/19	**0820**
06/07/19	**0509**
06/10/19	**0158**
06/12/19	**2246**
06/15/19	**1935**
06/18/19	**1624**
06/21/19	**1513**
06/24/19	**1001**
06/27/19	**0650**
06/30/19	**0339**

Planets:
Planetary Positions June 2019: (from TVA App iOS version)



- **Mercury:** Mercury is an evening object in the beginning if the month. Look for it about 2030 in the Northwest, North of the ecliptic about 4° above the horizon. By mid month Mercury is quite visible as an evening object. Sunset is about **2000** and Mercury can be found along the ecliptic at **Z**: 289° 55.300' **L**: 13° 29.178' at **2030** on the 15th. Mercury will be less than a degree from Mars on the 18th at **2030**. By the end of the month Mercury Mars, Castor and Pollux will approximately be in a straight line with the horizon at **2030**. The Sun sets at 2005 and Mercury won't set until 2128. The Transit of Mercury is coming on 2019 November 11. This hasn't happened since 2016. **DON'T LOOK DIRECTLY AT THE SUN!**

- **Venus:** Is the Morning Star. Venus rises at **0434** on the first followed by the Sun at **0538**. By mid-month Venus is rising at **0436** followed by the Sun at **0536** and Venus rises at **0448** by the end off the month with sunrise at **0540**.
- **Mars:** Mars is still visible this month but very small. The Warrior rises on the first in the midmorning at about **0742**. Transiting by **1456** and not setting until **2210**. This gives you over 2 hours of viewing before the Warrior lumbers of to slumber. Mid-month finds Mars visible about the same time and setting around **2150**. Mars is very close to Mercury now (see Mercury). You will have a Waxing Gibbous Moon to contend with however at about 98% illuminated. Luna is on the other side of the sky in the East. By the end of June Mars will be rising during during the morning **0716** and setting at **2126**.
- **Jupiter:** Jupiter is back in the evening sky rising at **2026** on the first of the month and transiting at **0125+**. By mid-month Jove is up by **1923** and transits by **0023+**. The end of the month sees a rise time of **1816** and a transit at **2316**.
- **Saturn:** Saturn is trailing Jove rising near the Teapot at at **2228** on the first and transiting about **0331+**. Saturn is rising about **2130** by mid-month. By the end of the month you'll get a little longer view of Saturn as it rises at **2027** and transits at **0129+**.
- **Uranus:** On the first Uranus rises at 0147 with sunrise following at 0540. By the ides Uranus is rising at **0053**. Sunrise is at **0548**. By the 30th Uranus rises at **2355** before sunrise at **0558**. You won't be finding Uranus easily or with a scope less than about 12-inches aperture.
- **Neptune:** Neptune is rising before the Sun in the beginning of the month by about 3-hours. Not enough to find the +7.95 magnitude planet in the early dawn light. By the 15th Neptune has moved slightly ahead of Sol rising at **0046** with sunrise at **0536**. By the end of the month Neptune is rising by **2347**. This should give you about 6-hours to find the blue planet.
- **Pluto:** Pluto is back rising at **2247** and sunrise is not until **0538**. Mid-month finds Pluto rising at **2147** and trailing Saturn. Sunrise is not until **0536+**. Month end finds Pluto rises about **2047** and the sun sets at **2005**.

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2019 with a reasonable magnitude; say less than or equal to +10 in June 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:

- July may see some activity from the Southern delta Aquariids. Even so you should be able to see between 2 and 6 meteors per hour on any given night.

Comets:

- Comets come in various classifications:
  - 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 June have a near circular orbit or an elliptical orbit. The latter being far more common.
  - 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.

- Unless some bright long period comets are discovered it promises to be a disappointing year for comet enthusiasts. (https://www.ast.cam.ac.uk)

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 June 2019 at 2100 PDT and you will have about 20 minutes of viewing time total.

Lets look for some familiar objects:

- .**Markarian's Chain:**

By Hewholooks - Own work, CC BY-SA 3.0,
https://commons.wikimedia.org/w/index.php?curid=4290651

Markarian's Chain is a stretch of galaxies that forms part of the Virgo Cluster. When viewed from Earth, the galaxies lie along a smoothly curved line. Charles Messier first discovered two of the galaxies, M84 and M86, in 1781. The other galaxies seen in the chain were first mentioned in John Louis Emil Dreyer's New General Catalogue, published in 1888. It was ultimately named after the Armenian astrophysicist, Benjamin Markarian, who discovered their common motion in the early 1960s. Member galaxies include M84 (NGC 4374), M86 (NGC 4406), NGC 4477, NGC 4473, NGC 4461, NGC 4458, NGC 4438 and NGC 4435. It is located at RA 12h 27m and Dec +13° 10′.

The bright members of the chain are visible through small telescopes. Larger telescopes can be used to view the fainter galaxies.

At least seven galaxies in the chain appear to move coherently, although others appear to be superposed by channel. Six of the points on the chain can be marked by galaxies. The other two points are pairs of galaxies. (Wikipedia)

- **Messier 9:**

By NASA & ESA, CC BY 4.0, https://commons.wikimedia.org/w/index.php?curid=20197163

AKA – M9 NGC 6333 is a globular cluster in the constellation of Ophiuchus. It is positioned in the southern part of the constellation to the southwest of Eta Ophiuchi, and lies atop a dark cloud of dust designated Barnard 64. The cluster was discovered by French astronomer Charles Messier on June 3, 1764, who described it as a "nebula without stars". In 1783, English astronomer William Herschel was able to use his reflector to resolve individual stars within the cluster. He found the cluster to be 7−8′ in diameter with stars densely packed near the center.

M9 has an apparent magnitude of 7.9, an angular size of 9.3′, and can be viewed with a small telescope. It is one of the nearer globular clusters to the center of the Milky Way Galaxy with a separation of around 5,500 light-years from the Galactic Core. Its distance from Earth is 25,800 light-years.

The total luminosity of this cluster is around 120,000 times that of the Sun, the absolute magnitude being -8.04. The brightest individual stars in M9 are of apparent magnitude 13.5, making them visible in moderately sized telescopes. There have been 24 variable stars found in M9: 21 RR Lyrae variables, plus a long-period variable, Type II Cepheid, and an eclipsing binary. No blue stragglers or SX Phoenicis variables have been discovered. Based upon the periods of the RR Lyr variables, this cluster is classified as an Oosterhoff type II globular, which precludes an extra-galactic origin.

Nearby, at about 80' to the northeast of M9 is the dimmer globular cluster NGC 6356, while at about 80' to the southeast is the globular NGC 6342. (Wikipedia)

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

For now – Keep looking up.

Explore the Stars
by the US Forest Service

The TVA is one of several astronomy clubs that support the US Forest Service's program "Explore the Stars" on Palomar Mountain. If you would like to participate, contact our star party coordinator, Deborah Cheong <geedeb@gmail.com>. This is from their web page:

> The Explore the Stars program is made up of a group of amateur astronomers from across southern California, who bring the wonders of the night sky to more than one hundred stargazers. Just a short drive from many of the light-polluted cities, these star parties provide visitors an opportunity to see rare views of the night sky. It brings clear sky views in close range with powerful telescoped and knowledgeable amateur astronomers. This experience is as entertaining and educational, as it is memorable for visitors of all ages.
>
> **Make plans to attend one of these free Star Parties -** Conducted on Friday and Saturday nights once a month during the spring, summer, and fall. Party goers can attend both nights or just one night. If planning to camp in the Observatory Campground, camping spaces are on a first come, first serve basis or you make reservations in advance at www.recreation.gov. The nightly camping fee at Observatory Campground is $15 for a single site, $30 per night for a double unit, and $5 per night for an extra vehicle. Observatory Campground has accessible sites, flush toilets, and coin operated hot showers. RV hookups are not available. Plan to bring water for drinking and cooking. Visit this link for more information on Observatory Campground.
>
> Limited parking is available; plan to arrive early if not camping and only attending the Star Party. Free interpretive programs take place on Saturday nights in the campground's amphitheater and begin at dusk.
>
> Explore the Stars is a joint program administered by the U.S. Forest Service and local astronomers. We welcome amateur astronomer volunteers regardless of club affiliation, and can provide limited reserved parking for volunteers who sign up in advance, bring telescopes and participate. To volunteer, please visit this web link: http://www.nanzscience.com/explore/index.html

Jupiter Shines in June
by David Prosper

Jupiter stakes its claim as the king of the planets in June, shining bright all night. **Saturn** trails behind Jupiter, and the **Moon** passes by both planets mid-month. **Mercury** puts on its best evening appearance in 2019 late in the month, outshining nearby **Mars** at sunset.

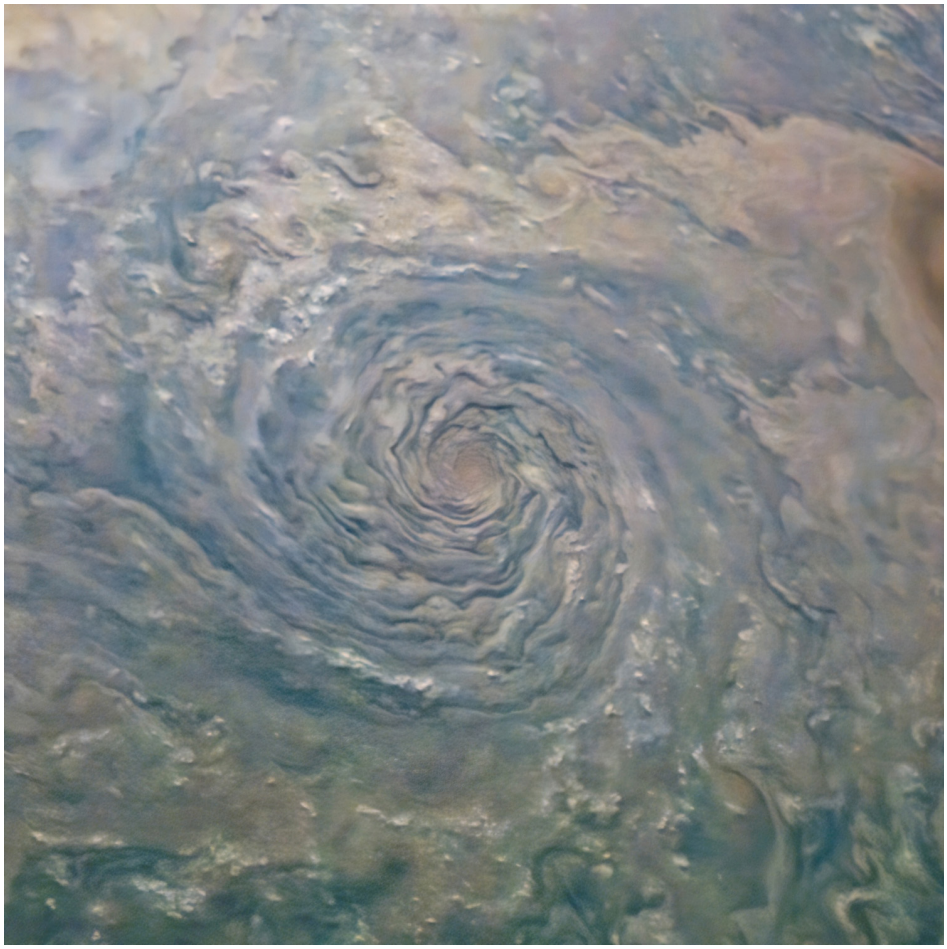
Jupiter is visible almost the entire evening this month. Earth will be between Jupiter and the Sun on June 10, meaning Jupiter is at **opposition**. On that date, Jupiter rises in the east as the Sun sets in the west, remaining visible the entire night. Jupiter will be one of the brightest objects in the night sky, shining at magnitude -2.6. Its four largest moons and cloud bands are easily spotted with even a small telescope.

What if your sky is cloudy or you don't have a telescope? See far more of Jupiter than we can observe from Earth with NASA's **Juno** mission! Juno has been orbiting Jupiter since 2016, swooping mere thousands of miles above its cloud tops in its extremely elliptical polar orbits, which take the probe over 5 million miles away at its furthest point! These extreme orbits minimize Juno's exposure to Jupiter's powerful radiation as it studies the gas giant's internal structure, especially its intense magnetic fields. Juno's hardy JunoCam instrument takes incredible photos of Jupiter's raging storms during its flybys. All of the images are available to the public, and citizen scientists are doing amazing things with them. You can too! Find out more at bit.ly/JunoCam

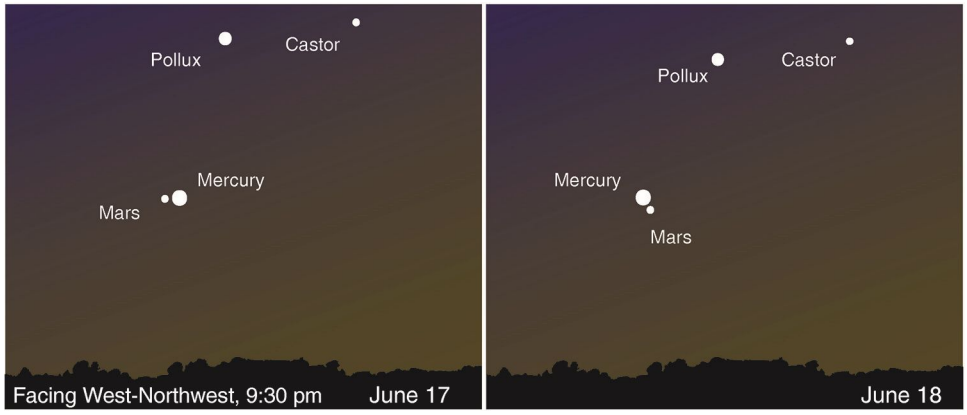
Saturn rises about two hours after Jupiter and is visible before midnight. The ringed planet rises earlier each evening as its own opposition approaches in July. The **Moon** appears near both gas giants mid-month. The Moon's tour begins on June 16 as it approaches Jupiter, and its visit ends on June 19 after swinging past Saturn.

Mercury is back in evening skies and will be highest after sunset on June 23, just two days after the summer solstice! Spot it low in the western horizon, close to the much dimmer and redder **Mars**. This is your best chance this year to spot Mercury in the evening, and nearly your last chance to see Mars, too! The two smallest planets of our solar system pass close to each other the evenings of June 17-18, coming within just ¼ degree, or half the width of a full Moon, making for a potentially great landscape photo at twilight.

Discover more about NASA's current and future missions at nasa.gov



A giant storm in Jupiter's north polar region, captured by JunoCam on February 4, 2019. Image processing performed by citizen scientists Gerald Eichstädt and Seán Doran.
Source: bit.ly/JupiterSpiral



Mars and Mercury after sunset the evenings of June 17-18, 2019. Image created with assistance from Stellarium.

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!

Dave Prosper is the program manager for amateur astronomy outreach at the Astronomical Society of the Pacific, in San Francisco, CA. Born and raised under the dark skies of the Adirondack foothills in Northern New York State, he came to love the night sky at a young age and has been watching the stars ever since.

The TVA is a member club of The Astronomical League.