



Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers July 2019

Events:

General Meeting :

General Meeting : No general meeting this month. Check your TVA email for details about the Star-B-Q in Anza. It will include a commemoration of the 50th anniversary of the Apollo 11 lunar landing with a screening of the movie "*Apollo 11*".

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](#).



Apollo 11 astronaut Buzz Aldrin saluting the flag at Tranquility Base. Credit: [NASA](#).

General information:

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

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WHAT'S INSIDE THIS MONTH:

Cosmic Comments

by President Mark Baker

Looking Up Redux

compiled by Clark Williams

Observe the Moon and Beyond:

Apollo 11 at 50

by David Prosper

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

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Cosmic Comments by President Mark Baker

JULY 20, 1969...very few of us that were double digits of age cannot remember where they were and what they were doing on this most famous of dates. For me, I had a summer league basketball game that evening and had scored 44 points in a losing effort. After the game, I was surprised to have two faces from my youth greet me...my boyhood buddy, Skip Stephenson, and his Dad!!! After a short chat, I mentioned that I needed to get going to watch the Apollo 11 moon landing. They immediately reminded me that they lived nearby and that I was welcome to take it in with them...an absolutely great evening ensued and we stayed up until dawn, taking it all in and catching up.

Another marked effect over the next week or so, at least to me, was how it seemed that the world in total was enthralled with the events. A sort of calm seemed to hold sway, probably because there was something more important on the TV than Viet Nam coverage, bad politics, world unrest, baseball scores, etc. I might go so far as to say that the moon landing allowed a Peace to transcend all else for a while...

Jump 50 years later and it is still a pinnacle of human achievement and demonstrated just what can be accomplished by the people of planet Earth. We are so fortunate to be able to celebrate the anniversary and for many of us, that also means - STAR-B-Q...!!! What a great opportunity to magnify what has become an annual celebration of the Cosmos with the added recognition of that "one small step for a man"...it is a most delicious icing on a Celestial cake!!!

Over the years, this has become a personal favorite event and this year promises to be even more so...I am truly thankful for [Terry and Frances Ostahowski](#) for "growing" it to where it is now. I don't ever remember a bad sky, and the people, food, music, and frolic add to a great night of observing things celestial through a plethora of different scopes. If you haven't been to one yet, make this the one...but don't forget to RSVP, either by email or via the [Facebook](#) page. And feel free to contribute a side dish or dessert, and bring your favorite beverage, chairs...and scope!!!

Thanks again to all members, like the O's, that make our TVA such a great group. Keep encouraging those around you to look up and enjoy the wonders and beauty of our Universe. Who knows what next "small step" we might inspire...??!!

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:

- Tuesday** the 2rd @ **1217** NEW in Gemini
- Tuesday** the 9th @ **0355** FIRST QTR in Virgo
- Tuesday** the 16th @ **1439** FULL in Sagittarius
- Wednesday** the 24th @ **0247** THIRD QTR in Pisces
- Wednesday** the 31st @ **2012** NEW in Cancer (Black Moon like a Blue Moon but cooler!)

Apogee comes on 2019-07-21 @ **1702** – 405 478 km (251, 952 mi)

Perigee comes on 2019-07-04 @ **2156** – 363 727 km (226, 010 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 heading toward New on the 2nd of the month so you should have some dark nights for twelve days of the month. Luna by mid-month is only one day short of Full and 99% illuminated. Luna is rising by **1919** in the evening and glowing without mercy while insisting on staying up until **0441+**. 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. Luna will be Full by the 16th. The end of the month we're deep into the third-quarter and dark night



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viewing will be back. In fact on the 31st Luna has hit the pillow by **1951** and you will have a full dark night for viewing.

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

July 2 - 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. ([SeaSky.org](#))

July 2 - Total Solar Eclipse. A total solar eclipse occurs when the moon completely blocks the Sun, revealing the Sun's beautiful outer atmosphere known as the corona. The path of totality will only be visible in parts of the southern Pacific Ocean, central Chile, and central Argentina. A partial eclipse will be visible in most parts of the southern Pacific Ocean and western South America. ([NASA Map and Eclipse Information](#)) ([NASA Interactive Google Map](#)) ([SeaSky.org](#))

July 9 - Saturn at Opposition. The ringed 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 Saturn and its moons. A medium-sized or larger telescope will allow you to see Saturn's rings and a few of its brightest moons. ([SeaSky.org](#))

July 16 – 50 Years ago Apollo 11 was launched from Kennedy Space Center Launch Complex 39A at **1317 PDT (2017 UTC)** on its way to landing the first humans on the Moon.

July 16 - 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 21:38 UTC. This full moon was known by early Native American tribes as the Full Buck Moon because the male buck deer would begin to grow their new antlers at this time of year. This moon has also been known as the Full Thunder Moon and the Full Hay Moon. ([SeaSky.org](#))

July 16 - Partial Lunar Eclipse. A partial lunar eclipse occurs when the Moon passes through the Earth's partial shadow, or penumbra, and only a portion of it passes through the darkest shadow, or umbra. During this type of eclipse a part of the Moon will darken as it moves through the Earth's shadow. The eclipse will be visible throughout most of Europe, Africa, central Asia, and the Indian Ocean. ([NASA Map and Eclipse Information](#)) ([SeaSky.org](#))

July 20 – 50 Years ago Apollo 11 separated into *Columbia* and *Eagle*. Mike Collins orbiting in *Columbia* watched as Neil Armstrong and Buzz Aldrin descended to and landed on the lunar surface. Armstrong stepped into the lunar dust at **195615 PDT (19690721T025615 UTC)**.

July 21 – 50 Years ago 1969-07-21 10:54:00 The *Eagle* blasted off from *Tranquility Base* rejoining Mike Collins orbiting in *Columbia*. Neil and Buzz then rejoined Mike in *Columbia* for the trip back to Earth.

July 28, 29 - Delta Aquarids Meteor Shower. The Delta Aquarids is an average shower that can produce up to 20 meteors per hour at its peak. It is produced by debris left behind by comets Marsden and Kracht. The shower runs annually from July 12 to August 23. It peaks this year on the night of July 28 and morning of July 29. The waning crescent moon will



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not be too much of a problem this year. The skies should be dark enough for what could be a good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Aquarius, but can appear anywhere in the sky. (SeaSky.org)

Algol minima: (All times **PDT**)

07/03/19	0028
07/05/19	0916
07/08/19	0605
07/11/19	0254
07/14/19	1142
07/17/19	0831
07/20/19	0519
07/23/19	0208
07/25/19	1057
07/28/19	0745
07/31/19	0434

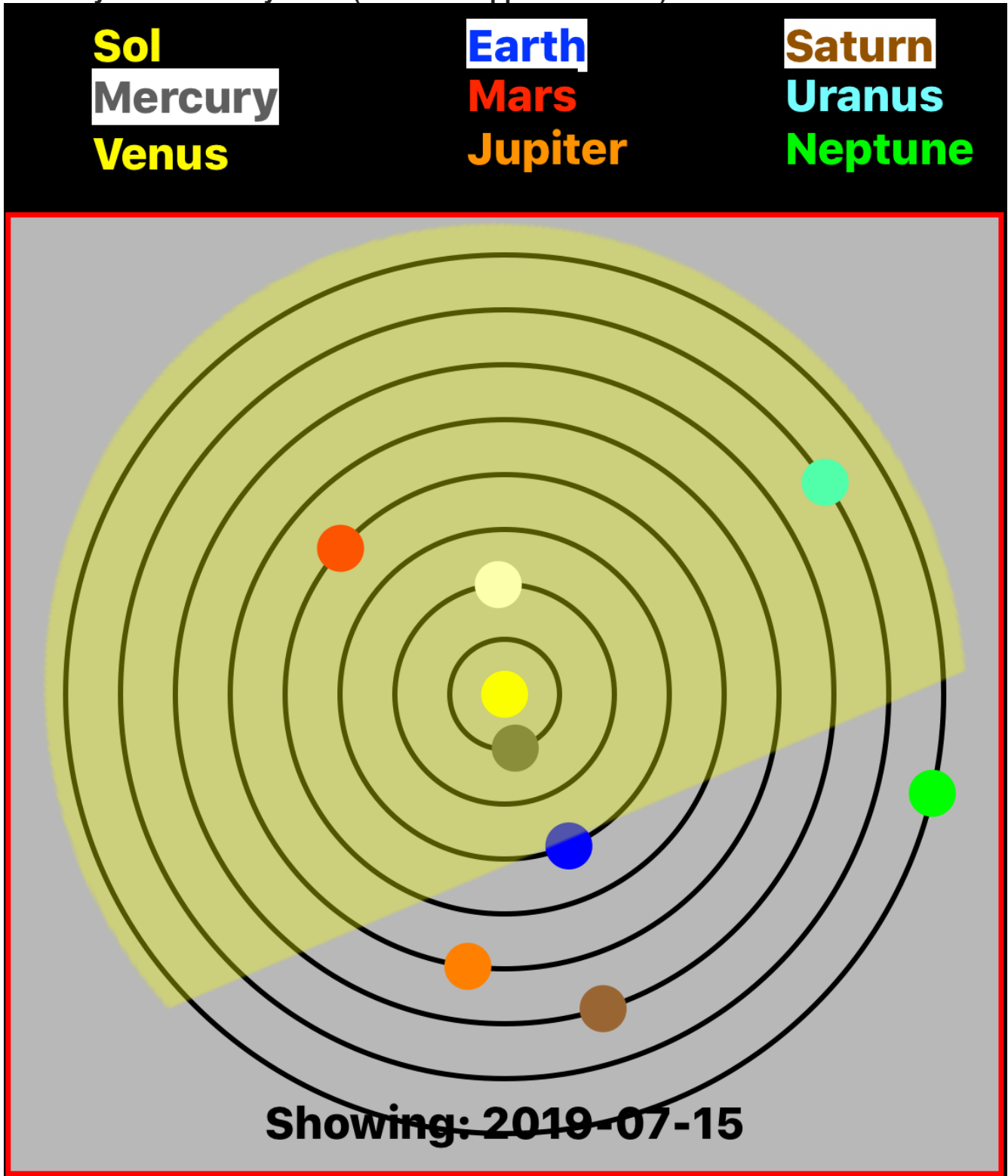


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Planets:

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





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- **Mercury:** Mercury is an evening object in the beginning of the month. Look for it about **2015** in the WNW, About 5° above the horizon and 4° West of Mars. By mid month Mercury is invisible as it is just too close to the Sun. Sunset is about **2000** and Mercury is setting thirteen minutes later on the 15th. Mercury is into the realm of the Sun by the 31st. 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 **0449** on the first followed by the Sun at **0540**. By mid-month Venus is rising at **0509** followed by the Sun at **0548** and Venus rises at **0539** by the end of the month with sunrise at **0558**.
- **Mars:** Mars is still visible this month but very small and very much in the West. The Warrior rises on the first in the mid-morning at about **0715**. Transiting by **1420** and not setting until **2124**. This gives you over an hour of viewing before the Warrior lumbers off to slumber. Mid-month finds Mars visible about the same time and setting around **2059**. You will have a Waxing Gibbous Moon to contend with however and around 99% illuminated. By the end of July Mars will be rising during the morning **0650** and setting at **2028**.
- **Jupiter:** Jupiter is back in the evening sky rising at **1811** on the first of the month and transiting at **2312**. By mid-month Jove is up by **1710** and transits by **2211**. The end of the month sees a rise time of **1603** and a transit at **2104**.
- **Saturn:** Saturn is trailing Jove rising near the Teapot at **2023** on the first and transiting about **0125+**. Saturn is rising about **1924** by mid-month and transiting about midnight. By the end of the month you'll get a little longer view of Saturn as it rises at **1817** and transits at **2318**.
- **Uranus:** On the 1st, Uranus rises at **0147** with sunrise following at **0540**. By the ides Uranus is rising at **0050**. Sunrise is at **0548**. By the 31st Uranus rises at **2347** 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 at **2339** in the beginning of the month; transiting about sunrise. By the 15th Neptune is rising at **2243** and transiting just before sunrise. By the end of the month Neptune is rising by **2140**. This should give you about 6-hours to find the blue planet.
- **Pluto:** Pluto is back rising at **2043** and transiting **0144+**. Mid-month finds Pluto rising at **1947** but lost in the glare of a Waxing gibbous Moon at 99% illumination. Month end finds Pluto rises about **1842**; transiting at **2343** and setting at **0444+**

Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2019 with a reasonable magnitude; say less than or equal to +10 in July there is nothing except the regulars: Juno, Vesta, Hebe, Eros and Herculina. So consult your local planetarium software or try Asteroids Near Earth 2019.

Meteors:

- The Alpha Capricornids are active from July 3 through August 15 with a "plateau-like" maximum centered on July 30. This shower is not very strong and rarely produces in excess of five shower members per hour. What is notable about this shower is the number of bright fireballs produced during its activity period. (American Meteor Society)



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Comets:

- Comets come in various classifications:
 - 1) Short Period comets – further broken down into:
 - Halley Type: The Halley Types are believed 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 July 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. Look at the University of Cambridge, Institute of Astronomy.



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Deep Sky:

Notes:

L/Z abbreviation for ALT/AZ

R/D abbreviation for Right Ascension/Declination

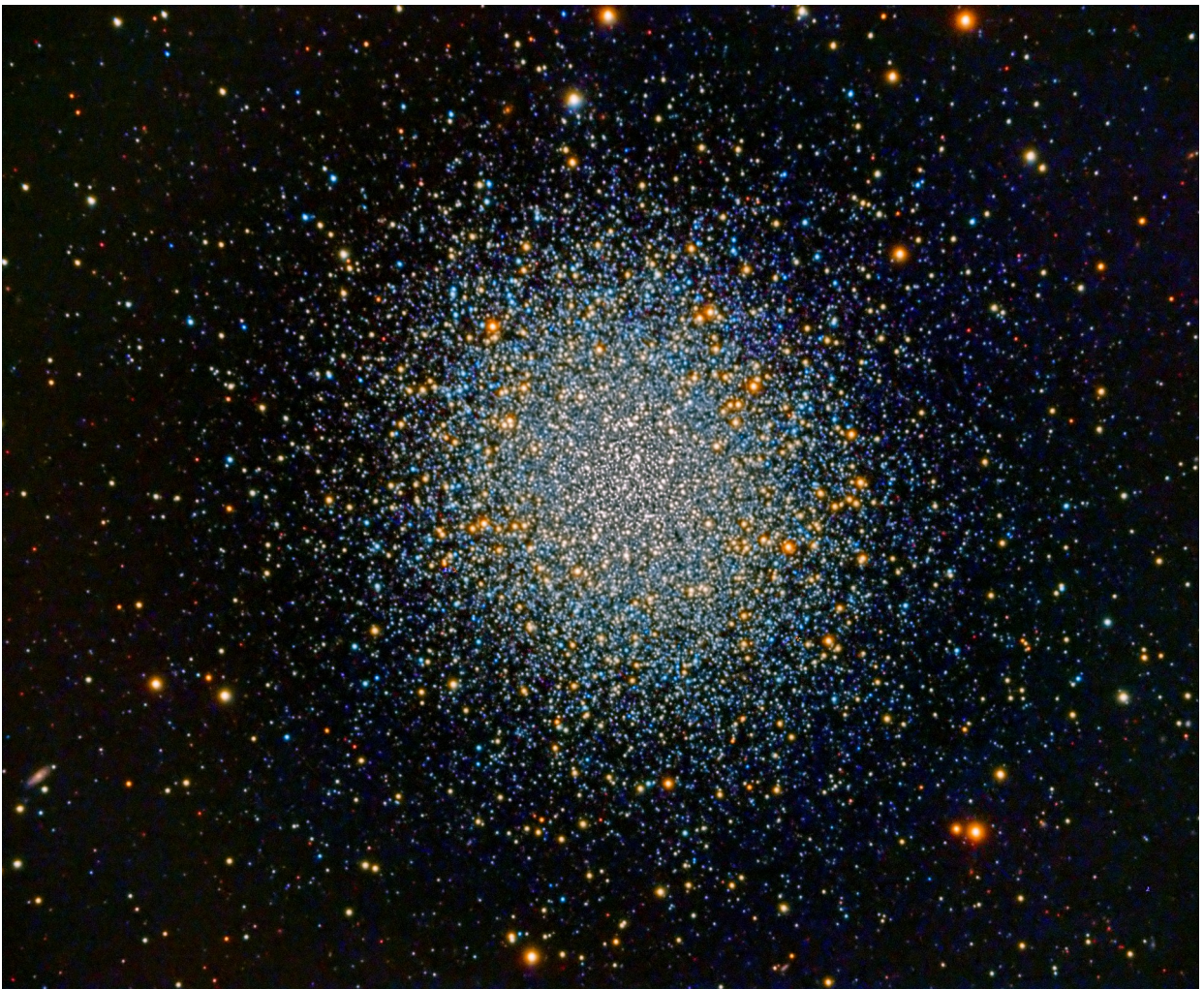
α is right ascension

δ is declination

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

Lets look for some familiar objects:

- o **M13:**



Credit: ESA/Hubble and NASA. Public Domain

Messier 13 or **M13**, also designated **NGC 6205** and sometimes called the **Great Globular Cluster in Hercules** or the **Hercules Globular Cluster**, is a **globular cluster** of



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several hundred thousand stars in the [constellation of Hercules](#). M13 was discovered by Edmond Halley in 1714, and cataloged by Charles Messier on June 1, 1764.

M13 is about 145 light-years in diameter, and it is composed of several hundred thousand stars, the brightest of which is a red giant, the variable star V11, with an apparent visual magnitude of 11.95. M13 is about 22,200 light-years away from Earth.

It wasn't until 1779 that the single stars in this globular cluster were resolved. Compared to the stars in the neighborhood of the Sun, the stars in M13's stellar population are more than a hundred times denser. They are so densely packed together that they sometimes collide and produce new stars. The newly-formed, young stars, so-called "blue stragglers," are particularly interesting to astronomers.

The Arecibo message of 1974, which contained encoded information about the human race, DNA, atomic numbers, Earth's position and other information, was beamed from the Arecibo Observatory radio telescope towards M13 as an experiment in contacting potential extraterrestrial civilizations in the cluster. The cluster will move through space during the transit time; opinions differ as to whether or not the cluster will be in a position to receive the message by the time it arrives. (Wikipedia)

○ **NGC 6946:**



Credit: NASA - Public Domain

Also known as the Fireworks Galaxy is a face-on intermediate spiral galaxy with a small bright nucleus, whose location in the sky straddles the boundary between the northern constellations of Cepheus and Cygnus. Its distance from Earth is about 25.2 million light-years or 7.72 megaparsecs, similar to the distance of M101 (NGC 5457) in the constellation Ursa Major. Both were once considered to be part of the Local Group, but are now known to be among the dozen bright spiral galaxies near the Milky Way but beyond the confines of the Local Group. NGC 6946 lies within the Virgo Supercluster.

Discovered by William Herschel on 9 September 1798, this well-studied galaxy has a diameter of approximately 40,000 light-year, about one-third of the Milky Way's size and it contains roughly half the number of stars as the Milky Way. The galaxy is heavily



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obscured by interstellar matter as it lies quite close to the galactic plane of the Milky Way. Due to its prodigious star formation it has been classified as an active starburst galaxy.

Various unusual celestial objects have been observed within NGC 6964. This includes the so-called 'Red Ellipse' along one of the northern arms that looks like a super-bubble or very large supernova remnant, and which may have been formed by an open cluster containing massive stars. There are also two regions of unusual dark lanes of nebulosity, while within the spiral arms several regions appear devoid of stars and gaseous hydrogen, some spanning up to two kiloparsecs across. A third peculiar object, discovered in 1967, is now known as "Hodge's Complex". This was once thought to be a young supergiant cluster, but in 2017 it was conjectured to be an interacting dwarf galaxy superimposed on NGC 6964. ([Wikipedia](#))

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

For now – Keep looking up.



Observe the Moon and Beyond: Apollo 11 at 50

by David Prosper

Saturn is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The **Moon** prominently passes Saturn mid-month, just in time for the 50th anniversary of **Apollo 11!**

Saturn is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, next door in Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full **Moon** scrapes by the ringed planet late in the evening of the 15th through the early morning of the 16th. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

While observing the Saturn-Moon celestial dance the early morning of the 16th, you can also contemplate the 50th anniversary of the launch of the **Apollo 11** mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, [Neil Armstrong](#) and [Buzz Aldrin](#) set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil samples. After spending less than a day on the Moon's surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by [Michael Collins](#). Just a few days later, on July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at bit.ly/TimelineApollo11 and dig deep into mission history and science on **NASA's Apollo History Site**: bit.ly/ApolloNASA.

Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind at the landing sites, you can discover how much you **can** observe with **the Flag on the Moon** handout: bit.ly/MoonFlag

You can catch up on all of NASA's current and future missions at nasa.gov

The Moon

Copernicus

This crater (left) is easy to spot. It formed about 800 million years ago, and is 57 miles (92 km) wide. Note central peaks and terraced walls, caused by impact.

Aristarchus

Young crater. So bright that Sir William Herschel thought it was an active volcano.

Kepler

Small version of Copernicus

Grimaldi

Lava-filled crater is one of the darkest spots you can see on the Moon. It's 145 miles wide (233 km).

Mare Humorum

The Sea of Moisture is about 220 miles (350 km) across. You can spot it with the naked eye. With a telescope, you might notice two craters along its edge.

Tycho

Young crater best seen during a full Moon. Rays of bright material are ejecta blasted out of the crust when a large asteroid struck about 109 million years ago.

Mare Serenitatis

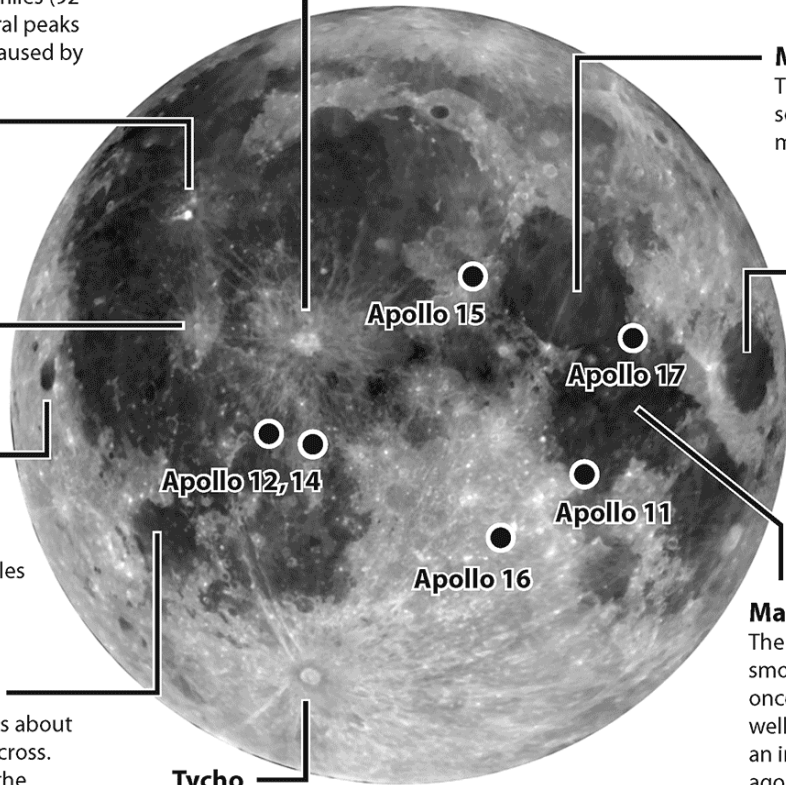
The Sea of Serenity is solid lava, some 380 miles (610 km) across.

Mare Crisium

The Sea of Crisis is about 340 miles wide (550 km) and visible to the naked eye.

Mare Tranquillitatis

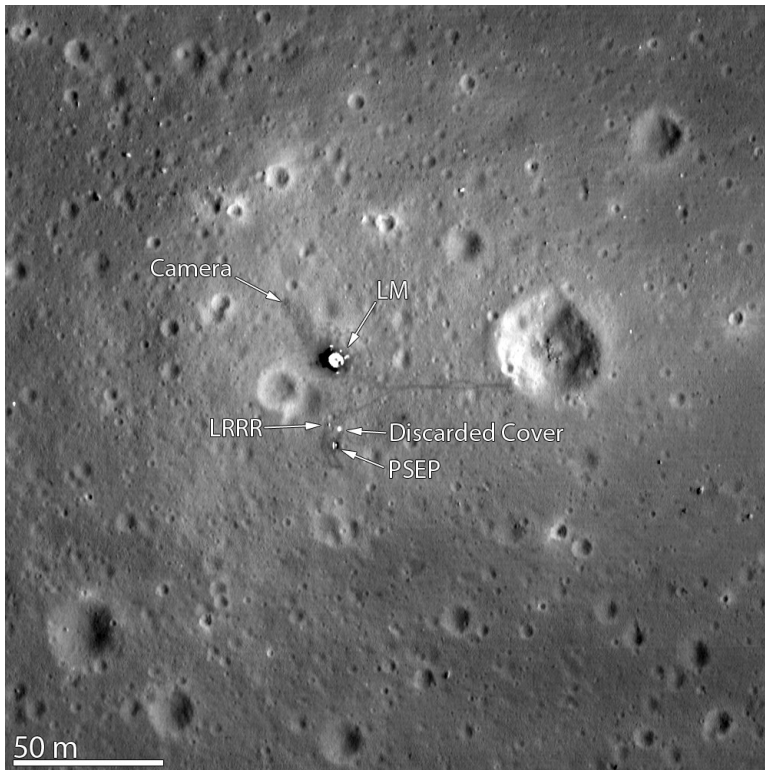
The Sea of Tranquility is a smooth plain filled with once-molten lava that welled up from below after an impact billions of years ago. The first humans to walk on the Moon, Apollo 11 astronauts, landed near the edge.



SOURCES: NASA; ADVANCED SKYWATCHING; CAMBRIDGE ATLAS OF ASTRONOMY; DK VISUAL ENCYCLOPEDIA

Photos: James Scala. Layout and text for Moon map used with permission: Robert Roy Britt/SPACE.com.

Observe the larger details on the Moon with help from this map, which also pinpoints the Apollo landing site. Full handout available at bit.ly/MoonHandout



Earth-based telescopes can't see any equipment left behind at the Apollo 11 landing site, but the cameras onboard NASA's Lunar Reconnaissance Orbiter (LRO) can. This is Tranquility Base as seen from the LRO, just 24 kilometers (15 miles) above the Moon's surface, with helpful labels added by the imaging team. Image Credit: NASA Goddard/Arizona State University. See more landing sites at:

bit.ly/ApolloLRO

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](#).

