



# Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers December 2021

**Events: General Meeting,  
Monday, December 6, 2021,  
at the Ronald H. Roberts  
Temecula Library, Room B,  
30600 Pauba Rd, at 6:00 PM.**

- IFI & Gallery by Clark Williams
- James Webb Space Telescope by Steve Miller
- Refreshments by TBD

**Star Parties at South Coast Winery  
every Friday evening in December.  
For upcoming school Star Parties check  
the Calendar on the [web page](#).**

## Ray Stan's Image of Stephan's Quintet



Per Ray: Notice the tidal interactions between the two of the galaxies that are close together. NGC7230, the bluer galaxy, is not part of that group and is much closer to us.

## WHAT'S INSIDE THIS MONTH:

**Cosmic Comments**  
by President Mark Baker

**Looking Up Redux**  
compiled by Clark Williams

**Random Thought – ARE WE ALONE?  
(Part Two)**  
by Chuck Dyson

**Another Look**  
by Dave Phelps

**TVA Joins NSN**  
by Paul Kreitz

**The James Webb Space Telescope:  
Ready for Launch!**  
by David Prosper (NASA/JPL)

Send newsletter submissions to Paul Kreitz  
<[pkreitz@sbcglobal.net](mailto:pkreitz@sbcglobal.net)> by the 20<sup>th</sup> of the  
month for the next month's issue.

## General information:

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

With so much happening, I don't want anyone to think that I have kicked INGENUITY to the curb, because I'm far from that...as of this writing, INGENUITY is preparing for Flight 16!!! SIXTEEN...!!! It truly is the 'copter that could...!!!

Flight 16 will be a shorter, 109-second flight. Ingenuity will climb up to 33 feet (10 meters), glide over the "Raised Ridges" at 3 mph (1.5 meters per second), then land near the edge of "South Séítah," covering a distance of 380 feet (116 meters). The plan is to capture a series of nine(9) color Return-to-Earth (RTE) camera images evenly spaced throughout the flight, oriented to the southwest and opposite the flight path.

I'm sure some are asking, if we could fly all the way across Séítah on Flight 9, why are we breaking the return path into multiple segments?? As discussed in the Flight 9 retrospective post, the terrain of Séítah is particularly challenging for Ingenuity's navigation algorithm. Because the navigation algorithm assumes flat terrain, any changes to the terrain height introduces heading error. On Flight 9, Ingenuity landed 154 feet (47 meters) away from the center of our 164-foot-(50-meter)-radius target airfield. The heading error on Flight 9 was less of a concern because the terrain of South Séítah was benign and allowed a large degree of uncertainty in our landed position. However, the terrain on the north side of Séítah is rockier. As a result, we have to be more precise in our landing location on the return path. Flight 16 will tackle the tricky terrain of the Raised Ridges. By doing a short flight over these ridges, we reduce accumulated heading error that can build up over longer flights.

Flight 16 will set up Ingenuity for a Séítah crossing on Flight 17, getting us closer to the current goal of Wright Brothers Field. While waiting for the Perseverance rover to catch up after Flight 17, the Ingenuity team is considering performing a flight software update to enable new navigation capabilities and better prepare Ingenuity for future flights.

I'd like to offer my thanks to little Ingenuity for making our job easier on Terra in getting people to Look Up... it's another exciting dimension in inspiring awe and wonder in us all. And there's so much more ahead...

Clear, Dark Skies my Friends...



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## Looking Up Redux – December 2021

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 8

SkySafari 6 Pro

Stellarium

timeanddate.com/astronomy

<https://www.fourmilab.ch/earthview/pacalc.html>



**ALL TIMES ARE LOCAL PACIFIC TIME (PST / PDT) UNLESS NOTED OTHERWISE**

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)

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

### Moon Phases for the month by date:

<b>Friday</b>	<b>the 3<sup>rd</sup></b>	<b>@ 2344 NEW in OPHIUCHUS</b>
<b>Friday</b>	<b>the 10<sup>th</sup></b>	<b>@ 1736 First QTR in AQUARIUS</b>
<b>Saturday</b>	<b>the 18<sup>th</sup></b>	<b>@ 2036 FULL in TAURUS</b>
<b>Sunday</b>	<b>the 26<sup>th</sup></b>	<b>@ 1824 THIRD QTR in VIRGO</b>

Apogee comes on 2021-12-17 @ **1818 – 406,321 km (252,476 mi)**

Perigee comes on 2021-12-04 @ **0202 – 356,793 km (221,701 mi)**

2021 has: (12) new moons, (13) 1<sup>st</sup> Qtr moons, (13) Full moons, (12) 3<sup>rd</sup> Qtr moons  
(1) Blue moon and (0) Black moons

**Daylight Savings:** Starts: 2021-Mar-14 : Ends: 2021-Nov-07

**Luna:** Luna is Waning Crescent on the first of the month, headed for NEW on the 3<sup>rd</sup> rising at **0324**, transiting at **0909** and setting by **1454**. Luna by mid-month is 88% illuminated, Waxing gibbous. Rising at **1402** and transiting at **2048** and setting at **0328+**. By the-end-of-the-month Luna is well



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into the 3<sup>rd</sup> Quarter, 7.4% illuminated rising at 0437- transiting at **0944** and setting by **1452**.

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

December 3 - 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 **2344**. 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.

December 4- 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 for this eclipse will be limited to Antarctica and the southern Atlantic Ocean. A partial eclipse will be visible throughout much of South Africa. ([NASA Map and Eclipse Information](#)) ([Interactive NASA Google](#))

December 13, 14 - Geminids Meteor Shower. The Geminids is the king of the meteor showers. It is considered by many to be the best shower in the heavens, producing up to 120 multicolored meteors per hour at its peak. It is produced by debris left behind by an asteroid known as 3200 Phaethon, which was discovered in 1982. The shower runs annually from December 7-17. It peaks this year on the night of the 13th and morning of the 14th. The waxing gibbous moon will block out most of the fainter meteors this year. But the Geminids are so numerous and bright that this could still be a good show. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Gemini, but can appear anywhere in the sky.

December 18 - 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 **2036**. This full moon was known by early Native American tribes as the Cold Moon because this is the time of year when the cold winter air settles in and the nights become long and dark. This moon has also been known as the Long Nights Moon and the Moon Before Yule.

December 21 - December Solstice. The December solstice occurs at **0750**. The South Pole of the earth will be tilted toward the Sun, which will have reached its southernmost position in the sky and will be directly over the Tropic of Capricorn at 23.44 degrees south latitude. This is the first day of winter (winter solstice) in the Northern Hemisphere and the first day of summer (summer solstice) in the Southern Hemisphere.

December 21, 22 - Ursids Meteor Shower. The Ursids is a minor meteor shower producing about 5-10 meteors per hour. It is produced by dust grains left behind by comet Tuttle, which was first discovered in 1790. The shower runs annually from December 17-25. It peaks this year on the night of the 21st and morning of the 22nd. The nearly full moon will be a problem this year, blocking all but the brightest meteors. But if you are patient enough, you may still be able to catch a few good ones. Best viewing will be just after midnight from a dark location far away from city lights. Meteors will radiate from the constellation Ursa Minor, but can appear anywhere in the sky.

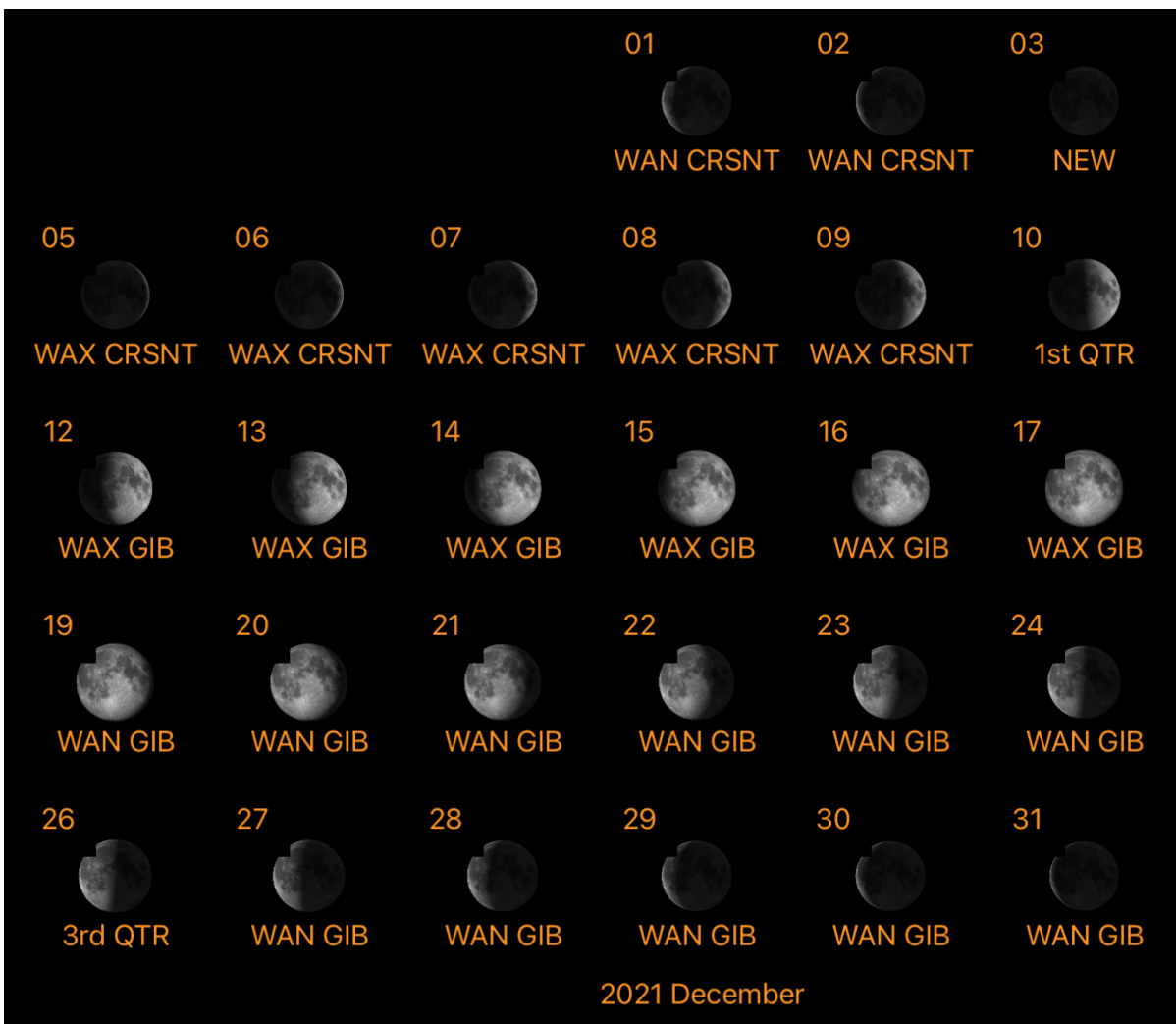


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## Algol minima: (All times Pacific Time)

12/02/2021	0330
12/05/2021	0019
12/07/2021	2108
12/10/2021	1757
12/13/2021	1446
12/16/2021	1136
12/19/2021	0825
12/22/2021	0514
12/25/2021	0203
12/27/2021	2252
12/30/2021	1941





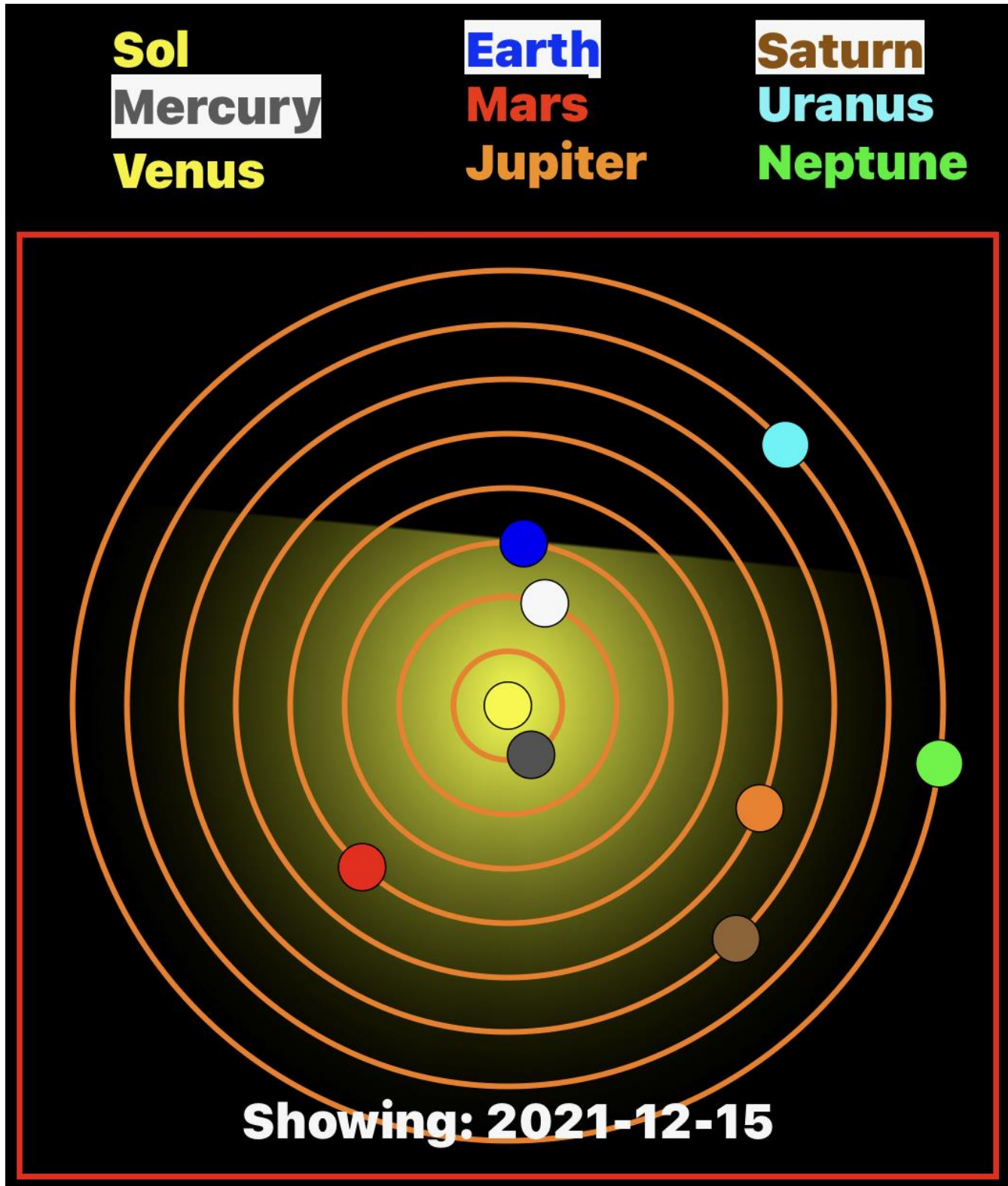


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Planets:

Planetary Positions December 2021: (from TVA App iOS version)





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- **Mercury:** Mercury is lost to the Sun in the beginning of the month. Mercury by mid-month has become an evening object (just barely). Setting about 30-minutes after sunset at **1644**. Mercury will be setting at **1716**. By the 31<sup>st</sup> Mercury setting by **1810** and sunset is at **1652**.
- **Venus:** Is the Evening Star on the first of the month, setting by **1931**, preceded by sunset at **1642**. By mid-month Venus is setting at **1908** preceded by sunset at **1643**. The best thing is that you may get a look at comet Leonard C/2021 A1 setting just above the horizon in the W-SW at Apparent Magnitude 4.32 just 13° 39' along the ecliptic toward the horizon. Leonard will be rising along the ecliptic (setting later) for the next several days as it heads away from the sun. On the 17<sup>th</sup> of December at about **1757** you will have a great imaging opportunity as Venus, Pluto and Leonard C/2021 A1 will be within 4° 59' 27" of each other. Here is a little table of Alt/AZ for the three objects at: **202112T175700-0800**

Object	Altitude	Azimuth
Venus	10° 34.630'	235° 24.821'
Pluto	9° 08.597'	234° 50.910'
Leonard C/2021 A1	5° 47.792'	234° 09.029'

By the 31<sup>st</sup> Venus is setting at **1757** preceded by sunset at **1652**.

- **Mars:** Mars is a morning object on the first, rising at **0509**, followed by sunrise at **0634**. By mid-month Mars is rising at **0501** preceding sunrise at **0644**. End-of-month finds the Warrior rising at **0452** with sunrise at **0651**.
- **Jupiter:** Jupiter is an evening object on the first of the month visible from about **1800** until it sets at **2222**. By mid-month Jove is setting at **2137**. Come the end of the month Jupiter is setting by **2049**.
- **Saturn:** Saturn is leading Jupiter during December. Saturn is visible from about **1800** until it sets at **2103**. Saturn by mid-month is setting at **2014**. By the end-of-the-month Saturn is setting at **1919**.
- **Uranus:** On the first of the month Uranus is transiting by **2141** and not setting until **0425+**. By the ides Uranus will transit at **2044** setting at **0328+**. End-of-month finds Uranus transits at **1940**, setting at **0224+**. This is a great opportunity to attempt an image of Uranus as it is high-in-the-sky during the month of December.
- **Neptune:** Neptune is leading Uranus during December. Neptune transits at **1830** in the beginning of the month and does not set until **0021+**. Neptune is also high-in-the-sky this month and makes a great imaging opportunity. By the 15<sup>th</sup> Neptune is transiting at **1736** and does not set until **2326**. By the-end-of-the month Neptune is visible an hour after sunset (**1652**) and sets at **2224**.
- **Pluto:** Pluto is hanging out around Venus this month so Pluto is an evening object. On the first of the month Pluto doesn't set until **1953** following sunset at **1642**. By mid-month Pluto is setting by **1900**. There is a 91% illuminated Moon moving toward transit at 2130 in the sky but you should be able to pick up Leonard C/2021 A1 by now. See Venus for details. By the 31<sup>st</sup> Pluto is setting at **1759** almost an hour after sunset at **1652**.



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## Asteroids:

- Still a dearth of asteroids. I searched for asteroids in 2021 with a reasonable magnitude; say less than or equal to +10 in December 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=2021>

## Meteors:

- Perseids Meteor Shower is back! **See *Highlights* (above).**

## 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 December 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.

Your best bet this month is comet Leonard C/2021 A1. On the 15<sup>th</sup> it will be at Mag +4.32 on the 15<sup>th</sup> about **1757**. Sunset is at **1644**. On the 17<sup>th</sup> you will have a great imaging opportunity (see Venus for details).

## Deep Sky:

Notes:

**L/Z** abbreviation for ALT/AZ

**R/D** abbreviation for Right Ascension/Declination

**$\alpha$**  is right ascension

**$\delta$**  is declination

**In each case, unless otherwise noted, you should look for the following on or about the 15<sup>th</sup> Day of December 2021 at 2100 PDT and you will have about 20 minutes of viewing time total.**



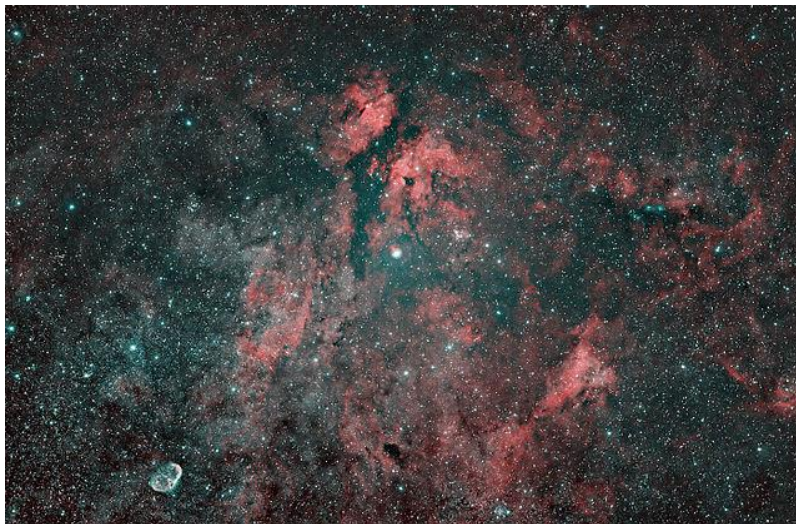
• IC 405 (Caldwell 31):



[IC 405 A.K.A. *The Flaming Star Nebula*, SH 2-229, or Caldwell 31, is an emission and reflection nebula in the constellation Auriga north of the celestial equator, surrounding the bluish star AE Aurigae. It shines at magnitude +6.0. Its celestial coordinates are RA 05h 16.2m dec +34° 28'. It surrounds the irregular variable star AE Aurigae and is located near the emission nebula IC 410, the open clusters M38 and M36, and the K-class star Iota Aurigae. The nebula measures approximately 37.0' x 19.0', and lies about 1,500 light-years away from Earth. It is believed that the proper motion of the central star can be traced back to the Orion's Belt area. The nebula is about 5 light-years across.]([Wikipedia](#))

*Illustration 1: By Hewholooks - Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=8477483>*

**NGC 1435 – The Merope Nebula:**



The Sadr Region A.K.A. IC 1318 or the Gamma Cygni Nebula, is the diffuse emission nebula surrounding Sadr ( $\gamma$  Cygni) at the center of Cygnus's cross. The Sadr Region is one of the surrounding nebulous regions; others include the Butterfly Nebula and the Crescent Nebula. It contains many dark nebulae in addition to the emission diffuse nebulae. Sadr itself has approximately a magnitude of 2.2. The nebulous regions around the region are also fairly bright... ([Wikipedia](#))

*Illustration 2: By Eric Larson <https://www.flickr.com/photos/31986095@N05/5183823288/>, CC BY 2.0, <https://commons.wikimedia.org/w/index.php?curid=12100647>*



December is great for both viewing and imaging.  
Spend some time outside with your scope. Winter will be here soon.

For now – Keep looking up.

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## RANDOM THOUGHT

By Chuck Dyson

### ARE WE ALONE (Part Two)?

Last month we looked at where and under what conditions we could possibly find planets with life on them; so, this month let's look how life could have gotten started and what it may have looked like. "That should be easy" you say because all one has to do is find the oldest rocks with impressions of cells in them and presto the beginning of life. Unfortunately, NO. That would be the earliest signs of cellular life, life as we know it, but we are after life as we do not know it, the chemical basics that culminated in cellular life. So, the 3.45 billion year old to 4.0 billion year old rocks that may have the chemical signatures of life are the starting point for our search. Because of plate tectonics and asteroid cratering, the Earth has at least as many craters as the Moon but because of our atmosphere and weather they are rapidly eroded away, finding any rock that is "only" 4 billion years old is extremely rare. Geologists want these rocks because, often, within them are zircon crystals and these crystals can have within them bits of Uranium that acts like a clock to tell how old the crystal is and bits of other material that can give hints as to what the Earth was like so long ago.

Before we start looking for "life" or things that could be precursors to living things we should have a definition of life that we all agree on and fortunately that is no problem because there are about 48 different definitions that are considered reasonable by different fractions of the science community, OK and YES we are in trouble. Because we are looking for the origin of life I am going with the NASA Exobiology panel definition which states "Life is a self-sustained chemical system capable of undergoing Darwinian evolution". This simple definition tells us to look for unique collections of elements, and isotope ratios, that are very unlikely to naturally occur in nature and could form the basis of complex but stable molecules all of the same chirality.

I mention the unique chirality, molecules that bend light to the right of the left, of our amino acids because proteins that are built from amino acids that have a different sequence of chirality every time fold differently and function differently every time, not good for life. You and I are made, almost exclusively, from amino acids that bend light to the left and, just for good measure, sugars that only bend light to the right. Our picky metabolic system does not end there either, because there is one stable isotope of carbon C12 and that is C13. Because C13 is 8% heavier than C12 and our metabolic system seems to want to build proteins as fast as possible living things have a much higher ratio of C12 to the C13 than is found in inorganic materials; so, if you find a bit of carbon in really old rocks that has that high C12 to C13 ratio you may have found the



first signs of life, if you are really lucky and there are some peptide chains and sugars in your sample and they demonstrate preferred not random chirality you may have just hit the origin of life jackpot. There are several other organic peptides that are considered to be markers of emerging metabolic processes as-well-as phospholipids that tend to form bilayer vesicles; think cell walls.

We have a good idea of the age of the rocks we should be looking for and what chemical signatures that we should look for, but what type of location do we want those rocks to be from? As water appears to be a non-negotiable ingredient for life ponds are popular. We like ponds because the water in them is not being exchanged in rain dependent freshwater ponds and as the water evaporates the dissolved mineral and carbon compounds are concentrated and then with a little rain and a little runoff, fresh compounds for our existing compounds to interact with are delivered.

The second type of pond that life could have started in is the saltwater pond, very high up in the tidal zone so that the water is not flushed out every day by the tide. Salt water has the advantage of having lots of minerals in it so that it concentrates nicely with evaporation. Both fresh water and saltwater ponds need to have the active compounds recharged or replaced for our almost living chemicals to continue building new compounds, metabolism. In nature both lightning, a jolt of energy that can not only recharge but destroy our target compounds, and hot water or gases from volcanoes can recharge our systems. Note; in the laboratory scientists use electric spark generators to recharge the soup in the experiments because electricity is so much easier to use in the laboratory than an active volcano.

A third option and one that we can see in action today, with the help of a deep submersible, is the ocean bottom hydrothermal vent, black smoker. We know that black smokers have the chemicals that will provide energy to support life because today there are colonies of bacteria, shrimp, tube worms, and crabs that are sustained by the smokers. The big problem with studying the chemical reactions that could have occurred in smokers 3.8 billion years ago is that the reactions and their endpoints are different when you are under the pressure of 11/2 to 2 miles of seawater instead of on land at one atmosphere (11/2 miles down = 264 atmospheres and 2 miles = 352 atmospheres); however, there are labs that have the equipment to produce and maintain high pressures so the possibility of life forming on the seabed is being explored.

Actually there are three different ways life could have begun on Earth. The spontaneous emergence on Earth itself, the stuff I have been writing about. A cosmic God says, "let there be life" and there is a gooey glob of self-replicating chemicals undergoing Darwinian evolution on bits of clay minerals, and I will have more to say about clay minerals shortly, and presto change in almost 4 billion years you have an article being written for an astronomy newsletter by some amateur astronomer. Our last option is panspermia, life from outer space. Panspermia does not tell us how life got started, only that it started someplace else. I like to breakup panspermia into two components, local and distant. Local panspermia objects have two components, objects that formed in the solar system but were never part of a planet and bits of planets blasted off the surface of planets by impact.



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In the 3.5 billion, or so, years that there has been life on Earth there have been a plethora of impacts with enough energy to blast stuff off our planet and into the solar system and maybe beyond. A computer simulation of the Chicxulub impact indicated thousands of tons of debris ejected into Earth orbit and beyond. The researchers estimate that 360,000 rocks made it to Mars but only 6 rocks made it to Jupiter's moon Europa. The last criteria the researchers had for the transportation of life across space was that the rock be 3 meters (10 feet) in diameter in order to be big enough to protect the living things from the deleterious effects of space radiation and by this criteria Mars could have been seeded but Europa was probably not. However, over several billion years of bombardment the chances of life from Earth getting to Europa, really good. Even with billions of years of bombardment the chances of a life bearing rock getting to a planet in orbit around another star, the nearest star to Earth is 266,000 times further from us than Earth is from the Sun, are really small and that's why I am not in favor of distant panspermia. On the other hand, many of those comets and asteroids hitting Earth were rich in amino acids, some peptides, a few proteins, and sugars, the reason scientists talk about making amino acids in the lab is because they have a really hard time making sugars and sugars are the essential chemical back bone of our DNA and RNA. These space rocks may not have brought life to Earth but over time they certainly delivered the materials to create it; and that's why I think local panspermia could play a big part in the origin of life on Earth story.

Finally, comets and asteroids have clay minerals in them. Clay minerals are very fine, just dust particles really, bits of rock and because they are so small they have a surface charge that may not be neutral and a charged surface, especially one that has a negative charge, will attract and hold atoms and molecules with the opposite charge. When researchers place clay particles in a solution of amino acids and minerals stable matts of more complex compounds are formed on their surface and even though no one has gotten these organic matts to self-replicate clay minerals and their matts are considered a promising way life could have started on Earth. We have several places and multiple energy sources that could have combined to form the very first self-replicating molecules and start the long march to all of the lifeforms that we see today, but for now exactly how this happened we can only speculate.

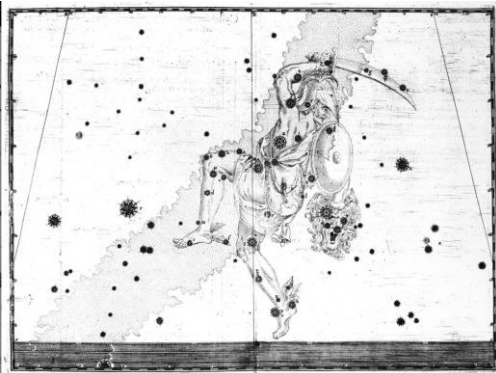
Cheers,  
Chuck

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## Another Look

By Dave Phelps



Perseus is one of the richest regions of the Milky Way with clusters of galaxies, Messiers, open clusters and nebulae. Great fun to study.

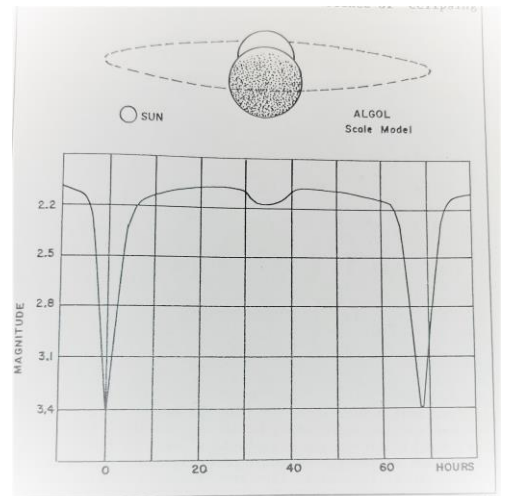
Let's start out with a bare eye wide angle view and look up, maybe you can envision a waterfall of light spilling through the constellation and into the southern night sky. The double cluster is near the top and stars flow down all the way to Triangulum and the Pleiades. Be sure to look for Algol, along Perseus's arm and called the Eye of Medusa. Perseus used her to defeat the sea monster, Cetus. Algol, also known as the demon star and the

demon's head, is mythologically the head of Medusa. She is also the first identified eclipsing binary, discovered back in 1782. A regular variable to cut your teeth on, the AAVSO will always accept your estimate. We can thank Burnham for the chart.

Sorta between Algol the Pleiades and Capella is the California Nebula. You can see it naked eye if you use a filter and have dark skies. It's dim but big and a tiny bit of a challenge. The nebula, designated NGC 1499, is next to  $\xi$  xi Persei, a very energetic star named Menkib, the shoulder. We can thank it for providing the energy to light up the California nebula for us.



At the other end of Perseus, not too far from Cassiopeia, is the double cluster, NGC's 884 and 869, the sword hand of Perseus. Maybe best seen in binoculars, a RFT or the like, they are a spectacular field of blue white stars sprinkled with a red or garnet star (per Admiral Smith) visible in your telescope.



I love reading the descriptions our astronomical forbearers wrote about so many of the objects we still love to look at. In Celestial Objects for Common Telescopes by the Reverend T. W. Webb he writes "These two gorgeous clusters, described by Smith as 'affording together one of the most brilliant telescopic objects in the heavens' are visible to the naked eye as a protuberant part of the galaxy, and so Herschel considers them." The man knew how to string together a sentence.

Lastly, near Algol, is M34, an open cluster Webb called "a very grand low power field; one of the finest

objects of its class.” and M76 – Little dumbbell, faint at 11<sup>th</sup> magnitude, its central star is less than 16<sup>th</sup>. It has a squarish shape reminiscent of its larger cousin. From Burnham we learn that Webb found it to be a “pearly-white nebula” while Messier thought of it as “small stars containing nebulosity. Rather dim for a backyard telescope at 11<sup>th</sup> magnitude, our modern instrument will do much better than our astronomical ancestors.

I asked Dave Kodama of the Orange County Astronomers for images he may have for the objects I wanted to talk about this month and he really came through. Years ago, I was on a mountain top in southwestern Utah and I remember starting at Epsilon Cass. and hopping west following a sort of tunnel of darkness. I



came across a dark hole in the stars that I called the cave. I now know that I found the “Heart” nebula, IC 1805. What an image Dave has produced. The panorama shows IC 1805 and IC 1848. Also in the image is the open clusters M103 and IC 457. IC 281 and the double cluster are also prominent. Dave also pointed out for me IC 59 and IC 63, two faint nebulae next to Gamma. Two more items for my bucket list.

About 4 degrees north of  $\gamma$  gamma is the radiant for the Perseid's, a good direction to point your chair on August 10.

We can thank Dave also for his images of the California nebula and M33.

Next to M31, our wonderful friend in Andromeda, I think M33, the spiral in Triangulum is the most recognizable to our northern hemisphere eyes. It is pretty much face on, decently bright and rather large. There are lanes and knots easily seen in a larger amateur telescope, many of whom have their own NGC designation.

I only have identified a couple but we can thank the interweb for the neighboring image and a few designations. First, along the western edge you can identify NGC 588, a moderately bright knot and NGC 595, close and also a bright knot.

Use your H $\alpha$  filter to identify NGC 592, a moderately bright and large HII region also west of the core of M33. I am told that a little west of NGC 592 is NGC 588. There are many more, as the image shows, so go nuts and have a good time.

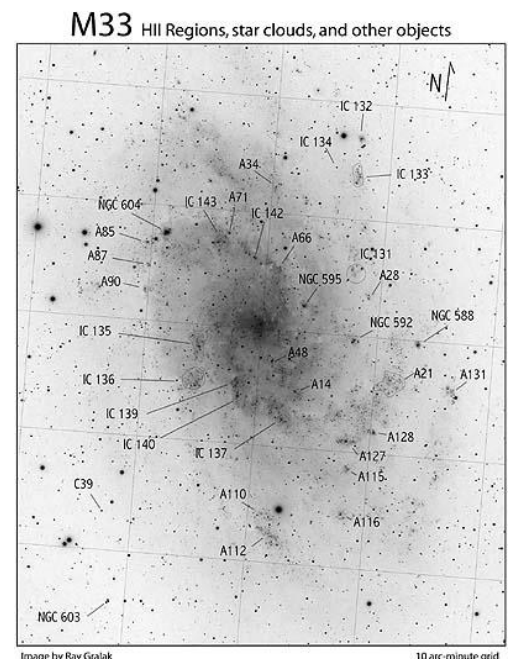


Image by Ray Galak

10 arc-minute grid







## TVA Joins NSN

By Paul Kreitz

The TVA Newsletter (which you are currently reading) has for a number of years included an article of general interest supplied by NASA's Night Sky Network (NSN), and generally written by David Prosper, of NSN.

In early October of 2021 TVA President Mark Baker was contacted by a representative of NSN, suggesting that TVA could gain a number of benefits by joining NSN. One thing led to another and I ended up accepting the role of Night Sky Network Club Coordinator for TVA. My commitment at this point is to see the process through for the next year, so that we can make an informed assessment of the benefits of membership in NSN.

Among the more obvious potential benefits are:

- An easy way for interested parties to find TVA (at least if they can find NSN), potentially bringing in new members.
- Access to handout materials for use at Star Parties or other Outreach events.
- Access to materials, such as PowerPoint presentations, for use at school or public events.
- More that I haven't checked out yet.

I have therefore set up TVA as a member Astronomical Club of NSN. Please take a look at the NSN home page, accessible here: <https://nightsky.jpl.nasa.gov/> . When you do that you should get this screen:



Jet Propulsion Laboratory  
California Institute of Technology

JF

# Night Sky Network

Astronomy clubs bringing the wonders of the universe to the public

CLUBS & EVENTS      NIGHT SKY PLANNER      OUTREACH RESOURCES

## Find Clubs and Events in Your Area

CURRENT LOCATION  
**Murrieta, CA 92563, USA**

If you enter your ZIP code and click the "GO!" box, something like this should pop up:



# Temecula Valley Astronomer

The monthly newsletter of the Temecula Valley Astronomers December 2021



MY CLUB    CLUBS & EVENTS    NIGHT SKY PLANNER    OUTREACH RESOURCES

## Clubs & Events

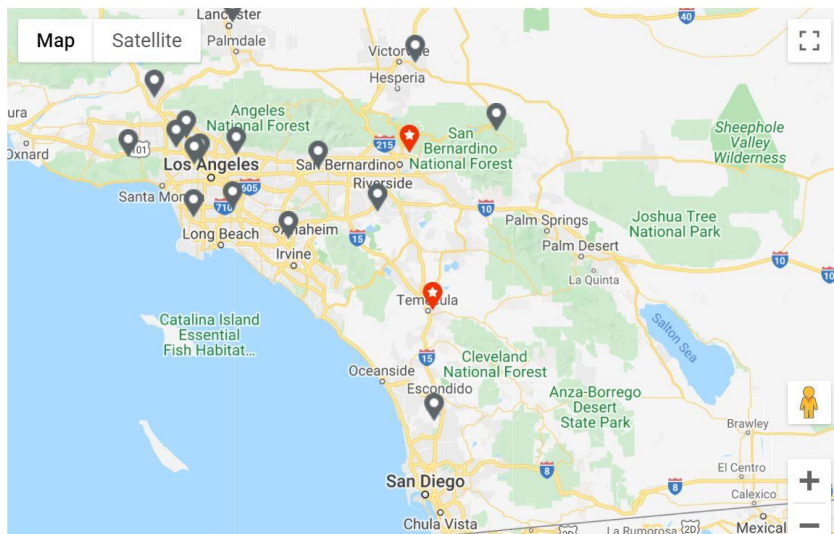
### ASTRONOMY EVENTS IN YOUR AREA

Searching for events within 100 miles of Murrieta, CA 92563, USA.

November 2021						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	01 6:00 PM TVA Monthly Meeting 7:00 PM Constellation Tour 61	02 10:00 AM Lure and Lore of the Nigh 4:48 PM Utah Skies	03 7:30 PM Monthly meeting	04 10:00 AM NightFall 10:00 AM Lure and Lore of the Nigh 7:00 PM Monthly Club Meeting + more (6 events)	05 7:00 PM HAS General Meeting	06 5:00 PM Nov. Star Party
07 7:00 PM Constellation Tour 62 7:30 PM CAA Lecture	08 Statewide Star Party	09 4:48 PM Utah Skies	10	11 10:00 AM Lure and Lore of the Nigh 7:00 PM Birth of Stars	12	13 7:00 PM Telescope Live Stream

Note that TVA's November meeting is listed on the November 01 block! If you scroll down a bit, you come to this section:

### ASTRONOMY CLUBS IN YOUR AREA



- 7:30 PM - 9:00 PM ET  
Mon 11/8/21  
virtual event  
[Cuyahoga Astronomical Association Lecture and Meeting](#)
- 4:48 PM - 5:50 PM MT  
Tue 11/9/21  
virtual event  
[Utah Public Radio - Utah Skies](#)
- [+ more events](#)

### CLUBS NEAR YOU

- 6 miles [Temecula Valley Astronomers](#)  
Temecula, CA 92592
- 27 miles [Riverside Astronomical Society](#)  
Riverside, CA 9250
- 38 miles [San Diego Astronomy Association](#)  
San Diego, CA 92127
- 40 miles [San Bernardino Valley Amateur Astronomers](#)  
San Bernardino, CA 92404

Now we're getting there! TVA is listed first on the "Clubs near you" box. Click on our name in the "Clubs Near You" box, or on the red location pin at Temecula on the map, and you go to this page:





# Temecula Valley Astronomer

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JPL HOME EARTH SOLAR SYSTEM STARS & GALAXIES SCIENCE & TECHNOLOGY

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## Night Sky Network

Astronomy clubs bringing the wonders of the universe to the public

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## Temecula Valley Astronomers

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FOLLOW THE NIGHT SKY NETWORK  

### About Us

Sharing the night sky with our friends and neighbors in the Temecula Valley

Follow us 

#### UPCOMING EVENTS

6:00 PM - 8:00 PM PT Mon 12/6/21 club event	<a href="#">TVA Monthly Meeting</a> Robin H. Roberts Temecula Public Library 30600 Pauba Road Temecula, CA
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Feel free to wander about the web site from here to see what looks interesting. I would be delighted to hear from any TVA members who choose to click on "Join Club". If you do, you will be presented with a choice to "Join", or, since you are already a TVA member, to "Register" with NSN. In either case you will be presented with a form asking for name, address, phone, etc., followed by some choices as to what of the information you just supplied should be visible to whom:

#### Personal information display preferences on Find Members (visible to all NSN Members)

OK to display name?

Yes  No

OK to allow contact by email? (Actual email address is not displayed)

Yes  No

OK to display primary phone number?

Yes  No

#### Personal information display preferences on Club Roster (visible only to Club Members)

OK to allow contact by email?

Yes  No

OK to display primary phone number?

Yes  No



You can opt to not display anything to anyone, or allow name only, etc.

One benefit of registering is that once you have, there is an easy way to enter the time you have spent at each Outreach Event in which you have participated, and upon reaching various milestones of hours qualify for Astronomical Society Of The Pacific recognition for your contribution. I'm looking forward to seeing how that works in real life.

After playing with the system for a few weeks I believe that it will be worth the effort to enter and track our events and participation. Please let me know what YOU think!

Read the next article for another example of a benefit to TVA from Night Sky Network.

Keep looking up!  
Paul Kreitz

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## **The James Webb Space Telescope: Ready for Launch!**

**By David Prosper – NASA / JPL**

NASA's James Webb Space Telescope is ready for lift-off! As of this writing (November 15), the much-anticipated next-generation space telescope is being carefully prepared for launch on December 18, 2021, and will begin its mission to investigate some of the deepest mysteries of our universe.

The development of the Webb began earlier than you might expect – the concept that would develop into Webb was proposed even before the launch of the Hubble in the late 1980s! Since then, its design underwent many refinements, and the telescope experienced a series of delays during construction and testing. While frustrating, the team needs to ensure that this extremely complex and advanced scientific instrument is successfully launched and deployed. The Webb team can't take any chances; unlike the Hubble, orbiting at an astronaut-serviceable 340 miles (347 km) above Earth, the Webb will orbit about one million miles away (or 1.6 million km), at Lagrange Point 2. Lagrange Points are special positions where the gravitational influence between two different bodies, like the Sun and Earth, "balance out," allowing objects like space telescopes to be placed into stable long-term orbits, requiring only minor adjustments - saving Webb a good deal of fuel.

Since this position is also several times further than the Moon, Webb's sunshield will safely cover the Moon, Earth, and Sun and block any potential interference from their own infrared radiation. Even the seemingly small amount of heat from the surfaces of the Earth and Moon would interfere with Webb's extraordinarily sensitive infrared observations of our universe if left unblocked. More detailed information about Webb's orbit can be found at [bit.ly/webborbitinfo](http://bit.ly/webborbitinfo), and a video showing its movement at [bit.ly/webborbitvideo](http://bit.ly/webborbitvideo).

Once in its final position, its sunshield and mirror fully deployed and instruments checked out, Webb will begin observing! Webb's 21-foot segmented mirror will be trained on targets as fine and varied as planets, moons, and distant objects in our outer Solar System, active centers of galaxies, and some of the most distant stars and galaxies in our universe: objects that may be some of the first luminous



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objects formed after the Big Bang! Webb will join with other observatories to study black holes - including the one lurking in the center of our galaxy, and will study solar systems around other stars, including planetary atmospheres, to investigate their potential for hosting life.

Wondering how Webb's infrared observations can reveal what visible light cannot? The "Universe in a Different Light" Night Sky Network activity can help - find it at [bit.ly/different-light-nsn](https://bit.ly/different-light-nsn). Find the latest news from NASA and Webb team as it begins its mission by following #UnfoldTheUniverse on social media, and on the web at [nasa.gov/webb](https://nasa.gov/webb).



## 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 [nightsky.jpl.nasa.gov](https://nightsky.jpl.nasa.gov) to find local clubs, events, and more!



The TVA is a member club of [The Astronomical League](https://www.astronomicalleague.org/)

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