# Temecula Valley Astronomer

**The monthly newsletter of the Temecula Valley Astronomers November 2024**


## Events: General Meeting, Monday, November 4, 2024, ZOOM meeting, at 6:00 PM.

- **IFI & Gallery by Clark Williams**
- **Refreshments - NA**
- **Speaker: Paul Lynam – History of the Lick Observatory**
- **Star Parties at Europa Village every Friday evening**
- **For upcoming school Star Parties check the Calendar on the web page.**

**WHAT'S INSIDE THIS MONTH:**



Send newsletter submissions to Sharon Smith <sas19502000@yahoo.com> by the 20th 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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Temecula Valley Astronomer
The monthly newsletter of the Temecula Valley Astronomers November 2024

# Looking Up Redux – November 2024

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 (6.8.2)
Stellarium (24.1)
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:**

| | | |
|---|---|---|
| **Friday** | **the 15th** | **@1329 FULL in ARIES** |
| **Friday** | **the 22nd** | **@1729 THIRD QTR in LEO** |
| **Friday** | **the 1st** | **@0547 NEW in LIBRA** |
| **Saturday** | **the 30th** | **@2222 NEW in SCORPIUS (Black Moon)** |
| **Friday** | **the 8th** | **@2156 First QTR in CAPRICORNUS** |

Perigee comes on 2024-11-14 @ **1119 – 360,109 km (223,761 mi)**
Apogee comes on 2024-11-26 @ **1157 – 405,314 km (251,851 mi)**

2024 has: (12) new moons, (12) 1st Qtr moons, (13) Full moons, (12) 3rd Qtr moons
(1) Blue moon and (0) Black moons

**Daylight Savings:** Starts: 2024-Mar-12 : Ends: 2024-Nov-05 (CA does not keep PDT year-round)

**Luna:** Luna is New on the first of the month rising at **0721**, transiting at **1237** and setting by **1754**. Luna by mid-month is FULL Rising at **1632** and transiting at **2355** setting at **0726+**. By the-end-of-the-month Luna is again New, rising at **0612** transiting at **1109** and setting by **1806**.

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

November 1 - 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 **0549**. 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.

November 4, 5 - Taurids Meteor Shower. The Taurids is a long-running minor meteor shower producing only about 5-10 meteors per hour. It is unusual in that it consists of two separate streams. The first is produced by dust grains left behind by Asteroid 2004 TG10. The second stream is produced by debris left behind by Comet 2P Encke. The shower runs annually from September 7 to December 10. It peaks this year on the the night of November 4. The first quarter moon will block out all but the brightest meteors this year. If you are patient, 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 Taurus, but can appear anywhere in the sky.

November 15 - Full Moon, Supermoon**. 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 2130 UTC. This full moon was known by early Native American tribes as the Beaver Moon because this was the time of year to set the beaver traps before the swamps and rivers froze. It has also been known as the Frosty Moon and the Dark Moon. This is also the last of three supermoons for 2024. The Moon will be near its closest approach to the Earth and may look slightly larger and brighter than usual.

November 16 - Mercury at Greatest Eastern Elongation. The planet Mercury reaches greatest eastern elongation of 22.5 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.

November 17 - Uranus at Opposition. The blue-green 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 Uranus. Due to its distance, it will only appear as a tiny blue-green dot in all but the most powerful telescopes.

November 17, 18 - Leonids Meteor Shower. The Leonids is an average shower, producing up to 15 meteors per hour at its peak. This shower is unique in that it has a cyclonic peak about every 33 years where hundreds of meteors per hour can be seen. That last of these occurred in 2001. The Leonids is produced by dust grains left behind by comet Tempel-Tuttle, which was discovered in 1865. The shower runs annually from November 6-30. It peaks this year on the night of the 17th and morning of the 18th. Unfortunately the nearly full moon will block all but the brightest meteors this year. If you are patient, you may still be able to catch a few good ones. Best viewing will be from a dark location after midnight. Meteors will radiate from the constellation Leo, but can appear anywhere in the sky.

November 30 - 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 **2222**. 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.

“Supermoon” is a pointless term invented by Astrologers. The astronomical term for a supermoon is "perigee-syzygy Moon". Which no one uses because it is POINTLESS! Just say a Full Moon at perigee.

**Algol minima: (All times Pacific Time)**

| | |
|---|---|
| **11/02/2024** | **1942** |
| **11/05/2024** | **1631** |
| **11/08/2024** | **1320** |
| **11/11/2024** | **1009** |
| **11/13/2024** | **1800** |
| **11/14/2024** | **0658** |
| **11/17/2024** | **0347** |
| **11/20/2024** | **0036** |
| **11/22/2024** | **2125** |
| **11/25/2024** | **1814** |
| **11/28/2024** | **1503** |


01 New
02 WAX CRST
03 WAX CRST
04 WAX CRST
05 WAX CRST
06 WAX CRST
07 WAX CRST
08 1stQ
09 WAX GIB
10 WAX GIB
11 WAX GIB
12 WAX GIB
13 WAX GIB
14 WAX GIB
15 Full
16 WAN GIB
17 WAN GIB
18 WAN GIB
19 WAN GIB
20 WAN GIB
21 WAN GIB
22 3rdQ
23 WAN CRST
24 WAN CRST
25 WAN CRST
26 WAN CRST
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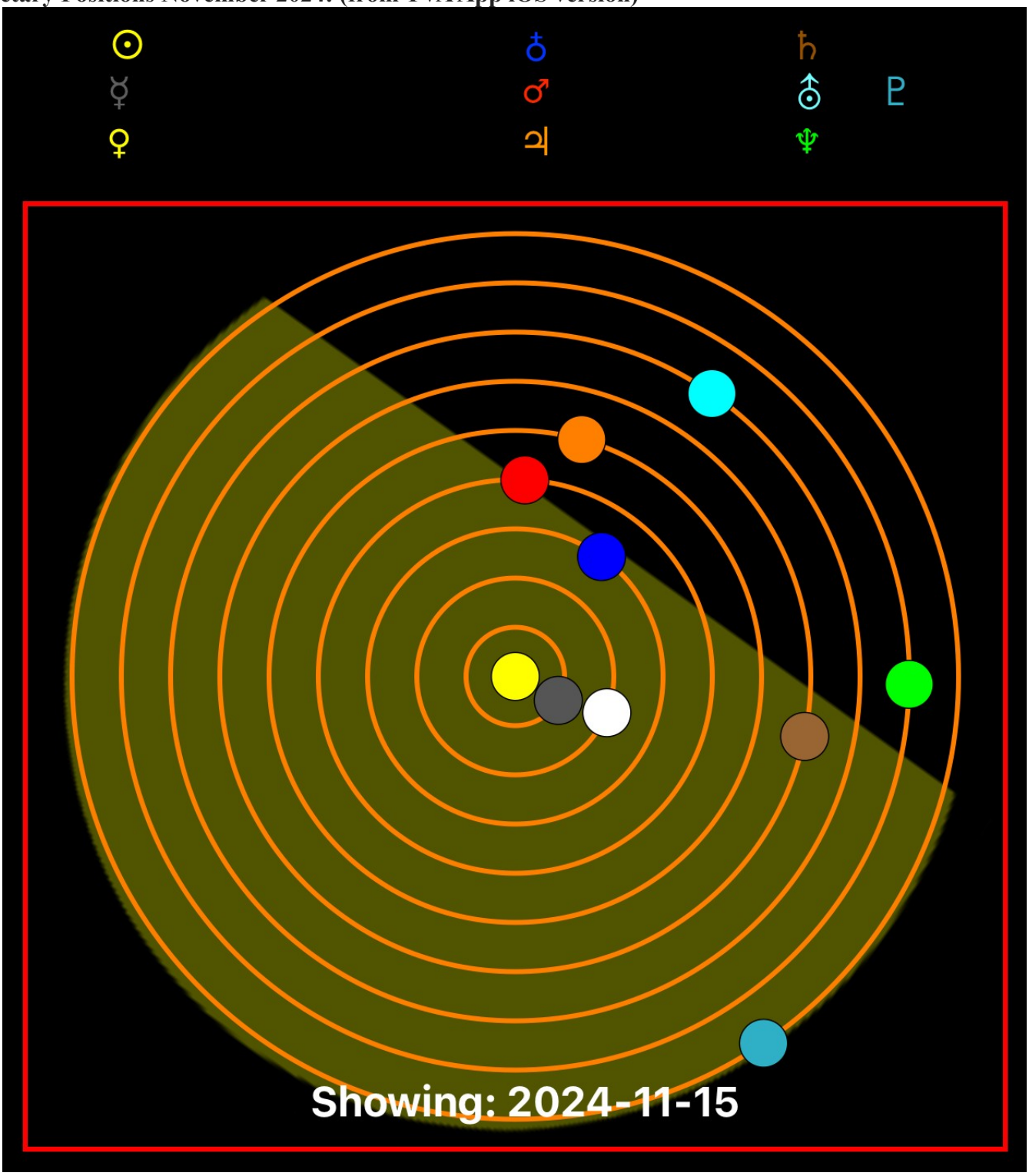
2024 November

**Planets:**

**Planetary Positions November 2024: (from TVA App iOS version)**



- **Mercury:** Mercury is an evening object at the beginning of the month rising at **0844**, transiting at **1346** and setting at **1847**. Mercury by mid-month is still an evening object. Rising at **0817**, transitioning at **1306** and setting at **1756**. By the 30th Mercury is an evening object. Mercury rises at **0733**, transits at **1227** and sets st **1722**.
- **Venus:** On the first of the month is the Evening Star rising at **1018**, transiting at **1510** and setting by **2002**. By mid-month Venus as the Evening Star is rising at **0940**, transiting at **1429** and setting at **1918**. By end of month The Evening Star is rising at **0953**, transiting at **1447** and setting at **1942**.
- **Mars:** Mars is an evening object on the first of the month. Mars rises at **2303**, transits at **0607**+ and sets by **1311**+. By mid-month Mars is rising at **2128**, transits at 0430+ and doesn't set until 1132+. End-of-month finds the Warrior rising at **2039** transiting at **0341+** and setting at **1043+**.
- **Jupiter:** Jupiter is an evening object on the first of the month. Rising at **2013**, transitioning at **1835**+ and setting by **1024**+. By mid-month Jove is rising at **1812**, Jupiter transits at **0117**+ and sets at **0822**+. Come the end-of-month Jupiter rises at **1706** and transits at **0010**+, setting by **0715**+.
- **Saturn:** Saturn is an evening object on the first of the month rising at **1522**, transiting at **2101** and setting at **0239+**. Saturn by mid month rises by **1327**, transiting at 1905 and setting at **0044+**. By the end-of-the-month Saturn is rising by **1228**, transits at **1807** and sets at **2346**.
- **Uranus:** On the first of the month Uranus is a evening object rising at **1840**, transiting at **0134**+ and setting at **0829**+. By the ides Uranus is rising at **1643**, transiting at **2337** and setting by **0631**+. End-of-month finds Uranus as an evening object rising at **1542** transiting at **2235** and setting at **0529**+.
- **Neptune:** Neptune in the beginning of the month is a evening object. Neptune rises at **1558**, transits at **2153** and sets by **0349**+. By the 15th Neptune rise at **1402**, although it is washed out by the Full Moon. Neptune transits at **1958** and sets by **0153+**. By the end of the month Neptune is rising at **1303**, transiting at **1858** and sets by **0054+**.
- **Pluto:** Pluto on the first of the month is an evening object rising at **1317**, transiting at **1812**. and setting at **2307**. By mid-month Pluto is rising by **1122**, transiting by **1618** and sets by **2113**. Pluto's apparent magnitude is 14.53 so good luck if you're looking for Pluto during the Full Moon. By the 30th Pluto is rising at **1024**, transits at **1520** and sets at **2016**.

**Asteroids:**

- Still a dearth of asteroids. I searched for asteroids in 2024 with a reasonable magnitude; say less than or equal to +10 in November there is nothing except the regulars: Juno, Vesta. Hebe, Eros and Herculina. So consult your local planetarium software or try: https://www.asteroids near.com/year?year=2024

**Meteors:**

- See above under Highlights: Taurids and Leonids Meteor Showers.

**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 November 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.

**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 November 2024 at 2100 PDT and you will have about 20 minutes of viewing time total.**

Lets take a look at one object for November:

- **NGC 7662:**

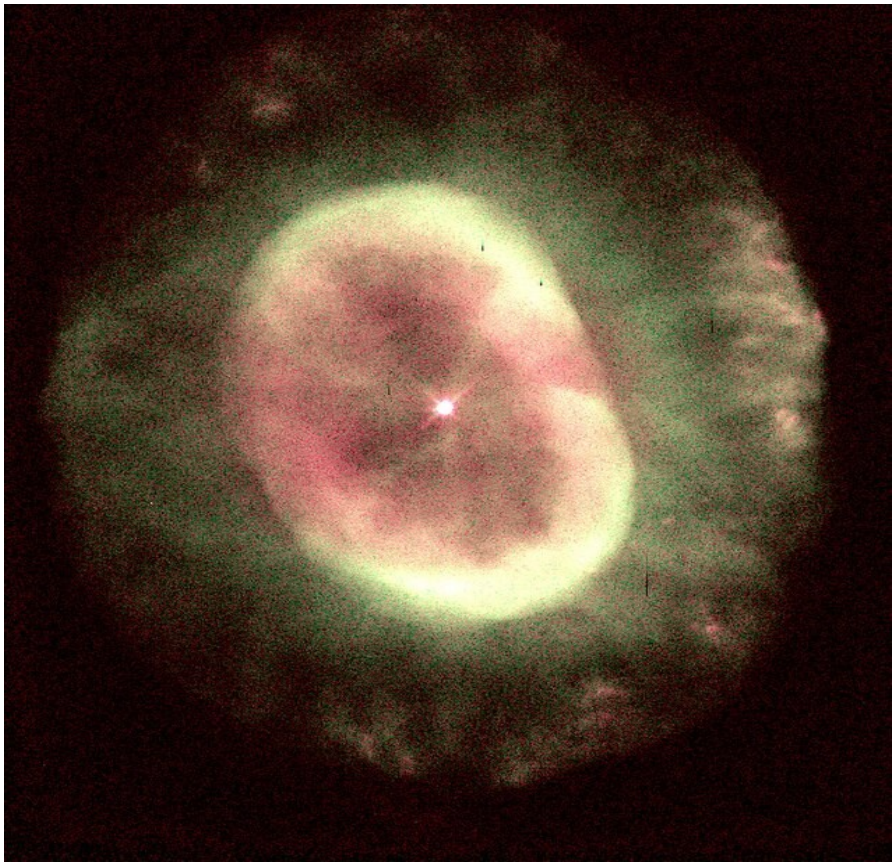


*Illustration 1: By Judy Schmidt - Flickr: NGC 7662 "Blue Snowball", CC BY 2.0, https://commons.wikimedia.org/w/index.php?curid=31290182*

NGC 7662 is a planetary nebula located in the northern constellation Andromeda. It is known as the Blue Snowball Nebula, Snowball Nebula, and Caldwell 22. This nebula was discovered October 6,

1784 by the German-born English astronomer William Herschel. In the New General Catalogue it is described as a "magnificent planetary or annular nebula, very bright, pretty small in angular size, round, blue, variable nucleus". The object has an apparent visual magnitude of 8.3 and spans an angular size of 32″ × 28″. Parallax measurements give a distance estimate of 5,730 ± 340 ly (1,757 ± 103 pc). NGC 7662 is a popular planetary nebula for casual observers. A small telescope will reveal a star-like object with slight nebulosity. A 6" telescope with a magnification around 100x will reveal a slightly bluish disk, while telescopes with a primary mirror at least 16" in diameter may reveal slight color and brightness variations in the interior. This nebula has an elliptical shape with a triple-shell structure. The brightest is the main shell, which spans 12″ × 18″. This is surrounded by a fainter outer shell, which has an elliptical form. Both shells are enclosed by a faint, circular halo, some 134″ in diameter. The two shells can be modeled as prolate spheroids, with the inner shell having the greater elongation, a major axis tilt of 50° to the line of sight, and a hull thickness of ~2.5″. Several knots and a jet-like structure are visible, which display emission lines and low ionization. Based on the expansion rate, the estimated age of the nebula is 3,080 years. The central star of the planetary nebula is a subdwarf O star with a spectral type of sdO. The best fit model for this star gives an effective temperature of 100 kK, with 5,250 times the luminosity of the Sun and 60.5% of the Sun's mass. X-ray emission from the nebula is being generated by the stellar wind from this star striking previously ejected matter... (Wikipedia)

Summer is over. Longer nights are coming! November is great for both viewing and imaging. Spend some time outside with your scope. Autum is here!

For now – Keep looking up.

# NOVEMBER 2024
# TWO STARS YOU MAY WANT TO LOOK AT
# RIGEL AND BETELGEUSE

No star chart needed to find these two stars! Orion is arguably the most recognizable constellation in the sky and Rigel and Betelgeuse are the two brightest stars in that constellation.

First we need to hope that Orion has had good bath before we start poking around him and you will soon see the reason why.

We will start our stellar tour of Orion with Rigel. In Johann Bayers 1603 Urometria catalogue of stellar bright stars he labeled Rigel as Beta Orionis meaning that it was the second brightest star in the constellation but today it is recognized as the brightest. Both Rigel and Betelgeuse, the star Bayer labeled as the Alpha star, are variable and in 1603 Betelgeuse may have been brighter than Rigel. Rigel is a blue-white supergiant star and at 7 million years old is the youngest of the two. Rigel in Arabic means left foot and is one of two reasons that I hoped Orion had bathed recently. Even though Rigel is blue-white most astronomers think that it has left the main sequence and is now starting to fuse Helium into Carbon and Oxygen. Rigel is about 21 times a massive as our sun and 70 times its diameter, if it were to replace our sun it would swallow Mercury and incinerate Venus. Because Rigel is so big and hot, with a surface temperature of 36,000 F. it is about three times hotter than our Sun, it radiates way more light than our Sun. For example our Sun would be a 6$^{th}$ magnitude star (the faintest star that can be seen by the eye under clear, calm, dark skies) at 73 light years distance; Rigel would be a 6$^{th}$ mag star at 25,000 light years. If you observe Rigel under clear dark skies with at least a six inch telescope look for Rigel's companion star. This star is thought to be the brightest of four stars that orbit Rigel.

So, what does the future hold for Rigel? To answer that question we need to turn to our second star Betelgeuse.

Although Betelgeuse is thought to be only two million years older than Rigel it is well into the red giant phase of its life. One of the tricks to seeing the color of a star is to defocus your telescope just a little and this turns the star from a dot to a little disk and the color really pops out. When you do this Rigel looks like an unshielded security light pointed directly at you and Betelgeuse looks like the perfect Halloween pumpkin. Betelgeuse is a pumpkin because its surface temperature is only 6,000F about 2/3 the temperature of our Sun; so, it is emitting much less light per surface area than our Sun and especially Rigel. For Betelgeuse to be so bright in our night sky it must be really close, which it is not, or really big, which it is. The trouble with Betelgeuse is in its death throws it is throwing out giant gas clouds that make it difficult to determine how bright, how far, and what is happening on the surface of our star. A great demonstration of just how big and dense these clouds could be came in 2019 when a dust cloud blocked 60% of the light from Betelgeuse. At first astronomers thought that Betelgeuse was collapsing and going supernova but it soon became apparent that this was not the case and the next question was how could such a massive gas cloud be created. The astronomers best guess, because of a doppler shift in Betelgeuse's light curve is there is a companion star, that we will never see because it is buried in the general dust cloud, that helps to create occasional giant dust clouds. Astronomers now estimate that

Betelgeuse will go supernova in the next 100,000 years and at 400 to 600 lightyears distance our descendants will get a spectacular view of the event but not get burned by the fireworks.
Take a few minutes to look at these two stars and marvel at what you are seeing.

CHEERS CHUCK

**This article is distributed by NASA's Night Sky Network (NSN).** The NSN program supports astronomy clubs across the USA dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, and more!

# November's Night Sky Notes: Snowballs from Space

By Kat Troche

If you spotted comet C/2023 A3 (Tsuchinshan-ATLAS) in person, or seen photos online this October, you might have been inspired to learn more about these visitors from the outer Solar System. Get ready for the next comet and find out how comets are connected to some of our favorite annual astronomy events.

## *Comet Composition*

A comet is defined as an icy body that is small in size and can develop a 'tail' of gas as it approaches the Sun from the outer Solar System. The key traits of a comet are its **nucleus**, **coma**, and **tail**.

The **nucleus** of the comet is comprised of ice, gas, dust, and rock. This central structure can be up to 80 miles wide in some instances, as recorded by the Hubble Space Telescope in 2022 – large for a comet but too small to see with a telescope. As the comet reaches the inner Solar System, the ice from the nucleus starts to vaporize, converting into gas. The gas cloud that forms around the comet as it approaches the Sun is called the **coma**. This helps give the comet its glow. But beware: much like Icarus, sometimes these bodies don't survive their journey around the Sun and can fall apart the closer it gets.

The most prominent feature is the **tail** of the comet. Under moderately dark skies, the brightest comets show a dust tail, pointed away from the Sun. When photographing comets, you can sometimes resolve the *second* tail, made of ionized gases that have been electronically charged by solar radiation. These ion tails can appear bluish, in comparison to the white color of the dust tail. The ion tail is also always pointed away from the Sun. In 2007, NASA's STEREO mission captured images of C/2006 P1 McNaught and its dust tail, stretching over 100 million miles. Studies of those images revealed that solar wind influenced both the ion and dust tail, creating striations – bands – giving both tails a feather appearance in the night sky.

Comet McNaught over the Pacific Ocean. Image taken from Paranal Observatory in January 2007. Credits: ESO/Sebastian Deiries

## *Coming and Going*

Comets appear from beyond Uranus, in the Kuiper Belt, and may even come from as far as the Oort Cloud. These visitors can be **short-period** comets like Halley's Comet, returning every 76 years. This may seem long to us, but **long-period** comets like Comet Hale-Bopp, observed from 1996-1997 won't return to the inner Solar System until the year 4385. Other types include **non-periodic** comets like NEOWISE, which only pass through our Solar System once.

But our experiences of these comets are not limited to the occasional fluffy snowball. As comets orbit the Sun, they can leave a trail of rocky debris in its orbital path. When Earth finds itself passing through one of these debris fields, we experience meteor showers! The most well-known of these is the Perseid meteor shower, caused by Comet 109P/Swift-Tuttle. While this meteor shower happens every August in the northern hemisphere, we won't see Comet Swift-Tuttle again until the year 2126.

A view of the 2023 Perseid meteor shower from the southernmost part of Sequoia National Forest, near Piute Peak. Debris from comet Swift-Tuttle creates the Perseids. Credit: NASA/Preston Dyches

See how many comets (and asteroids!) have been discovered on NASA's Comets page, learn how you can cook up a comet, and check out our mid-month article where we'll provide tips on how to take astrophotos with your smartphone!

The TVA is a member club of The Astronomical League