

# The Night Sky this Month – December 2021



## Sirius serving as a “Christmas Star”.

It was another challenging year on Earth. But it was a splendid year for us happy few who like to see what’s going on in the rest of the universe. As 2021 winds down, Jupiter and Saturn linger in the western sky after sunset. Mercury and Venus make a close but low conjunction in the evening sky later in the month. And the Geminid meteor shower enjoys a few hours of darkness in the early morning at mid-month. Here’s what to see in the night sky in December.....

### **December: find M31 - The Andromeda Galaxy - and perhaps M33 in Triangulum**

In the late evenings when the Moon is not prominent, the galaxy M31 in Andromeda will be visible high in the southeast. The chart (Next page) provides two ways of finding it:

1) Find the square of Pegasus. Start at the top left star of the square - Alpha Andromedae - and move two stars to the left and up a bit. Then turn 90 degrees to the right, move up to one reasonably bright star and continue a similar distance in the same direction. You should easily spot M31 with binoculars and, if there is a dark sky, you can even see it with your unaided eye. The photons that are falling on your retina left Andromeda well over two million years ago!

2) You can also find M31 by following the "arrow" made by the three rightmost bright stars of Cassiopeia down to the lower right as shown on the chart.

Around new Moon (3rd December) - and away from towns and cities - you may also be able to spot M33, the third largest galaxy after M31 and our own galaxy in our Local Group of galaxies. It is a face on spiral and its surface brightness is pretty low so a dark, transparent sky will be needed to spot it using binoculars (8x40 or, preferably, 10x50). Follow the two stars back from M31 and continue in the same direction sweeping slowly as you go. It looks like a piece of tissue paper stuck on the sky just a bit brighter than the sky background. Good Hunting!



Chart to find the Andromeda Galaxy - and perhaps M33 in Triangulum



**2 December 2021.** Look for Jupiter, Saturn, and Venus lined up in the southwestern sky after sunset. The three planets remain visible here all month.

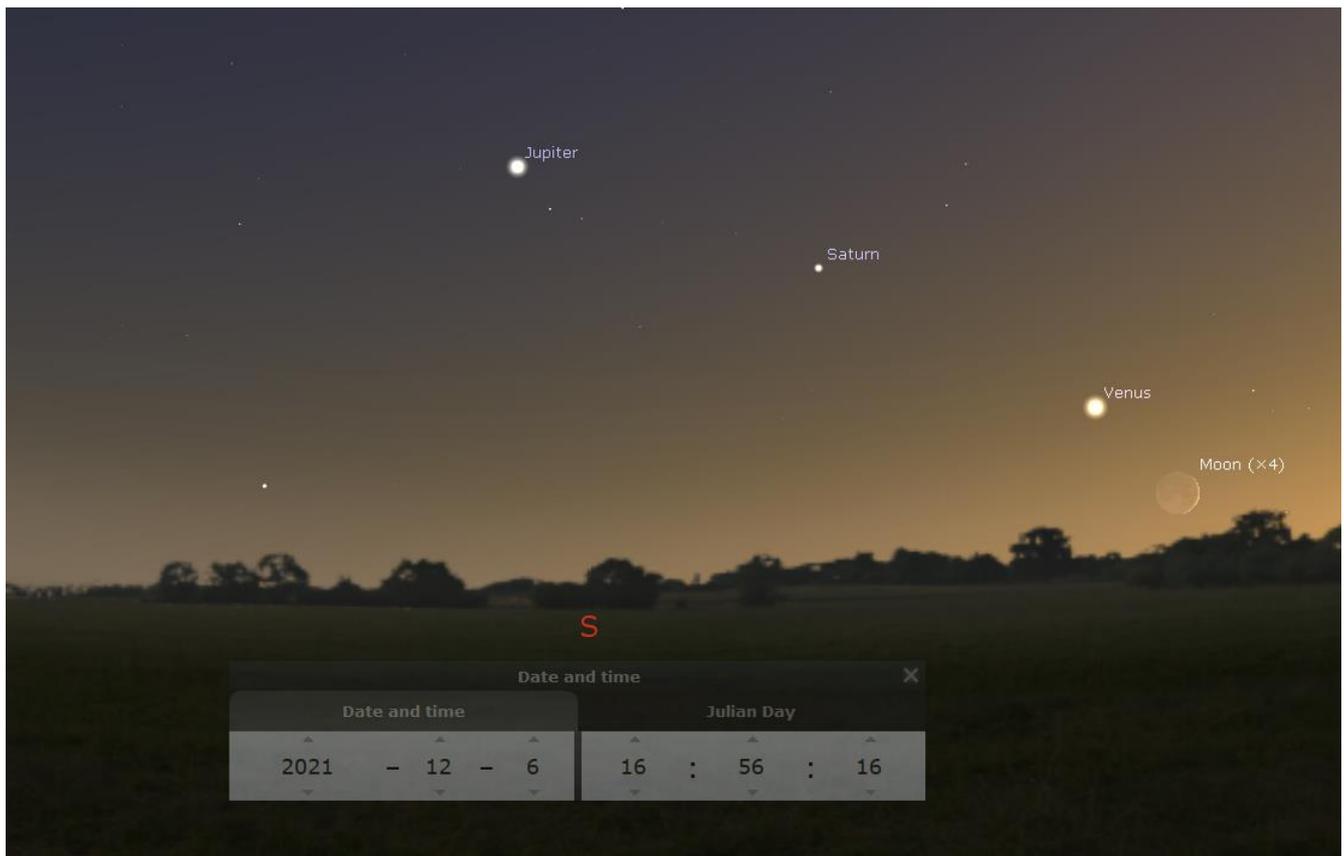
**3 Dec.** Venus reaches its greatest illuminated extent, that is, its greatest apparent size in the sky. It's only 26% illuminated by its crescent spans about 41". The planet shines at a dazzling magnitude -4.7, about as bright as it ever gets in the southwestern sky in the constellation Sagittarius after the Sun goes down.

**4 Dec.** New Moon, 07:43UT

**4 Dec.** If you happen to find yourself in Antarctica today, a total solar eclipse passes across a narrow band from Berkner Island to Shepard Island.

**6-8 Dec.** Look for the waxing crescent Moon passing Venus, Saturn, then Jupiter on these nights in the southwestern sky after sunset. On the night of the 6th, the Moon is just two degrees from Venus.

**11 Dec.** First Quarter Moon, 01:36UT



**Jupiter, Saturn, Venus and the crescent Moon looking southwest after sunset on Dec. 6, 2021.**

**14 Dec.** The usually reliable Geminid meteor shower peaks in the late hours of December 13 and into the early morning of the 14th. The waxing gibbous Moon obscures the faintest meteors this year, at least until it sets at about 3:30 a.m. So pre-dawn meteor watching is your best bet. Geminids can appear anywhere in the sky and trace their path back to a point near the star Castor in the constellation Gemini. Also, try looking after dark on the 13th for a few brighter Geminids that may enter the atmosphere at a shallow angle and burn slowly across the sky. The meteor shower happens on this date each year as the Earth passes through a stream of debris from the asteroid 3200 Phaethon, an Apollo asteroid discovered in 1983.

**16 Dec.** The brilliant gibbous Moon lies between the Hyades and Pleiades star clusters in the constellation Taurus.

**19 Dec.** Full Moon, 04:35UT

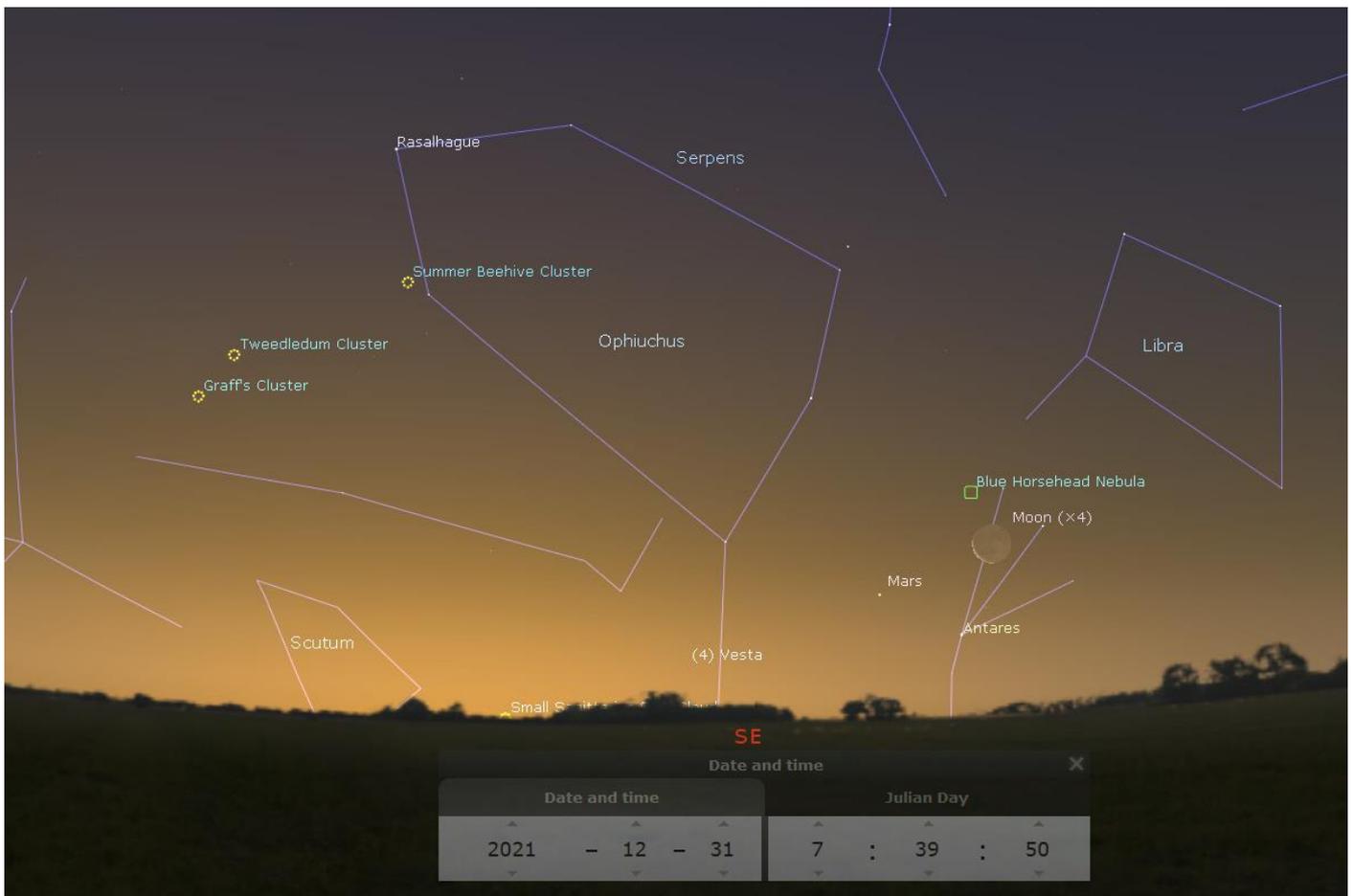
**21 Dec.** The December solstice arrives at 15:59 UT. This marks the beginning of winter in the northern hemisphere and summer in the south. **27 Dec.** Last Quarter Moon, 02:24UT

**28-29 Dec** The year ends with a conjunction of the two inner planets Mercury and Venus very low in the southwestern sky after sunset. These two hot and rocky worlds fit nicely in a binocular field of view, but you will need a clear view of the southwestern horizon (and likely a pair of binoculars) to spot them. Jupiter and Saturn, both well past opposition, lie to the upper left. Mercury shines at magnitude -0.7 just four degrees south of Venus which shines about thirty times brighter at

**Mercury and Venus over the southwestern horizon after sunset on Dec. 28, 2021.**



magnitude -4.4. Over the coming days, Mercury moves a little higher as Venus drops quickly towards the Sun on its way to inferior conjunction early next month. For most of 2022, it will appear as the “Morning Star”.



**Mars, Antares, and the crescent Moon in the south eastern sky on the morning of Dec. 31, 2021.**

**31 Dec.** In the early morning twilight, look to the south-eastern sky to see Mars, a slender waning crescent Moon, and the star Antares rise before the Sun. The Moon lies in between Mars and Antares, which are about five degrees apart. A view of the south eastern horizon and a pair of binoculars is all but essential to spot this conjunction. Note the similarity in colour between planet and star. The name Antares is a nod to Mars, a planet which the ancient Greeks called Ares. Ant-Ares means “opposed” or “against” Mars. Presumably, this served as a reminder that the star, despite its resemblance, is “not Mars”. Mars shines about half as bright as the star during this conjunction.

**Sources:**

- Cosmicpursuits.com
- Jodrell Bank Centre for Astrophysics
- Sky at Night Magazine

Stellarium Planetarium Software