

# Astronomy News

## Night Sky 2021 - December

Sunrise	Sunset	Mercury Sets	Venus Sets
1 <sup>st</sup> – 7:52am 10 <sup>th</sup> – 8:03am 20 <sup>th</sup> – 8:12am 30 <sup>th</sup> – 8:15am	1 <sup>st</sup> – 4:07pm 10 <sup>th</sup> – 4:04pm 20 <sup>th</sup> – 4:06pm 30 <sup>th</sup> – 4:13pm	23 <sup>rd</sup> – 4:50pm 27 <sup>th</sup> – 5:08pm 30 <sup>th</sup> – 5:22pm	1 <sup>st</sup> – 6:40pm 10 <sup>th</sup> – 6:34pm 20 <sup>th</sup> – 6:13pm 30 <sup>th</sup> – 5:33pm
Moon Rise	Moon Set	Moon Rise	Moon Set
1 <sup>st</sup> – 3:42am 2 <sup>nd</sup> – 5:09am (ESE) 3 <sup>rd</sup> – 6:40am 4 <sup>th</sup> – 8:12am 5 <sup>th</sup> – 9:37am 6 <sup>th</sup> – 10:46am (SE) 7 <sup>th</sup> – 11:37am 8 <sup>th</sup> – 12:12pm 9 <sup>th</sup> – 12:37pm 10 <sup>th</sup> – 12:56pm (ESE) 11 <sup>th</sup> – 1:12pm 12 <sup>th</sup> – 1:26pm (E) 13 <sup>th</sup> – 1:39pm 14 <sup>th</sup> – 1:53pm 15 <sup>th</sup> – 2:09pm (ENE) 16 <sup>th</sup> – 2:27pm 17 <sup>th</sup> – 2:51pm 18 <sup>th</sup> – 3:22pm 19 <sup>th</sup> – 4:02pm (NE)	1 <sup>st</sup> – 2:41pm 2 <sup>nd</sup> – 3:01pm (WSW) 3 <sup>rd</sup> – 3:28pm 4 <sup>th</sup> – 4:04pm 5 <sup>th</sup> – 4:56pm (SW) 6 <sup>th</sup> – 6:04pm 7 <sup>th</sup> – 7:23pm 8 <sup>th</sup> – 8:47pm 9 <sup>th</sup> – 10:10pm (WSW) 10 <sup>th</sup> – 11:28pm 12 <sup>th</sup> – 12:42am 13 <sup>th</sup> – 1:53am (W) 14 <sup>th</sup> – 3:03am 15 <sup>th</sup> – 4:13am (WNW) 16 <sup>th</sup> – 5:23am 17 <sup>th</sup> – 6:33am 18 <sup>th</sup> – 7:41am 19 <sup>th</sup> – 8:43am 20 <sup>th</sup> – 9:37am (NW)	20 <sup>th</sup> – 4:53pm 21 <sup>st</sup> – 5:54pm 22 <sup>nd</sup> – 7:02pm 23 <sup>rd</sup> – 8:14pm 24 <sup>th</sup> – 9:28pm (ENE) 25 <sup>th</sup> – 10:43pm 26 <sup>th</sup> – 11:59pm (E) 28 <sup>th</sup> – 1:18am 29 <sup>th</sup> – 2:40am 30 <sup>th</sup> – 4:06am (ENE) 31 <sup>st</sup> – 5:35am ----- All times in notes are set for <b>Somerton</b> unless stated	21 <sup>st</sup> – 10:21am 22 <sup>nd</sup> – 10:55am 23 <sup>rd</sup> – 11:21am 24 <sup>th</sup> – 11:41am (WNW) 25 <sup>th</sup> – 11:59am 26 <sup>th</sup> – 12:14pm 27 <sup>th</sup> – 12:29pm (W) 28 <sup>th</sup> – 12:44pm 29 <sup>th</sup> – 1:02pm (WSW) 30 <sup>th</sup> – 1:24pm 31 <sup>st</sup> – 1:54pm ----- <b>Moon Phases</b> New Moon – 4 <sup>th</sup> First Quarter – 11 <sup>th</sup> Full Moon – 19 <sup>th</sup> Last Quarter – 27 <sup>th</sup>
A useful site: <a href="http://www.heavens-above.com">www.heavens-above.com</a>	A S Zielonka		

At 6:00am on the 1<sup>st</sup> the star Spica (1 mag) in Virgo is  $5\frac{1}{2}$  degrees to the right of the crescent Moon in the south east.

Mercury is at aphelion (when its most distant from the Sun during its orbit) on the 2<sup>nd</sup>.

On the 2<sup>nd</sup> at 7:00am the star Zubenelgenubi (2.7 mag) in Libra is  $2\frac{3}{4}$  degrees to the lower left of the thin crescent Moon. Mars is 5 degrees above the horizon at 127 degrees azimuth and 10 degrees to the lower left of the Moon.

There is a scheduled launch around Dec 3<sup>rd</sup> 11:04pm – Dec 4<sup>th</sup>\* 1:04am of a United Launch Alliance Atlas V 551 rocket from Cape Canaveral in Florida. Laser Communications Relay Demonstration (LCRD) will fly as a payload on STPSat-6, the primary spacecraft of the third Space Test Program (STP-3) mission for the Department of Defense.

At 7:10am on the 3<sup>rd</sup> a very thin crescent Moon is  $2\frac{3}{4}$  degrees above the horizon at 127 degrees azimuth. Mars is  $4\frac{1}{2}$  degrees to the upper right of the Moon at 130 degrees azimuth.

A Total Eclipse of the Sun occurs on the 4<sup>th</sup> across Antarctica. Partial phase will be seen from S. Africa and SE. Australia. Greatest Eclipse occurs at 7:33:22.5am

The Moon is at perigee (356,794km) on the 4<sup>th</sup> at 10:05am.

On the 6<sup>th</sup> at 5:30pm a very thin crescent Moon will be  $2\frac{1}{2}$  degrees above the horizon at 219 degrees azimuth. Venus is 6 degrees to the upper left of the Moon.

At 6:00pm on the 7<sup>th</sup> the thin crescent Moon is  $7\frac{1}{2}$  degrees above the south west horizon. Venus is 9 degrees to the right of the Moon and 3 degrees below. Saturn is  $7\frac{1}{2}$  degrees above the Moon and 2 degrees to the left. Jupiter is 17 degrees to the upper left of Saturn.

On the 8<sup>th</sup> at 6:00pm Saturn is  $9\frac{1}{4}$  degrees to the right of the crescent Moon. Jupiter is 9 degrees above the Moon and  $4\frac{1}{2}$  degrees to the left.

There is a planned launch on the 9<sup>th</sup>\* of the Imaging X-Ray Polarimetry Explorer (IXPE) from Kennedy Space Centre. This x-ray astronomy satellite will study active

galactic nuclei, microquasars, pulsars and pulsar wind nebulae, magnetars, accreting X-ray binaries, supernova remnants and the galactic centre.

At 6:00pm on the 9<sup>th</sup> Jupiter is  $6\frac{1}{2}$  degrees to the right of the crescent Moon and 2 degrees above.

On the 10<sup>th</sup> at 8:05pm Neptune is  $6\frac{1}{2}$  degrees above the crescent Moon.

At 6:55pm on the 11<sup>th</sup> Neptune is  $8\frac{3}{4}$  degrees to the right of the first quarter Moon.

On the 13<sup>th</sup> at 6:00pm the star Nu Piscium (4.4 mag) is  $2\frac{1}{2}$  degrees to the left of the Moon and  $\frac{3}{4}$  of a degree below.

The Geminids meteor shower reaches its peak on the 13<sup>th</sup> /14<sup>th</sup>. They can be seen from the 3<sup>rd</sup> – 16<sup>th</sup>. It's considered to be the best shower in the heavens. It is produced by debris left behind by an asteroid known as 3200 Phaethon, which was discovered in 1982.

At midnight on the 14<sup>th</sup> Uranus is  $4\frac{1}{2}$  degrees above the Moon and 1 degree to the left.

Northern winter skies feature a six-sided asterism known as the Winter Hexagon with Betelgeuse (in Orion) near its centre. From the middle of the month around 9:30pm the six stars that form the hexagon (in a clockwise direction, starting from above Betelgeuse) are Capella, Aldebaran, Rigel, Sirius, Procyon and Pollux.

From the 15<sup>th</sup> – 24<sup>th</sup> Mars passes through the constellation of Scorpius. On the 19<sup>th</sup> at 7:00am the star Acrab (2.5 mag) is  $1\frac{1}{2}$  degrees above Mars with the star Omega Scorpii (4.3 mag) less than a  $\frac{1}{4}$  of a degree above right of the planet.

On the 15<sup>th</sup> at 8:00pm Uranus is  $6\frac{1}{4}$  degrees to the right of the Moon and 2 degrees above.

At 8:00pm on the 16<sup>th</sup> the Pleiades star cluster is 5 degrees to the upper left of the Moon.

On the 17<sup>th</sup> at 9:00pm the star Tau Tauri (4.2 mag) is less than ½ a degree above left of the Moon.

There is a long awaited launch on the 18<sup>th</sup>\* of the James Webb Space Telescope (JWST) from Kourou, French Guiana. It will find the first Galaxies that formed in the early universe and peer through dusty clouds to see stars forming planetary systems. (See below for details)

The Moon is at Apogee (406,320km) on the 18<sup>th</sup> at 2:16am. At 8:15pm the Moon lies approximately midway between the stars Elnath (1.6 mag) and Zeta Tauri (2.9 mag).

At 6:30pm on the 19<sup>th</sup> the star Mu Geminorum (2.8 mag) is 3 degrees lower right of the Moon. At 11:30pm Mebsuta (3 mag) is 3 degrees to the lower left of the Moon.

On the 20<sup>th</sup> at 11:40pm the stars Pollux (1.1 mag) and Upsilon Geminorum (4 mag) point the way to the Moon.

The December solstice occurs on the 21<sup>st</sup> at 3:50pm. 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 marks the first day of winter in the northern hemisphere and the first day of summer in the southern hemisphere.

At midnight on the 21<sup>st</sup> the Beehive Star cluster is 6 degrees below the Moon and 2 degrees to the left.

On the 22<sup>nd</sup> at 9:00pm the stars Epsilon Leonis (2.9 mag) and Lambda Leonis (4.3 mag) point the way to the Moon low in the ENE.

The Ursids meteor shower reaches its peak on the 22<sup>nd</sup> – 23<sup>rd</sup>. They can be seen from the 17<sup>th</sup> – 26<sup>th</sup>.

At midnight on the 23<sup>rd</sup> the star Eta Leonis (3.4 mag) is 1½ degrees to the lower left of the Moon.

An occultation of Eta Leonis (3.5 mag) starts at 4:18:20am on the 24<sup>th</sup>. It reappears at 5:10:12am. (These times are set for Yeovilton. For times in other areas of the UK or Europe please visit [www.lunar-occultations.com](http://www.lunar-occultations.com))

On the night of the 25<sup>th</sup> at 12:30am the star Nu Virginis (4 mag) is 2 degrees to the lower left of the Moon... Then at 5:30am Nu Virginis is less than ½ a degree above the Moon.

At 6:30am on the 27<sup>th</sup> the star Porrima (2.7 mag) in Virgo is 2¼ degrees to the lower left of the Moon.

Venus is 8 degrees above the south west horizon on the 27<sup>th</sup> at 4:45pm. Venus is at 225.5 degrees azimuth with Mercury 3 degrees above the horizon and directly below it.

On the 28<sup>th</sup> at 7:00am the star Spica (1 mag) in Virgo is 5 degrees below the crescent Moon.

There is a close conjunction between Venus and Mercury on the 29<sup>th</sup>. At 4:45pm Mercury is just 4¼ degrees to the lower left of Venus.

At 6:00am on the 29<sup>th</sup> the star Kappa Virginis (4.1 mag) is 2 degrees above the crescent Moon.

On the 30<sup>th</sup> at 6:00am the star Zubenelgenubi (2.7 mag) in Libra is 5 degrees to the upper right of the crescent Moon.

At 6:00am on the 31<sup>st</sup> the crescent Moon is 2 degrees above the south east horizon at 130 degrees azimuth. The star Acrab (2.5 mag) is 2¾ degrees above the crescent Moon with the two stars named Omega Scorpii (3.9 and 4.3 mag) midway between them. At around 7:00am Mars will be 7 degrees to the lower left of the Moon.

Venus is 6 degrees above the south west horizon on the 31<sup>st</sup> at 4:45pm. Venus is at 230.5 degrees azimuth with Mercury 6½ degrees to the left of Venus and just ¾ of a degree below.

An occultation of the planet Mars by the Moon occurs on the 31<sup>st</sup>. This will only be seen from south west Australia.

\* = Dates and times are subject to change

James Webb Space Telescope (JWST): The telescope was assembled at NASA's Goddard Space Flight Centre in Greenbelt, Maryland, starting in 2013. In 2017, it was shipped to NASA's Johnson Space Centre in Houston for cryogenic testing at the historic "Chamber A" test facility, famous for its use during the Apollo missions. In 2018, JWST was shipped to Space Park in California, where for three years it underwent rigorous testing to ensure its readiness for operations in the environment of space.

Late in the evening of Friday 14<sup>th</sup> September 2021 the JWST travelled with a police escort 26 miles through the streets of Los Angeles, from Northrop Grumman's facility in Redondo Beach to Naval Weapons Station Seal Beach. There, it was loaded onto the MN Colibri, a French-flagged cargo ship that has previously transported satellites and spaceflight hardware to Kourou. The MN Colibri departed Seal Beach Sunday 26<sup>th</sup> September and entered the Panama Canal Tuesday 5<sup>th</sup> October. The sixteen day ocean journey across the Atlantic represented the final leg of JWST's long, earthbound travels over the years. (For more information about the JWST mission, please visit: <https://www.nasa.gov/webb>.)

Facts: Big Bear Solar Observatory is set on a lake in the mountains of southern California and is the largest solar observatory in the world.