

# Astronomy News

## Night Sky 2021 - November

Sunrise	Sunset	Mercury Rises	Venus Sets
1 <sup>st</sup> – 7:04am	1 <sup>st</sup> – 4:45pm	1 <sup>st</sup> – 5:28am	1 <sup>st</sup> – 6:31pm
10 <sup>th</sup> – 7:19am	10 <sup>th</sup> – 4:30pm	5 <sup>th</sup> - 5:48am	10 <sup>th</sup> – 6:33pm
20 <sup>th</sup> – 7:36am	20 <sup>th</sup> – 4:17pm	10 <sup>th</sup> – 6:15am	20 <sup>th</sup> – 6:38pm
30 <sup>th</sup> – 7:51am	30 <sup>th</sup> – 4:08pm	15 <sup>th</sup> – 6:43am	30 <sup>th</sup> – 6:40pm
Moon Rise	Moon Set	Moon Rise	Moon Set
1 <sup>st</sup> – 2:05am	1 <sup>st</sup> - 3:48pm	20 <sup>th</sup> – 4:48pm	21 <sup>st</sup> – 9:50am
2 <sup>nd</sup> – 3:26am (E)	2 <sup>nd</sup> – 4:04pm (W)	21 <sup>st</sup> – 5:21pm	22 <sup>nd</sup> – 10:50am
3 <sup>rd</sup> – 4:50am	3 <sup>rd</sup> - 4:20pm	22 <sup>nd</sup> – 6:05pm	(NW)
4 <sup>th</sup> – 6:17am	4 <sup>th</sup> – 4:39pm	(NE)	23 <sup>rd</sup> – 11:40am
5 <sup>th</sup> – 7:47am (ESE)	(WSW)	23 <sup>rd</sup> – 6:59pm	24 <sup>th</sup> – 12:20pm
6 <sup>th</sup> – 9:19am	5 <sup>th</sup> – 5:03pm	24 <sup>th</sup> – 8:02pm	25 <sup>th</sup> – 12:52pm
7 <sup>th</sup> – 10:46am	6 <sup>th</sup> – 5:34pm	25 <sup>th</sup> – 9:12pm	26 <sup>th</sup> – 1:16pm
8 <sup>th</sup> – 12:02pm	7 <sup>th</sup> – 6:17pm	26 <sup>th</sup> – 10:26pm	27 <sup>th</sup> – 1:36pm
9 <sup>th</sup> – 12:59pm (SE)	8 <sup>th</sup> – 7:15pm	27 <sup>th</sup> – 11:42pm	(WNW)
10 <sup>th</sup> – 1:41pm	9 <sup>th</sup> – 8:27pm (SW)	(ENE)	28 <sup>th</sup> – 1:53pm
11 <sup>th</sup> – 2:10pm	10 <sup>th</sup> – 9:46pm	29 <sup>th</sup> – 12:59am	29 <sup>th</sup> – 2:08pm (W)
12 <sup>th</sup> – 2:32pm	11 <sup>th</sup> – 11:07pm	30 <sup>th</sup> – 2:19am (E)	30 <sup>th</sup> – 2:24pm
(ESE)	13 <sup>th</sup> – 12:25am	-----	-----
13 <sup>th</sup> – 2:49pm	(WSW)	All times	<b>Moon Phases</b>
14 <sup>th</sup> – 3:04pm	14 <sup>th</sup> – 1:40am	in notes are set	New Moon – 4 <sup>th</sup>
15 <sup>th</sup> – 3:17pm (E)	15 <sup>th</sup> – 2:52am(W)	for	First Quarter –
16 <sup>th</sup> - 3:31pm	16 <sup>th</sup> – 4:03am	<b>Somerton</b>	11 <sup>th</sup>
17 <sup>th</sup> – 3:45pm	17 <sup>th</sup> – 5:13am	unless stated	Full Moon – 19 <sup>th</sup>
(ENE)	18 <sup>th</sup> – 6:23am		Last Quarter –
18 <sup>th</sup> – 4:02pm	(WNW)		27 <sup>th</sup>
19 <sup>th</sup> – 4:22pm	19 <sup>th</sup> – 7:34am		
	20 <sup>th</sup> – 8:43am		
A useful site: <a href="http://www.heavens-above.com">www.heavens-above.com</a>	A S Zielonka		

There is a planned launch in November of the Orion spacecraft, Space Launch System (SLS) rocket from Cape Canaveral, Florida. The Artemis 1 mission will be the first integrated test of NASA's deep space exploration systems. This is the first in a series of increasingly complex missions. Artemis 1 will be an uncrewed flight test that will provide a foundation for human deep space exploration, and demonstrate our commitment and capability to extend human existence to the Moon and beyond. During this flight, the spacecraft will travel 280,000 miles from Earth, thousands of miles beyond the Moon over the course of about a three-week mission. Orion will stay in space longer than any ship for astronauts has done without docking to a space station and return home faster and hotter than ever before.

There is a planned landing of NASA's SpaceX Crew-2 mission from early to mid-November. NASA astronauts Shane Kimbrough and Megan McArthur, along with Japan Aerospace Exploration Agency (JAXA) astronaut Akihiko Hoshide, and European Space Agency (ESA) astronaut Thomas Pesquet return to Earth after about six months aboard the International Space Station.

During the the first three weeks of the month the asteroid Ceres will pass through the Hyades star cluster. From the 30<sup>th</sup> Nov – 4<sup>th</sup> Dec it passes very close to the bright star Aldebaran. On the 2<sup>nd</sup> at 9:00pm Ceres will be less than quarter of a degree below right from Aldebaran. (Please see the “Asteroid “ section in the website above for more details)

During this month Venus is passing through the constellation of Sagittarius. On the 19<sup>th</sup> at 5:30pm the star Nunki (2 mag) is less than half a degree to the upper right of Venus.

At 6:00am on the 1<sup>st</sup> the star Sigma Leonis (4 mag) is 3½ degrees to the right of the Moon.

From the 1<sup>st</sup> - 4<sup>th</sup> Mercury passes close to the star Porrima (2.7 mag) in Virgo. On the 2<sup>nd</sup> at 6:15am Mercury is 6 degrees above the horizon at 110 degrees azimuth with Porrima 4 degrees to the lower right at 4½ degrees above the horizon at 113.5 degrees azimuth.

On the 2<sup>nd</sup> at 6:00am the star Zaniah (3.8 mag) in Virgo is 2½ degrees to the lower right of the thin crescent Moon.

At 6:00am on the 3<sup>rd</sup> the star Theta Virginis (4.3 mag) is  $1\frac{3}{4}$  degrees to the right of a very thin crescent Moon. Mercury is 6 degrees below the Moon and  $2\frac{1}{2}$  degrees to the left. Mercury is 3 degrees above the horizon with the star Spica (1 mag)  $4\frac{1}{2}$  degrees to the right of Mercury and half a degree below.

Uranus is at opposition on the 4<sup>th</sup>. Uranus will be about as bright and easy to see for a month or so centred on this date. On the 4<sup>th</sup> at 9:00pm in the south east Uranus is 5 degrees above the star Mu Ceti (4.2 mag) and 2 degrees to the left.

On the 4<sup>th</sup> at 6:30am Mercury is 7 degrees above the horizon at 113 degrees azimuth. Mars is 6 degrees to the lower left of Mercury at 1 degree above the horizon at 111 degrees azimuth. The New Moon (not that you will see it) is 2 degrees to the left of Mars.

The Moon is at perigee (358,844km) on the 5<sup>th</sup> at 10:18pm.

At 5:00pm on the 6<sup>th</sup> a very thin crescent Moon is due south west (225 degrees azimuth) and just 3 degrees above the horizon in the constellation of Scorpius.

On the 7<sup>th</sup> at 5:15pm the thin crescent Moon is low in the south west and just  $5\frac{1}{4}$  degrees above the horizon. Venus is just 7 degrees to the left of the Moon and 2 degrees above.

Comet Churyumov-Gerasimenko (10.3 mag – 16<sup>th</sup> Oct) closest approach to Earth is from the 8<sup>th</sup> - 14<sup>th</sup> Nov when it will be 0.418AU. Chur-Gera is at perihelion on the 2<sup>nd</sup> when it will be 1.211AU from the Sun. On the 8<sup>th</sup> at 6:00am Chur-Gera is  $1\frac{1}{4}$  degrees to the lower right of the star Pollux (1.1 mag) in Gemini.

At 6:00pm on the 8<sup>th</sup> Venus is  $6\frac{1}{2}$  degrees to the lower right of the crescent Moon in the south west. The star Phi Sagittarii (3.1 mag) is less than half a degree to the upper left of the Moon. An occultation of the star Phi Sagittarii (3.1 mag) occurs today. It disappears behind the Moon at 6:52:03pm just before the Moon sets at 7:15pm. (Please note that the time of the disappearance is set for Yeovilton)

On the 9<sup>th</sup> at 7:00pm the crescent Moon is  $7\frac{1}{4}$  degrees above the horizon at 210 degrees azimuth.

From the 9<sup>th</sup> – 11<sup>th</sup> Mercury passes close to Mars. On the 10<sup>th</sup> at 6:30am Mercury will be 2 degrees above the horizon at 113 degrees azimuth with Mars 1 degree to the lower right at 113.5 degrees azimuth.

At 7:00pm on the 10<sup>th</sup> Saturn is 5 degrees upper right of the crescent Moon.

On the 11<sup>th</sup> at 10:00pm Jupiter is 5 degrees to the upper right of the Moon. The brighter star between them is Delta Capricorni (2.8 mag).

The Taurids meteor shower reaches its peak on the 12<sup>th</sup> though they can be seen between the 20<sup>th</sup> Oct – 10<sup>th</sup> Dec.

At 10:00pm on the 12<sup>th</sup> Jupiter is 14½ degrees to the lower right of the Moon. The star Tau Aquarii (4 mag) is just 1½ degrees upper left of the Moon.

From the 12<sup>th</sup> – 16<sup>th</sup> Jupiter passes within 1½ degrees of the star Delta Capricorni (2.8 mag). Each evening at around 7:30pm Jupiter is to the upper right of Delta Capricorni.

On the 13<sup>th</sup> at 10:00pm Neptune is 3¾ degrees above the Moon and 2½ degrees to the right.

At 10:00pm on the 14<sup>th</sup> the star Iota Ceti (3.5 mag) is 5 degrees below the Moon and 1¼ degrees to the left.

On the 16<sup>th</sup> at 10:00pm the star Omicron Piscium (4.2 mag) is 2 degrees above the Moon and half a degree to the right.

At 9:45pm on the 17<sup>th</sup> Uranus is 5¼ degrees above the star Mu Ceti (4.2 mag) in Cetus with the near full Moon just 3¼ degrees to the lower right. At 4:00am the following morning the Moon is between Uranus and Mu Ceti. Uranus is then 1¾ degrees to the upper right of the Moon.

The Leonids meteor shower reaches its peak on the 17<sup>th</sup>/18<sup>th</sup> of this month, though they can be seen between the 5<sup>th</sup> – 29<sup>th</sup>.

On the 18<sup>th</sup> at 10:00pm the Pleiades is 10 degrees to the upper left of the Moon. Uranus is 10 degrees to the right of the Moon and 2½ degrees above.

There is a Partial Lunar Eclipse on the 19<sup>th</sup>. The penumbral phase starts at 6:02:09am. The umbral phase (Which is clearly visible with the naked eye) starts at 7:18:41am low in the WNW. The Moon sets at 7:34am so there is a very short window on viewing this eclipse. The greatest eclipse occurs at 9:04:06am

At 10:00pm on the 19<sup>th</sup> the Moon is midway between Pleiades and Hyades star clusters.

The Parker Solar Probe that was launched in 2018 to study the Sun is at Perihelion on the 21<sup>st</sup> November. Its closest approach to the Sun on August 9<sup>th</sup> was 6.5 million miles (10.4 million km) from its surface. October 16<sup>th</sup> perihelion brought it even closer to the Sun, as will this months.

The Moon is at Apogee (406,279km) on the 21<sup>st</sup> at 2:13am. In the evening at 10:00pm the star Zeta Tauri (2.9 mag) is 5 degrees to the right of the Moon and 1 degree below.

On the 22<sup>nd</sup> at 10:00pm the star Mebsuta (3 mag) in Gemini is just 1 degree to the lower right of the Moon.

At 12:30am on the night of the 23<sup>rd</sup> the star Kappa Geminorum (3.5 mag) is just 1 degree below the Moon.

On the 24<sup>th</sup> there is a Double Asteroid Redirection Test (DART). It's NASA's first flight demonstration for planetary defense, that seeks to test and validate a method to protect Earth in case of an asteroid impact threat. The mission aims to shift an asteroid's orbit through kinetic impact – specifically, by impacting a spacecraft into the smaller member of the binary asteroid system Didymos to change its orbital speed.

On the 24<sup>th</sup> at 11:00pm the Beehive star cluster is 4 degrees below the Moon and 1 degree to the right.

At 12:30am on the night of the 25<sup>th</sup> the star Epsilon Leonis (2.9 mag) is 6 degrees to the left of the Moon.

The Solar Orbiter receives a gravity assist manoeuvre from Earth on the 26<sup>th</sup>.

On the 26<sup>th</sup> at midnight the star Eta Leonis (3.4 mag) is 2 degrees above right of the Moon.

At 12:30am on the night of the 27<sup>th</sup> the star Chertan (3.3 mag) in Leo is 4½ degrees to the left of the Moon and 2 degrees above... and at 6:45am on the 28<sup>th</sup> Chertan is 5½ degrees above the Moon. The star Iota Leonis (4 mag) is 2½ degrees to the left of the crescent Moon and ¾ of a degree above.

Mercury is at superior conjunction on the 29<sup>th</sup>.

On the 29<sup>th</sup> at 6:00am the star Zavijava (3.5 mag) in Virgo is 3½ degrees to the right of the crescent Moon and 1½ degrees below.

At 6:00am on the 30<sup>th</sup> the star Porrima (2.7 mag) in Virgo is 2¾ degrees upper right of the crescent Moon.

\* = Dates and times are subject to change.

News: Analysis of the Lunar material delivered to Earth by China's Chang'e 5 mission last year confirms that the samples are the youngest collected to date. Their composition was surprising. A team of scientists led by Xiaochao Che (Chinese Academy of Geological Sciences) analyzed the lead content in two basalt fragments of around 3 to 4 millimetres in size, publishing the results in the October 8<sup>th</sup> "Science". They determined the fragments' to be around 1.96 billion years old, making them almost a billion years younger than material returned by the Apollo and Soviet-era Luna missions as well as what's found in lunar meteorites.

Facts: The previous record of a probe passing close to the Sun was set by Helios 2 in April 1976 when it was 26.55 million miles (42.73 million km) from its surface.