

# Astronomy News

## Night Sky 2022 - October

Sunrise	Sunset	Mercury Rises	Venus Rises
1 <sup>st</sup> – 7:11am 10 <sup>th</sup> – 7:26am 20 <sup>th</sup> – 7:43am 30 <sup>th</sup> – 7:00am	1 <sup>st</sup> – 6:49pm 10 <sup>th</sup> – 6:29pm 20 <sup>th</sup> – 6:08pm 30 <sup>th</sup> – 4:49pm	1 <sup>st</sup> – 5:58am 10 <sup>th</sup> – 5:44am 20 <sup>th</sup> – 6:27am 30 <sup>th</sup> – 6:25am	1 <sup>st</sup> – 6:39am 2 <sup>nd</sup> – 6:42am 3 <sup>rd</sup> – 6:45am 4 <sup>th</sup> – 6:48am
Moon Rise	Moon Set	Moon Rise	Moon Set
1 <sup>st</sup> – 2:12pm (SE) 2 <sup>nd</sup> – 3:25pm (SE) 3 <sup>rd</sup> – 4:22pm (SE) 4 <sup>th</sup> – 5:03pm 5 <sup>th</sup> – 5:33pm 6 <sup>th</sup> – 5:54pm (ESE) 7 <sup>th</sup> – 6:11pm 8 <sup>th</sup> – 6:26pm (E) 9 <sup>th</sup> – 6:39pm 10 <sup>th</sup> – 6:53pm 11 <sup>th</sup> – 7:09pm (ENE) 12 <sup>th</sup> – 7:27pm 13 <sup>th</sup> – 7:51pm 14 <sup>th</sup> – 8:22pm 15 <sup>th</sup> – 9:04pm (NE) 16 <sup>th</sup> – 9:56pm (NE) 17 <sup>th</sup> – 10:58pm 19 <sup>th</sup> – 12:07am 20 <sup>th</sup> – 1:20am	1 <sup>st</sup> – 9:25pm (SW) 2 <sup>nd</sup> – 10:20pm (SW) 3 <sup>rd</sup> – 11:31pm (SW) 5 <sup>th</sup> – 12:54am 6 <sup>th</sup> – 2:22am 7 <sup>th</sup> – 3:48am (WSW) 8 <sup>th</sup> – 5:12am 9 <sup>th</sup> – 6:34am (W) 10 <sup>th</sup> – 7:54am 11 <sup>th</sup> – 9:13am (WNW) 12 <sup>th</sup> – 10:31am 13 <sup>th</sup> – 11:47am 14 <sup>th</sup> – 1:00pm 15 <sup>th</sup> – 2:04pm (NW) 16 <sup>th</sup> – 2:58pm (NW) 17 <sup>th</sup> – 3:40pm (NW) 18 <sup>th</sup> – 4:11pm 19 <sup>th</sup> – 4:35pm 20 <sup>th</sup> – 4:53pm (WNW)	21 <sup>st</sup> – 2:33am (ENE) 22 <sup>nd</sup> – 3:48am 23 <sup>rd</sup> – 5:03am (E) 24 <sup>th</sup> – 6:20am 25 <sup>th</sup> – 7:40am 26 <sup>th</sup> – 9:05am (ESE) 27 <sup>th</sup> – 10:32am 28 <sup>th</sup> – 11:58am 29 <sup>th</sup> – 1:17am (SE) 30 <sup>th</sup> – 1:20am (SE) 31 <sup>st</sup> – 2:06am ----- All times in notes are set for Somerton unless stated	21 <sup>st</sup> – 5:09pm 22 <sup>nd</sup> – 5:22pm 23 <sup>rd</sup> – 5:35pm (W) 24 <sup>th</sup> – 5:48pm 25 <sup>th</sup> – 6:03pm (WSW) 26 <sup>th</sup> – 6:22pm 27 <sup>th</sup> – 6:47pm 28 <sup>th</sup> – 7:22pm (SW) 29 <sup>th</sup> – 8:13pm (SW) 30 <sup>th</sup> – 8:21pm (SW) 31 <sup>st</sup> – 9:41pm ----- Moon Phases First Quarter – 3 <sup>rd</sup> Full Moon – 9 <sup>th</sup> Last Quarter – 17 <sup>th</sup> New Moon – 25 <sup>th</sup>
A useful site: <a href="http://www.heavens-above.com">www.heavens-above.com</a>	A S Zielonka		

The first flight of the Quesst quiet supersonic aircraft will take place out of Lockheed flight facilities in Palmdale, California during late 2022. The Quesst mission has two goals: 1) design and build NASA's X-59 research aircraft with technology that reduces the loudness of a sonic boom to a gentle thump to people on the ground; and 2) fly the X-59 over select U.S. communities to gather data on human responses to the sound generated during supersonic flight and deliver that data set to U.S. and international regulators.

On the 1<sup>st</sup> at 8:00pm the star Theta Ophiuchi (3.2 mag) is just 2½ degrees to the upper right of the crescent Moon. Also, two other stars the same distance from the Moon are 84405 (4.3 mag) to the right of the Moon, and 85423 (4.2 mag) lower left of the Moon. (All numbered stars are from the Hipparcos catalogue).

At 7:45pm on the 2<sup>nd</sup> the star Kaus Media (2.7 mag) in Sagittarius is 2½ degrees to the lower right of the crescent Moon.

On the 3<sup>rd</sup>\* NASA's SpaceX Crew-5 mission will lift off from Launch Complex 39A at NASA's Kennedy Space Centre in Florida. Crew-5 astronauts Nicole Mann and Josh Cassada, JAXA's (Japan Aerospace

Exploration Agency) Koichi Wakata, and Roscosmos cosmonaut Anna Kikina will travel to the space station for a six-month science mission aboard the microgravity laboratory. (See “News Extra” below for details)

The Moon is at perigee (369,325km) on the 4th at 5:34pm. At 11:00pm the star Psi Capricorni (4.1 mag) is  $1\frac{1}{4}$  degrees to the left of the Moon and  $\frac{1}{2}$  a degree below.

At 11:00pm on the 5th Saturn is 5 degrees upper right of the Moon. The star Iota Capricorni is just  $1\frac{1}{4}$  degrees below right of the planet Saturn. Saturn and the Moon also point the way to the asteroid Vesta (7 mag). Vesta is  $3\frac{1}{4}$  degrees lower left of the Moon and will be visible with binoculars. (For further information on this asteroid or others please see the “Asteroid” section in the website above.

Mercury is at perihelion on the 6th.

From the 6th – 10th Mercury passes close to the star Zavijava (3.5 mag) in Virgo low in the east. On the 7th at 6:15am Mercury is 5 degrees above the horizon at 92 degrees azimuth with Zavijava 1 degree below. On the 8th at the same time Zavijava is  $\frac{3}{4}$  of a degree to the lower right of Mercury.

From the 6th – 12th the asteroid Pallas (8.6 mag) passes close to the bright star Sirius (-1.4 mag). On the 9th at 5:00am Pallas will be just above and very close to Sirius.

On the 6th at 11:00pm the star Tau Aquarii (4 mag) is  $3\frac{1}{2}$  degrees above left of the Moon.

Mercury reaches maximum western elongation on the 8th.

At 8:00pm on the 7th the star Psi Aquarii (4.4 mag) is just  $1\frac{1}{2}$  degrees above right of the Moon. Neptune is 6 degrees to the left of the Moon and  $3\frac{1}{4}$  degrees above. At 11:00pm Neptune is 5 degrees above the Moon and 3 degrees to the left.

On the 8th at 9:00pm Jupiter is just 3 degrees above the Moon. Neptune is  $8\frac{1}{2}$  degrees to the right of Jupiter and  $1\frac{1}{2}$  degrees above.

The Draconids meteor shower reaches its peak on the 8th/9th though they can be seen from the 6th – 10th.

At 11:20pm on the 9th the star Epsilon Piscium (4.2 mag) is  $3\frac{1}{4}$  degrees above the Moon.

On the 10th at 8:00pm the star Omicron Piscium (4.2 mag) is  $1\frac{1}{2}$  degrees to the upper right of the Moon.

From the 10th – 30th Mars passes close to the star Gamma Tauri (3.6 mag) in Taurus. On the 17th & 18th Gamma Tauri is just 2 degrees to the lower right of Mars in the east. On the 18th at 11:00pm Mars will be 18 degrees above the eastern horizon at 75 degrees azimuth.

Northrop Grumman’s 18th commercial resupply services mission to the International Space Station will launch mid-October\* from NASA’s Wallops Flight Facility on Wallops Island in Virginia.

At midnight on the 11th Uranus is  $3\frac{3}{4}$  degrees to the left of the Moon and  $\frac{1}{2}$  a degree below... ..then at 5:30am the following morning Uranus is  $1\frac{1}{2}$  degrees above left of the Moon.

On the 12th at 10:00pm the Pleiades star cluster is 5 degrees to the upper left of the Moon. Uranus is  $7\frac{1}{2}$  degrees to the right of the Moon and 3 degrees above.

The Solar Orbiter which was launched on the 10th February 2020 will reach perihelion the middle part of this month. Around the 13th it will be just 0.29AU from the Sun and 1.14AU from Earth.

At 11:00pm on the 13th the star Upsilon Tauri (4.2 mag) is  $\frac{3}{4}$  of a degree to the right of the Moon with a fainter star midway between them.

On the 14<sup>th</sup> at midnight Mars is 3½ degrees below the Moon. The star Elnath (1.6 mag) in Taurus is 2¾ degrees to the upper left of the Moon, while the star Zeta Tauri (2.9 mag) is 2½ degrees below Mars and ½ a degree to the right.

At midnight on the 15<sup>th</sup> the star Mu Geminorum (2.8 mag) is 4 degrees below the Moon and 2 degrees to the right. Mars is 10½ degrees to the upper right of the Moon.

From the 15<sup>th</sup> – 30<sup>th</sup> Saturn stays around ¾ of a degree left of the star Iota Capricorni (4.2 mag).

On the 16<sup>th</sup> at midnight the star Iota Geminorum (3.7 mag) is 3¼ degrees to the left of the Moon and 1 degree below.

The Moon is at apogee (404,328km) on the 17<sup>th</sup> at 11:21am. At midnight on the star Pollux (1.1 mag) in Gemini is 6 degrees above the last quarter Moon and 1½ degrees to the right.

On the 19<sup>th</sup> at 6:00am the Beehive star cluster is 6 degrees to the right of the crescent Moon and 1½ degrees above.

At 6:00am on the 20<sup>th</sup> the star Eta Leonis (3.4 mag) is 3 degrees to the lower left of the crescent Moon.

The Taurids don't reach their peak till the middle of next month though they can be seen from the 20<sup>th</sup>.

On the 21<sup>st</sup> at 6:00am the star Rho Leonis (3.8 mag) is 4½ degrees to the right of the crescent Moon and 2 degrees below.

The Orionids meteor shower reaches its peak on the 21<sup>st</sup>/22<sup>nd</sup> though they can be seen from the 2<sup>nd</sup> Oct – 7<sup>th</sup> Nov.

Venus is at superior conjunction on the 22<sup>nd</sup>.

At 6:00am on the 22<sup>nd</sup> the star Sigma Leonis (4 mag) is 2½ degrees to the right of the crescent Moon.

On the 23<sup>rd</sup> at 6:15am the star Zaniah (3.8 mag) in Virgo is 2½ degrees below a thin crescent Moon and ½ a degree to the right.

At 6:40am on the 24<sup>th</sup> a very thin crescent Moon may be seen low in the east. It will be just 2¼ degrees above the horizon at 100 degrees azimuth. The star Porrima (2.7 mag) in Virgo is 6 degrees above the Moon and 2½ degrees to the right.

There is a Partial Solar Eclipse on the 25<sup>th</sup>. The penumbral phase starts at 9:58:19am. The partial phase starts at 10:09:47am and ends at 11:44:48am with the maximum eclipse at 10:56:31am. The penumbral phase ends at 2:02:12pm. The eclipse will be seen from the majority of Europe (though not Portugal or half of Spain), north eastern Africa and the west half of Asia.

On the 27<sup>th</sup> at 6:25pm a very thin crescent Moon will be seen low in the south west. It will be just 2 degrees above the horizon at 227.5 degrees azimuth.

At 6:40pm on the 28<sup>th</sup> a thin crescent Moon will be 3½ degrees above the horizon at 217.5 degrees azimuth. The star Theta Ophiuchi (3.2 mag) is degrees above left of the Moon.

The Moon is at perigee (368,291km) on the 29<sup>th</sup> at 3:36pm. At 6:30pm on the 29<sup>th</sup> the star Kaus Media (2.7 mag) in Sagittarius is just 2¾ degrees to the left of the crescent Moon and ¾ of a degree below. (PLEASE NOTE: THE CLOCKS GO BACK 1 HOUR TONIGHT)

On the 30<sup>th</sup> at 6:30pm the star Nunki (2 mag) in Sagittarius is 5 degrees to the right of the crescent Moon.

From the 30<sup>th</sup> Oct – 3<sup>rd</sup> Nov the asteroid Ceres passes close to the star Chertan (3.3 mag) in Leo. During this period Ceres will be just 1¼ degrees from Chertan.

At 7:00pm on the 31<sup>st</sup> the star Omega Capricorni (4.1 mag) is 7 degrees to the left of the crescent Moon.

\*= Dates and times are subject to change.

News: Astronauts to Venus? Yes, it sounds like a joke. Why would bright and apparently sane people gather to discuss such an outlandish thing? We all know that Venus is an oven, and about the last place you'd want to send people. Yet it's the closest planet to Earth, rich with mystery and untapped, priceless knowledge. There are important lessons that we'll never learn about our home planet, and therefore about ourselves, until we deeply explore this neighbouring world. Imagine astronauts using remote observation to explore Venusian landscapes in real time. We use ROVs now to investigate Earth's deep oceans, with operators on surface ships using teleoperation. On Venus, ROVs couldn't be driven from Earth; the time delay is too great. But astronauts in orbit or passing through near-Venus space could drive them. These explorers would virtually search through enchanting landscapes while an enthralled public looked over their shoulders, safely wandering Venus with their own VR devices. So don't worry, we're not cooking anyone. In fact, keeping humans alive while engaging in breathtaking exploration and crucial science is very much the point. Some people are getting quite excited about the possibility of making it happen.

A star named Rasalhague (2.07 mag) in the constellation on Ophiuchus has a very fast rotational speed. It's spinning almost fast enough to break itself apart. The star is 48.59 light years away from us, close, by astronomical distances.

NASA says the clock is ticking for Voyager space vehicles 1 and 2. Voyager 1 has gone farther since being launched in 1977, along with its twin, than any other manmade space vehicles in human history. The vehicles are expected to completely run out of power by 2025, and NASA has been cutting off features as necessary to extend their lives until then.

An international team of astronomers has revealed why the star Betelgeuse famously dimmed back in 2019. The dying star coughed out a huge chunk of material weighing several times more than the Moon, which then blocked out some of its light. Betelgeuse is the 10th brightest star in the night sky.

The asteroid that wiped out the dinosaurs 66 million years ago might not have been alone. In the August 17th Science Advances, scientists report the discovery of what appears to be the scar of a smaller impact that occurred at roughly the same time. A team led by Uisdean Nicholson (Heriot-Watt University, Edinburgh) now says that a smaller crater in the eastern Atlantic Ocean has approximately the same age as Chicxulub, suggesting that the two impacts may have been related. The Nadir crater (named after a nearby seamount) is about 9km across and lies some 350km out of the coast of the African countries Guinea and Guinea Bissau. So might there be a connection with the Chicxulub impact? Nicholson and his colleagues think so. Maybe the impactor was a binary asteroid. After all, we know that many asteroids are accompanied by small moonlets, and there are confirmed cases of dual impacts, like the 470-million-year-old Lockne and Malingen craters in Sweden. Interestingly, an impact in Ukraine, the 24-kilometer-wide Boltysh Crater, has an estimated age of 65.4 million years and could have been formed as part of the same impact cluster.

A tiny space rock may hint at a new population of asteroids in the inner solar system, suggests a new study in the Monthly Notices of the Royal Astronomical Society. A team of astronomers spotted the asteroid on the night of January 4<sup>th</sup> 2020, as part of a survey of near-Sun sky using the 48-inch Samuel Oschin telescope at Palomar Observatory. It orbits entirely within Venus's orbit, travelling at most 0.65AU from the Sun. Its reddish in colour, like asteroids in the Main Belt are, and it spans 2km, making it surprisingly large for its

location. Its formal name and designation, is now 594913 Aylochaxnim, (pronounced ai-LOH-chakh-nym) which means “Venus Girl”.

Evidence for water ice exists at the poles of Mars and even at mid-latitudes, but new evidence, suggests that “tropical” Mars (near the equator) is dry. The landing of InSight November 26<sup>th</sup>, 2018 in Elysium Planitia, 4.5 degrees north of the Martian equator, brought a new capability – the first seismometer to operate on the planet since the Viking landers attempted similar operations on Mars in 1976. Using the seismic wave data, they analyzed the structure of InSight’s landing site. They found no evidence of water or ice in the sedimentary layers, down to 300 metres beneath the lander. The find has implications for past habitability and future missions to Mars.

Donald Edward Machholz (7<sup>th</sup> Oct 1952 – 9<sup>th</sup> August 2022) was an American amateur astronomer who was the leading, visual comet discoverer, credited with the visual discovery of 12 comets that bear his name. Machholz spent more than 9,000 hours comet-hunting in a career spanning over 50 years.

The University of Hawaii has overseen the construction of 13 telescopes on the peak of Mauna Kea over the last 50 years – each one larger and more groundbreaking than the last. But with the passage of a law inspired by Native Hawaiian protests, the volcanic summit will soon transition to new management: an 11-member board that includes a broad spectrum of voices. With the observatories’ leases up for renewal in 2033 and the construction of the Thirty Metre Telescope still in limbo, the re-organization could change the face of astronomy at the summit.

Remember New Horizons? The spacecraft that gave us our first up-close looks at Pluto and Arrokoth? Of course, we do! Well, it’s still out there, traveling deeper into the Kuiper Belt. Every Monday, New Horizons sends back a little signal called a “Green Beacon”, signalling that it’s doing fine and hasn’t whacked into anything yet. To save money and fuel, though, the spacecraft entered hibernation mode and has been sleeping since the 1<sup>st</sup> June, 2022. It’s going to stay that way until the 1<sup>st</sup> March, 2023. Their job is to collect information about the environment of space that New Horizons is passing through. When New Horizons comes out of hibernation, the science teams are going to do long-planned “look backs” at Uranus and Neptune. Those two worlds will be in the right positions to allow a look at how they reflect sunlight. The data from those observations could provide some ideas about the two planets’ internal energy balance. For its position please visit: <http://pluto.jhuapl.edu/Mission/where-is-New-Horizons.php#current-position>.

The number of space launches worldwide is growing: We’re on track for a record-setting year, with more than 100 launches thus far. But with more frequent launches, comes the increased hazard posed by reentering space debris. A recent study finds that heavily populated areas, bears a disproportionately high level of risk.

Through the first week of September, the James Webb Space Telescope (JWST) has captured both its first exoplanet and its first brown dwarf as well as photographed the firestorm of star formation in the Tarantula Nebula. Though all three celestial objects have been studied before, the JWST provides details astronomers can’t get anywhere else.

An icy moon torn apart in Saturn’s gravitational field some 150 million years ago could explain why the planet’s rings are so young and a host of other puzzles. In a recently weekly edition of “Science”, Jack Wisdom and his colleagues propose that tidal forces tore apart the unfortunate moon. The scenario could also explain Saturn’s axial tilt, and the somewhat elongated orbit of the planet’s largest moon, Titan.

Nasa has announced a status update on the Perseverance rover trundling through Jezero Crater on Mars, highlighting news from the mission’s second science campaign. Scientists already know that Jezero was filled with a lake some 3.5 billion years ago, fed in part by a river that broke through the walls of the crater

rim. Now, scientists are revealing the first results from investigations of the delta deposits that the river left behind. Perseverance has now collected 13 samples to date. You can view the rock sample data on Nasa's website. That's impressive progress over the 18 months since Perseverance landed. About one-third of their samples are now collected. NASA and ESA are planning the Earth Return Orbiter and Sample Retrieval Lander for the autumn 2027 and summer 2028, respectively. Samples would then come to Earth by 2033.

News extra:

Nicole "Duke" Victoria Aunapu Mann (b. 1977) is married to Travis R Mann. She is an American test pilot and NASA astronaut. They have one son. In an interview with National Geographic, she said that she and her son often sat outside looking at the Moon, and "hopefully someday, he'll be able to watch his Mom fly by and walk on the Moon". Nicole has over 2,500 flight hours in 25 types of aircraft, 200 carrier landings, and has flown 47 combat missions in Iraq and Afghanistan.

Josh Aaron Cassada (b.1973) is married to Megan, and have two children. He is an American physicist, test pilot and NASA astronaut. In August 2018, Sunita Williams and himself were selected to fly on CTS-1, the first operational flight of Boeing's CST-100 Starliner spacecraft. However, due to delays in Starliner's development, Cassada was reassigned to SpaceX's crew-5 flight

Koichi Wakata (b.1963) is married to Stefanie von Sachsen-Altenburg of Bonn, Germany. They have one son aged 22. Koichi is a Japanese engineer and a JAXA astronaut. He became the first Japanese astronaut to work on the assembly of the International Space Station (ISS) during the STS-92 mission. During a nearly two-decade career in space flight, he has logged more than eleven months in space. During Expedition 39, he became the first Japanese commander of the ISS.

Anna Yuryevna Kikina (b.1984) is a Russian engineer and test cosmonaut. She is the only woman cosmonaut currently in active service at Roscosmos. She is to perform a spacewalk during this current mission to the ISS. This mission is to last 188 days.

Facts: A solar eclipse always occurs about two weeks before or after a lunar eclipse. Usually, there are two eclipses in a row, but other times there are three during the same eclipse season.