

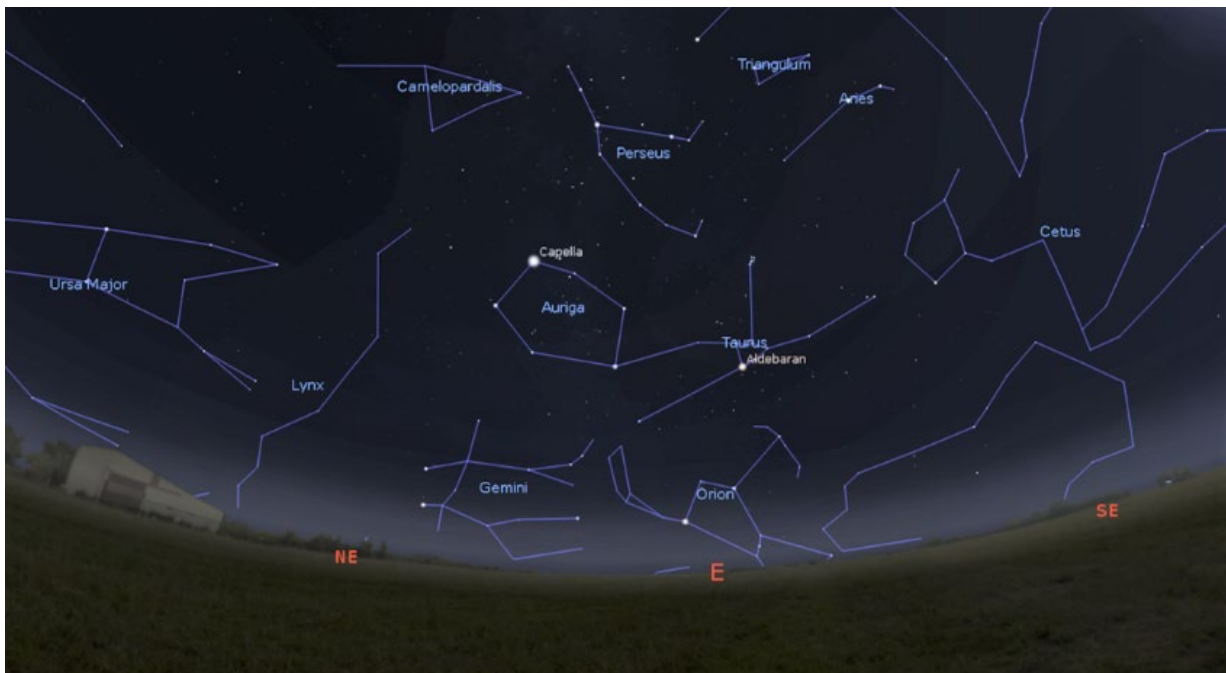
St Benedict's NIGHT SKY NEWS – Nov 2023

St Benedict's is a member of the **SOCIETY FOR POPULAR ASTRONOMY** and receives regular newsletters regarding astronomical events and information. If you would like to be included on the mailing list for these, please contact JGregory@st-benedicts.suffolk.sch.uk

STARS IN YOUR EYES

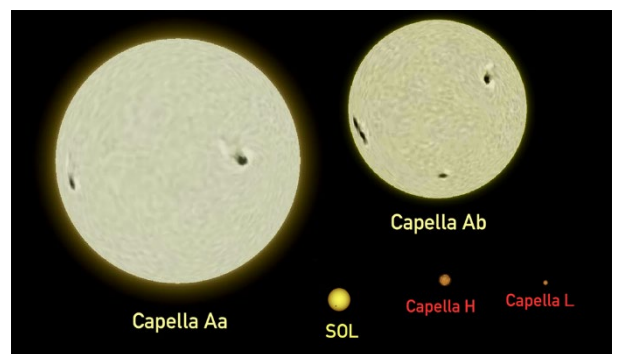
The night-time temperatures have dropped noticeably in recent days, but don't let that deter you from venturing out to look at the stars. At this time of year, you can still see the last of the summer night sky sights, and there are plenty of wonderful autumn and winter highlights to be seen in the early evening alone. November is notable as being the first month following the clocks going back at the end of October, which means that the evening sky gets darker earlier – ideal for stargazing.

Our featured constellation this month is prominent in the dark, eastern sky of the early evening: **AURIGA**.



Its name means “the charioteer” in Latin. The constellation got this name because its major stars form a shape similar to that of the pointed helmet of a charioteer. Auriga was first catalogued by the Greek astronomer Ptolemy in his *Almagest* in the 2nd century CE. The constellation contains **Capella**, the third brightest star in the northern sky, after Arcturus and Vega. Auriga is also the site of the galactic anti-centre, the point in the sky opposite to the centre of the Milky Way Galaxy, which is located in the constellation Sagittarius.

Capella has a distinct, yellowish tinge and is sometimes described as a “yellow giant” star. However, there is much more to Capella than just a single star – there are actually 4 individual stars in the Capella “system”. Capella may appear as a single star to the unaided eye, but it is in fact a multiple star system consisting of two pairs of stars. The four components are designated *Capella Aa*, *Capella Ab*, *Capella H*, and *Capella L*. The brighter *Capella Aa* and *Capella Ab* form one binary pair and the fainter *Capella H* and *L*, the other.



The brighter pair, the components *Aa* and *Ab*, are yellow-orange giants with a combined magnitude of about 0.85. The secondary pair in the Capella system, *Capella HL*, consists of two faint, red dwarf stars and are considerably less massive than the Sun.

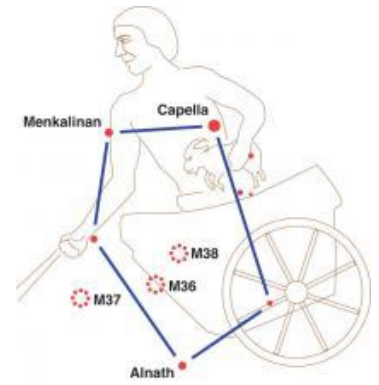
THE AURIGA MYTH

Auriga is usually depicted as a charioteer, holding the reins of a chariot with his right hand and carrying a goat and its two young on his left arm. Even though the image of the charioteer appears in Johann Bode's *Uranographia* (1801), none of the stories Auriga is usually associated with have a goat in them.

In mythology, Auriga is most frequently identified with **Erichthonius**, king of Athens and son of the fire god **Hephaestus**. Erichthonius was raised by the goddess **Athena**, who taught him many skills he wouldn't have ordinarily learned. He was the first man to tame and harness four horses to a chariot, imitating the chariot of the Sun god. **Zeus** was impressed and later placed Erichthonius among the stars. Erichthonius is usually credited for the invention of the four-horse chariot, the *quadriga*.

In another popular myth, the charioteer is **Myrtilus**, son of **Hermes**, who served **King Oenomaus** of Pisa. Oenomaus had a beautiful daughter, **Hippodamia**, and was determined not to give her hand away to any of her suitors. He would challenge each of them to a chariot race. If he caught up with them before they arrived to Corinth, they would meet their end at his hands. With Myrtilus driving the king's chariot, none of Hippodamia's suitors survived the race until **Pelops**, son of Tantalus, came to ask the king for his daughter's hand. Hippodamia fell in love with Pelops at first sight and asked Myrtilus to let him win. The charioteer, who was himself in love with the king's daughter, obeyed and tampered with the chariot's wheels. During the race, the wheels fell off and King Oenomaus was thrown off the chariot and did not survive. Once Pelops had won the race, he cast his rival Myrtilus into the sea. Betrayed, Myrtilus cursed the house of Pelops before he drowned. It was Myrtilus' father Hermes who placed his son's image among the stars.

The star Capella, *Alpha Aurigae*, is associated with **Amalthea**, the goat who was foster-mother to Zeus. The name Capella is Roman and means "she-goat." The star is located on the Charioteer's left shoulder.



THE MOON THIS MONTH

PHASE

3rd Quarter	5th
New Moon	13th
1st Quarter	20th
Full Moon	27 th

The Full Moon in November is the **BEAVER MOON**, named after the North American beavers who build their winter dams at this time of year. It is also called **Frost Moon** and **Mourning Moon**, depending on the winter solstice. The beaver is mainly nocturnal, so they keep working under the light of the Full Moon.



Beavers make dams of wood and mud. In the middle, they build dome-shaped homes called lodges with underwater entrances. Beavers continue to grow throughout their lives, and so do their teeth. They constantly gnaw on wood, but because the enamel in a beaver's incisors contains iron, their front teeth never wear down.

Other names for the November Full Moon are **Frost Moon**, **Trading Moon**, and **Snow Moon**, although the latter is more common for the February Full Moon, while **Oak Moon** can be either the Full Moon in November or December, depending on which source you use. Traditionally, the last Full Moon before the winter solstice has also been named Mourning Moon. The astronomical seasons do not match up with the lunar months. Therefore, the month of the Mourning Moon varies. Some years, the Mourning Moon is in November, while other years, it is in December.

THE PLANETS THIS MONTH

MERCURY: Very low in the sky after sunset – probably not visible.

VENUS: Still a very bright "morning star".

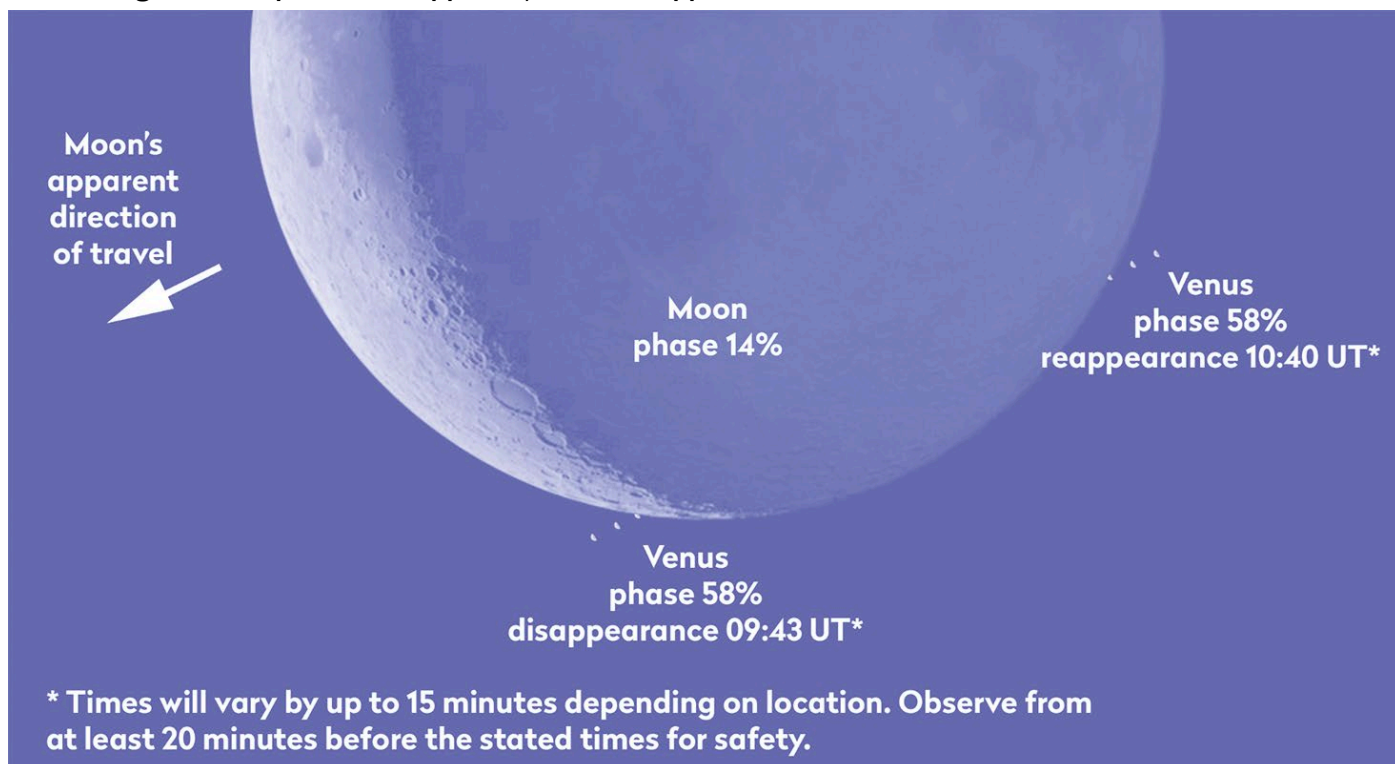
MARS: Too close to the Sun to be seen this month.

JUPITER: Jupiter is superbly placed, high in the southern sky at about 50 degrees elevation. At the beginning of the month it will be close to the Earth as it ever gets – what is known as **opposition**. This is when the Earth is aligned between the Sun and Jupiter.

SATURN: Like Jupiter, Saturn is a well-placed evening planet, though not as bright.

A RARE LUNAR OCCULTATION OF VENUS – THURSDAY 9th NOVEMBER

A rare lunar occultation of Venus can be seen during the day on the morning of 9th November 2023. Venus will be showing a 58%-lit phase and appear 1/90th the apparent size of the Moon. Credit: Pete Lawrence.



NOTE: A lunar occultation is when the Moon appears to move in front of another object in the sky like a star, a planet or an asteroid. Since the Moon is close to us, we see it move relatively fast, even against other planets in the Solar System. A lunar occultation of a planet lasts about an hour.

Possibly the first recording of a lunar occultation was made by the Greek, Aristotle, when he noted the Moon covering Mars on April 4, 357 B.C.

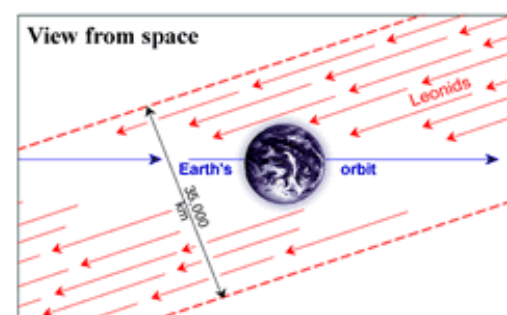
METEORS THIS MONTH

Although the October Orionids persist into the beginning of the month, November is notable for two showers: the **TAURIDS** and the **LEONIDS**.

The **Taurids** are not particularly frequent – about 5 per hour at their peak on 12-13 November – but they are relatively slow moving and can be quite bright. The Taurid meteor shower is caused by the Earth ploughing through debris left behind by Comet Encke. Because of their occurrence in late October and early November, they are also called **Halloween fireballs!**

The **Leonids** are often one of the more prolific showers with fast, bright meteors. The peak will be on 17-18 November and typically there are around 10 per hour. About every 33 years (the period of Comet Tempel-Tuttle, the debris from which produces the Leonid meteors), the Leonids produce meteor 'storms' when hundreds or even thousands of shooting stars can be seen. Such storms were seen in 1799, 1833, 1866, 1966 and 1999-2001 (although the expected 1899 and 1933 storms were disappointing). The 1833 storm was particularly spectacular, with an estimated 100,000 meteors per hour. The 1999-2001 storms produced about 3000 per hour. Unfortunately we shall have to wait until around 2033 before we get the next 'storm'.

We talk about a meteor shower's '**radiant point**', as though the individual meteors are all coming from a single point in space – but this is an illusion. The meteors in the meteor stream are basically travelling parallel to each other when they hit the top of the Earth's atmosphere. However, an observer standing in the middle of the stream will see the meteors fall to the left and right, behind and in front of him, and a meteor coming directly from the radiant would appear as a point of light rather than a streak. If the paths of all the meteors are traced back, they appear converge to a single point – the radiant.



ISS SIGHTING TIMETABLE

Date	Visible	Max Height*	Appears	Disappears
Mon Oct 30, 3:41 AM	1 min	16°	16° above E	10° above E
Mon Oct 30, 5:14 AM	4 min	79°	39° above W	10° above E
Tue Oct 31, 4:28 AM	3 min	51°	51° above E	10° above E
Tue Oct 31, 6:01 AM	6 min	47°	12° above W	10° above SE
Wed Nov 1, 3:41 AM	1 min	15°	15° above E	10° above E
Wed Nov 1, 5:14 AM	4 min	59°	37° above WSW	10° above ESE
Thu Nov 2, 4:28 AM	2 min	41°	41° above ESE	10° above ESE
Thu Nov 2, 6:01 AM	6 min	27°	11° above W	10° above SSE
Fri Nov 3, 3:41 AM	< 1 min	12°	12° above E	10° above E
Fri Nov 3, 5:14 AM	4 min	36°	33° above SW	10° above SE
Sat Nov 4, 4:28 AM	2 min	27°	27° above SE	10° above SE
Sat Nov 4, 6:01 AM	4 min	14°	10° above WSW	10° above S

To keep up to date with future sighting opportunities, go to....

[Newmarket, England, United Kingdom | Sighting Opportunity | Spot The Station | NASA](#)

BENNU ASTEROID SAMPLE UPDATE

Since our last issue of *Night Sky News* a small team of scientists have had a first “quick look” at the sample of rock and dust from the asteroid Bennu, returned to Earth by the Osiris-Rex mission. Initial analysis has led to great excitement.

One of the select group of scientists is Dr Ashley King from our own Natural History Museum. His first remark was *"It's beautiful, it really is - certainly what we've seen of it so far."* The materials, scooped up by a US space agency (Nasa) mission and returned to Earth 17 days ago, are currently being examined in a special lab in Texas. The three-day analysis by Dr King and five others on the "Quick Look" team showed the black, extra-terrestrial powder to be rich in carbon and water-laden minerals, along with compounds of iron and sulphur.

This is important because there is a theory that carbon-rich (organic), water-rich asteroids similar to Bennu may have been involved in delivering key components to the young Earth system some 4.5 billion years ago, very soon after the Earth formed. It's potentially how we got the water in our oceans and some of the compounds that were necessary to kick-start life. The Bennu samples will be used to test these ideas.



So far the samples have been analysed using a number of different techniques - the dust was put in a scanning electron microscope, and probed via infrared spectroscopy, X-ray diffraction and chemical element analysis. X-ray computed tomography (CT) was used to make 3D models of particles and look inside them. One of the key findings is the presence of that carbon. Lots of it. Close to 5% by weight.

Once the full sample is extracted, a portion of it will be shared with researchers worldwide. About 100 milligrams is expected to come to the UK to be further worked on by Dr King's department at the NHM, and by collaborators at the Open, Oxford and Manchester universities.

Data from the worldwide research will be collated and it is hoped that a comprehensive report will be published next March.

<https://www.bbc.co.uk/news/science-environment-67078632>

PRINCIPAL SOURCES OF INFORMATION

<https://www.constellation-guide.com/constellation-list/auriga-constellation/>

<https://www.timeanddate.com/astronomy/moon/full-moon-names.html>

<https://www.skyatnightmagazine.com/advice/skills/astronomy-guide-viewing-planets-night-sky>

<https://www.rmg.co.uk/stories/topics/meteor-shower-guide>