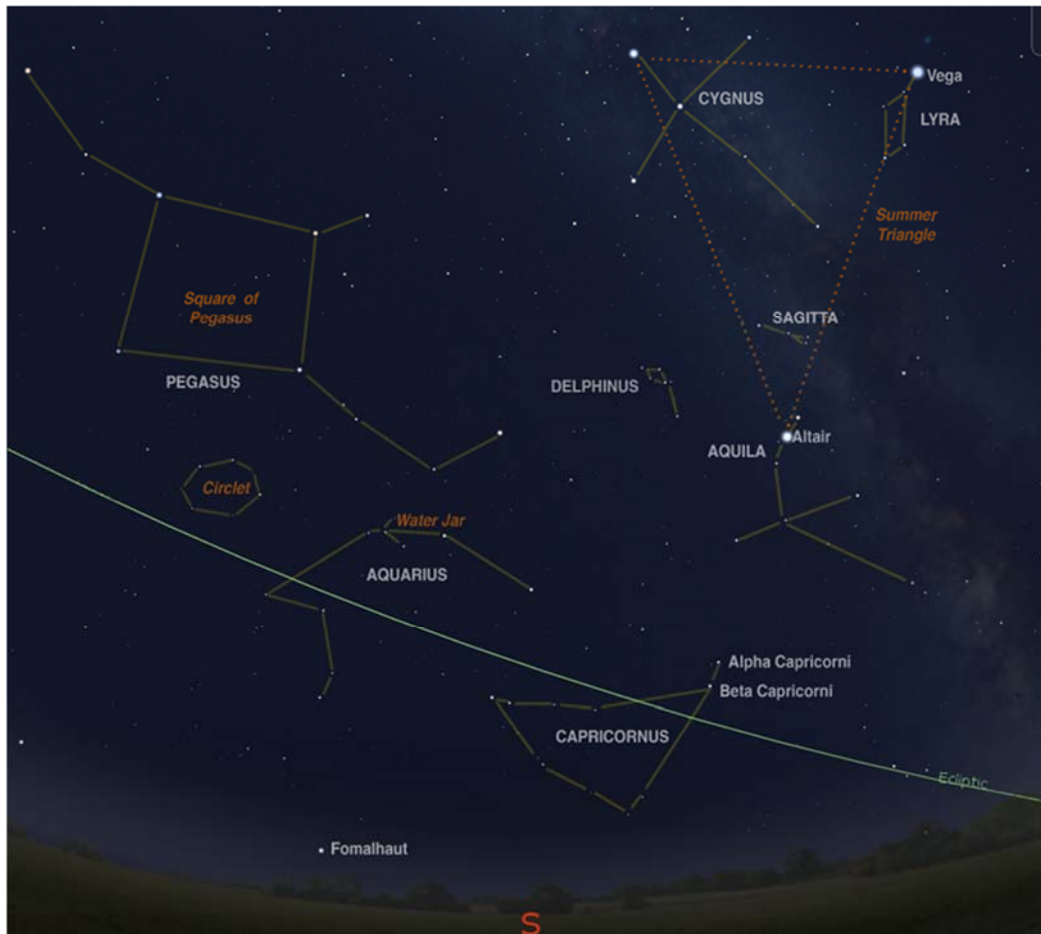


St Benedict's NIGHT SKY NEWS – Oct 2023

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 sky looking south at 21:00 (BST) in mid-October as seen from the UK. Map created using Stellarium software. No planets are shown but the green line marks the ecliptic, where the Moon and the planets, Jupiter and Saturn, may be seen.

From light-polluted areas, there are hardly any stars visible in the lower part of the southern sky, which is occupied by the constellations of Capricornus and Aquarius, so the town-based stargazer will have to journey out into the countryside. Nevertheless, there is much of interest in the autumn southern sky. Anyone who regards these as 'their' constellations on the basis of astrology is in for a disappointment as there are few bright stars. The skies were not cooperative in producing twelve nice bright pretty star groups evenly spaced around the track of the planets through the sky, as humans would have liked.

But take a look at the Water Jar area of **AQUARIUS**, which is a very recognisable pattern of fairly faint stars, and which helps you to find your way around the rest of the constellation. Also look at the stars *Alpha* and *Beta capricorni*, which you can find by following the line of stars formed by *Altair* and its two companion stars southwards. You should be able to pick out with the naked eye that *Alpha* is a pair of stars. They are six minutes of arc apart, and the human eye should be able to distinguish two stars about 1 minute apart. Though they look similar, these two stars just happen to be in line of sight with each other, forming an **optical binary**. The easternmost one is around 100 light years away and the westernmost one is nearly 600 light years away. Below Aquarius is a bright star that is often forgotten about from the UK, and also often mis-spelled. This is **Fomalhaut**, in the constellation of **PISCIS AUSTRINUS**, the Southern Fish. For some reason a lot of people call it *Formal*haut so don't make the same mistake. It is the most southerly first-magnitude star visible from the UK.

Coming into view farther east is the constellation of **PEGASUS**, the Flying Horse. Its four main stars form a rough square – actually quite large in the sky, and the stars are only second magnitude, so don't expect anything too easy. By counting the number of stars that you can see with the naked eye in the Square you can discover how dark your sky really is, in terms of the faintest magnitude visible.

Note that the “**Summer Triangle**” formed by the bright stars of the constellations **CYGNUS**, **AQUILA** and **VEGA** is still prominent high in the south-west.

SPOT A GALAXY!

Now that the constellation **PEGASUS** is rising high, it is good time to have a go at spotting the most distant astronomical object visible to the naked eye: the **ANDROMEDA GALAXY**, which is 2.5 million light years away.

In late September and early October, the Andromeda galaxy is visible in the eastern sky at nightfall, swings high overhead in the middle of the night, and stands rather high in the west at the onset of morning dawn. Winter evenings are also good for viewing the Andromeda galaxy. Although it is visible to the naked eye, it is not a bright object (mag 3.5) and you will need a clear, dark (moonless) sky with minimal light pollution. You will also need to know where to look. To do this you can use the constellation PEGASUS to “star hop” to it.

In the evening, the Andromeda galaxy is visible almost overhead standing looking south:



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. If there is a really dark sky, you will see it with your unaided eye; however, a small pair of binoculars will help. It will not appear as a pinpoint of light, like a star, but as a fuzzy smudge.

It is often referred to as M31, being the 31st on a famous list of fuzzy objects compiled by the French astronomer Charles Messier (1730-1817). In the modern astronomical catalogue it is NGC224.

The Andromeda and our own Milky Way galaxy reign as the two most massive and dominant galaxies within the Local Group of Galaxies, of which Andromeda is the largest.

Andromeda and the Milky Way are actually heading on a collision course that will alter the structure of the two galaxies forever. The galaxies are rushing closer to one another at about 70 miles per second (112 kilometres per second). Astronomers estimate that Andromeda will collide with the Milky Way in 4 billion years, with the merger concluding 6 billion years from now. By that time, the sun will have swollen into a red giant and swallowed up the terrestrial planets, so Earth will have other things to worry about.

Like many of the heavenly bodies that we can see in the night sky, planets/moons/stars/constellations, the Andromeda galaxy takes its name from Ancient Mythology, in this case **GREEK MYTHOLOGY**. It is so-named because it lies in the small, faint constellation named Andromeda, one of 48 listed by the Greco-Roman astronomer, **PTOLEMY**, in the 2nd century.

In 964, the Persian astronomer **Abd al-Rahman al-Sufi** described the galaxy as a "small cloud" in his "Book of Fixed Stars," the first known report of our nearest neighbour. When Charles Messier labelled it M31 in 1764, he incorrectly credited the discovery of what was then called a nebula to the German astronomer, Simon Marius, who provided the first telescopic observation of the object. The first photographs of Andromeda were taken in 1887, by Isaac Roberts.

ANDROMEDA was the daughter of **CASSIOPEIA**, Queen of Ethiopia, who bragged that her daughter was more beautiful than the **NEREIDS**, sea nymphs said to be blessed with godly beauty. Offended by this the sea nymphs asked the sea-god **POSEIDON** to punish the country of Ethiopia. Andromeda's father, the king **CEPHEUS**, was told that the only way to save his country was to sacrifice his daughter to the great sea monster, **CETUS**. Cepheus did this by stripping his daughter bare and chaining her to a rock by the sea. She was eventually saved by the hero **PERSEUS** who appeared on his winged horse, **PEGASUS**, and killed the sea monster with his diamond sword.

Note that many of the names, in addition to Andromeda, are also given to constellations in this region of the sky, all dedicated to the **PERSEUS MYTH**.

The picture on the right is a painting by the 19th century English painter **FREDERIC LEIGHTON** – it shows Andromeda chained to a rock at the mercy of the sea monster Cetus, but about to be saved by Perseus arriving on his winged horse Pegasus.



THE MOON THIS MONTH

PHASE

3rd Quarter	6th
New Moon	14th
1st Quarter	22nd
Full Moon	28th

The October Moon is generally referred to as the HUNTER'S MOON although, technically, every three years it becomes the Harvest Moon. The Harvest Moon is the full moon closest to the autumnal equinox. With the autumnal equinox in the Northern Hemisphere occurring on September 22 or 23, that puts most Harvest Moons in the month of September. But every three years the Harvest Moon is in early October and November's Moon becomes the Hunter's.

In North America and Europe, the Harvest Moon was a time when the bright moon meant farmers could stay out later, working in their fields, gathering in the crops before the first freeze. When the harvest was over, the farmers would turn to hunting deer and other animals to bolster their food stores before winter; thus, the Hunter's Moon.

Early evening moonrises make every Hunter's Moon special. Every full moon rises around sunset. After the full Hunter's Moon, you'll see the moon ascending in the east relatively soon after sunset for a few days in a row at northerly latitudes. Look for the moon to be bright and full-looking for several nights from around October 18-21.

If you've ever wondered why Full Moons, when they rise and are close to the horizon, appear orange, it is a true physical effect: It stems from the fact that, when you look toward the horizon, you're looking through a greater thickness of Earth's atmosphere than when you gaze up and overhead. The atmosphere scatters blue light – that's why the daytime sky looks blue. The greater thickness of atmosphere in the direction of a horizon scatters blue light most effectively, but it lets red light pass through to your eyes. Therefore, a full moon near the horizon – any full moon near the horizon – takes on a yellow or orange or reddish hue.

On 28 October 2023, the UK will see a **partial lunar eclipse**. A partial lunar eclipse happens when the Moon passes through the Earth's penumbra (the outer region of the Earth's shadow), and only a section of it passes through the umbra (the darkest part of the Earth's shadow). From the UK we'll only see a small fraction of the Full Moon pass into the umbra. At its maximum, which occurs at 21:15, just 12% will be in shadow. However, it should still be noticeable.



THE PLANETS THIS MONTH

MERCURY: Try spotting it towards the end of the month, when it will rise in the east about 100 minutes before sunrise.

VENUS: Impressively bright "morning star", visible against dark skies at the end of the month, rising four hours before sunrise.

MARS: Not visible this month.

JUPITER: Bright morning planet reaching its highest position under darkness from mid-month. The Moon is close on 4/5 September.

SATURN: Evening planet, currently well presented. Reaches 24° altitude under dark sky conditions.

METEORS THIS MONTH

One of the year's major meteors showers peaks this month – the **ORIONIDS**.

In 2023 the Orionid meteor shower is active from 2 October - 7 November and will peak on the night of 21-22 October between midnight and dawn. However, if you're looking you should be able to see the shower for several days either side of this 'maximum' date. With a maximum rate of around 25 meteors per hour, the Orionid meteor shower features fast meteors which can leave persistent trains. With the Moon in 2023 around First Quarter during the peak, conditions should be quite good to spot the Orionids.

Some people view the Orionids as extra special as the meteors are actually pieces of Comet 1P/Halley, famously known as **Halley's comet**. The comet swings by the earth only once every 75 - 76 years but this annual shower provides some compensation for those who may miss that once-in-a-lifetime event. As the comet follows its path around the sun, it leaves a path of tiny debris. The cometary debris enters our planet's atmosphere at speeds of around 41 miles per second, vaporising from friction with the air causing the streaks of light we call meteors.

ISS SIGHTING TIMETABLE

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

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

PRINCIPAL SOURCES OF INFORMATION

[Learning the October constellations – Society for Popular Astronomy \(popastro.com\)](#)

<https://www.almanac.com/content/full-moon-october>

<https://www.rmg.co.uk/stories/topics/orionid-meteor-shower-2023-when-where-see-it-uk>

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

TO ASTEROID BENNU – AND BACK!

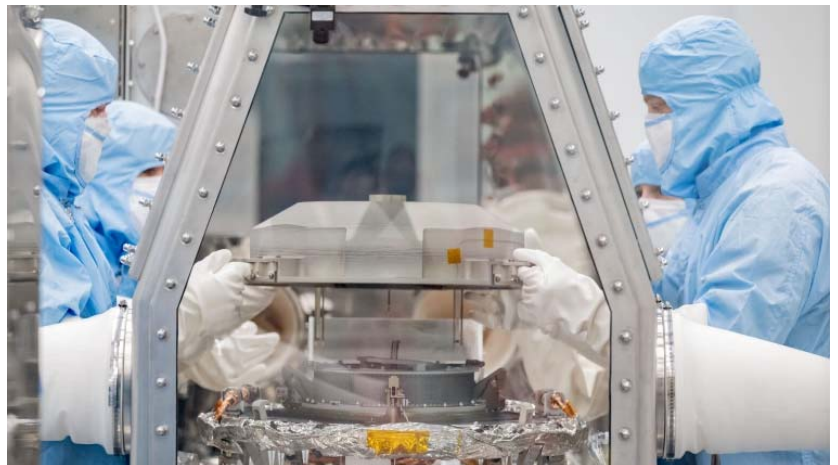


Launched on Sept. 8, 2016, the Origins, Spectral Interpretation, Resource Identification, and Security-Regolith Explorer, or **OSIRIS-REx**, spacecraft travelled to a near-Earth asteroid named **Bennu** (formerly 1999 RQ36). It carried out an intensive survey of the asteroid's surface with a view to grabbing a sample of rocks and dust. But that wasn't all – the plan was for the spacecraft to set a return trajectory to Earth, carrying its sample of Bennu in a special container. When about 63,000 miles from Earth, the container would be jettisoned and re-enter the

Earth's atmosphere. After a 3 year voyage, that container landed safely in the Utah (US) desert on September 24th.

Although the container was sealed, it would have to be opened to retrieve the sample and that could expose it to Earthly contamination. Within an hour and a half of landing, the container was transported by helicopter to a temporary clean room set up in a hangar nearby, where it was connected to a continuous flow of nitrogen. Getting the sample under a “nitrogen purge,” as scientists call it, was one of the OSIRIS-REx team's most critical tasks. Nitrogen is a gas that doesn't interact with most other chemicals, and a continuous flow of it into the sample container will keep out contaminants to leave the sample pure for scientific analyses.

On Tuesday September 26th, two days after OSIRIS-REx's return container landed, scientists at NASA's Johnson Space Center (JSC) in Houston opened the lid on the canister to reveal the contents. All this was done in a specially designed 'clean room', with the scientists all wearing surgical gowns and masks. The container itself was inside a sealed compartment with the team working on it using special glove devices. All this would ensure that no earthly contaminants could possible enter.



The materials within will be carefully curated and divided up for study among scientific institutions and space agencies worldwide. For decades to come, the samples will be studied to help us learn more about the solar system's formation and evolution, as well as the role that carbon-rich asteroids like Bennu may have played in bringing the building blocks of life to Earth.

When it delivered the sample of asteroid Bennu to Earth, the OSIRIS-REx spacecraft had completed its primary mission. But the spacecraft, didn't land back on Earth. It is continuing on to a new mission. With a new name – **OSIRIS-APEX** (OSIRIS-APophis EXplorer) – the spacecraft will explore **Apophis**, an asteroid roughly 1,200 feet (roughly 370 meters) in diameter that will come within 20,000 miles (32,000 kilometres) of Earth in 2029.