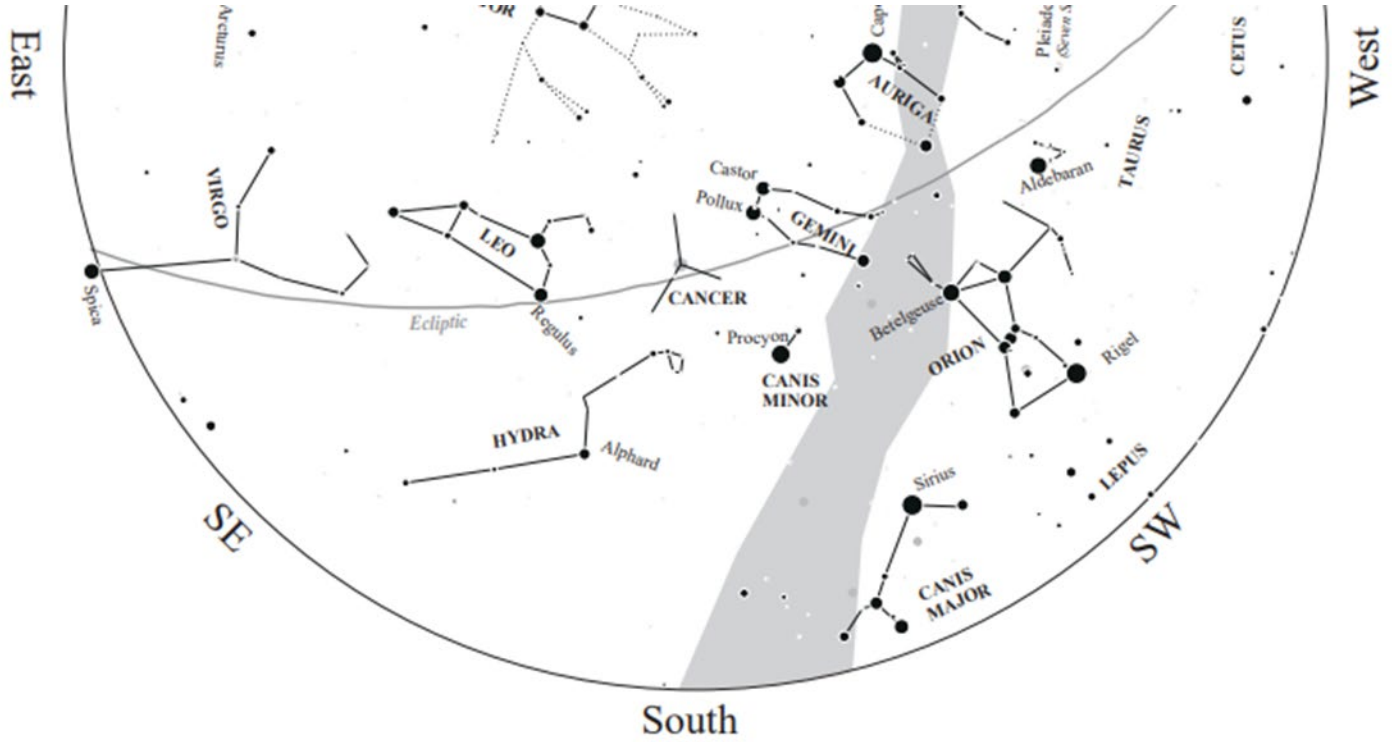
St Benedict's NIGHT SKY NEWS – Mar 2022

St Benedict's Catholic Secondary School 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, as well as our monthly ***Night Sky News***, please contact: JGregory@st-benedicts.suffolk.sch.uk

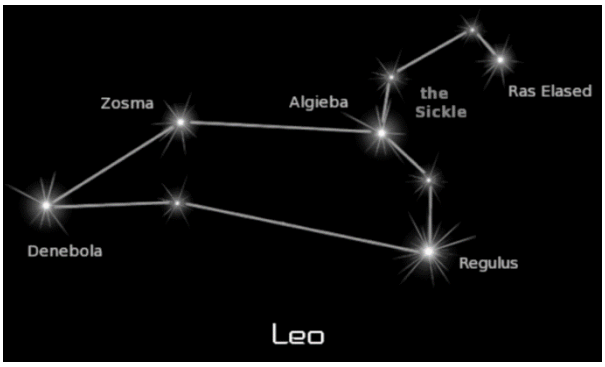
STARS IN YOUR EYES

Although the nights are now getting noticeably shorter, the evenings still get dark quite early. The great winter constellations of the southern sky continue to dominate and this month's featured constellation is **LEO**.



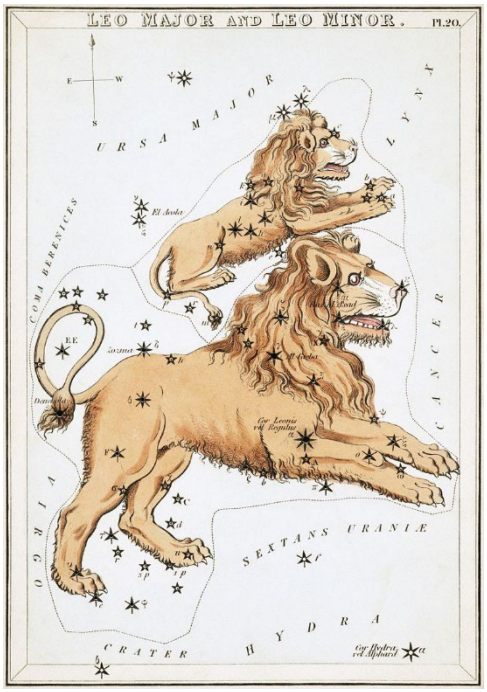
March is a good month for the LEO enthusiasts, as it rises in the east and passes high across the south during the evening after sunset. Although the majority of named constellations depict mythological characters or beasts, for most of them it is almost impossible to visualise the character. There are, of course, two notable exceptions: ORION, the hunter; and LEO, the lion.

The "head" of the lion is formed by a pattern of 6 bright stars with the shape of a "backwards question mark", also known as the "Sickle". The dot of the question mark (or handle of the Sickle, if you prefer) is the brightest star in the constellation: **REGULUS**. At magnitude 1.35, it is the 21st brightest star in the night sky. Although it appears to the naked eye as a blue-white dot, it is actually a system comprising 3 stars dominated by the largest and brightest Regulus A. There is some evidence that there is a 4th, smaller star (probably a white dwarf) associated with the Regulus system, but this has not been reliably observed.



The name Regulus means "little king" and, at the opposite end of the constellation is its next brightest star, **DENEBOLA**, which means "lion's tail"! In the sky, the six bright stars that form the Sickle of Leo represent the lion's head, and the brightest star in the constellation, Regulus (Alpha Leonis), marks the beast's heart. Another bright star, Denebola (Beta Leonis) marks the tip of the lion's tail. Algieba (Gamma Leonis) lies on the lion's neck, even though its name means "the forehead." Zosma (Delta Leonis) marks the lion's rump.

Leo is one of the oldest constellations in the sky. Archaeological evidence suggests that Mesopotamians had a constellation similar to Leo as early as 4000 BC. The Persians knew the constellation as Shir or Ser, Babylonians called it UR.GU.LA ("the great lion"), Syrians knew it as Aryo, and the Turks as Artan. Babylonians knew the star Regulus as "the star that stands at the Lion's breast," or the King Star. Both the constellation and its brightest star were well-known in most ancient cultures.



The Greeks associated Leo with the Nemean lion, the beast defeated by Heracles (Hercules) during the first of his twelve labours. Both Eratosthenes and Hyginus wrote that the lion was placed among the constellations because it was the king of beasts.

The lion lived in a cave in Nemea, a town located to the south-west of Corinth. It set upon the local inhabitants and could not be defeated because it had impenetrable skin. Heracles could not defeat the lion with arrows, so he trapped it in its cave, grappled with the beast and eventually defeated it. He used the lion's claws to cut off its pelt, and then wore the pelt as a cloak, complete with the lion's head. The cloak both protected Heracles and made him appear even more fearsome.

The lion also has a smaller "companion" constellation: **Leo Minor**. Above the major constellation is a group of faint stars that, only recently, have been officially named as a constellation. For their proximity to Leo, it seemed appropriate to name the constellation Leo Minor.

It has no myths associated with it and was first depicted in 1687 in Johannes Hevelius' *Catalogus Stellarum Fixarum*. In 1845, the catalogue was revised by Francis Baily, who assigned Greek letters to stars that were brighter than magnitude 4.5, but he did not give the constellation's brightest star the designation Alpha in his British Association Catalogue. In 1870, the English astronomer Richard A. Proctor renamed the constellation to Leaena, or the Lioness, in an attempt to shorten constellation names in order to make them easier to manage on star charts, but the name was not widely adopted.

Leo Minor, unlike its major relative, has no stars brighter than magnitude 3.8, so will be very difficult to spot in our light-polluted skies.

THE MOON THIS MONTH

PHASE

New Moon	2nd March
1st quarter	10th March
Full Moon	18th March
3rd quarter	25th March

The Full Moon in March is the **WORM MOON**, and it is usually considered the last Full Moon of winter. It is also called Lenten Moon, Crow Moon, Crust Moon, Chaste Moon, Sugar Moon, and Sap Moon.

The name Worm Moon was originally thought to refer to the earthworms that appear as the soil warms in spring. This invites robins and other birds to feed—a true sign of spring! An alternative explanation for this name comes from Captain Jonathan Carver, an 18th-century explorer, who wrote that this Moon name refers to a different sort of "worm"—beetle larvae—which begin to emerge from the thawing bark of trees and other winter hideouts at this time.

There are quite a few names for the March Moon that speak to the transition from winter to spring. Some refer to the appearance (or reappearance) of certain animals, such as the **Eagle Moon**, **Goose Moon** (Algonquin, Cree), or **Crow Comes Back Moon** (Northern Ojibwe), while others refer to signs of the season:

- The **Sugar Moon** (Ojibwe) marks the time of year when the sap of sugar maples starts to flow.
- The **Wind Strong Moon** (Pueblo) refers to the strong windy days that come at this time of year.
- The **Sore Eyes Moon** (Dakota, Lakota, Assiniboine) highlights the blinding rays of sunlight that reflect off the melting snow of late winter.

March's full Moon often plays a role in religion, too. Specifically, in Christianity, this Moon is known as the **Lenten Moon** if it is the last full Moon of the winter season (i.e., if it occurs before the spring equinox) or as the Paschal Full Moon if it is the first full Moon of spring (i.e., if it occurs after the spring equinox). This year, March's full Moon (March 18, 2022) occurs before the spring equinox (March 20, 2022), making it the Lenten Moon. April's full Moon (April 16, 2022) will be the first full Moon to occur after the spring equinox and will therefore determine the date of Easter this year.

THE PLANETS THIS MONTH

MERCURY: Too close to the Sun this month – therefore "out of sight".

VENUS: A classical "morning star" and about as bright as it gets at magnitude -4.7.

MARS: has joined Venus in the morning sky but, at magnitude 1.1, is not quite as bright.

JUPITER: Will be too close to the morning Sun to be visible this month.

SATURN: Starts the month very close to the horizon before sunrise, so very difficult to spot. As the month goes on it will become more easy to see. At the end of the month it will feature in a conjunction with Venus and Mars.

If you time it right at the end of the month, for example if you are out on your early morning dog walk just before sunrise, you will be able to see a close conjunction of **Venus, Mars and Saturn**. They will be close to the eastern horizon so you will need a clear view. Shortly after the planets get lost in the Sun's glare, you will also have the spectacle of a rising, waning crescent Moon.

METEORS THIS MONTH

Another quiet month: no significant showers. But the **Lyrids** are coming in April!

ISS SIGHTING TIMETABLE

The timetable is kept up to date online at relatively short notice. Although the March sightings seem to be restricted to just the first few days of the month, it is possible that further sighting opportunities will be posted later. Keep fully up to date throughout the month by visiting the official website:

Newmarket, England, United Kingdom | Sighting Opportunity | Spot The Station | NASA

You can also sign up to receive daily alerts (email/text) notifying you of sighting opportunities on those days.

Date	Visible	Max Height*	Appears	Disappears
Tue Mar 1, 4:32 AM	3 min	57°	57° above ESE	10° above E
Wed Mar 2, 3:46 AM	1 min	19°	19° above E	10° above E
Wed Mar 2, 5:19 AM	5 min	82°	28° above W	10° above E
Thu Mar 3, 4:33 AM	3 min	74°	74° above ESE	10° above E
Fri Mar 4, 3:47 AM	1 min	23°	23° above E	10° above E
Fri Mar 4, 5:19 AM	5 min	66°	24° above W	10° above ESE
Sat Mar 5, 4:33 AM	3 min	76°	74° above SSE	10° above ESE
Sun Mar 6, 3:47 AM	1 min	23°	23° above E	10° above E
Sun Mar 6, 5:20 AM	5 min	42°	23° above W	10° above SE
Mon Mar 7, 4:34 AM	3 min	55°	54° above S	10° above ESE
Tue Mar 8, 3:48 AM	1 min	22°	22° above ESE	10° above ESE
Tue Mar 8, 5:21 AM	4 min	24°	17° above WSW	10° above SSE

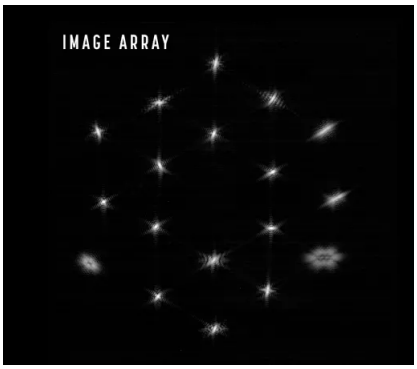
PRINCIPAL SOURCES OF INFORMATION

https://www.constellation-guide.com/constellation-list/leo-constellation/
https://www.timeanddate.com/moon/phases/uk/london?year=2022
https://www.timeanddate.com/astronomy/moon/worm.html
https://www.almanac.com/content/full-moon-march

JAMES WEBB SPACE TELESCOPE – update

JWST is now settled into its "orbit" around the Sun-Earth L2 point in space, about a million miles away. Much excitement was created on 18th February when NASA released the first image of a star to be taken by JWST. However, it was an image with a difference.....

JWST's main mirror comprises 18 individual hexagonal mirrors that each provide an image. Because these 18 mirrors are yet to be accurately aligned and focused, although JWST was pointed at a single star it rendered 18 separate images. The images could be related to each of the 18 mirrors and adjusted into the pattern of the main mirror – see the image on the right.



The next stage will be to complete the alignment of the 18 individual mirrors so that they each produce a sharp image, and then focus all 18 so that they produce a single, sharp image. This will be completed once JWST has finished its "cooling down" period and has attained the stable, cold temperature of deep space. After this, its instruments will be calibrated prior to beginning the scientific observations that are planned.

Much has been said about the fact that JWST will be able to look into deep space using its infrared sensors, thus enabling it to effectively look back into the past to within a few 100 thousand years after the *Big Bang*. However, JWST's powerful abilities will also be used to look for a category of interstellar object that, although long predicted, has only come to be observed in the last 5-6 years: these interstellar objects that come rushing through our solar system are actually from deep space and are not part of our own solar system. Where they originate is a mystery that JWST might be able to solve.

An artist's depiction of the interstellar object 'Oumuamua.
Image Credit: European Southern Observatory / M. Kornmesser

To date, scientists have spotted two: **'Oumuamua** in 2017 and **Comet Borisov** in 2018. But the James Webb Space Telescope is more powerful than anything in the sky during those two visits, plus it has the capacity to observe in infrared, a key skill. These objects appear unpredictably, so astronomers have to scramble to gather as many observations as possible during the brief period they're close enough to study. Fortunately, JWST should widen that window.

"The supreme sensitivity and power of Webb now present us with an unprecedented opportunity to investigate the chemical composition of these interstellar objects and find out so much more about their nature: where they come from, how they were made, and what they can tell us about the conditions present in their home systems," Martin Cordiner, principal investigator of the project, said in a statement. Cordiner is an astrophysicist at NASA's Goddard Space Flight Center in Maryland and at The Catholic University of America in Washington, D.C.

Specifically, the team would use infrared observations to study any gas and dust that the interstellar object is emitting, giving scientists a taste of the object's native system. *"The ability to study one of these and find out its composition — to really see material from around another planetary system close up — is truly an amazing thing,"* Cordiner said.

The object was officially named **1I/2017 U1** by the International Astronomical Union (IAU), which is responsible for granting official names to bodies in the solar system and beyond. In addition to the technical name, the Pan-STARRS team dubbed it **'Oumuamua** (pronounced oh MOO-uh MOO-uh), which is Hawaiian for *"a messenger from afar arriving first."* It was discovered Oct. 19, 2017 by the University of Hawaii's Pan-STARRS1 telescope, funded by NASA's Near-Earth Object Observations (NEOO) Program, which finds and tracks asteroids and comets in Earth's neighbourhood. While originally classified as a comet, observations revealed no signs of cometary activity after it slingshotted past the Sun on Sept. 9, 2017 at a blistering speed of 196,000 miles per hour (87.3 kilometres per second). It was briefly classified as an asteroid until new measurements found it was accelerating slightly, a sign it behaves more like a comet.

An interesting footnote is that before the official Hawaiian name 'Oumuamua was selected by the International Astronomical Union, a popular candidate choice was **Rama**. This was due to the arrival of 'Oumuamua being remarkably similar to a fictional story, *"Rendezvous with Rama"*, by the author Arthur C Clarke published in 1973. Clarke's Rama was a similarly shaped object, an unusually long and narrow cylindrical form, that turned out to be an artificial vehicle whose hollow interior contained an intriguing ecosystem. Supposedly constructed and operated by an alien civilisation from light years beyond our own solar system, the Ramans, we never get to actually meet them in the book.

There is no serious suggestion that 'Oumuamua was a huge, alien spacecraft....but perhaps it's worth a thought?!

https://www.jwst.nasa.gov/
https://www.space.com/news/live/james-webb-space-telescope-updates
https://solarsystem.nasa.gov/asteroids-comets-and-meteors/comets/oumuamua/in-depth/