St Benedict's NIGHT SKY NEWS – Oct 2022

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

SPECIAL EDITION: PARTIAL ECLIPSE OF THE SUN – Tuesday 25th October

On the morning of the 25th there will be a partial eclipse of the Sun which will be visible from the UK, Europe, western Russia, the Middle East, western Asia and northeast Africa. Here is a table of the timings for Bury St Edmunds:

Time	Phase	Event	Direction	Altitude
10:07:36 Tue, 25 Oct		Partial Eclipse begins The Moon touches the Sun's edge.	 140°	 17.7°
10:59:54 Tue, 25 Oct		Maximum Eclipse Moon is closest to the center of the Sun.	 153°	 22.0°
11:53:58 Tue, 25 Oct		Partial Eclipse ends The Moon leaves the Sun's edge.	 167°	 24.8°

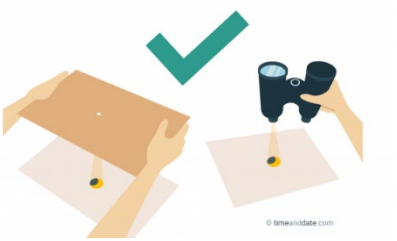
WARNING: NEVER LOOK DIRECTLY AT THE SUN
YOU CAN SERIOUSLY HURT YOUR EYES, AND EVEN GO BLIND

HOW NOT TO WATCH AN ECLIPSE OF THE SUN – THE FOLLOWING MATERIALS SHOULD NEVER BE USED:

- sunglasses of any kind
- colour film
- medical X-ray film
- smoked glass

The Sun can burn the retinas in the eyes leading to permanent damage or even blindness. This can occur even if your eyes are exposed to direct sunlight for just a few seconds.

HOW TO OBSERVE THE PARTIAL ECLIPSE SAFELY:



The only way to safely view the Sun – eclipsed or not – is to either **project** or **filter** the Sun's rays.

Projection works well. You can make your own box projector or use a telescope or binoculars. However, don't look through the telescope's eyepiece or side-mounted finder scope while projecting the Sun's image onto a screen.

The best way to **filter** the Sun's rays is to use properly certified **Eclipse Glasses**.

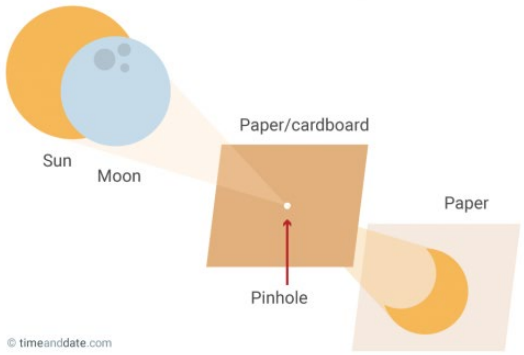
As long as your eclipse glasses or viewers are compliant with the ISO 12312-2 safety standard and the filters are not scratched, punctured, torn, or coming loose from their frames, you may reuse them indefinitely. Eclipse glasses, and eclipse viewers, block out 100% of harmful ultra-violet rays, 100% of infrared, and 99.999% of intense visible light, protecting your eyes and letting you view these spectacular natural phenomena. Eclipse viewing glasses allow you to view the Sun in its natural orange colour.

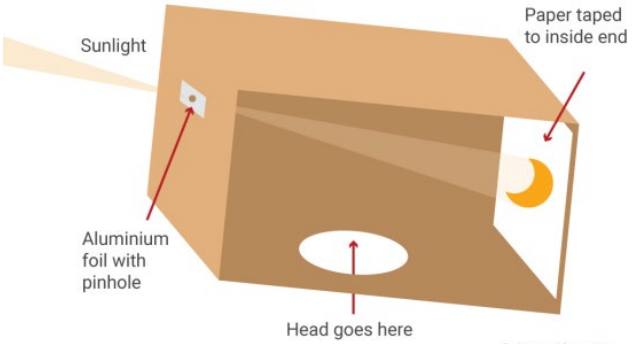
How to Use Eclipse Glasses

- Hold the eclipse glasses with two hands
- Stand with the front of your body toward the Sun, but look down
- Still looking down, put the eclipse glasses onto your face
- When they are securely fastened, raise your head and look up at the Sun

(Do not try to walk around wearing them – you will be completely in the dark!)

Instructions for making a box projector or a simple projector using two pieces of card, can be found here: https://www.timeanddate.com/eclipse/box-pinhole-projector.html

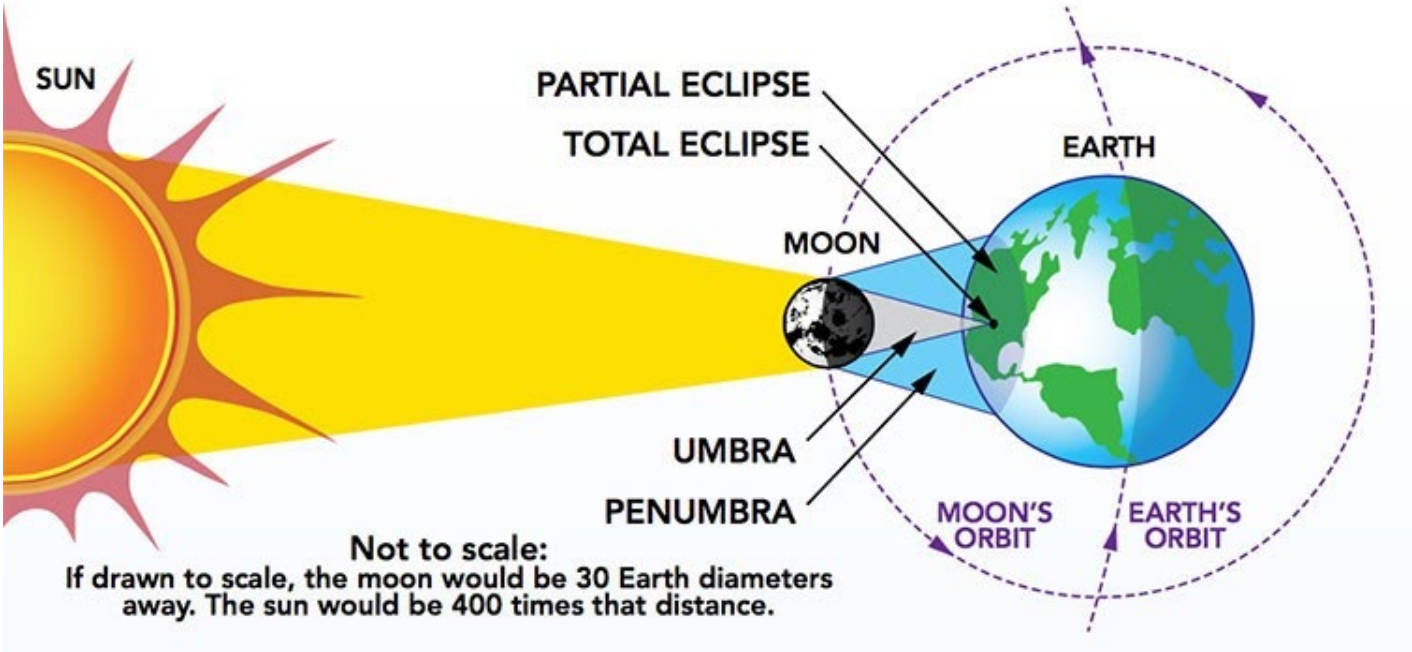




WHAT IS A PARTIAL ECLIPSE OF THE SUN?

A solar eclipse occurs when the Moon passes between the Sun and Earth. When the Sun, Moon and Earth line up exactly, it causes a Total Eclipse. This is because the diameter of the Sun is 400 times that of the Moon, but coincidentally it is also 400 times further away. During an eclipse, the Moon temporarily covers the Sun, blocking out the daylight for a short period and casting a shadow on part of Earth.

There are two parts to this shadow: the umbra, where sunlight is blocked completely and a total eclipse is experienced, and the **penumbra**, where only some sunlight is blocked and a **Partial Eclipse** is experienced.



For us, as observers on the Earth's surface, the amount of the Sun's disk that will be obscured will depend on exactly where we are. For example, at its maximum in Bury St Edmunds 17.3% of the Sun will be obscured (see table on page 1); in northern Scotland it will be 23%; in northern Spain it will be only 2%.

Solar eclipses only take place during a New Moon phase. This is because, from our perspective on Earth, during a solar eclipse the Sun is behind the Moon lighting up the side that we can't see, leaving the side facing us in darkness. Not every New Moon coincides with an eclipse, because the Sun, Moon and Earth need to line up in such a way that the Moon's shadow lands on our planet and this doesn't always happen. This is because the Moon's orbit around Earth is slightly inclined, by about 5 degrees, compared to Earth's orbit around the Sun.

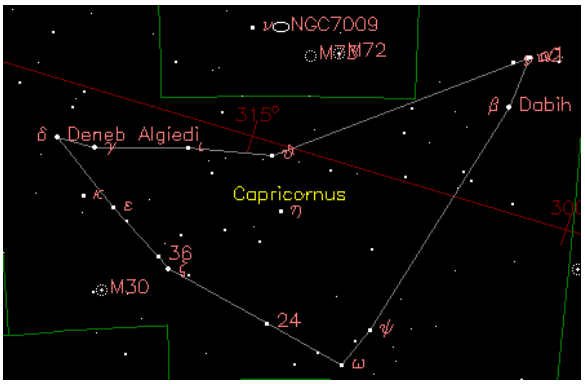
If the Moon, Sun and Earth align when the Moon is full, it causes a lunar eclipse. In this case, it is Earth that passes between the Sun and Moon and casts its shadow on the Moon.

https://www.timeanddate.com/eclipse/in/@2654186
https://www.nhm.ac.uk/discover/solar-eclipse-guide.html
https://www.timeanddate.com/eclipse/eclipse-tips-safety.html

STARS IN YOUR EYES

Keeping with the trend of featuring rather faint constellations that may still be known by their distinctive name, this month's constellation is **CAPRICORNUS**, sometimes referred to simply as Capricorn. Astrologers amongst us will know it as one of the 12 constellations of the **zodiac.** Like other zodiac constellations, Capricornus was first catalogued by the Greek astronomer Claudius Ptolemy in his Almagest in the 2nd century CE.

It is a faint constellation with only one star brighter than magnitude 3, so you will need exceptionally good, dark conditions to spot it – but this is a good challenge for stargazers! It is made easier to spot this month because the bright planet Saturn is within the constellation during the evening. Mid-month, at 8:30pm, stand facing due south. A little way to your left (east) will be the unmistakably bright Jupiter at just over 25 degrees elevation above the horizon. Move your gaze back directly to the south and there, a little lower in the sky, will be the slightly dimmer (but still bright) Saturn – the planet will be in the midst of the faint stars that make up Capricornus.



Delta (δ) Capricorni is the brightest star in Capricornus. It is a multiple star system with an apparent magnitude of 2.81, located at a distance of 38.70 light years from Earth. The primary component (Delta Capricorni Aa), formally named Deneb Algedi, is a giant star in an eclipsing binary system. The two components – δ Cap Aa and δ Cap Ab – orbit each other with a period of 1.022768 days. When the fainter star eclipses the giant, the system's visual magnitude drops by 0.24. When the giant eclipses the companion, the brightness decreases by 0.09 magnitudes. The system is classified as an Algol-type variable.

Capricornus is Latin for *"horned goat"* or *"goat horn"* or *"having horns like a goat's"*, and it is commonly represented in the form of a sea goat: a mythical creature that is half goat, half fish. The visible stars of the goat constellation form a pattern reminiscent of two horns, with the luminaries Deneb Algedi (δ) and Nashira (γ) marking one tip and Algedi (α^2) and Dabih (β) the other. The faint Omega (ω) Capricorni lies at the bottom of the triangular pattern.

Even though Capricornus is one of the faintest constellations in the sky, it is associated with myths and images that date back to the 21st century BCE. The story of Capricornus originated with the Babylonians and Sumerians. The Sumerians knew the constellation as the goat-fish, or SUHUR-MASH-HA, while Babylonian star catalogues compiled around 1000 BCE called it MUL.SUHUR.MAŠ, also meaning "goat fish." In the early Bronze Age, Capricornus marked the winter solstice and, in modern astrology, Capricorn's rule still begins on the first day of astronomical winter.

The Greeks associated the constellation with the forest deity Pan, who had the legs and horns of a goat. Crotus, his son, is usually associated with another amphibious creature, represented by the neighbouring constellation Sagittarius. Pan was placed in the sky by Zeus in gratitude for his coming to the other gods' rescue on several occasions. During the gods' war with the Titans, Pan helped scare the Titans away by blowing his conch shell. Later, he warned the gods that Typhon, a monster sent by Gaia to fight them, was approaching. He also suggested that gods disguise themselves as animals until the danger passed. In the myth, Pan eluded the monster himself by jumping into the river Nile and turning the lower part of his body into that of a fish. Zeus eventually struck down Typhon with his thunderbolts. In reference to the myth, Capricornus is still often depicted as a goat with the tail of a fish.

In another story, Capricornus is identified as Amalthea, the goat that suckled Zeus when he was an infant, hiding from his father Cronos. Cronos had devoured his other children, all future gods and goddesses, because of a prophecy that said that he would be overthrown by one of them.

https://www.constellation-guide.com/constellation-list/capricornus-constellation/

THE MOON THIS MONTH

PHASE

1st Quarter	3rd
Full Moon	9th
3rd Quarter	17th
New Moon	25th

This month's Full Moon is known as the **Hunter's Moon**. There are many stories surrounding the names of the moons, including the Hunter's Moon. From a practical standpoint, the Harvest Moon and subsequent Hunter's Moon provided light in the evenings for farmers and hunters to finish their tasks.

https://earthsky.org/moon-phases/hunters-harvest-october-full-moon/

THE PLANETS THIS MONTH

MERCURY: It's there in the morning sky but very low and soon lost in the Sun's glare.

VENUS: Bright morning planet, rises 40 minutes before sunrise at start of October, lost soon thereafter.

MARS: Rises in the east late evening, following Jupiter and Saturn across the southern sky.

JUPITER: Very bright quite high to the south east in the evening. Passes close to the nearly Full Moon on the 8th.

SATURN: Seen almost due south in the evening, lower in the sky than Jupiter.

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

METEORS THIS MONTH

There are two significant showers that peak this month: first, the **Draconids** (8-9 Oct) and later the **Orionids** (21-22 Oct). The predicted hourly rate at maximum is 10 for the former and 25 for the latter.

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

ISS SIGHTING TIMETABLE

For the most up to date timetable of sightings, visit....

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