



STARGAZING LIVE.

MOON GUIDE



The Open
University



THE MOON

The Moon is our nearest neighbour in space. It is a stark, barren world with no atmosphere and measures 2,160 miles across. It lies approximately 239,000 miles from Earth, and is big, bright and easy to find when it is in the night sky.

Through binoculars or a telescope, the best views to be had are close to the terminator – the line that divides the sunlit portion of the Moon's surface from the unlit part. Features such as craters cast impressive shadows when they are close to the terminator, making them much easier to see.

The dark patches visible on the Moon's surface are known as seas (or maria) but are nothing like Earth's seas. On the Moon they are vast fields of solidified lava from ancient volcanic eruptions.

DID YOU KNOW?

It takes 29.5 days for the Moon to go through a complete set of phases, which is the basis of the length of our months – the word for which derives from moon.



PHASES OF THE MOON



The Moon's rotation keeps pace with its orbit round the Earth, which means that the same side of the Moon (the near side) faces the Earth at all times. The amount of the illuminated surface we can see from Earth changes as the Moon moves round the Earth and gives us the lunar phases.

BEST TIMES TO SEE

- 1 Spring, early evening
- 2 Winter, middle of the night
- 3 Autumn, early morning



WHAT YOU CAN EXPECT TO SEE

The detail you'll see depends on the equipment you use. For the most detailed view the best time to look at the Moon is when it's not full.

1 NAKED EYE

Moon phases and lunar maria.

2 BINOCULARS OR SMALL TELESCOPE

Maria, large craters, mountain ranges and valleys.

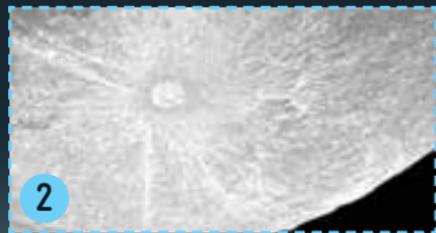
3 LARGE TELESCOPE

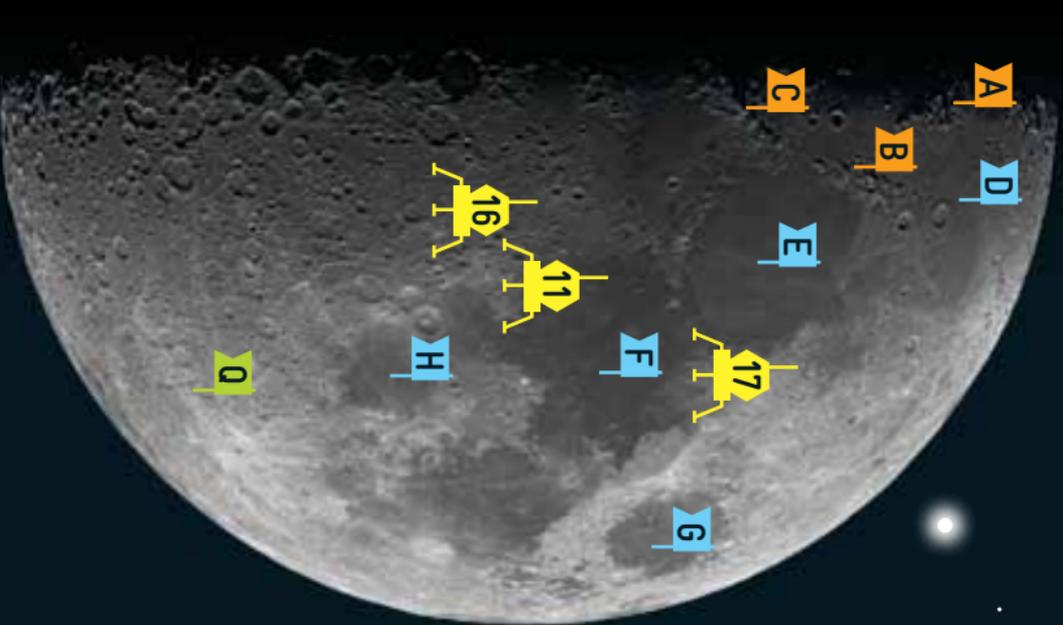
Details within craters, cracks in the Moon's surface, mountains and sinuous rilles (channels).



FEATURES OF THE MOON'S SURFACE

- 1 Craters are the result of impacts by asteroids and comets on the Moon's surface. Large craters often contain a central mountain complex like Aristillus (right). The largest craters are hundreds of miles across.
- 2 Relatively new craters sit in the centre of bright rays, which show up best when the Sun is overhead. These are formed by material blasted out from the impact that formed the crater.
- 3 There are lots of mountains on the Moon. Some poke up through flat lava as single peaks, while others occur in vast ranges. The Moon has Alps too, as the lunar ranges take their names from those on Earth.





MOON ATLAS

FIRST QUARTER MOON

MOUNTAINS SEAS

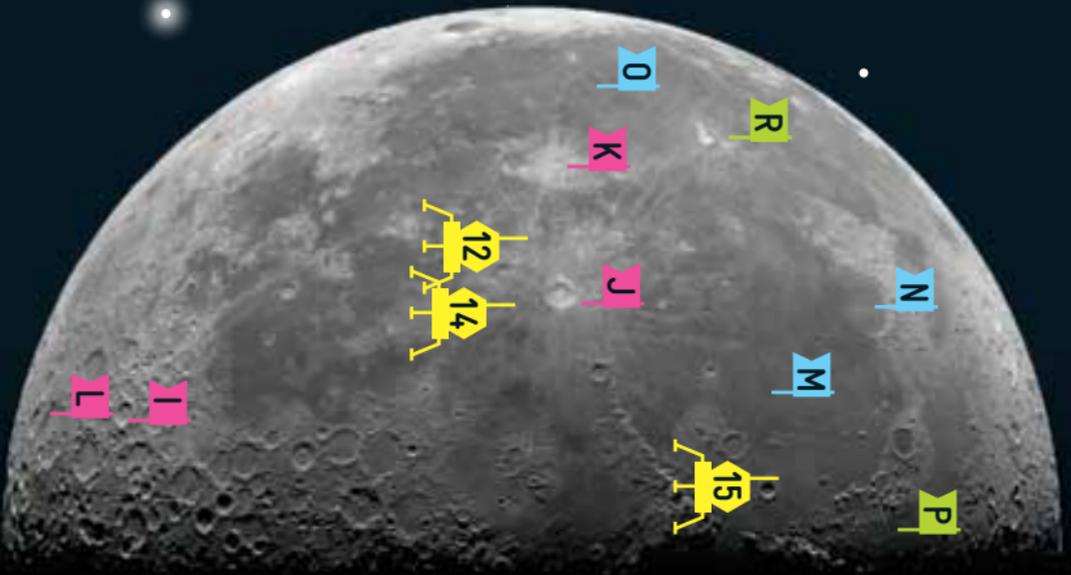
- A Alps
- B Apennines
- C Caucasus

- D Mare Frigoris
- E Mare Serenitatis
- F Mare Tranquillitatis

- G Mare Crisium
- H Mare Nectaris

 Apollo landings

Rotate and start to explore some
of the Moon's landmarks



LAST QUARTER MOON

CRATERS

- I Tycho
- J Copernicus
- K Kepler
- L Clavius

SEAS

- M Mare Imbrium
- N Sinus Iridum
- O Oceanus Procellarum

VALLEYS

- P Vallis Alpes
- Q Vallis Rheieta
- R Vallis Schröteri

OTHER MOONS IN OUR SOLAR SYSTEM

The Moon is the Earth's only natural satellite. Apart from Mercury and Venus, all the other planets in the Solar System have their own moons.

Jupiter has more than 60 but only four can be seen easily through a small telescope. These are known as the Galilean moons in honour of their discovery by Galileo Galilei in 1610.

In order of distance from Jupiter, the Galilean moons are Io, Europa, Ganymede and Callisto. Ganymede is the largest moon in the Solar System. With a diameter of 3,273 miles, it's larger than the planet Mercury!

FIND OUT MORE

Has the Moon grabbed your attention? Explore our nearest neighbour with The Open University's free online study material about the Moon. Go to [bbc.co.uk/stargazing](https://www.bbc.co.uk/stargazing) and follow the links.



MOON-SPOTTING CHALLENGE

In 2012, Jupiter starts the year in the constellation of Aries and later moves to Taurus. Saturn starts the year in Virgo and ends it in Libra. Flip to our Star Guide to find these constellations.

- 1** Using binoculars, can you spot the Galilean moons around Jupiter? Take a look two hours later – you may see that they have moved slightly as they progress around their orbit. This is what prompted Galileo to accept that the planets orbit the Sun in the same way.
- 2** Saturn also has more than 60 moons, a number of which can be seen through small telescopes. Saturn's largest moon, Titan, has a dense atmosphere and is the second largest moon in the Solar System.



JUPITER'S GALILEAN MOONS



SATURN AND ITS MOONS