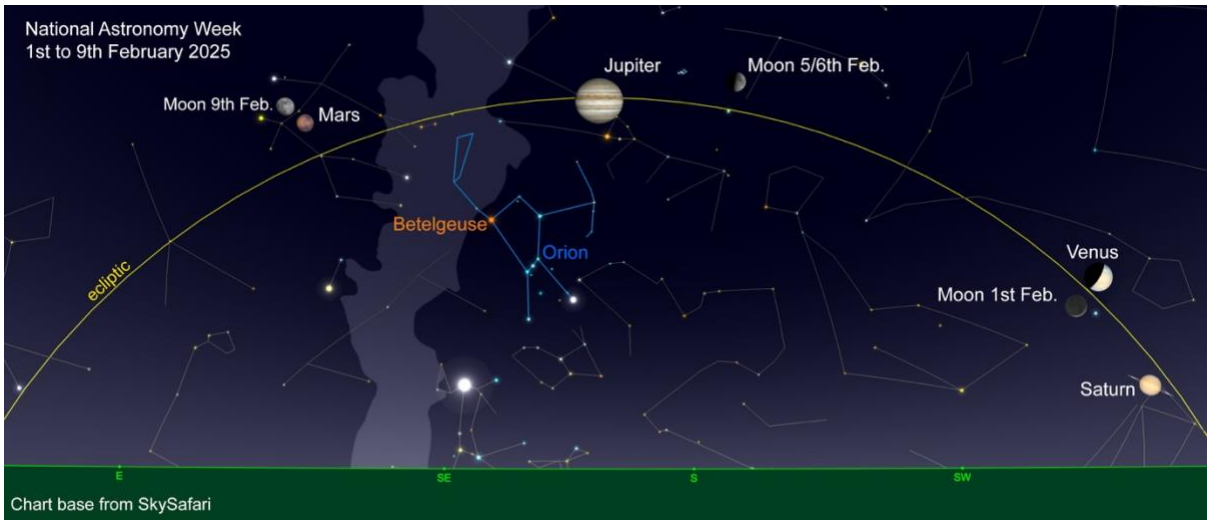
The 1st to 9th February is National Astronomy Week, so we have selected five stargazing challenges for you!



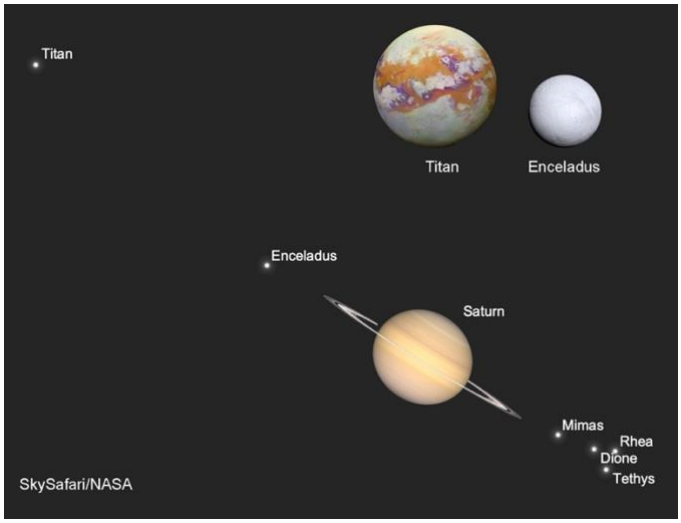
Challenge 1

1st February Moon, Venus and Saturn

Early evening, just after dusk, look towards the south-west, near to the horizon and you will spot an elegant Crescent Moon with the planets Venus above and Saturn below, both easily visible with the naked eye. Venus is very bright because its thick cloud cover reflects the sunlight, making it the third-brightest object in the sky. It is also the most inhospitable of the rocky planets, with crushing pressures equal to a kilometre of water above your head, temperatures hot enough to melt lead and sulfuric acid rain.

Saturn is the second-largest gas giant planet and has a distinctive ring system, which was first noticed by Galileo, who famously described them as looking like “ears” to the planet. He did not actually think they were ears but was puzzled by what they were. They are a collection of thousands of ringlets made from a mix of ice and dust, of only about 20 metres average thickness. With a pair of binoculars, you should be able to see the faint line of Saturn’s ring system, currently visible end-on.

Saturn has the most known moons, currently totalling 146, one of which, Titan, is larger than the planet Mercury. Titan is the only other world known to have liquid on the surface; it has lakes and seas of liquid hydrocarbons. The Dragonfly mission, due to launch in 2028, is going to visit Titan and fly over the surface.

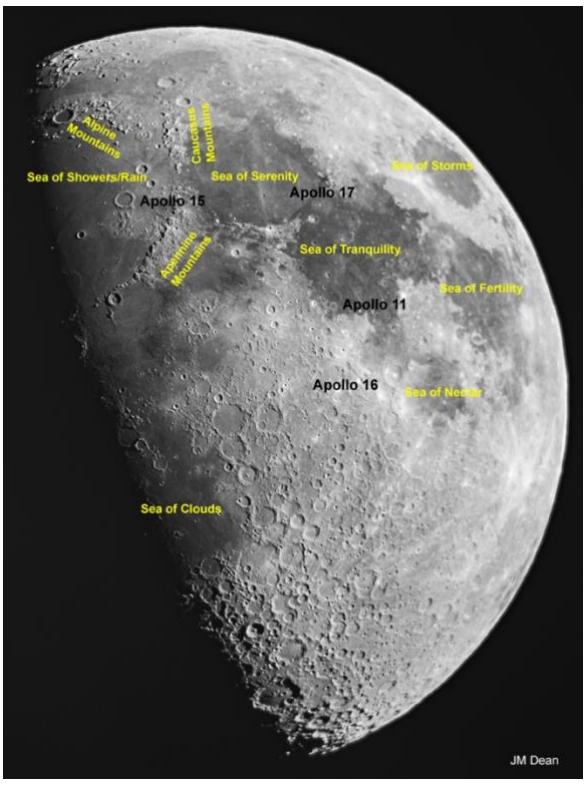


Challenge 2

2nd February Constellation of Orion

Look towards the south and find the constellation of Orion, the Hunter. Look for the star Betelgeuse (often pronounced "beetle juice") on Orion's shoulder. This is a blazing red supergiant star and is one of the brightest stars in the night sky. The star is about 700 light-years away from Earth, so we are seeing light that is 700 years old. It is also about 700 times the size of our sun. If we were to place it at the centre of our Solar System, it would stretch past Jupiter's orbit. It is thought that Betelgeuse is nearing the end of its life and may soon (astronomically speaking) violently explode as a supernova when it will be visible in the daytime sky for a brief period. Some of the heavier elements in our bodies originate from supernova explosions.

While the sky is still dark because the Moon is a thin crescent, look for Orion's Belt and Sword below, where you will be able to see a small "fuzzy" patch. If you have binoculars, have a look and you will see a faint cloud. It is the Orion Nebula, which is one of the closest star-forming regions to Earth and comprises interstellar gas and dust. It is a nebulous cloud like this, that our Solar System is made from and where many of the lighter elements in our bodies originate – so we are made from stardust!



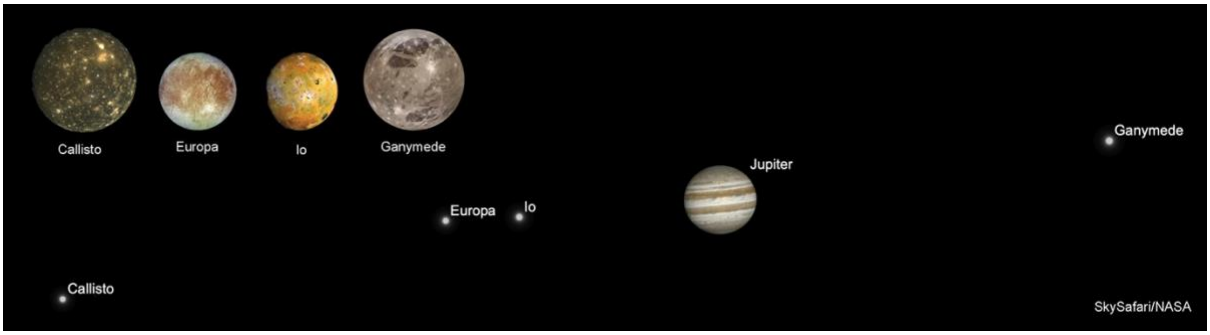
Challenge 3

5th February First Quarter Moon

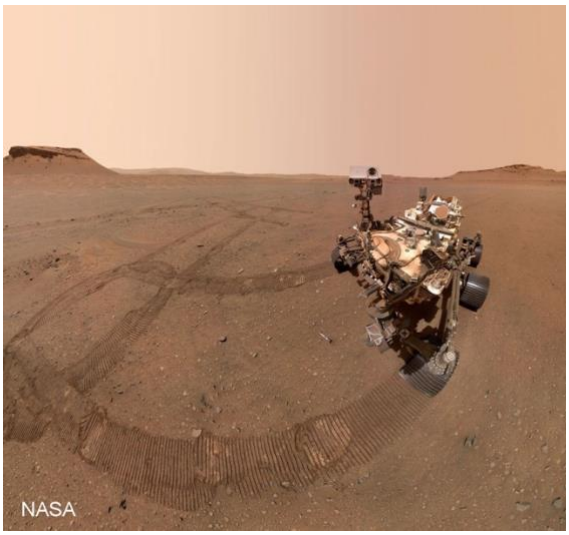
Now you have found the Moon, try to observe it throughout February. On the 5th, it is the First Quarter Moon. You should see some large darker regions. Ancient astronomers thought these were oceans and so gave them the name *mare*. Look for *Mare Serenitatis*, or Sea of Serenity. Then look for *Mare Tranquillitatis* or Sea of Tranquillity, which is where Apollo 11 landed, and Neil Armstrong became the first man to walk on the Moon. Next, look around the line between the illuminated and dark portions – this line is called the "terminator". If you view with binoculars, you will see some wonderful detail as the shadows create a 3-dimensional effect on the craters.

Challenge 4
6th February The Moon and Jupiter
Look for the Moon and Jupiter close together in the night sky. Jupiter is the largest planet in our Solar System. If we could squash together all the other planets, moons and asteroids in the Solar System, Jupiter would still be 2 ½ times bigger. Like Saturn, it is a gas giant and if you were looking for somewhere solid to stand on the planet, you would fall through thousands of miles of gas before finding anywhere solid.

Jupiter has 95 moons, and four of these, called the Galilean Moons, were the first objects to be discovered with a telescope in 1610, by Galileo. They are Io, Ganymede, Callisto and Europa. Ganymede is larger than the planet Mercury, while Europa is thought to have a global ocean similar to the Earth's ocean, beneath a crust of ice. Two missions are on their way to explore Jupiter and its moons, the Europa Clipper and JUICE. One of the tasks is to see if the oceans might support life. With binoculars, you should be able to see the Galilean Moons orbiting Jupiter like a smaller version of a solar system.



Challenge 5
9th February The Moon and Mars
Look towards the east to see a much fuller Moon and the unmistakable red Mars. In the early 20th Century, people believed there were canals on Mars and thought the planet was inhabited by Martians. We now know of course that is not true. However, we do know Mars was once a water world, not dissimilar to Earth. Unfortunately, it lost its oceans to space about 3 billion years ago, becoming a frozen, dusty desert-like environment. But by the time Mars lost its oceans, life had begun on Earth, so astronomers are keen to investigate whether life did evolve on Mars and if there could even today be some microbial life still present in the frozen water beneath the surface.



Mars is the most explored planet in our Solar System and is currently home to the Curiosity and Perseverance Rovers, who like to take selfies!

Clear Skies and Good Luck!