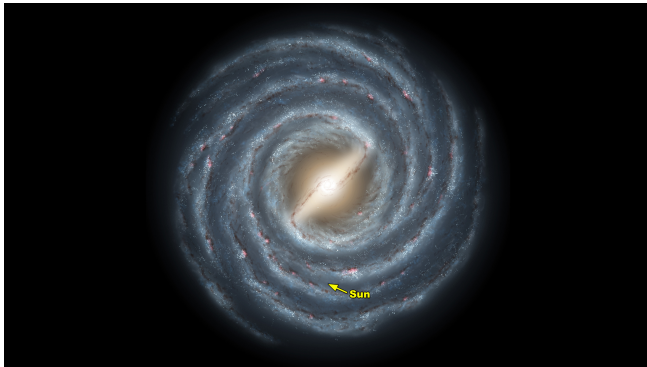


## 8.1 The Solar System

The Solar System consists of the Sun and objects in motion around the Sun. Objects are kept in orbit around the Sun by the force of gravity. The Sun is a 'main sequence' star (one that is fusing hydrogen in its core). The fusion of hydrogen releases a vast amount of energy which causes the star to shine.

(1) *As well as light, what else does the Sun emit?*



The Sun is one of around 300 billion stars in our galaxy called the Milky Way. The image, left is an artist's impression of the Milky Way as viewed from several hundred thousand light years away, looking down. The Milky Way is disk shaped.

As we are inside the Milky way we see the disk of stars edge on which means that stars are concentrated in a path across the sky.

The Milky way is just one of 100 billion galaxies in the visible universe.

(2) *All the stars that we see in the night sky are from our own galaxy.*

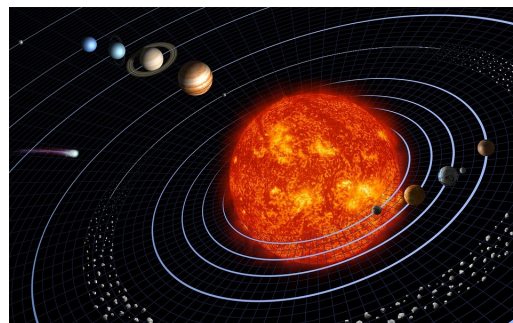
*Why don't we observe individual stars in other galaxies?*



### The planets

There are eight planets, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

One way to remember the order of planets is:



**My Very Educated Mother Just Served Us Noodles**

Pluto (once classified as a planet) is now known as a 'dwarf planet. The four inner planets are rocky planets, because they have a rocky surface.

(3) *List the four, inner, rocky planets.*

The outer four planets are much larger and principally made of gas. They are referred to as 'gas giants'.

(4) *List the four, outer, gas giant planets.*

The planets orbit the Sun in elliptical orbits which are close to being circular.

(5) *What could happen if the planets had much more elliptical orbits?*

## Moons

Apart from Mercury and Venus, all the planets have moons in orbit around them. Earth has one moon – the Moon!

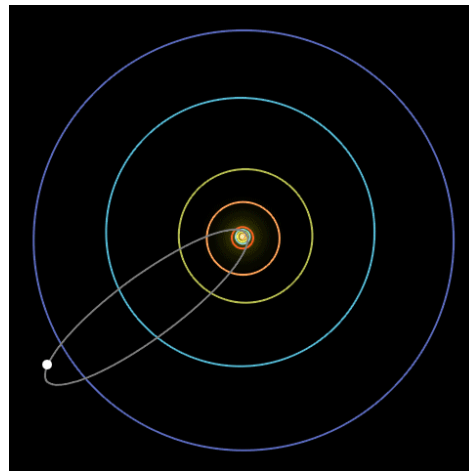
(6) *What force keeps moons in orbit around a planet?*

## Other objects orbiting the Sun

Asteroids are lumps of rock which lie in a broad belt between the orbits of Mars and Jupiter (called the 'asteroid belt').

Comets are lumps of ice and rock. They originate beyond the orbit of Neptune. They tend to orbit the Sun in very elliptical orbits.

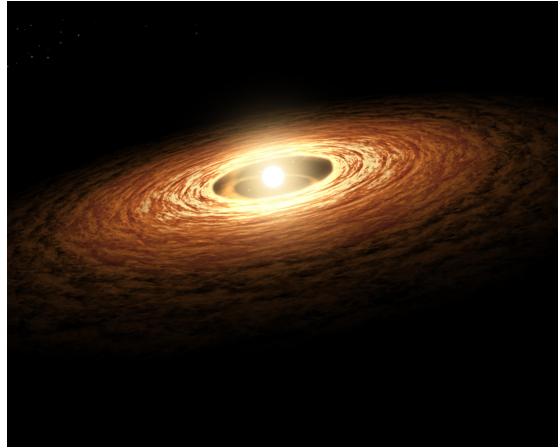
When they are close to the Sun, they develop characteristic gas and dust tails.



(7) *Why does a comet develop a tail when it is close to the Sun?*

## Origin of the Solar System

The solar system developed 4.6 billion years ago. A cloud of dust and gas collapsed due to the attractive force of gravity. This spinning clump of dust and gas formed a disk shape. At the centre of the disk, where temperatures and pressures increased to a high enough temperature, nuclear fusion started and a star (the Sun) was born. The remaining dust and gas formed into clumps and eventually planets were formed.



(8) *Why do you think the planets orbit the Sun in the same direction?*