

ASTRONOMY



A LOOK AT OUR SOLAR SYSTEM AND BEYOND

The Solar System is full of many different things including, planets, moons, asteroids, comets, minor planets and lots of other exciting things. We have the Inner Solar System which has Mercury, Venus, Earth and Mars. These are closest to the sun and are called the 'terrestrial' planets; this is because they have very hard rocky surfaces. The Outer Solar System includes Jupiter, Saturn, Uranus and Neptune these are often called 'gas giants'. If you were to keep travelling out past Neptune you would come across the small planet 'Pluto', this planet has a hard icy surface. Pluto is often not classified as a planet like the rest of them due to its size; it is quite a lot smaller than the rest. The Inner Solar System and the Outer Solar System are separated by an asteroid belt.



Everything that is within the Solar System orbits or moves around the Sun. To demonstrate how big the sun is, it contains 98% of all the material in the entire Solar System. When in space the larger an object is, the more gravity it will have, as the Sun is so large it has a huge powerful gravity which pulls all the other objects in the Solar System towards it. However as the objects are being pulled towards the sun at a very fast pace, they are also trying to push themselves away from the sun as well. By the planets trying to push themselves away at the same time as the Sun is trying to pull them in they become trapped half-way in between, and stay at the same distance orbiting around the Sun.

HOW DID THE SOLAR SYSTEM FORM?

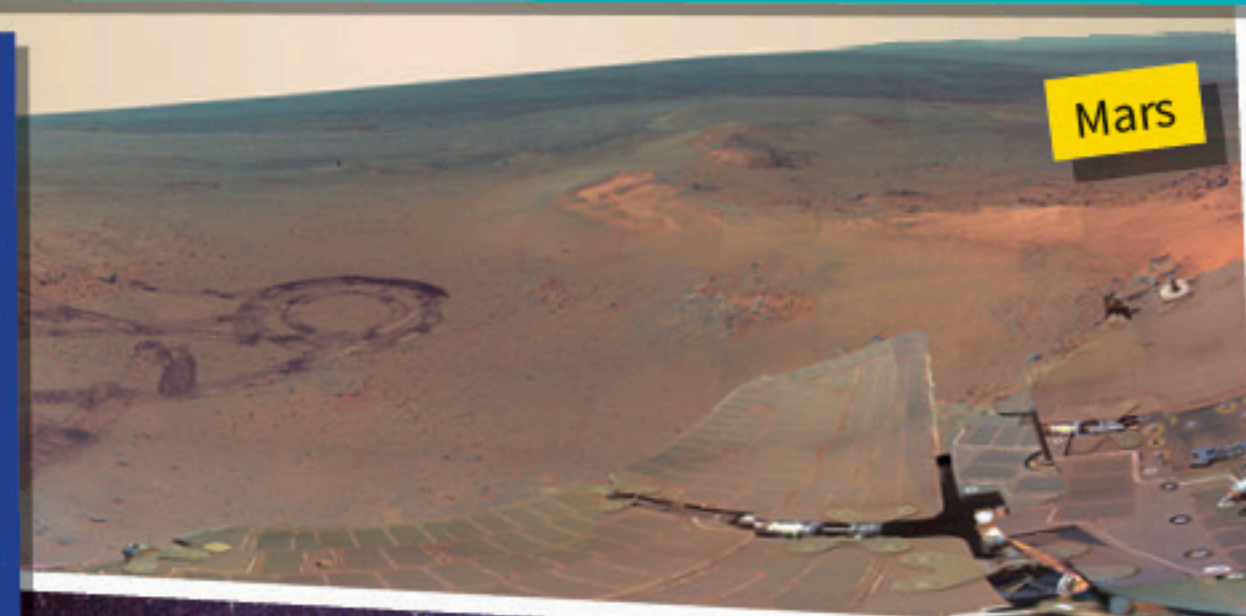
Our solar system formed about 4.5 billion years ago from a dense cloud of interstellar gas and dust. The cloud collapsed, possibly due to the shockwave of a nearby exploding star, called a supernova. When this dust cloud collapsed, it formed a solar nebula—a spinning, swirling disk of material.

At the center, gravity pulled more and more material in. Eventually the pressure in the core was so great that hydrogen atoms began to combine and form helium, releasing a tremendous amount of energy. With that, our Sun was born, and it eventually amassed more than 99 percent of the available matter.

Matter farther out in the disk was also clumping together. These clumps smashed into one another, forming larger and larger objects. Some of them grew big enough for their gravity to shape them into spheres, becoming planets, dwarf planets and large moons. In other cases, planets did not form: the asteroid belt is made of bits and pieces of the early solar system that could never quite come together into a planet. Other smaller leftover pieces became asteroids, comets, meteoroids, and small, irregular moons.

THE SOLAR SYSTEM HAS OVER 100 WORLDS

Within our Solar System there are only eight planets. However, the Solar System is made up of over 100 worlds. Some of these minor planets and moons are actually larger than the planet Mercury. The names of some of these moons are 'Io', which has active volcanoes. 'Europa' which has a liquid water ocean, while the moon 'Titan' has lakes, rivers, and oceans of liquid Methane.



COMETS

Comets are thought to have been bits of debris from early solar systems when they were forming. Comets are made of dust, rocks, organic compounds, and ice. Comets are made up of three different sections: nucleus, coma, and tail. A comet nucleus can range in size from 1 kilometre to 25 kilometres across. The longest comet tail, which measured over 570 million kilometres, was the Comet 'Hyakutake' which was recorded in May 1996. Astronomers believe there could be as many as one trillion comets.



STARS

There are several different kinds of stars in the sky. Some of them have been known to be 100 to 200 times larger than the sun. Some very old stars are smaller than the Earth. Scientists study stars and place them in groups based on what their characteristics are.

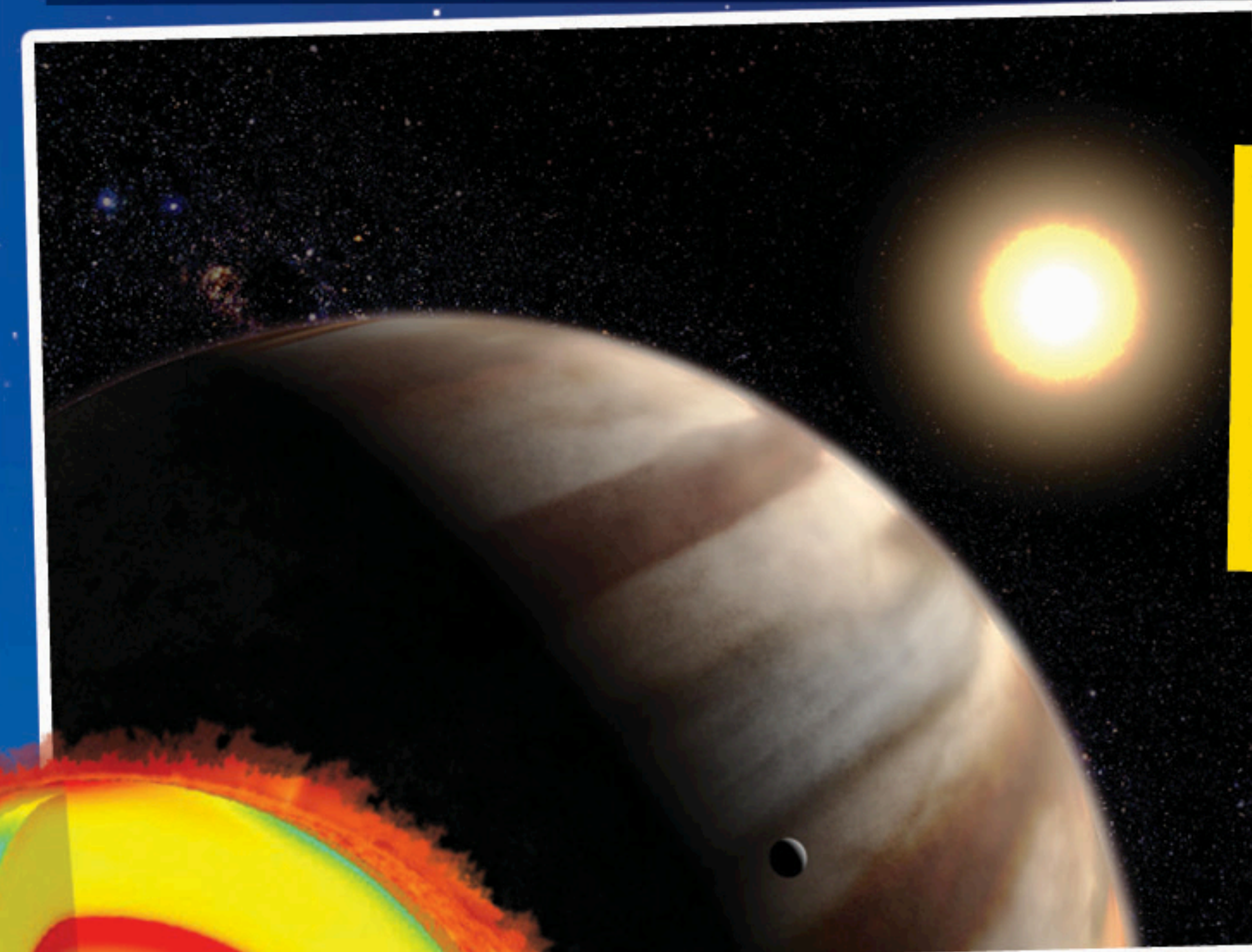
RED DWARF

Red Dwarf stars are smaller than our sun, due to them being smaller; these stars burn their fuel very slowly, this allows them to live for a very long time. With them burning so slowly, they do not shine as bright as other stars. Some red dwarf stars will live trillions of years before they run out of fuel. They are not very hot compared to other stars, the name came from the idea of what a fire looks like, the coolest part of the fire is at the top of the flame which glows red, the hotter part of the flame which is in the middle glows yellow, and the hottest part near the bottom of the flame glows blue. The colour of stars work in the same way, the temperate of them determines what colour they are going to be. The Red dwarf stars are the most common type of star in outer space. However, it is very hard to see them in the sky, this is because they are so small and make very little light.



YELLOW STAR

A Yellow Star is a medium-sized star and are yellow because they have a medium temperature. As they have a higher temperature than a Red Dwarf star they burn their fuel faster. This means they will not live as long as a Red Dwarf. When they get close to the end of their lives these medium-sized stars swell up, becoming very large.

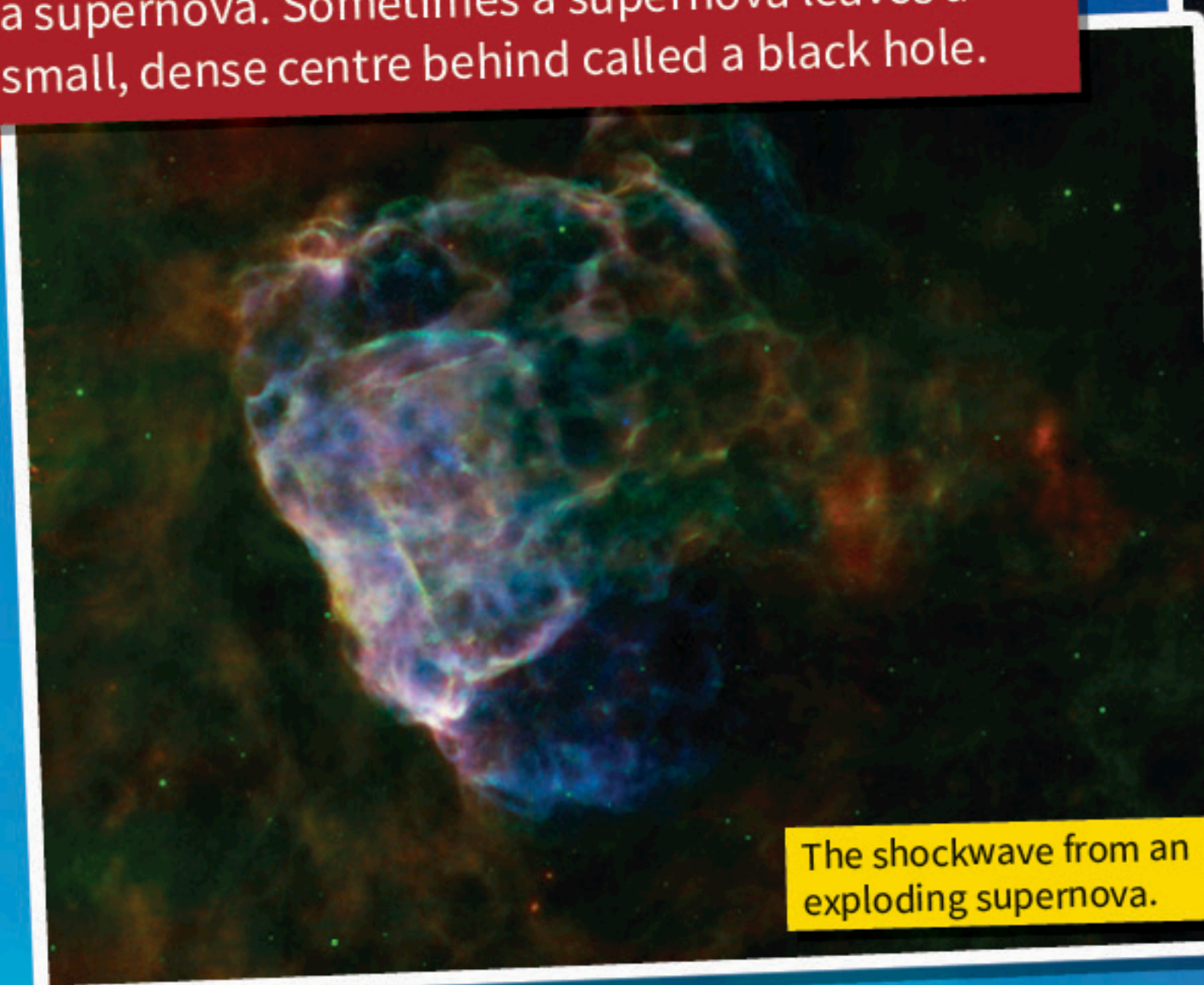


DID YOU KNOW?



Stars radiate energy created from nuclear fusion, which is a process that takes place in a star's core and involves hydrogen fusing (burning) to make helium.

Some stars go out with a brilliant explosion, called a supernova. Sometimes a supernova leaves a small, dense centre behind called a black hole.



The shockwave from an exploding supernova.

The Milky Way Galaxy



There are approximately 200-400 billion stars in our Milky Way Galaxy alone.

According to best estimates, there are around 100 billion galaxies in the observable universe.

A star is a massive, bright, sphere of very hot gas called plasma which is held together by its own gravity.

Stars are usually between 1 and 10 billion years old. Some stars may even be close to the age of the observed Universe at nearly 13.8 billion years old.

