



The Ringed World of Saturn

Saturn is the sixth planet from the Sun. Because it is so far from the Sun, it doesn't get much sunlight and it is very, very, very cold! It is much sunnier and warmer on Earth. Don't worry about getting a sunburn on Saturn!

Saturn moves much slower in its orbit around the Sun than Earth does. It takes Earth one whole year — 365 days — to go all the way around the Sun. But it takes Saturn almost 30 Earth years to go all the way around the Sun! That's a long, long time.

The first thing most people notice about Saturn is its very special rings. They are very, very big. Saturn is far, far away from us — so far, in fact, that Saturn looks a lot like a small speck of light in the sky. While the Cassini spacecraft is close to Saturn and its rings, we are finding many new things about Saturn and what is around it.

Let's begin our trip to Saturn.

Imagine you are the Cassini spacecraft and you have been on the very, very long trip to Saturn. The trip from Earth to Saturn takes about 7 years, traveling day and night! Space is a very, very big place! After being in space for all that time, you see a beautiful planet in the distance. As you get closer, you realize it is a huge gas planet with rings. What do you think it is? It's Saturn!

First Stop — The Rings

You might think there are only two rings around Saturn, but hundreds of rings form the ring system of Saturn. Scientists use letters to name the rings, and they have named 7 ring zones so far. We can see some of the rings from Earth using telescopes. We can observe the outer zone, called the A ring, and the brighter, inner zone called the B ring. The big space between the A and B rings is called the Cassini Division.

The rings are very wide, but very thin! Some of the rings look like they are braided — they are pretty complicated. Some of the rings even look twisted. There are also some small moons in the rings.

The rings are made mostly of chunks of water ice and ice-covered rock. Some of the chunks are small and some are pretty big — some are the size of a grain of sand, some are as big as a house. The rings do not stay in one place, but orbit Saturn, just like Earth orbits the Sun. Things are really moving in space!

Saturn's Surface

Saturn is covered with thick clouds. The top layer of the clouds is very cold. We have seen big storms in Saturn's clouds. It is very windy on Saturn. The clouds move and make Saturn look striped. The moving clouds give Saturn the swirling yellow and gold cloud bands that we see. Saturn also has big white spots. Scientists think the white spots may be big storms.

Now let's look past the clouds at Saturn's core and its gas layers.

Saturn's Core

The very center of Saturn is called the core. The core is metallic — iron — surrounded by molten rock. Molten means melted — the center is made of liquid rock. Earth's core is also made of molten rock. Why do you think it is liquid rock? The reason is, it is very, very hot and rock that is so hot melts into a liquid, like lava from volcanoes here on Earth.

Saturn's Inner Layer — Metallic Hydrogen Gas

Except for the core, Saturn is made of lots of gas. One of the inner layers of Saturn is made of a gas or liquid called hydrogen (when it is hot and deep inside the planet there is no difference between gas and liquid). Don't forget we are still pretty close to the core of Saturn and it is very, very hot! Saturn isn't very dense because it is made mostly of hydrogen. If you ever got close to Saturn, you could put your hand right through it. Remember, Saturn is not solid like Earth, but a big ball of gas and liquid. You would sink into Saturn if you ever visited it. Scientists want to know more about the gases on Saturn.

Saturn's Outer Layer — Hydrogen Gas

We find hydrogen gas in lots of places in the solar system. Not all parts of Saturn move at the same speed. When Earth spins, it all moves together because it is solid. (Remember, the water in the ocean is sloshing around on solid ground!) When Saturn spins, some parts move faster and some parts move slower — because it is made of gas. Isn't that surprising?

Saturn's Neighbors

Saturn is not in space all by itself. Many icy, frozen moons orbit around Saturn. Some of the moons are in the rings, but most of them are a little farther from Saturn. Earth has only one moon, but Saturn has more than 60 moons. It's kind of crowded up there with all those moons. Saturn's biggest moon is named Titan.

Can you think of something else that is in the sky? (Hint — we see them twinkle at night.) Stars! The stars are really far away from Saturn, but we can still see their light as they shine in the sky.