

Essay on Saturn – The Most Beautiful Planet

Saturn is the sixth planet from the Sun and is the second-largest in the solar system with an equatorial diameter of 1,19,300 kilometers (74,130 miles). Much of what is known about the planet is due to the Voyager explorations in 1980-81. Saturn is visibly flattened at the poles, a result of the very fast rotation of the planet on its axis. Its day is 10 hours, 39 minutes long and it takes 29.5 Earth years to revolve around the Sun. The atmosphere is primarily composed of hydrogen with small amounts of helium and methane. Saturn is the only planet less dense than water (about 30 percent less). Saturn's hazy yellow hue is marked by broad atmospheric banding similar to, but fainter than that found on Jupiter.'

The wind blows at high speed on Saturn. Near the equator, it reaches velocities of 500 meters a second (1,100 miles an hour). The wind blows mostly in an easterly direction. The strongest winds are found near the equator and velocity falls off uniformly at higher latitudes. At latitudes greater than 35 degrees, winds alternate east and west as latitude increases.

Saturn's ring system makes the planet one of the most beautiful objects in the solar system. The rings are split into a number of different parts which include the bright A and B rings and a fainter C ring. Space probes have shown that the main rings are really made up of a large number of narrow ringlets. The origin of the rings is obscure. It is thought that the rings may have been formed from larger moons that were shattered by impacts of comets and meteoroids. Radial, spoke-like features in the broad B-ring were also found by the Voyagers. The features are believed to be composed of fine, dust-

size particles. The spokes were observed to form and dissipate in the time-lapse images taken by the Voyagers.

Saturn has 18 named satellites and more than a dozen of newly reported satellites that have been given provisional designations till they are verified and named.

In one of nature's most dramatic examples of "now-you see-them, now-you-don't," NASA's Hubble Space Telescope captured Saturn on May 22, 1995, as the planet's magnificent ring system turned edge-on. This ring-plane crossing occurs approximately every 15 years when the Earth passes through Saturn's ring plane.

The rings do not disappear completely because the edge of the rings reflects sunlight. The dark band across the middle of Saturn is the shadow of the rings cast on the planet (the Sun is almost 3 degrees above the ring plane.) The bright stripe directly above the ring shadow is caused by sunlight reflected off the rings onto Saturn's atmosphere.

An image, taken by the Hubble Space Telescope, shows a rare storm that appears as a white arrowhead-shaped feature near the planet's equator. The storm is generated by an upwelling of warmer air, similar to a terrestrial thunderhead. The Hubble images are sharp enough to reveal that Saturn's prevailing winds shape a dark "wedge" that eats into the western (left) side of the bright central cloud. The planet's strongest eastward winds, clocked at 1,600 kilometers (1,000 miles) per hour based on Voyager spacecraft images taken in 1980-81, are at the latitude of the wedge. The storm's white clouds are ammonia ice crystals that form when an upward flow of warmer gases shoves its way through Saturn's frigid cloud tops.

The top image shows the first image ever taken of bright aurorae at

Saturn's northern and southern poles as seen in far-ultraviolet light by the Hubble Space Telescope. Hubble resolves a luminous, circular band centered on the north pole, where an enormous auroral curtain rises as far as 2,000 kilometers (1,200 miles) above the cloud tops.

For comparison, the bottom image is a visible-light color composite of Saturn as seen by Hubble on December 1, 1994 pieces of evidence that unlike the ultraviolet image, Saturn's familiar atmospheric belts and zones are clearly seen. The lower cloud deck is not visible at UV wavelengths because sunlight is reflected from higher in the atmosphere.

Last View of Saturn :

Two days after its encounter with Saturn, Voyager-1 looked back on the planet from a distance of more than 5.0 million kilometers (3.0 million miles). This view of Saturn has never been seen by an earth-based telescope, since the earth is so close to the Sun only the sunlit face of Saturn can be seen.

Saturn has 18 officially recognized and named satellites. In addition, there are other unconfirmed satellites. One circle in the orbit of Dione, a second is located between the orbits of Tethys and Dione, and a third is located between Dione and Rhea. The unconfirmed satellites were found in Voyager photographs but were not confirmed by more than one sighting. Recently, the Hubble Space Telescope imaged four objects that might be new moons.

Several generalizations can be made about the satellites of Saturn. Only Titan has an appreciable atmosphere. Most of the satellites have a synchronous rotation. The exceptions are Hyperion which has a chaotic orbit and Phoebe. Saturn has a regular system of satellites. That is the satellites have nearly circular orbits and lie in the

equatorial plane. The two exceptions are Iapetus and Phoebe. A lot of probe of the Saturn is yet to complete, nothing certain can so far be said about the Saturn, but a mystery is being revealed. What earlier sounds impossible is on the verge of solutions.

“It is difficult to say what is impossible for the dream of yesterday is the hope of today and reality of tomorrow.”

—Robert Goddard