

Saturn is the second largest planet in the Solar system and sixth from the Sun. It is also a planet of the smallest density, because it consists mainly of gases – hydrogen and helium, and its core is tiny and rocky. Saturn has got 62 moons and rings of rocks and ice. Some of them are only few centimetres wide, yet some are real giants of diameter of 1 km.

Cassini Mission has already discovered many fascinating facts such as registering storms and thunders. The power of Saturn's thunder is approximately 1000 times bigger than those on the Earth. The storm on Saturn was the fiercest storm ever recorded.

Saturn emits more energy than it gets. This fact along with the powerful thunders proves that Saturn contains large amounts of energy. As humanity constantly needs energy resources Saturn might be a promising source. We know that the resources on Earth are slowly depleting (if we divide the known oil resources by the yearly usage, we can see that in forty years time humanity will be out of oil). This is why we search for alternative sources of energy, which perhaps could be found on other planets. The question remains, however, whether we can exploit this energy and at what costs?

The Cassini spacecraft constantly provides high quality photographs of Saturn and its rings. This is how we can observe that Saturn is a Solar system model from its beginnings. It is exactly what our system looked like before planets appeared – an enormous celestial object with stardust and ice revolving around it in a seemingly chaotic manner. Saturn allows us to see how our system evolved, because the processes are very similar to the ones that occurred at the beginning of the Solar System.

Another fascinating objects around Saturn are its rings. They consist mainly of ice; this is why they are so clearly visible from the Earth although the rings are only 3 meters wide. The space between the rings was created by a moon called Minas and fragments of matter; while they were revolving around Saturn at different speed the laws of gravity worked between them. Such dependence between orbits is called orbital resonance.

At an early stage of the development of the Solar System, when Earth was a solid rock, Saturn and Jupiter started orbital resonance. When these two largest planets of the system were as close to one another as it was only possible, the gravity was the strongest and it pushed Neptune to belt comets. It was the time of Late Heavy Bombardment as comets pushed away from their orbits were bombarding other objects in space, Earth as well. Comets contained ice so when they hit the Earth they created oceans. If it were not for Jupiter and Saturn life on Earth probably would not existed.

Saturn is a fascinating planet. I believe that exploring space is beneficial, because it brings answers to many questions about the past and might also be a solution for the future.

#### Bibliography:

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