

Saturn's Moon - Dione

I posed a question on my previous submission as to what the next and fourth biggest Moon of Saturn was. Do you recognize the picture below? It was only taken last by the Cassini Probe as it flew over this next intriguing moon.



It is a photograph of Dione, the fourth biggest moon of Saturn, the subject of this month's Moons of Saturn.

Below is a table giving details of Dione when compared to our own Moon.

Name	Diameter (km) ^[32]	Mass (kg) ^[33]	Orbital radius (km) ^[34]	Orbital period (days) ^[34]
Dione	1,123 (32% Moon)	11×10^{20} (1.5% Moon)	377,396 (98% Moon)	2.7 (10% Moon)

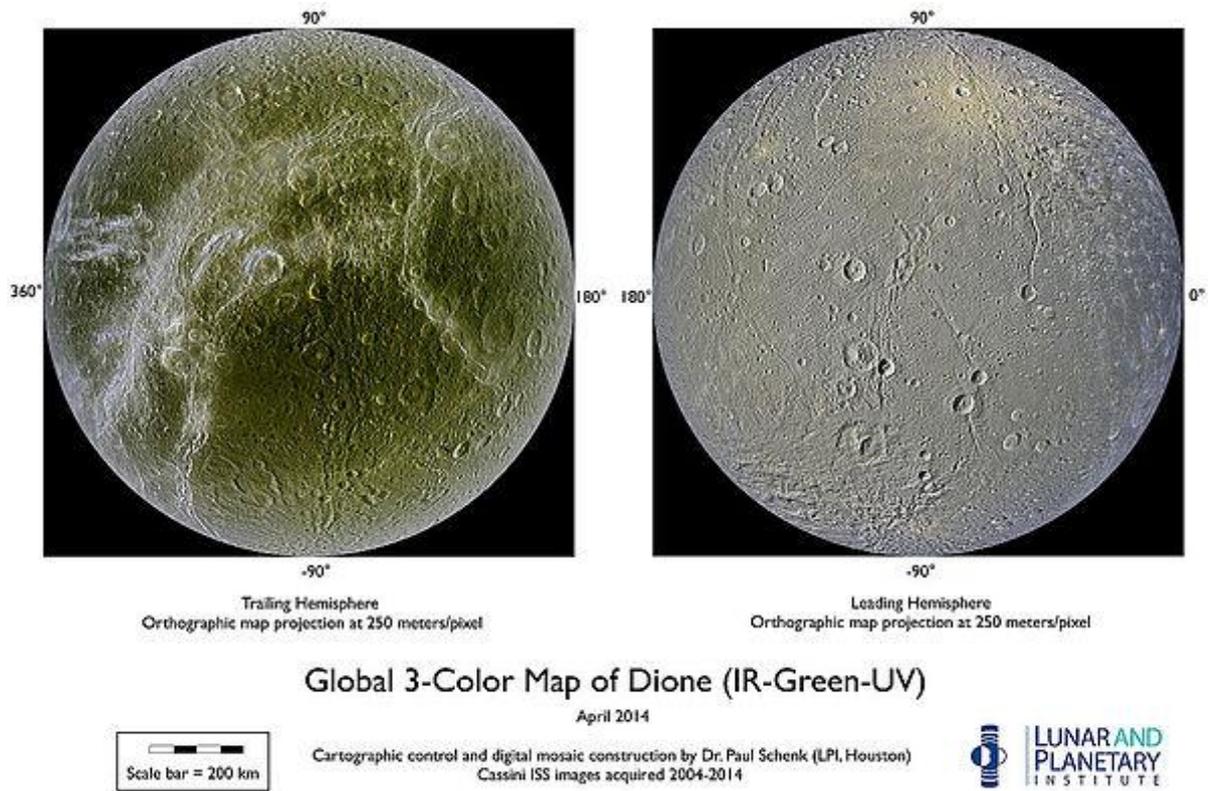
Dione was also discovered by our 17th Century Astronomer Giovanni Demenico Cassini and was given the Greek Titaness name Dione. Using an aerial telescope, Cassini found Dione at the grounds of the Paris Observatory.

Dione orbits Saturn at an incline of 0.019Deg and orbits Saturn every 2.74 days at a distance of 377,396Kms. Very oddly, Dione has two Trojan moons, Helene and Polydeuces which orbit Saturn at the same orbits. They follow the same orbit but will not collide into each other due to their stability at 60Deg apart, which form what is termed the Lagrangian Points.

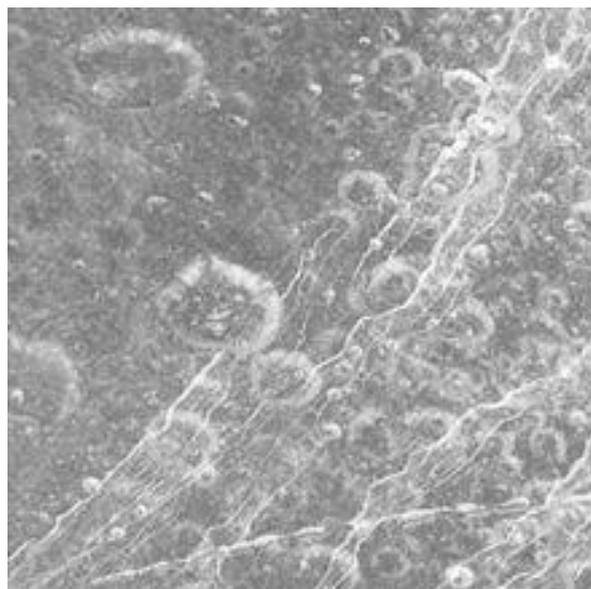
Dione is 122Km in diameter, which makes it the 15th largest moon in our Solar System. However it is more massive than all known combined moons smaller than itself. Composed of primarily of water ice, Dione is the third densest of all Saturn's Moons. So it is assumed that there must be denser material like silicate rock also present in it's make up.

Scientists have concluded that Dione would have geological features such as Chasms, ridges, depressions, craters and crater chains.

These are clearly visible from the pictures below which were taken by the Cassini Probe.

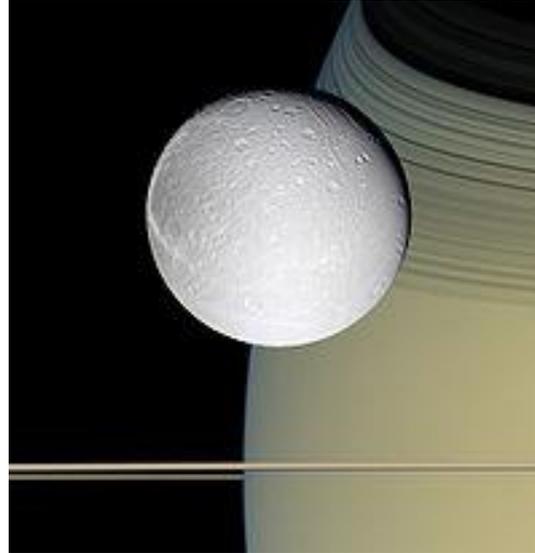


When the Voyager space probe photographed Dione it appeared as though there were wispy trails covering the trailing hemisphere. These were mysterious and at that time it was concluded that Dione was geologically active.



The theory was proved wrong after the Cassini probe flyby on December 13th 2004 when it was confirmed that these wisps were in fact bright ice cliffs created by tectonic fractures. Dione has now revealed itself as a world with enormous fractures on its trailing edge.

Dione has heavily cratered terrain on its icy surface and some of these craters are greater than 100kms in diameter. It is theorised that during the heavy bombardment period, Dione must have suffered several strikes and this could have caused it to be spun in the opposite orientation to Saturn. Latest studies suggest that Dione has remained in its current orientation to Saturn for several billion years.



The Picture above, taken by Cassini shows Dione with Saturn in the background and Saturn's rings directly below.

It is now believed that this moon has a sub-surface liquid ocean. This conclusion was derived from studying one of Dione's mountains, Janiculum Dorsa. There is a ridge of 0.5kms under the mountain which suggests that the icy crust may have been warm when the ridge formed. The theory is that the best way to obtain any heat on a moon is from a sub-surface ocean. It is also confirmed that Dione does get heated by tidal heating as it gets closer to and further from Saturn in its orbit.

The Cassini Probe has just completed a flyby of Dione on the 16th of June 2015, and data is coming in from this amazing Space project. So keep watching for news from that NASA's Cassini Website.

Submitted by Jay Nair – June 2015.