

SATURN'S RINGS

Students: Chisca Dan Gabriel, Caldarescu Tudor

School: Colegiul National, Iasi, Romania

Coordinating Teacher: Mihaela Cornelia Fiscutean

Rings of Saturn are for a long time the explored mystery of the coming of existence of our solar system. How did they form? When did they form? What are they made of? What makes Saturn so special from the rest of the giant planets of our solar system? One of the recent studies proposes the idea that a cosmic cataclysm was the origin of the ring and that the rings are the remains of a moon that exploded.

Saturn is one of the most studied planets from our solar system, from both Earth and space. The mission Cassini-Huygens has brought in past years new data regarding the chemical composition, the dynamics of the satellites of Saturn and the distribution of matter inside the rings. Considering the new data scientists started working of new ideas.

Three important assumptions are considered by the scientists when it comes to the the origins of Saturn's rings:

- The impact of a comet and one of the satellites of Saturn resulting the display of the matter left after the complete destruction of both celestial objects.
- The capture of a massive celestial object from another solar system and destroyed by the gravitational forces of the planet.
- The rings are a remain of a primordial cloud of gas and dust from which Saturn was made.

The information brought by the Cassini probe in the last years has determined the scientists to come with new ideas regarding the process of creation of Saturn's rings. Recently a group of scientists made of Sebastian Charnoz, Alessandro Morbidelli, Luke Dones si Julien Salmon proposed a new dynamical evolution model of the rings that reinforce the first two assumptions. In other words they propose us to imagine the forming of the rings as a result of a cosmic cataclysm event: either the impact between a comet and a satellite or Saturn captured a drifting satellite and destroyed it in orbit.

Catastrophical Scenarios and the forming of a Solar System

The recent model start from a global scenario regarding the forming of the Solar System called Nice Mode or Nisa Mode. This model has a connection with the Nice observer from France , where a team of scientists led by Alessandro Morbidelli made a study program of forming and evolution of the Solar System. Nisa mode is a mode of solar system where all giants planets – Jupiter, Uranus, Neptun- are already formed and has a huge influence on the evolution of the entire Solar System.