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How did Saturn get its rings?

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Saturn's ring system was discovered as long ago as the seventeenth century. The French astronomer Cassini quickly suspected that the rings consisted of individual particles. Saturn's rings are indeed not a single entity but consist of chunks of ice and rock that are orbiting the planet. The sizes of the particles range from specks of dust to rocks several metres across. There are gaps of various widths between the different rings. Small moons orbit Saturn in some of these gaps. The thickness of the rings is only about 10 to 100 metres, although the outer ring has a diameter of almost one million kilometres.

The origin of Saturn's rings

The origin of Saturn's rings is still the subject of debate. Theoretical calculations and measurements from a space probe named after Giovanni Domenico Cassini suggest that the ring system developed out of a cloud of dust and ice, as early as the time of the formation of the Solar System – about 4.6 billion years ago. As the photos from the Cassini probe show, the rings are also continuously fed with material from some of the moons that orbit Saturn in the gaps between the rings. For example, a small moon is distributing its material along its orbit and thereby forming the G ring. The rings of Saturn were named in the order of their discovery and are designated, from the innermost outwards, as the D, C, B, A, F, G and E rings.

The moon Enceladus feeds the E ring. Observations – also by the Cassini space probe – show that geysers on Enceladus are ejecting ice particles with salt in them into space. These particles travel to the E ring and collect there. The presence of the geysers on Enceladus and the detection of salty ice indicate that there is a reservoir of water, or perhaps even an ocean, hidden beneath the moon's surface.

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