

King of the Rings!

What is known about Saturn?

Saturn (SAT•ern) is a near-twin to Jupiter. It is the second-largest gas giant planet and is made mostly of hydrogen and helium. About 800 Earths could fit inside the volume of Saturn. Amazingly, the planet's density is less than that of water.

Saturn Has a Large Ring System

The planetary ring system that circles Saturn's equator is the planet's most spectacular feature. A **planetary ring** is a disk of material that circles a planet and consists of orbiting particles. Saturn's ring system has many individual rings that form complex bands. Between bands are gaps that may be occupied by moons.

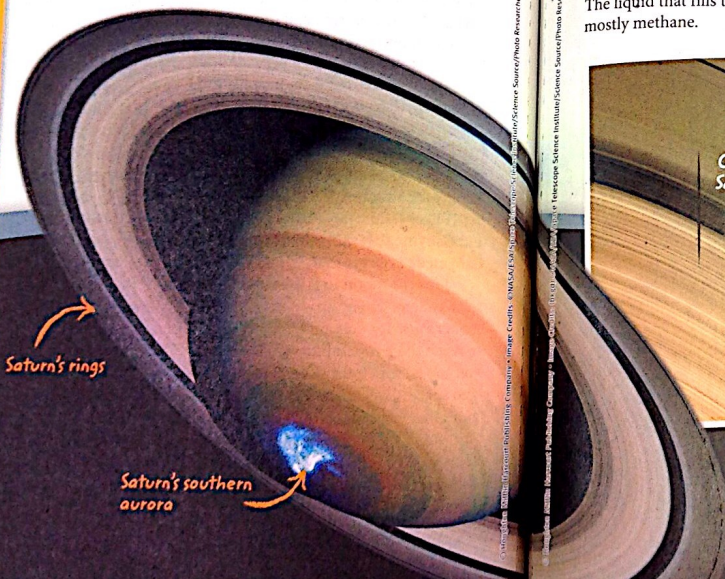
Although the rings of Saturn extend nearly 500,000 km in diameter, they are only a few kilometers thick. They consist of trillions of small, icy bodies that are a few millimeters to several hundred meters in size. The rings are mostly pieces left over from the collision of Saturn's moons with comets and asteroids.

Active Reading

8 Identify As you read the text, underline important physical properties about the planet Saturn.

Statistics Table for Saturn

Distance from the sun	9.58 AU
Period of rotation	10 h 39 min
Period of revolution	29.5 y
Tilt of axis	26.75°
Diameter	120,536 km
Density	0.69 g/cm ³
Mean surface temperature	-180 °C
Surface gravity	106% of Earth's gravity
Number of satellites	60



Saturn's Moon Enceladus Has Water Geysers

In the inner solar system, liquid rock erupts from volcanoes. In some parts of the outer solar system, liquid water erupts from volcanoes. When NASA's *Cassini* spacecraft explored Saturn's moon Enceladus (en•SEL•uh•duhs), it found an icy surface. Scientists believe that Enceladus has a liquid interior beneath this icy surface. Liquid water flows up through cracks in the moon's surface. It either freezes at the surface or forms spectacular water geysers. These geysers are the largest in the solar system.



9 Explain In your own words, write a caption for this illustration of Saturn's moon Enceladus.

Saturn's Moon Titan Has a Dense Atmosphere

Titan (TYT'in), the largest moon of Saturn, has an atmosphere that is denser than Earth's. The moon's atmosphere is composed mostly of nitrogen and has traces of compounds such as methane and ethane. Methane clouds form in Titan's atmosphere. From these clouds, methane rain may fall. Unlike Earth, Titan has a crust of ice, which is frozen at a temperature of -180 °C.

In 2005, the *Huygens* (HY•guhnhz) Titan probe descended through Titan's atmosphere. It took pictures of a surface with lakes and ponds. The liquid that fills these lakes and ponds is mostly methane.

10 Describe Complete this table by writing a description of each structure in Saturn's ring system.

Structure	Description
ring	
gap	
ring particles	