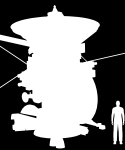


Saturn mission in epic "Grand Finale"

NASA's Cassini spacecraft enters the final stages of its remarkable exploration of Saturn with a series of 22 dives between the planet and the inner edge of its rings. The 20-year mission ends in September, when the probe will burn up in Saturn's atmosphere

Cassini



Height: 6.8m
Width: 4m
Human to scale

Plasma spectrometer
Measures charged particles and solar winds

Huygens
European probe landed successfully on Titan – largest of Saturn's 62 moons – in 2005

Thermoelectric generators
33kg of plutonium supply electricity for instruments

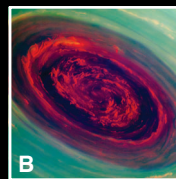
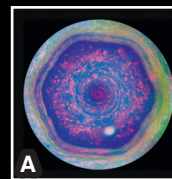
Rocket engines

High-gain antenna
Sends data back to Earth

Magnetometer
Measures magnetic fields

Cameras
Infra-red spectrometer
Analyses Saturn's temperature and composition

Cassini captures first complete view of **north polar hexagon (A)** – mysterious jet stream of over 300km/h winds with vast rotating storm at its centre (**B**). Probe also discovers second giant hurricane at south pole



Saturn's rings found to be active and dynamic – laboratory for how planets or moons are formed

Once fuel has run out, ground controllers will order Cassini to plunge into Saturn's atmosphere. Disposal needed to avoid potential biological contamination of Titan and Enceladus

Icy moon **Enceladus** found to have subterranean ocean of liquid salty water with conditions benign enough to support microbial organisms. **Presence of massive quantities of water makes Enceladus prime target in search for other life in solar system**

Titan revealed to have rain, lakes and seas of liquid methane – not water. Nitrogen-rich atmosphere may be similar to that of Earth long ago

Mission profile

- 1. Oct 15, 1997:** Launch
- 2-6. 1998-2004:** Two swingbys of Venus, one of Earth and one of Jupiter give Cassini boost needed to reach Saturn
- 6. Jul 1, 2004:** Enters orbit of Saturn, begins study of planet's system
- 7. Sep 15, 2017:** Probe plunges into Saturn's atmosphere – mission ends

Grand Finale orbits

Impacting orbit

Saturn

Grand Finale

From April 22 Cassini will dive 20 times, once every seven days, through 2,400km gap between planet and innermost ring

Probe will make detailed maps of Saturn's gravity and magnetic fields to reveal planet's internal structure, and possibly measure rotation rate

Spacecraft will also analyze samples and capture close images of rings. Data should help provide clues about age of ring system and how it was formed

Moon discoveries

Cassini has discovered seven moons within rings, including **Daphnis** – tiny moon residing in **Keeler Gap** whose gravity creates waves in rings around it

