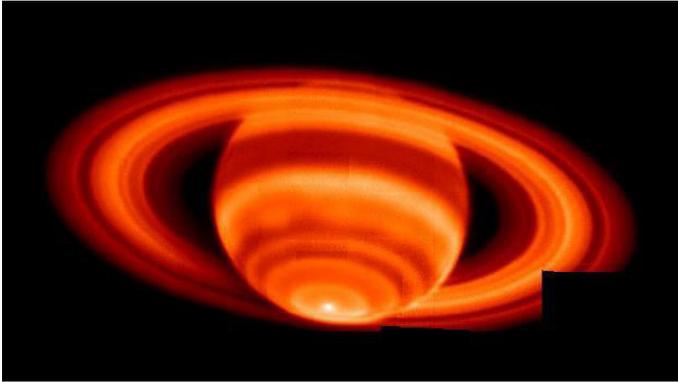


Hot spots of Saturn

Image Credits: NASA/JPL (both images this page)



Seeing Saturn in a new light This infra red composite image is a mosaic of 35 individual exposures (note missing exposure at lower right). The rings are not at a uniform temperature as the particles making them up are cooled in the planet's shadow before being warmed by the Sun's rays.

By Naomi Francey, Education Support Officer

In February 2004 an image was taken of temperature emissions from Saturn's interior with the Keck Telescope, Mauna Kea, Hawaii using infra red technology. The image (above) was a false colour image showing the hottest part as Saturn's South Pole. This hot spot (which appears as a white spot in the false colour-image) was expected as it was taken during Saturn's summer solstice. But at the start of January 2008 another image was taken not of the planet's south pole, but of the north pole and a similar hot spot was discovered.

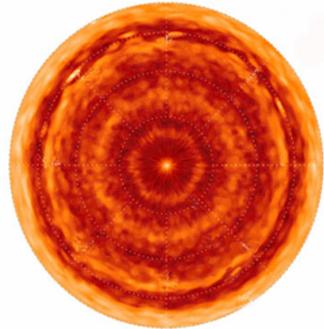
“...for the past ten years
it has been winter at
Saturn's north pole ”

This warming came as a shock because for the past ten years it has been winter at the north

pole of Saturn. For a decade the polar regions have been in darkness, so for a hot spot to occur here in the north is quite astonishing. If you look closely at the image, the white spot is the hot area (hot here means about -282°C), but surrounding it is a hexagonal shape. It is hard to picture just how big this hexagon is, but you could fit nearly four planets the same size as Earth inside it! It is about 25 000 km (about 15 500 miles) across! Scientists believe this could be a form of standing wave. A standing wave is a result

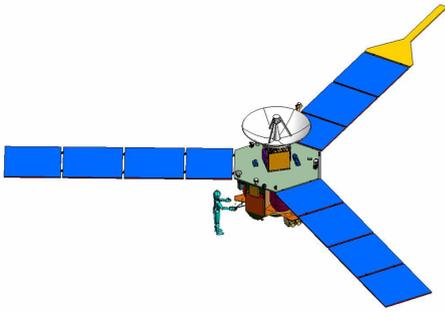
of interference between two waves travelling in opposite directions and is completely stationary. This hexagonal shape around the North Pole was discovered by Voyager 1 and confirmed by Cassini in 2006.

When the first image was captured scientists thought the hot spot was due to warming by sunlight on the south of the planet, but now a



Polar View This infra red composite of images from Cassini shows Saturn's mysterious polar hexagon.

Image Credit: NASA



Juno spacecraft This view of the Juno spacecraft shows the three huge solar panels. Juno is the first Jupiter probe powered by the Sun rather than a nuclear source. The main body of the spacecraft is underneath the high gain antenna, which is used for communications to Earth. A human figure in this picture gives an approximate idea of the size of the spacecraft.

similar structure has been found in the north by the Cassini probe, so the southern hot spot might not necessarily be caused by heat from our nearest star. The hexagons extend deep into Saturn's atmosphere, at least 75 km (47 miles).

These hot spots at the poles may be a characteristic of gas giant planets. A similar hot spot was discovered on Neptune's south pole. Scientists are hoping to find out more about the poles of gas giants when NASA's Juno spacecraft is launched in 2011 to arrive at Jupiter in 2016. Its primary function will be to orbit over the poles of Jupiter to investigate its atmosphere, but also trying to make discoveries about the core of the large planet. In the meantime all we can do is wait with anticipation!