

ESA at Venus!

At 07:17 UT (09:17 CEST) on 11 April 2006, the Venus Express spacecraft fired its main engine to enter orbit around Earth's sister planet, making ESA the first space agency to have vehicles orbiting the Moon, Mars and Venus at the same time.

With this latest success, the Agency has added another celestial body to its range of targets in the Solar System. ESA is operating Mars Express around Mars and SMART-1 around the Moon, and is a partner on the Cassini orbiter circling Saturn. ESA also has the Rosetta spacecraft en route to Comet 67P/Churyumov-Gerasimenko.

"With the arrival of Venus Express, ESA is the only space agency to have science operations under way around three planets and a moon," said David Southwood, Director of ESA Science. *"We are really proud to deliver such a capability to the international science community."*

Venus Express was launched on 9 November 2005, and its 50-minute main engine burn ended the 153-day and 400-million kilometre cruise through the inner Solar System. The spacecraft reduced its relative velocity towards the planet from 29 000 km/h to about 25 000 km/h and was captured by the planet's gravity field.

After arrival in its initial capture orbit, engineers lost no time in switching on several of the instruments. The southern hemisphere of Venus was observed for the first time in space history, by the Venus Monitoring Camera (VMC) and Visible & Infrared Thermal Imaging Spectrometer (VIRTIS) as the spacecraft arced below the planet.

Scientists were especially intrigued by the dark vortex shown almost directly over the south pole, a previously suspected but until now unconfirmed structure that corresponds to a similar cloud structure over the north pole. *"Just one day after arrival, we are already*

experiencing the hot, dynamic environment of Venus," said Dr Hakan Svedhem, Venus Express Project Scientist. *"We will see much more detail at an unprecedented level because we will have over 100 times better resolution as we get closer to Venus, and we expect to see these spiral structures evolve very quickly."*

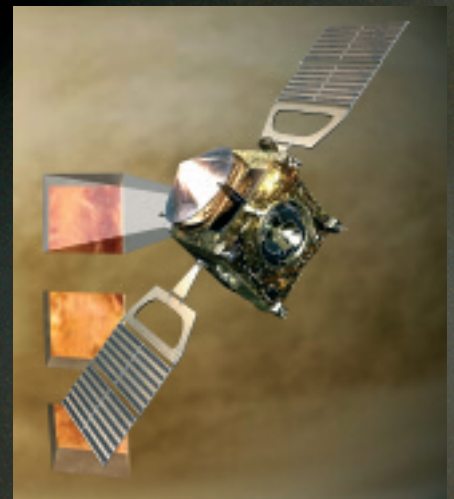
The initial, low-resolution images were taken from a distance of 206 452 km from the planet, and yet still caught the scientists' attention, particularly with the surprisingly clear structures and unexpected detail shown in the VIRTIS spectrometer images.

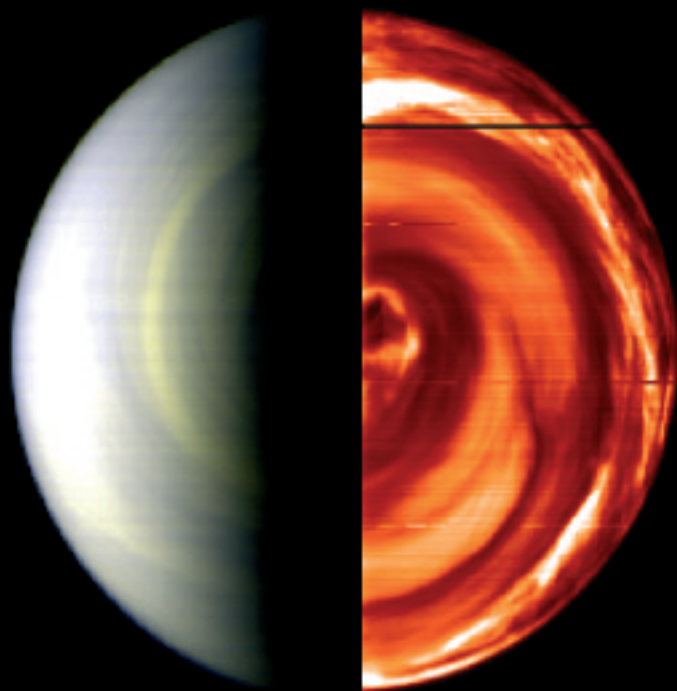
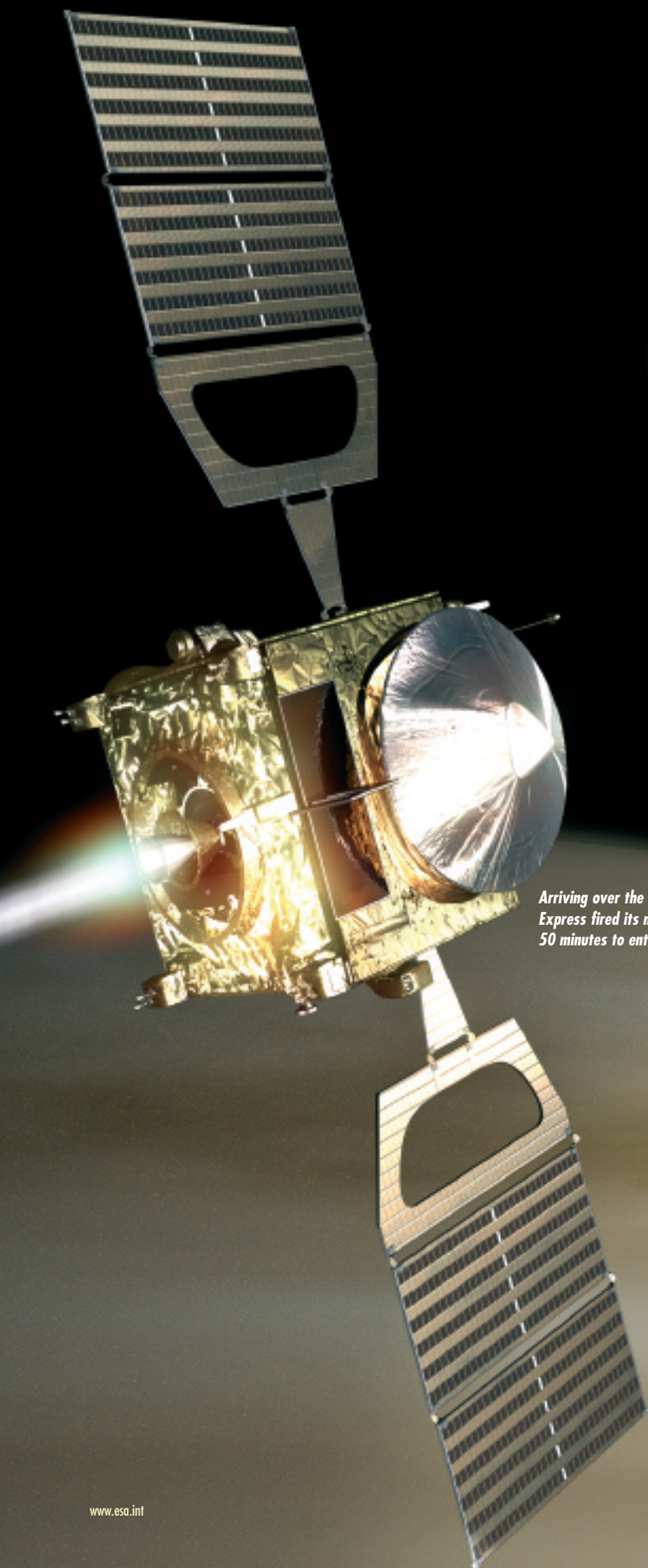
During the following four weeks, Venus Express made a series of manoeuvres to reach the scheduled orbit for its scientific mission. A highly elongated first nine-day capture orbit took it to an apocentre (maximum height) of 330 000 km below the south pole.

In the first capture orbit, Venus Express had five additional opportunities for gathering data before reaching pericentre. These observations were a great opportunity because, at apocentre,

the whole disc of Venus was fully visible to the instruments. Such opportunities will not occur again during the nominal mission, starting on 4 June 2006, because the range of distances to the planet will be much smaller.

A series of further engine and thruster burns gradually reduced the apocentre during the following 16 orbital loops, bringing Venus Express to its operational 24-hour polar orbit at an altitude of 66 000 km. From this vantage point, the spacecraft will conduct in-depth observations of the structure, chemistry and dynamics of the atmosphere for at least two Venusian days (486 Earth days).





ESA's Venus Express has returned the first-ever images of the planet's south pole. The images were taken on 12 April 2006 during the spacecraft's initial capture orbit after successful arrival on 11 April. The false-colour VIRTIS composite image shows the day side (left) and night side (right), with a resolution of 50 km per pixel. (ESA/INAF-IASF, Rome, and Observatoire de Paris)

Arriving over the north pole, Venus Express fired its main engine for 50 minutes to enter orbit

