

Edited by Emma Sanders

First light at the VLT



The first of the VLT's 8.2 m mirrors.

Observations at Europe's Very Large Telescope (VLT) are off to a successful start. At the end of May, the first astronomical images were taken using the 8.2 m telescope. A second telescope will be installed this autumn.

The European Southern Observatory's VLT at Cerro Paranal in the Chilean Atacama desert should be complete in 2005. Its four 8.2 m telescopes and three 1.8 m telescopes will make up the most sensitive interferometer in the world.

The first telescope has already achieved a

resolution equivalent to resolving a car's headlights at a distance of 1200 km. Current telescopes can look back around 94% of the lifetime of the universe (assuming a flat universe). With the VLT, astronomers estimate they will be able to see another 3% further back and are anticipating seeing their first pictures of remote galaxies.

"A key issue is when the dark ages ended, when the first stars and galaxies started to shine," says Cambridge astronomer Sir Martin Rees. He believes if this happened at a redshift of 10, the VLT will see them. The furthest galaxy observed so far has a redshift of 6.

Sir Martin also anticipates direct observations of planetary systems around other stars. "The telescope's large collecting area coupled with its high resolution is ideal," he says. "Planets are very faint and less than an arc-second from the star."

The telescope's 50 m² mirror has a surface which is accurate to 5×10^{-8} m, equivalent to a 1 mm deviation over an area the size of Paris. The surface is continually corrected for the gravitational distortions caused by the telescope's support structure.

A system of adaptive optics will be installed in 2000 to correct observations for atmospheric turbulence. A single star will be imaged 100 times a second to measure how its image changes. This data will be used to deform one of the telescope's mirrors, reducing observational errors and improving image quality.

SOHO back on track

After six weeks lost in space, the Solar and Heliospheric Observatory (SOHO) has been found. The \$1 billion satellite was located when it reflected a signal sent into space by the Arecibo radio telescope in Puerto Rico.

SOHO, a NASA/European Space Agency (ESA) collaboration, span out of control on 25 June leaving its solar panels almost edge-on to the Sun and unable to generate power. Since then the panels' position relative to the Sun has slowly changed and now engineers are able to communicate with the satellite for

short periods.

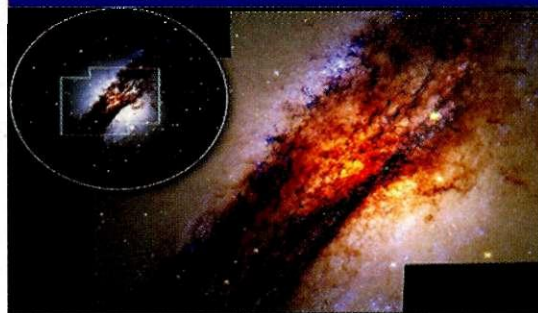
ESA and NASA engineers are working hard to reheat the craft. They need to find a way of storing enough energy in the batteries to unfreeze the fuel tanks so the thrusters can be used to turn the solar panels into the Sun.

SOHO has proved a very popular and versatile observatory. It houses 12 different instruments which have been used to study solar physics and the solar wind. "The mission is in a class of its own," says Giacomo Cavallo, head of science programmes at ESA.

ASTROWATCH

The universe is the ultimate particle physics experiment, and is a wonderful laboratory for effects which make terrestrial efforts seem puny. This new regular round-up of astronews will cover news and new developments in astronomy and astrophysics, with the accent on the physics.

Picture of the month



The Hubble Space Telescope reveals the activity at the centre of Centaurus A, the nearest active galaxy to the Earth. A black hole devouring a small neighbouring galaxy has fuelled a region of intense star formation.

Galactic downsizing

The Milky Way is smaller and slower than astronomers once thought. A group at Southampton, UK, has measured the motions of stars near the Sun and their findings suggest it is 5000 light years closer to the centre of the galaxy than previously thought. Also, the Sun is rotating at 185 km per second about the galactic centre – 35 km per second slower than measured before.

The work may have huge consequences, as astronomical distances are frequently measured in relative terms. Recalibrating this standard "ruler" decreases the distances to other more distant objects, and ultimately, the size of the universe as a whole.

Mars Express

Preparations for ESA's Mars Express are well underway now the spacecraft's scientific instruments have been agreed. One of their main tasks will be to search for frozen water below the planet's surface. Its discovery would shed light on the planet's chemical history and help show if conditions were ever right for life to have existed there. Mars Express will start its 700 million km journey in 2003.