

# Astronomy in the fast lane!

UK scientists have opened a new window on the Universe with the recent commissioning of ULTRACAM on the European Southern Observatory's (ESO) Very Large Telescope (VLT) in Chile. This ultra fast camera is capable of capturing some of the most rapid astronomical events in the cosmos.

ULTRACAM, the first UK-built instrument to be mounted on the VLT, has been designed and built by scientists from the Universities of Sheffield and Warwick, in collaboration with the UK Astronomy Technology Centre in Edinburgh. It can take up to 500 pictures a second in three different colours simultaneously.

ULTRACAM employs the latest in charged coupled device (CCD) detector technology in order to take, store and analyse data at the required sensitivities and speeds. CCD detectors can be found in digital cameras and camcorders, but the devices used in ULTRACAM are special because they are larger, faster and most importantly, much more sensitive to light than the detectors used in today's consumer electronics products.

In May 2002 the ULTRACAM saw first light on the 4.2-m William Herschel Telescope (WHT) on La Palma where it captured a variety of cosmic events including eclipses, transits, flickers, flares, outbursts and explosions. These observations have produced a bonanza of new and exciting results, leading to 11 scientific papers being published or in press.

However, in order to study the very faintest stars at the very highest speeds, it is necessary to use one of the world's largest telescopes located at one of the world's best astronomical sites. With this in mind, work began 2 years ago preparing ULTRACAM for use on the VLT, situated in the Atacama Desert in Chile.

Dr Vik Dhillon, ULTRACAM project scientist from the University of Sheffield said, "Astronomers using the VLT now have an instrument specifically designed for the study of high-speed phenomena. Using ULTRACAM in conjunction with the current generation of large telescopes means that it is now possible to study high-speed celestial phenomena such as eclipses, oscillations and occultations in stars which are millions of times too faint to see with the naked eye." He adds, "ULTRACAM is leading the way in combining an innovative technology with one of the best astronomical facilities in the world."

The instrument saw first light on the VLT on May 4, 2005, and was then used for 17 consecutive nights on the telescope to study extrasolar planets, black-hole binary systems, pulsars, white dwarfs, asteroseismology, cataclysmic variables, brown dwarfs, gamma-ray bursts, active-galactic nuclei and Kuiper-belt objects. "These few nights with ULTRACAM on the VLT have demonstrated the unique discoveries that can be made by combining innovative technology with one of the best astronomical observatories in the world," said Tom Marsh, ULTRACAM team member from the University of Warwick. "We hope that ULTRACAM will now become a regular visitor at the VLT, giving European astronomers access to a unique tool with which to study the Universe."

[ESO release](#)