



The central region of the Orion nebula as seen by WFCAM (right)

Infrared astronomy goes panoramic

The UK's Joint Astronomy Centre in Hawaii has just commissioned its latest instrument – a world-leading infrared imager for the UK Infrared Telescope (UKIRT).

For many decades, the panoramic sky surveys carried out in blue and red light by Schmidt telescopes at the Palomar and Anglo-Australian Observatories have been a priceless resource in astronomy. These surveys have now been outstripped by the Sloan Digital Sky Survey, SDSS, (p.17) at optical wavelengths, but our knowledge of the infrared sky has lagged behind and remains relatively shallow. But now, UKIRT's Wide Field Camera (WFCAM) is beginning to provide a modern, infrared counterpart to the SDSS and other, deeper surveys at visible

and other wavelengths.

A wide field of view is the key to the instrument's success. In a modern reflecting telescope, the conventional way to achieve this is to place the instrument at the prime focus – where the rays from the primary mirror come to their first convergence. But with UKIRT's optical design, this focal position would unfortunately be situated outside the telescope's extremely tight-fitting dome!

Designed and built at the UK Astronomy Technology Centre in Edinburgh, WFCAM achieves its wide field of view by occupying a 'forward Cassegrain' position, above the primary mirror of the telescope. This position, unique for an instrument of such size compared to its host telescope, ensures that WFCAM poses some interesting problems for the observatory. To install the instrument, weighing more than a tonne and measuring more than 5 metres in height, it is lifted with great care and precision up through the telescope struts, over the delicate 4-metre primary mirror and lowered (gingerly) onto its mounting position on a steel ring at the centre of the UKIRT primary. WFCAM needs to be precisely aligned with the telescope optical axis (to within a few tenths of a milliradian) – a considerable engineering challenge!

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