

Visible and Infrared Survey Telescope for Astronomy: Progress Report

Jim Emerson¹
Alistair McPherson²
Will Sutherland³

¹ Astronomy Unit, Queen Mary University of London, United Kingdom

² United Kingdom Astronomy Technology Centre, Edinburgh, United Kingdom

³ Institute of Astronomy, Cambridge, United Kingdom

Progress in implementing VISTA is summarised largely through pictures. VISTA's near-IR public surveys are expected to begin in 2007 quarter four.

VISTA (Visible and Infrared Survey Telescope for Astronomy) is a 4-m wide-field survey telescope (1.65° diameter in the IR), equipped with a near-IR (0.85–2.3 μm) camera facility for performing extensive surveys of the southern skies with sensitivity matched to the needs of 8-m-class telescopes. IR imaging surveys particularly target the cold, the obscured, and the high-redshift Universe, to generate science directly and also select objects worthy of further study by the VLT. Details of the design and expected performance of VISTA were given in *The Messenger* 117, page 27, so here we describe, mainly in pictures, progress in implementing VISTA. VISTA's first Public Surveys are expected to begin in late 2007.

Site and enclosure

VISTA lies some 1500 m away from the peak on which the VLT sits (Figure 1).

The enclosure (shown being built in the previous *Messenger* article) is now essentially completed (Figure 2 shows it with the slit open and the windscreen up). The enclosure successfully survived an unplanned water tightness test when ~ 10 cm of rain fell in one 24-hour period – a most unexpected event!



Photo: G. Hudepohl, ESO

Figure 1: VISTA (right) with VLT (left).



Photo: VISTA

Figure 2: Enclosure.

Telescope and mirrors

The telescope, including the primary mirror support and instrument rotator is fully assembled with dummy mirrors, and final cabling and testing is ongoing. Figure 3 (left) shows a side view also showing the dome flat screen in the upper centre, whilst Figure 3 (right) shows a front view with the secondary mirror support structure prominent.

The primary and secondary mirrors are both undergoing final polishing, which is taking longer than originally anticipated (no one has ever polished a 4-m f/1 primary before). Completion of polishing is expected in February 2007. The coating plant, which can coat in either aluminium or in protected silver is already installed in the enclosure annexe.



Photos: M. Cullum, ESO (2)

Figure 3: Telescope: side view (left), front view (right).

IR camera

The camera includes the entrance window, cold baffle tube, lenses, filter wheel and 16 2048 × 2048 IR detectors and is shown in Figure 4 without all its associated electronics boxes and gas lines attached. Note the entrance window, the vacuum vessel which is metallic or black, and that the camera is mounted in its (blue) transport carriage unit in which it will soon be air-freighted to Chile.

Science

VISTA's strength, in addition to its specifications (the exposure time calculator for VISTA may be found through www.vista.ac.uk/observing/etc/), is the dedication of the vast majority of its available time to ambitious, large-scale legacy public surveys (three quarters of VISTA time was envisaged at the start as the baseline fraction for public legacy surveys). At the time of writing the process of deciding which public surveys VISTA will actually undertake over the next few years is drawing to its conclusion. ESO's Public Surveys Panel for VISTA interacted with the original proposers of (12) public surveys to distil/merge these down to six candidate surveys and, following panel feedback and resulting discussions amongst the proposers, their updated submissions underwent review on 31 Oc-

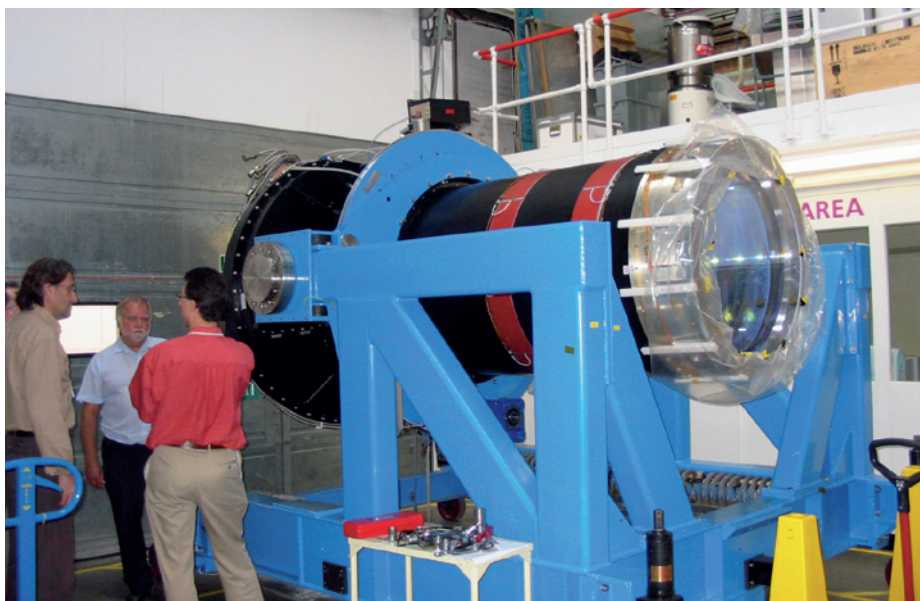


Photo: VISTA

Figure 4: IR camera.

tober 2006. The resulting recommendations of the Public Survey Panel will be put to ESO's Observing Programme Committee in November 2006. The results of this process should be known by the time this article appears in print (and will be posted at www.vista.ac.uk when known), and the surveys themselves are likely to start in 2007 quarter four.

Acknowledgments

The Office of Science and Technology and the Higher Education Funding Council for England funded VISTA through the Joint Infrastructure Fund; and the Particle Physics and Astronomy Research Council (PPARC) provide further funding. Many individuals, companies, and organisations, including ESO, have been crucial to making VISTA but are too numerous to mention here. In particular PPARC's UK Astronomy Technology Centre have organised the realisation of VISTA through their VISTA Project Office, and have skilfully coordinated the work of all those individuals and organisations, including UK ATC, who have contributed.