

News on the Commissioning of X-shooter

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X-shooter is the high efficiency, single target (slit or mini-integral field unit [IFU]), intermediate resolution, high efficiency spectrograph built for the Cassegrain focus of one of the UTs of the VLT (see Vernet et al., 2007). The instrument consists of three spectroscopic arms that allow, in a single exposure, the spectral range 310–2400 nm to be covered. X-shooter is the first of the second generation VLT instruments to go to Paranal. SPHERE, KMOS and MUSE will follow between 2010 and 2012.

The instrument was built by a consortium of institutes in Denmark, France, Italy, the Netherlands and by ESO. The co-principal investigators are P. Kjaergaard Rasmussen (Copenhagen), F. Hammer (Paris), L. Kaper (Amsterdam–NOVA), R. Pallavicini (INAF) and S. D'Odorico (ESO).

In the first commissioning, the instrument was mounted at the telescope with the UV-Blue (UV-B) and Visual-Red (V-R) arms. The near-IR arm is still being optimised in Garching and will be brought to the telescope in the first quarter of 2009. The instrument was attached to the telescope for the first time on 9 November. Observations began on the same night and continued for a further ten nights. Over the whole run, a total of only about seven hours of observing time was lost: four hours due to strong winds and three hours for telescope–instrument software interface problems. The many observations have been used to test the functionalities of the instrument at the telescope and to obtain sky data for instrument calibration. The observations will also be used to assess the performance of the instrument and its data reduction pipeline — quickly, during the commissioning time on Paranal, and more systematically in the next few weeks. Preliminary results indicate that the instrument meets most crucial specifications (and exceeds a few). It will

be offered as of Period 84 (deadline for application 1 April 2009).

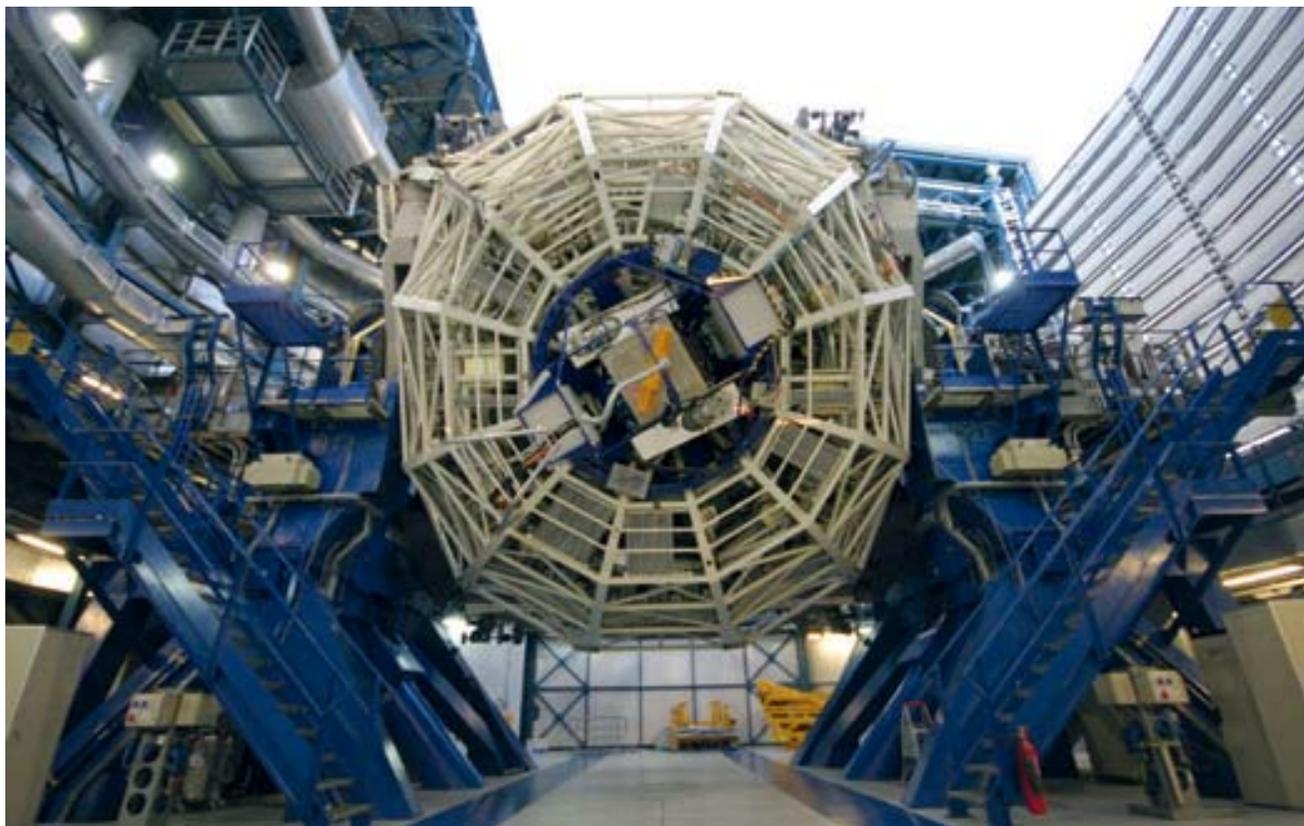
The successful X-shooter commissioning team on Paranal was composed of:

- H. Dekker (Project Manager and System Engineer), S. D'Odorico (ESO co-PI), M. Downing, J. L. Lizon, F. Kerber, C. Lucuix, A. Modigliani, V. Mainieri and J. Vernet (Instrument Scientist) from ESO Garching;
- R. Castillo, E. La Pena, E. Mason (Paranal Instrument Scientist) and A. de Ugarte Postigo from ESO Paranal;
- P. Santin and M. Vidali from INAF Trieste for the control software.

References

Vernet J. et al. 2007, *The Messenger*, 130, 5

Figure 1. A view of X-shooter at the centre of the M1 cell of UT3 (Melipal). The UV-B and V-R spectrographs and CCD cryostats are visible on the sides of the central backbone. The yellow counterweight is substituting for the near-IR spectrograph that will be installed in the first quarter of 2009.



Credit: A. de Ugarte Postigo/ESO



Figure 2. Composite of *B*-, *V*- and *R*-band images of the supernova SN2008hg in the spiral galaxy IC 1720 taken with the X-shooter acquisition camera.

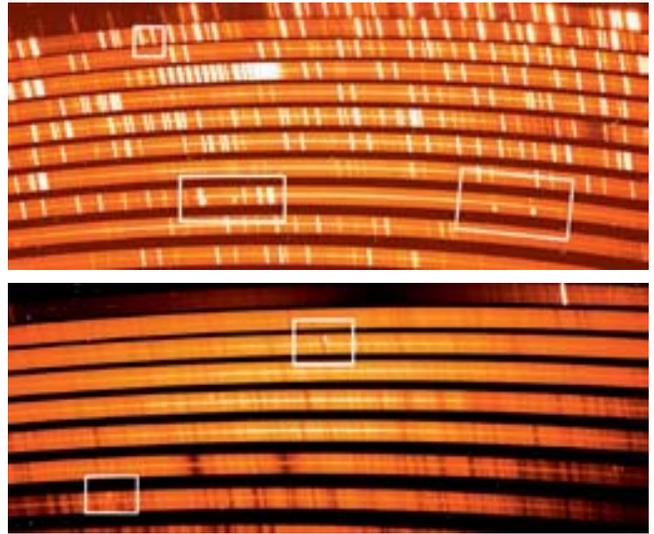
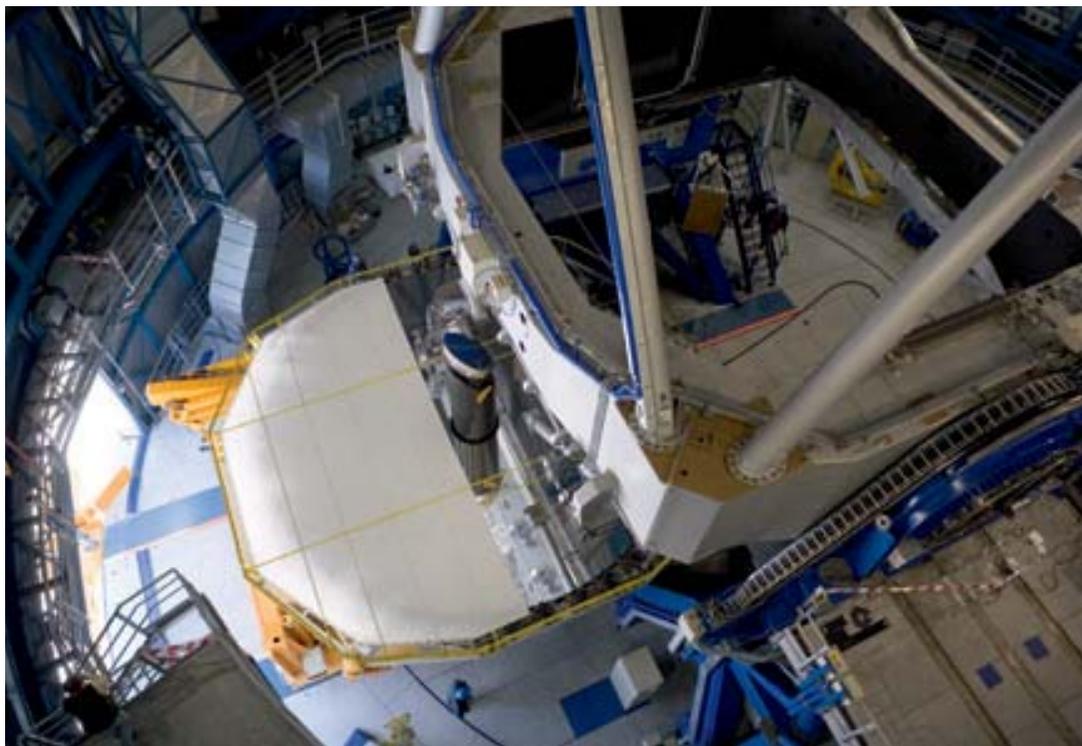


Figure 3. This 20-minute exposure of SN2008hg ($m_V \approx 17.5$) taken at full Moon gives a hint of the capability of X-shooter. *V*-*R* and *UV*-*B* spectra of the SN with emission lines of the nearby H II region (with the brightest highlighted in boxes) cover the range from 310 to 1000 nm. The spectra were taken with slit widths of 1.2 and 1.3 arcseconds in the *V*-*R* and *UV*-*B* ranges respectively in 1.4 arcsecond seeing. The resolving powers are 6000 and 4000 approximately. Using narrow slits, the instrument can reach resolutions of 14 000 and 9 000 in the *V*-*R* and *UV*-*B* bands respectively.



Delicate manoeuvres in the daylight. The 8.2 m primary mirror of VLT Antu (UT1) being removed prior to aluminization in December 2005. The white screen covering half of the mirror prevents direct sunlight from the open dome door falling onto the mirror during removal from the telescope.