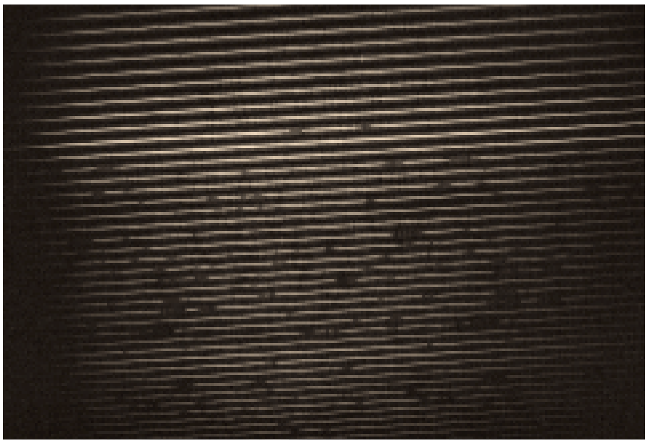


Figure 1: The power of UVES is demonstrated by this two-hour test exposure of the southern quasar QSO HE2217-2818 with U-magnitude = 16.5 and a redshift of z = 2.4. This UVES echelle spectrum is recorded in different orders (the individual horizontal lines) and altogether covers the wavelength interval between 330–450 nm (from the bottom to the top). It illustrates the excellent capability of UVES to work in the UV-band on even faint targets. Simultaneously with this observation, UVES also recorded the adjacent spectral region 465–660 nm in its other channel. The broad Lyman-alpha emission from ionised hydrogen associated with the powerful energy source of the QSO is seen in the upper half of the spectrum at wavelength 413 nm. At shorter wavelengths, the dark regions in the spectrum are Lyman-alpha absorption lines from intervening, neutral hydrogen gas located along the line-of-sight at different redshifts (the so-called Lyman-alpha forest) in the redshift interval z = 1.7–2.4. Note that since this exposure was done with the nearly Full Moon above the horizon, an underlying, faint absorption-line spectrum of reflected sunlight is also visible.

locity (a few km/sec only) can be accurately measured and also that it is possible to detect the faint spectral signatures of very rare elements in celestial objects.

One UVES channel is optimised for the ultraviolet and blue, the other for visual and red light. The spectra are digitally recorded by two highly efficient CCD detectors for subsequent analysis and astrophysical interpretation. By optimising the transmission of the various optical components in its two channels, UVES has a very high efficiency all the way from the UV (wavelength about 300 nm) to the near-infrared (1000 nm or 1 µm). This guarantees that only a minimum of the precious light that is collected by KUEYEN is lost and that detailed spectra can be obtained of even quite faint objects, down to about magnitude 20 (corresponding to nearly one million times fainter than what can be perceived with the unaided eye). The possibility of doing simultaneous observations in the two channels (with a dichroic mirror) ensures a further gain in data gathering efficiency.

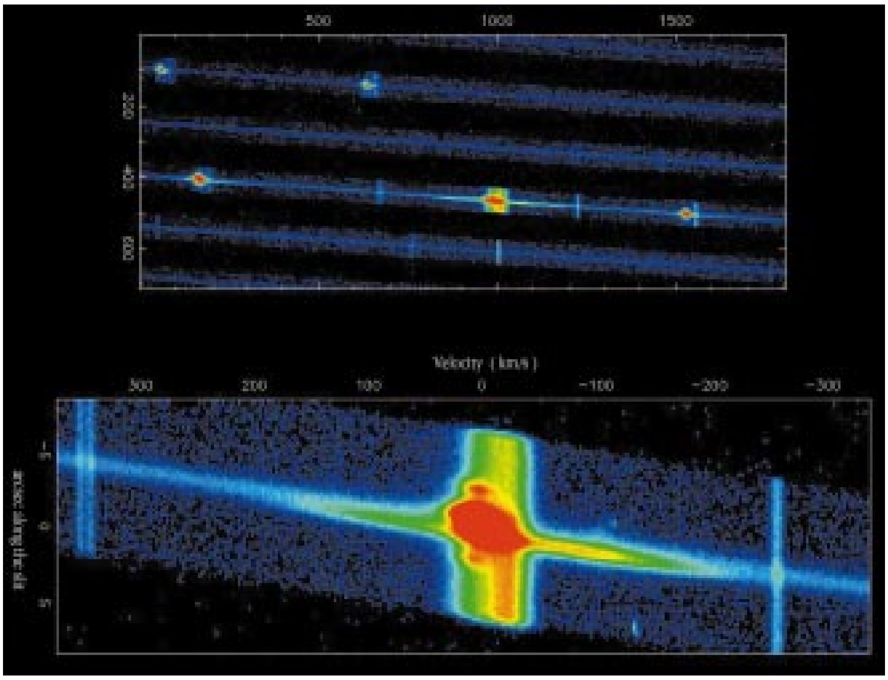
First Observations with UVES

In the evening of September 27, 1999, the ESO astronomers turned the KUEYEN telescope and – for the first time – focussed the light of stars and galaxies on the entrance aperture of the UVES instrument. This is the crucial moment of "First Light" for a new astronomical facility.

Much of the time during the first observing nights was spent by functional tests of the various observation modes and by targeting "standard stars" with well-known properties in order to measure the performance of the new instrument. They showed that it is behaving very well. This marks the beginning of a period of progressive fine-tuning that will ultimately bring UVES to peak performance.

The astronomers also did a few "scientific" observations during these nights, aimed at exploring the capabilities of their new spectrograph. They were eager to do so, also because UVES is the first spectrograph of this type installed at a telescope of large diameter in the southern hemisphere.

Many exciting research possibilities are now opening with UVES. They include a study of the chemical history of many galaxies in the Local Group, e.g. by observing the most metal-poor (oldest) stars in the Milky Way Galaxy and by obtaining the first, extremely detailed spectra of their brightest stars in the Magellanic Clouds. Quasars and distant compact galaxies will also be among the most favoured targets of the first UVES observers, not least because their spectra carry crucial information about the density, physical state and chemical composition of the early Universe.



This false-colour image has been extracted from an UVES echelle spectrum of SN 1987A, with a slit width of 1 arcsec only. The upper part shows the emission lines of nitrogen, sulfur and hydrogen, as recorded in some of the spectral orders. The pixel coordinates (X,Y) in the original frame are indicated; the red colour indicates the highest intensities. Below is a more detailed view of the complex H-alpha emission line, with the corresponding velocities and the position along the spectrograph slit indicated. Several components of this line can be distinguished. The bulk of the emission (here shown in red colour) comes from the ring surrounding the supernova; the elongated shape here is due to the differential velocity exhibited by the near (to us) and far sides of the ring. The two bright spots on either side are emission from two outer rings. The extended emission in the velocity direction originates from material inside the ring upon which the fastest moving ejecta from the supernova have impacted. Finally, there is a broad emission extending all along the spectrograph slit (here mostly yellow) upon which the ring emission is superimposed. This is not associated with the supernova itself, but is H-alpha emission by diffuse gas in the Large Magellanic Cloud (LMC) in which SN 1987A is located.

Erratum

In the June issue of *The Messenger* (No. 96), page 26 (article by H. Lamy and D. Hutsemékers), formula 2 should read:

$$q = \frac{R_q - 1}{R_q + 1} \quad \text{where } R_q^2 = \frac{I_0^s / I_0^l}{I_{45}^s / I_{45}^l}, \qquad (2)$$

$$u = \frac{R_u - 1}{R_u + 1} \quad \text{where } R_u^2 = \frac{I_{22.5}^s / I_{22.5}^l}{I_{67.5}^s / I_{67.5}^l}.$$