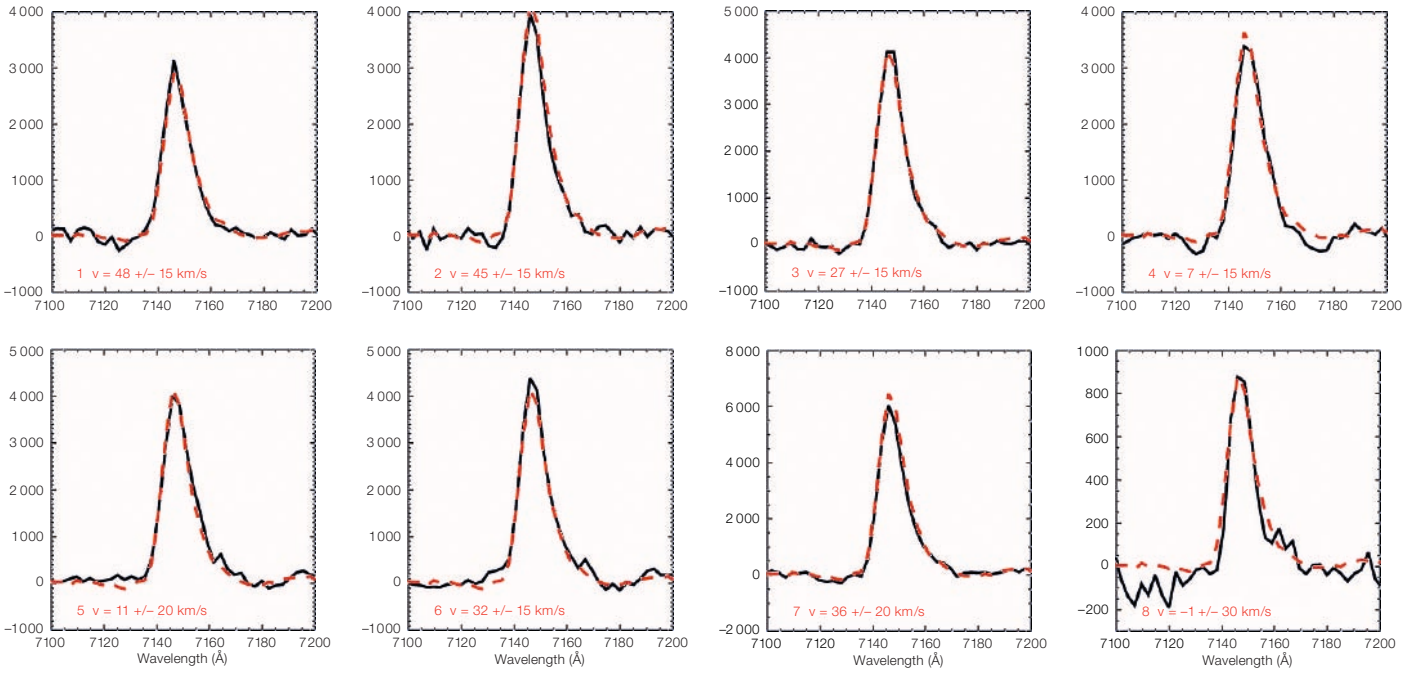
Figure 3: Spectra around the redshifted Lyα emission from the eight components labelled in Figure 2. The red dashed line shows the composite spectra from the arc (scaled in flux). In each independant pixel of the datacube we use the position and shape and intensity of the Lyα emission to study the superwind outflow. By combining these measurements with SINFONI spectroscopy of nebular emission lines we will investigate the star formation and chemical enrichment of this young galaxy.



Farthest Known Gamma-Ray Burst

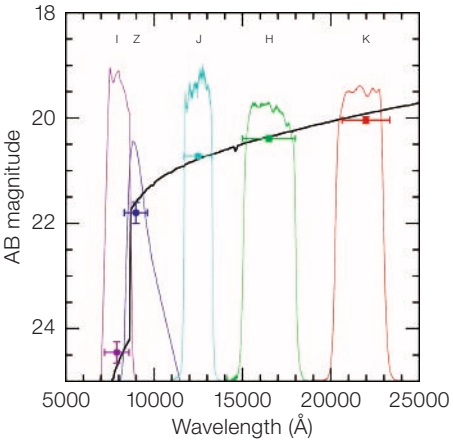
An Italian team of astronomers[1] has used the VLT to observe the afterglow of a Gamma-ray burst that is the farthest known to date with a measured redshift of 6.3. "This also means that it is among the intrinsically brightest Gamma-ray bursts ever observed", said Guido Chincarini from INAF-Osservatorio Astronomico di Brera and University of Milano-Bicocca (Italy) and leader of a team that studied the object with ESO's Very Large Telescope. "Its luminosity is such that within a few minutes it must have released 300 times more energy than the Sun will release during its entire life of 10 000 million years."

[1] The MISTICI collaboration consists of astronomers from Osservatorio Astronomico di Roma (INAF), Osservatorio Astronomico di Brera (INAF), Osservatorio Astronomico di Arcetri (INAF), Università degli Studi di Milano – Bicocca, International School for Advanced Studies (SISSA) and Observatori Astronòmic of Universitat de València (Spain). In particular, Angelo Antonelli, Daniele Malesani, Vincenzo Testa, Paolo D'Avanzo, Stefano Covino, Alberto Fernandez-Soto, Gianpiero Tagliaferri, Guido Chincarini, Sergio Campana, Massimo Della Valle, Felix Mirabel, and Luigi Stella were notably active with the data analysis and observations. Prof. Guido Chincarini is the Italian Principal Investigator of the Italian research on GRBs related to the Swift satellite, which is funded by the Italian Space Agency (ASI).

Gamma-ray bursts (GRBs) are short flashes of energetic gamma rays lasting from less than a second to several minutes. They release a tremendous quantity of energy in this short time, making them the most powerful events since the Big Bang. It is now widely accepted that the majority of the gamma-ray bursts signal the explosion of very massive, highly evolved stars that collapse into black holes.

The Gamma-ray burst GRB050904 was first detected on September 4, 2005, by the NASA/ASI/PPARC Swift satellite, which is dedicated to the discovery of these powerful explosions. Immediately after this detection, astronomers in observatories worldwide tried to identify the source by searching for the afterglow in the visible and/or near-infrared. The Italian group observed the object in the near-infrared with ISAAC and in the visible with FORS2 on the VLT. By comparing the brightness of the source in the various observing bands (see Figure), the astronomers were able to deduce its redshift, and hence its distance. "The value we derived has since then been confirmed by spectroscopic observations made by another team using the Subaru telescope", said Angelo Antonelli (Roma Observatory), another member of the team.

(Based on ESO Press Release 22/05)



This figure shows the magnitude of the Gamma-ray burst GRB 050904 as observed with FORS2 and ISAAC in the various filters. The bandpasses of the ESO filters are overplotted as well as the best-fitting template which allowed the astronomers to measure the photometric redshift. The clear drop of the flux of the object in the *I*-band compared to the others is the telltale signature of a high-redshift object.