

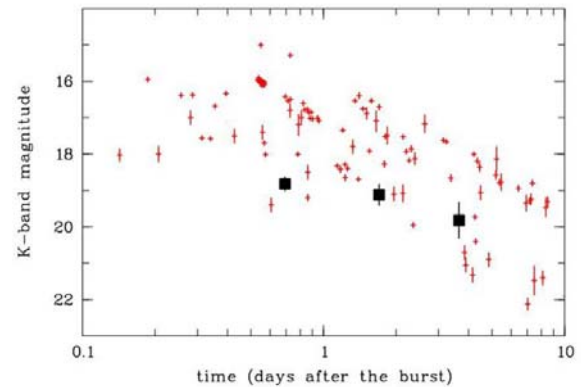


The rapid dissemination of an arcmin-sized *HETE-2* localization of the long-duration X-ray flash GRB 030528 led to the discovery of the near-IR afterglow and the detection of the underlying host galaxy in the optical and near-IR bands. The afterglow was not detected in the optical band. Our *K*-band photometry suggests that the lack of optical detection was simply due to the lack of rapid and deep follow-up observations and a high foreground extinction. The properties of the host are consistent with the idea that GRB hosts are star-forming blue galaxies.

## GRB 030528:

The error box of the long-duration *HETE-2* X-ray flash was measured with a variety of ground based near-IR facilities. Following the detection of four *Chandra* X-ray sources inside the error box five days post-burst, one source was found fading in our NTT SofI *K<sub>s</sub>*-band images taken 0.6 and 3.6 days after the burst by  $\sim 1$  mag (Rau et al. 2004). This fading was confirmed later by the detection of a fading X-ray source in a second *Chandra* observation. No optical afterglow was found. Thus, the burst is classified as optically dark.

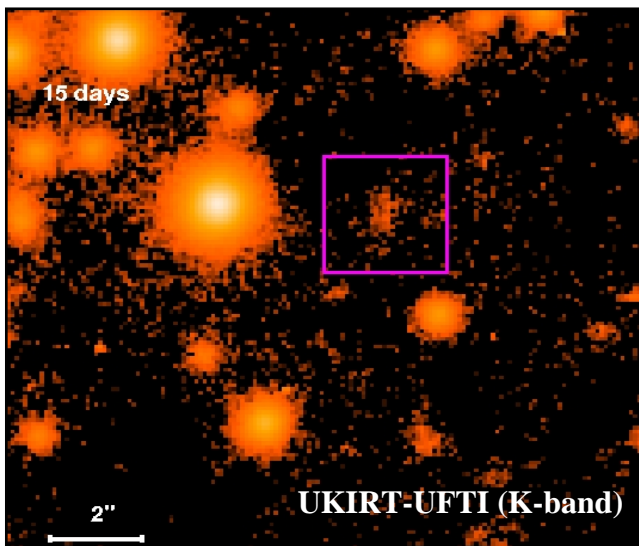
Compilation of K-band afterglow magnitudes (incl. GRB 030528; black squares)



## The Near-IR Afterglow:

The fading near-IR afterglow was only detected in the *K<sub>s</sub>*-band, and is among the faintest *K*-band afterglows detected so far (upper right figure). No variability is observed in J-band observations between 0.6 and 120 days post-burst. The temporal ( $\alpha=0.7-2$ ) and spectral ( $\beta>0.4$ ) slopes are typical for GRBs.

The afterglow observation suffered from high Galactic foreground extinction ( $A_V=2$ ). A lower limit ( $A_V>2$ ) on the intrinsic extinction can be derived from the near-IR afterglow photometry, consistent with X-ray results. An interpolation of the *K*-band afterglow into the optical regime shows that the early searches were not sensitive enough for a detection.



## The Host Galaxy:

Late time imaging in *K* and *J<sub>s</sub>* revealed the underlying host galaxy (left) at  $K=19.9\pm 0.7$ . This places it among the brightest hosts found. Our *VRIJHK* photometry is best fitted by a late type star-forming galaxy (similar to other known GRB hosts; le Floch et al. 2003) at  $z<4$ , using the photometric redshift method of Bender et al. (2001).

If the host galaxy has an absolute brightness comparable to that of the known sample of hosts (8% of  $L_*$  in a Schechter distribution function), a redshift of  $z\sim 0.4-0.6$  is suggested. This is consistent with the value estimated from the prompt emission properties using the pseudo redshift indicator of Atteia (2003).