



TORTORA

First Optical Observation of GRB

from the beginning to the end

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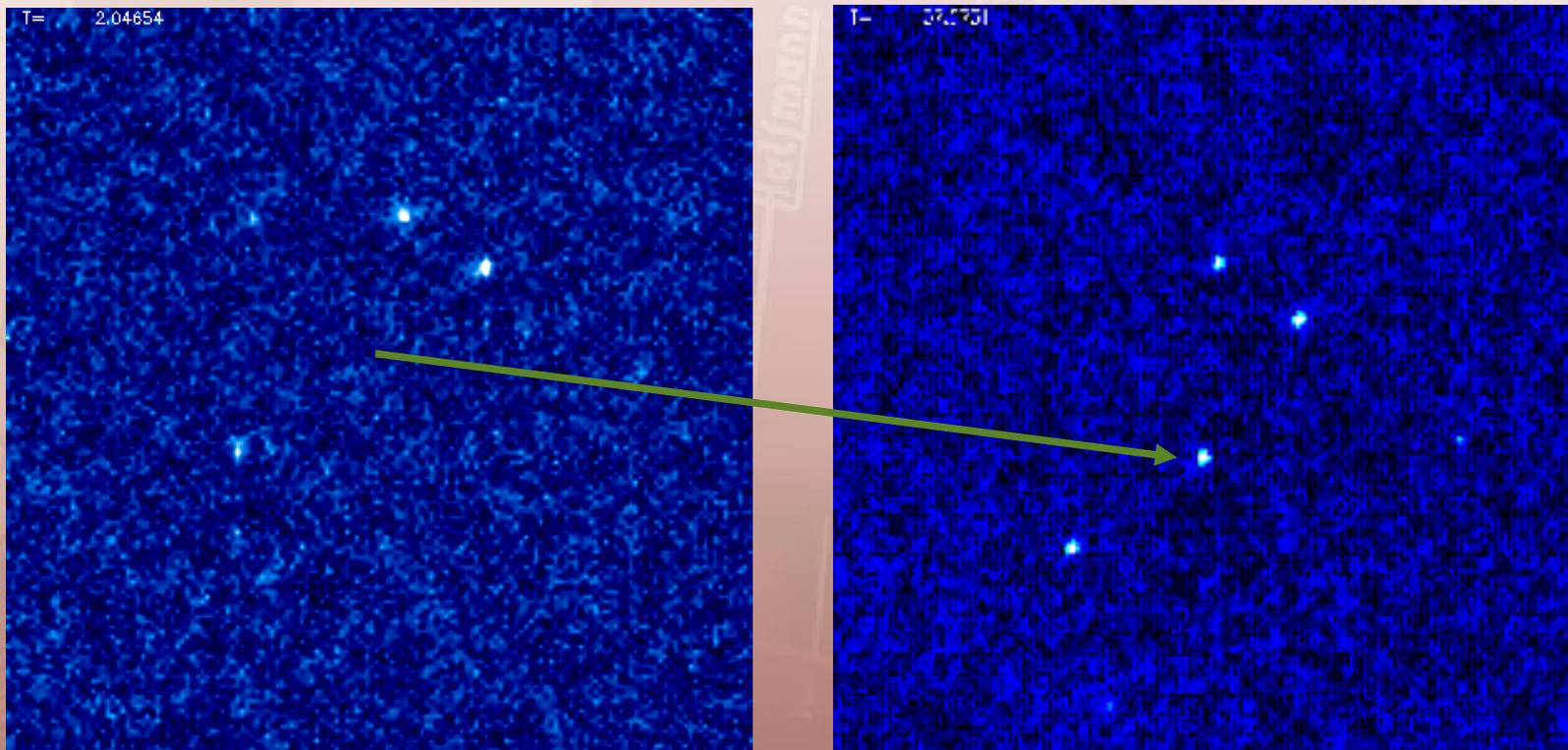
Special Astrophysical Observatory, Russia

TORTORA team

Presenting results from “Broadband Observations of the naked-eye γ -ray burst GRB 080319B”, Racusin et al., to appear in Nature on September 11, 2008

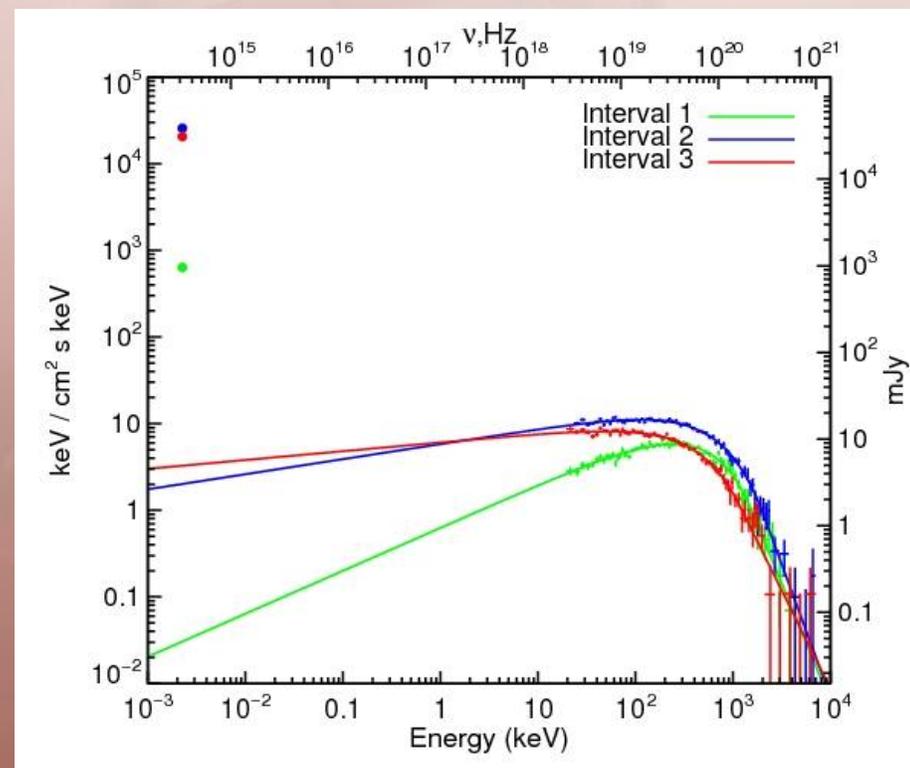
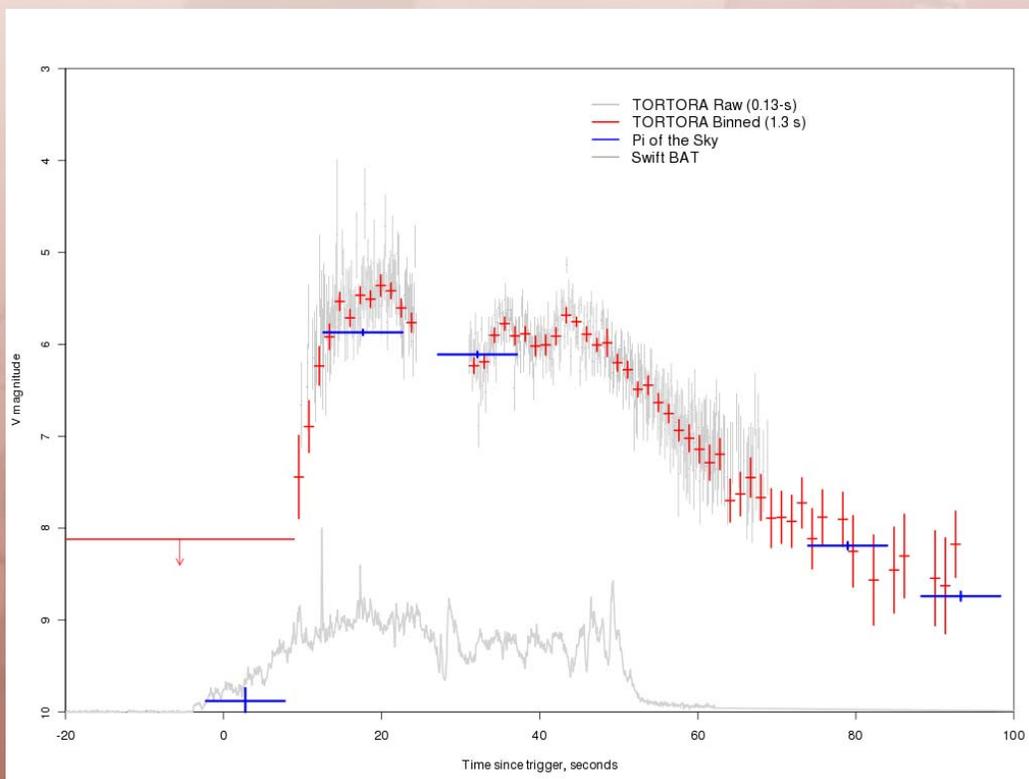
GRB080319B — Naked-Eye Burst

- Brightest GRB in optical band ever – peaked at 5.3 visual magnitude
- First GRB with detailed (sub-second temporal resolution) optical light curve – shows rapid variability



Animated version available on website

- First GRB detected by monitoring cameras independent from gamma-ray satellite triggers
 - TORTORA, Pi of the Sky, RAPTOR
- First chance to compare optical and gamma emission at prompt stage



TORTORA

GRB080319B

how did we catch it?

- Wide-field monitoring — the only way to catch initial stages of GRBs in optical band
- Good temporal resolution is crucial as GRBs **do have** fast optical variability

Naked-Eye Burst is a brilliant success for the strategy we chose to look for GRBs in optical range

TORTORA — Telescopio **O**ttimizzato per la **R**icerca dei **T**ransienti **O**ttici **R**apidi

Russian-Italian project since 2006
(SAO RAS, Bologna University, Brera Observatory)
Located at La-Silla, ESO, Chile
on top of Italian REM telescope



Small telescopes (5 inch)
may get great results too!

- Simultaneous optical and gamma emission — key to physics of the explosion
 - Optical is 10000 times brighter than implied by extrapolation of gamma-ray spectrum
 - Similarities and differences
 - Starts, peaks and ends at the same time
 - **Behavior in the middle is different!**
 - Lots of short peaks in gamma
 - Several broad peaks in optical band
 - We have studied over 3000 GRBs since 1970s
- *We now have the first one with complete optical data at high time resolution*

Obviously, we have to wait for more...