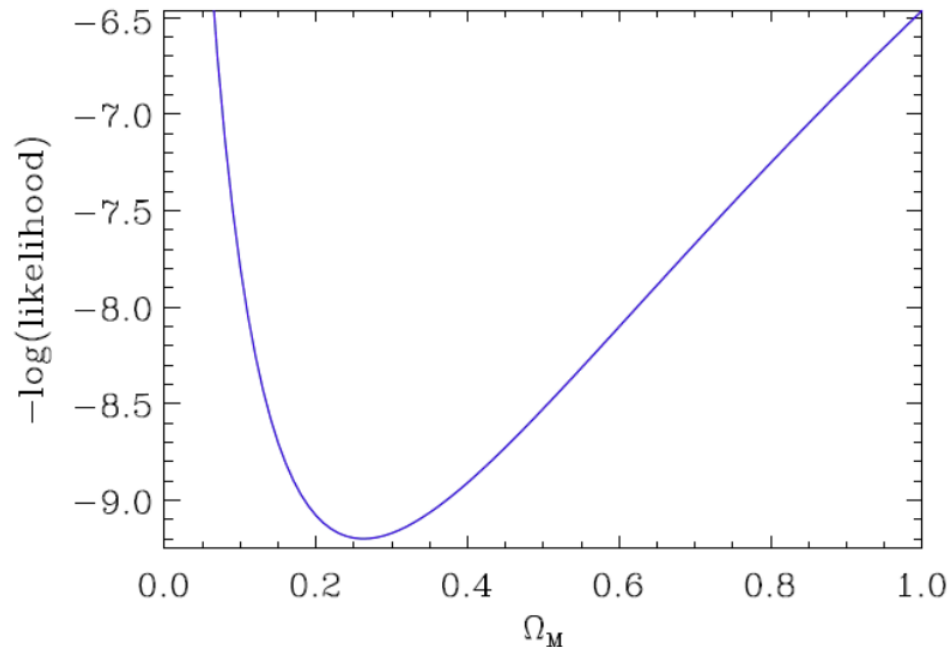
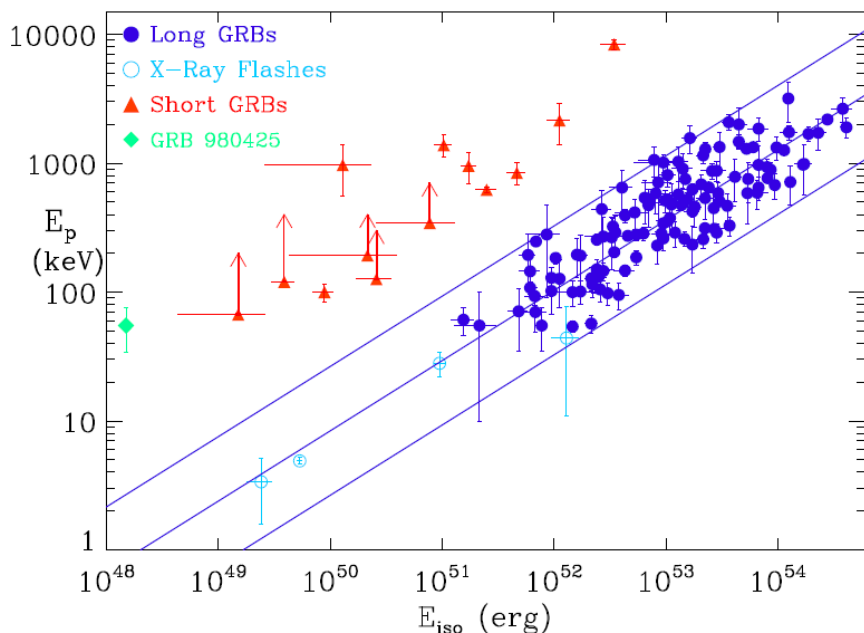


# GRB cosmology and physics with the Amati relation (Minigrant INAF 2022 – RSN4)

**Lorenzo Amati**  
(10 Novembre 2023)



# “Amati relation”: Impact on GRB science

- Physics of GRB prompt emission
- Jet structure and viewing angles
- Identification and understanding of GRB sub-classes
- GRB cosmology
- Other (e.g., redshift discrimination, GRB population models, SFR evolution)

## This minigrant INAF 2022

- **Aim:** providing a step forward in the characterization, understanding and uses of the correlation
- **How:** use of most recent catalogs by main GRB missions, specific spectral analysis, innovative analysis methods.

# Status of the project

- Activities started in Jan. 2023, when fundings made available
- Update of the  $E_{p,i}$  - Eiso sample up to Dec. 2022 almost completed, based on most recent Konus-WIND, Konus-WIND+BAT and Fermi/GBM catalogs, specific spectral analysis of Fermi/GBM data and optimized selection criteria, for a total of 293 events.
- Main collaborators in this phase: A. Tsvetkova (Univ. Cagliari), C. Guidorzi (Univ. Ferrara), F. Cogato (INAF - OAS Bologna)
- First use of the updated sample for GRB cosmology in synergy with other probes performed and published in Cogato, Moresco, Amati and Cimatti, MNRAS, in press (2023arXiv230901375C)
- Main paper (Amati et al.) presenting the updated Amati correlation and novel implications is in preparation; preliminary results have been presented at as contribute talks at Universum IV (Trento, Feb. 2023), 17<sup>o</sup> Iberian Cosmology meeting (Ponte de Lima, Pt, Apr. 2023), 10th GRavitation and AstroParticle Physcs (Amsterdam, Jul. 2023)