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GRBs in the Swift and Fermi era

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The era of the Swift and Fermi missions has marked a significant advance in the study of Gamma-Ray Bursts (GRBs). Swift's rapid detection and multi-wavelength observation capabilities have uncovered diverse GRB populations, including high-redshift bursts, and revealed extended emissions and X-ray flares, thus improving our knowledge of the environments surrounding GRBs.

Fermi's Large Area Telescope (LAT) and Gamma-ray Burst Monitor (GBM) have expanded this understanding by detecting high-energy gamma-ray emission, allowing for detailed spectral analysis and challenging existing theoretical models. Furthermore, with its nearly all-sky coverage capability and its broad range of gamma-ray energies, Fermi GBM proved to be the most prolific GRB detector ever.

In this contribution I will give a broad overview of GRB observations over the past 20 years, focusing on several joint GRB observations which have highlighted the key synergy between these missions, such as GRB 080916C, GRB 090510, GRB 130427A, and the landmark detection of GRB 170817A associated with gravitational waves, confirming neutron star mergers as short GRB sources. Also the detection and study of very high-energy (VHE) emission from bursts like GRB 180720B, GRB 190114C, and GRB 190829A have been significantly enhanced by the combined efforts of both observatories. Together, Swift and Fermi play a fundamental role in multi-messenger astronomy, enriching our understanding of GRB science and continuously driving new discoveries.

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