

INVITED LECTURE

Gamma-ray Bursts - mysteries and revelations

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Gamma-ray bursts (GRBs) more than 50 years after their discovery remain topic of a vivid scientific research, gaining a new momentum with detection of sources of gravitational waves in the last decade, which are closely related to a subclass of GRBs. They are the most violent (and given their short timescale the brightest) cosmic events and for this reason important cosmological probes, visible at very large distances. This review talk will cover specific approaches of their detection (discussing missions from historical to the planned ones) together with importance of followup by ground-based telescopes and alert distributing mechanisms. Observational evidence will be complemented with models of their central engine as well as for the interaction with surrounding material producing the afterglows. Processes during these events include very extreme states of matter and disentangling them can answer many questions of origin in Universe as well as those of fundamental physics.

