

High-z Universe with Gamma Ray Bursts

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Gamma-Ray Bursts (GRBs) are the most luminous explosions in space and trace the cosmic star formation history back to the first generations of stars. Their bright afterglows allow us to trace the abundances of heavy elements to large distances, thereby measuring cosmic chemical evolution. To date GRBs have been detected up to distances of $z=8.23$ and possibly even beyond $z\sim 9$. This makes GRBs a unique and powerful tool to probe the high- z Universe up to the re-ionization era. We discuss the current status of the field, place it in context with other probes, and also discuss new mission concepts that have been planned to utilize GRBs as probes.