

Type Ib/c Supernovae and Gamma-ray Bursts

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The properties of the broad-lined Type Ic Supernovae that are typically discovered in coincidence with long-duration Gamma-ray Bursts will be reviewed, and compared to those of other Supernovae for which GRBs are not observed.

The SNe associated with GRBs are of Type Ic. They are brighter than the norm, and show very broad absorption lines in their spectra, indicative of high expansion velocities and hence of large explosion kinetic energies.

There is strong evidence for gross asymmetries in the SN ejecta.

SNe associated with X-ray flashes are significantly less luminous, massive and energetic. They also appear to be less aspherical. This evidence suggests that GRB/SNe come from more massive stars.

For GRB/SNe the collapsar model is traditionally favoured, while XRF/SNe may host magnetars.

While the properties of the associated GRB can vary widely, those of the SNe seem to be almost constant. Possible implications of this will be discussed.

Finally, the recent extension of the SN-GRB connection to ultra-long GRBs and a subclass of Superluminous SNe will be presented, and its implications discussed.

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