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Insights into the Supernova-GRB Connection from Radio Synchrotron

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Relativistic outflows were observed in only a few supernovae, all of them accompanied by Gamma Ray Bursts (GRBs). All other supernovae had Newtonian outflows. This clear demarcation was blurred by discovery of the radio afterglow of SN 2009bb, the first supernova with a relativistic outflow without an observed GRB. We will discuss this, plus exciting new results from observations and modelling of a relativistic shockwave in SN 2012ap. Radio studies are revealing that supernova explosions with energetic relativistic ejecta can be found even without an observed GRB.

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