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Understanding Supernova Engines and the Properties of Compact Remnants [online]

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The energy released in the collapse of the core of a massive star are believed to produce a wide range of astrophysical transients including core-collapse (type Ib, Ic, II) supernovae and long duration gamma-ray bursts. A number of engines have been proposed to extract the energy released in the collapse and power an energetic explosion. All of the proposed engines are likely to occur in nature. But differentiating which engines produce which transients remains a point of intense discussion. A broad range of observations have focused on distinguishing these different engines. One of the most promising constraints has been observations of the properties of compact remnants: masses, spins, proper motions (a.k.a. kicks). Here I review the predictions of these compact remnant properties and show how observations of these properties have begun to constrain the nature of core-collapse engines.

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