Neutrinos and Supernovae

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In most astrophysical settings, neutrinos are minor players in terms of the energetics. Core-collapse supernovae, the deaths of stars at least ten times more massive than our Sun, are the rare exception. In these events, the weak nature of the interaction of neutrinos with matter allows them to carry away the binding energy released during the collapse. It also allows neutrinos to couple the inner core of the nascent neutron star to the overlying layers, which thereby allows them to contribute significantly to the explosion. Because neutrinos are so abundant during the supernova event, they also affect the nucleosynthesis occurring during the explosion. They do this by affecting the neutron-to-proton ratio, increasing the effective beta-decay rates of nuclei, and influencing the abundances by spallation of light particles from heavier nuclei. This talk will first review the role of neutrinos in the explosion of massive stars. It will then review recent advances in our understanding of neutrino-influenced supernova nucleosynthesis.