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Modeling of Core-Collapse Supernovae[1]

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Despite many decades of concerted theoretical effort and numerical modeling, the details of the core-collapse supernova explosion mechanism are still under debate. I review the current state of core-collapse supernova theory and highlight the recent progress made by multi-D hydrodynamic and neutrino-radiation-hydrodynamic core-collapse supernova models. I discuss how variations in the input nuclear and neutrino physics can effect the simulation outcome and the multi-messenger observational signature of core-collapse supernovae.

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