

## Core-Collapse Supernova Mechanisms

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The core-collapse supernova problem is central to our understanding of neutron star and black hole formation and the chemical enrichment of the universe. Stellar explosions from massive stars are intrinsically 3D and require complex multi-scale, multi-physics simulations. The availability of petascale supercomputers recently enabled the first high-resolution self-consistent 3D simulations. I review progress in the simulation and modeling of stellar collapse and the subsequent post-core-bounce core-collapse supernova evolution. Specifically, I present new results from general-relativistic 3D simulations of neutrino-driven and magnetorotational core-collapse supernovae. I discuss both explosion mechanisms and their implications and limitations in detail.

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