

Supernova Theory: Models

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Over the past decade state-of-the-art computer simulations of core-collapse supernovae by multiple modeling groups have converged on a mechanism for successful explosions based upon a combination of neutrino heating and turbulence. The neutrinos, gravitational waves and electromagnetic messages that we shall detect from the next supernova in the Milky Way will allow us to test this paradigm in exquisite detail. In this talk I will give an overview of the current state of supernova modeling, how we connect the simulations to the signals we expect to observe in DUNE (and elsewhere) when the message from the next Galactic supernova finally arrives, and the nascent efforts to rise to the challenge of modeling quantum neutrino transport.

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