

Gravitational wave emissions from core-collapse supernovae

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Core-collapse supernovae (CCSNe) are among the most explosive events in the universe and are the birthplaces of neutron stars and stellar-mass black holes under extreme conditions. CCSNe are also ideal multi-messenger sources, as they are expected to be detected not only through electromagnetic waves but also via neutrinos and gravitational waves.

In this talk, I will present the latest findings from our multi-dimensional supernova simulations with self-consistent neutrino transport and general relativistic corrections. In particular, I will focus on how the supernova progenitor, rotation, or magnetic fields affect the explosion engine and gravitational wave emission. I will also present our Machine-learning methods for searching CCSN events and estimating the possible physical parameters, such as rotational rates or nuclear equation of states.

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