

W54a **Fast collective neutrino oscillations in core-collapse supernovae and neutron star mergers**

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Neutrinos (ν 's) are copiously generated in supernova explosions and neutron star mergers. In supernovae, neutrinos are the key players as almost all of the energy released by the gravitational collapse of a massive star is emitted in the form of neutrinos and the kinetic energy of ejected materials in the explosion is only about one percent of the neutrino energy. In neutron star mergers, similar to the supernova explosions, neutrinos play an important role as they dominate the cooling of the merger remnants. They may change the composition of the ejecta, which may have an impact on the nucleosynthesis in that region.

In this presentation, I will report my latest results on the occurrence of fast neutrino oscillations by performing a thorough survey of the electron lepton number (ELN) crossing in our realistic Boltzmann simulations in two spatial dimensions under axisymmetry for the existence of the crossings between electron-type neutrino (ν_e) and anti-electron neutrino ($\bar{\nu}_e$) angular distributions, or the ELN crossing for both cases; core-collapse supernovae and neutron star mergers.