

Gravitational Waves from Cosmological B-L Breaking

Tuesday, 26 May 2020 11:45 (50 minutes)

The type-I seesaw mechanism crucially depends on the presence of right-handed neutrinos (RHNs) with large Majorana masses. These heavy RHN neutrinos are, however, notoriously hard to produce in terrestrial experiments, which impedes their experimental discovery. In the present talk, I will therefore present a novel, cosmological window onto the seesaw mechanism: the gravitational-wave (GW) signal associated with the cosmological phase transition in the early Universe during which RHNs acquire their mass. I will discuss both first-order and second-order phase transitions as well as GW production from both bubble collisions and cosmic strings. As I will show, the expected GW signal is going to be within the reach of upcoming GW experiments in large parts of the seesaw parameter space, opening up the possibility to probe a variety of RHN and leptogenesis scenarios in the near future. This talk is based on work in collaboration with Simone Blasi, Vedran Brdar, Wilfried Buchmuller, Valerie Domcke, Kohei Kamada, and Hitoshi Murayama (see 1305.3392, 1912.03695, 2004.02889).

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