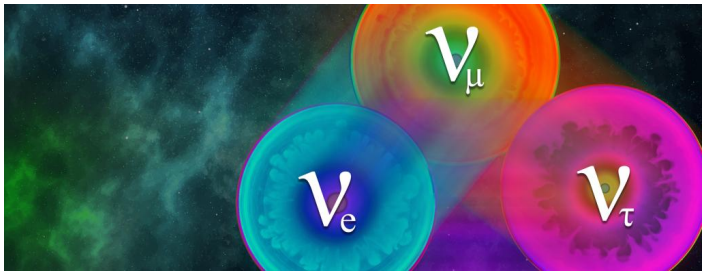


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# Novel Source of Gravitational Waves from First-order Phase Transition from Right-handed Neutrino Production

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We discuss a new source of gravitational waves (GWs) from first-order phase transitions arising from particle production from the walls of bubble walls, which inevitably modifies the standard GW spectrum produced from bubble walls collisions hitherto known. The new characteristic feature of the GW spectral shape entails a change of slope in frequency, which could be detected at GW detectors like LISA or SKA at low frequencies. We show that this opens the numerous and intriguing possibilities to probe beyond the standard model scenarios, involving heavy particles which can be produced in such a manner, including heavy Right-handed neutrinos, involving high scales of seesaw and leptogenesis. We will also show the impact on the analysis in dark matter formation and axion physics.

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