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Title: Baryogenesis and Dark Matter from Gravitational Waves

Theories of asymmetric dark matter provide a simultaneous solution to two of the most intriguing open questions in particle physics: What is the nature of dark matter? What is the origin of the observed matter-antimatter asymmetry of the Universe? I will demonstrate how this class of models can be probed via their gravitational wave signatures. I will focus on a theory in which the Standard Model gauge symmetry is extended by an additional SU(2) group, with the leptons forming doublets with new fermionic partners. Interestingly, one of the new fermions is a dark matter candidate. The breaking of this extra SU(2) symmetry occurs at a high scale, inaccessible in conventional particle physics experiments, and allows for a successful mechanism of baryogenesis. This is achieved via a first order phase transition in the early Universe, which, in turn, gives rise to a stochastic gravitational wave background. As I will show, the expected signal is within the reach of the upcoming gravitational wave detectors: Einstein Telescope, Cosmic Explorer, Big Bang Observer and DECIGO.