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News on Cold Baryogenesis

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The matter-antimatter asymmetry of the Universe represents one of the main open questions in particle physics and cosmology. In this talk, we will present a novel realization of cold baryogenesis, a mechanism involving the formation and decay of topological defects associated with the gauge group of the Standard Model known as SU(2) textures, that relies on the out-of-equilibrium dynamics during a strong first order electroweak phase transition. By performing extensive lattice simulations of the Higgs doublet and gauge field dynamics, we evaluate the related Chern-Simons number production as well as the rate of baryon number violation, as a function of the parameters of the phase transition and the shape of the Higgs potential. We finally provide an estimate for the total baryon asymmetry generated this way.

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