

Electroweak Cogenesis

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We propose a simple renormalizable model of baryogenesis and asymmetric dark matter generation at the electroweak phase transition. Our setup utilizes the two Higgs doublet model plus two complex gauge singlets, the lighter of which is stable dark matter. The dark matter is charged under a global symmetry that is broken in the early universe but restored during the electroweak phase transition. Because the ratio of baryon and dark matter asymmetries is controlled by model parameters, the dark matter need not be light. Thus, new force carriers are unnecessary and the symmetric dark matter abundance can be eliminated via Higgs portal interactions alone. The dark matter mass is also constrained within a window around the weak scale. One of the main predictions of this model is CP violating Higgs signals at the LHC and future colliders.

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