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Luminogenesis RG Flow

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Using constraints from Planck and BICEP2 on inflation models, and renormalization-group flow, we present constraints on the mass of dark-matter particles in a unification model with the gauge group $SU(3) \times SU(6) \times U(1)$, which breaks to the standard model with an extra gauge group for dark matter when the inflaton rolls into the true vacuum. In this model, inflaton decay gives rise to dark matter, which in turn decays to luminous matter in the right proportion that agrees with cosmological data. Some attractive features of this model include self-interacting dark matter, which may resolve the problems of dwarf-galaxy structures and dark-matter cusps at the centers of galaxies, and the absence of proton decay, which has evaded experimental detection to this day.

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