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Pure Glue Dark Sector Cosmology

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Dark glueballs, bound states of dark gluons in a $SU(N)$ dark sector (DS), have been considered as a dark matter (DM) candidate. We study a scenario where the DS consists only of dark gluons and dominates the Universe after primordial inflation. As the Universe expands and cools down, dark gluons get confined to a set of dark glueball states; they undergo freeze-out, leaving the Universe glueball-dominated. To recover the visible sector and standard cosmology, connectors between the sectors are needed. The heavy connectors induce decays of most glueball states, which populates the visible sector; however, some of the glueballs could remain long-lived on a cosmological time scale because of the (approximately) conserved charge, and hence they are a potential DM candidate. We study in detail the cosmological evolution of the DS, and show resulting constraints and observational prospects.

Mini Symposia (Invited Talks Only)

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