

Axion Dark Matter from Parametric Resonance during the QCD Phase Transition

The QCD axion cosmological abundance is usually attributed to the misalignment mechanism. We will present a complementary production channel that arises during the QCD phase transition. Primordial temperature fluctuations modulate the axion mass and can trigger parametric resonance in the axion field evolution, exciting finite-momentum modes and enhancing axion production. This effect can significantly modify the predicted axion relic abundance and shift the preferred dark-matter mass range, with implications for ongoing and future axion search experiments.

Primary author(s) : Dr ., Pirzada; Prof. YU, Gao; Prof. QIAOLI , Yang

Presenter(s) : Prof. QIAOLI , Yang