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Thermal axion production across the QCD phase transition

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We study thermal axion production around the confinement scale. At higher temperatures, we extend current calculations to account for the masses of heavy quarks, whereas we quantify production via hadron scattering at lower temperatures. Matching our results between the two opposite regimes provides us with a continuous axion production rate across the QCD phase transition. We employ such a rate to quantify the axion contribution to the effective number of neutrino species.

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