

Cosmic Axiverse Background

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Any light species in thermal equilibrium in the early universe, such as an axion, will contribute to the effective number of relativistic species, N_{eff} . In the context of the Axiverse, potentially hundreds of axions exist in the spectrum of nature and can thermalize with the Standard Model bath, but Planck data constrains the number of additional scalars to nine. Do they all contribute, vastly overproducing the observed value of N_{eff} ? I discuss an ongoing computation of the Axiverse contribution to N_{eff} under various assumptions for the flavor structure of the axion-fermion couplings.

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