

## Poster: Scalar perturbations from inflation in the presence of gauge fields

Different models of inflationary magnetogenesis have been receiving a lot of attention in the literature for the last two decades providing a possible explanation for the large-scale magnetic fields in voids, seeds for the astrophysical magnetic fields and having relation to baryogenesis, dark matter production, cosmological Schwinger effect etc. However, the presence of gauge fields during inflation may strongly alter the inflaton evolution, the universe expansion, and, consequently, the spectral properties of primordial perturbations generated at that time. The latter issue is extremely important as primordial perturbations later give rise to the CMB anisotropies and the large-scale structure of the universe and, thus, are strongly constrained by the observations. Although, the impact of gauge fields on primordial spectra has been studied in the literature earlier, the full and self-consistent treatment of this problem taking into account both inflaton and metric perturbations is still missing. In our work, we develop a general framework which allows one to compute the scalar power spectrum and bispectrum in a single-field inflationary model in the presence of an Abelian gauge field with kinetic and axial couplings to the inflaton which may cause a strong backreaction on the background evolution. We then apply this formalism to the model of axion inflation in the absence of backreaction and show that our results are consistent with earlier studies. Further, we plan to determine the scalar power spectrum in the regime of strong backreaction.

### Would you be interested in presenting a poster? (this will not impact the decision on your talk)

yes

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