## 10th International Conference on Gravitation and Cosmology: New Horizons and Singularities in Gravity (ICGC 2023)



Contribution ID: 128

Type: Oral

## An effective field theory approach to understand the primordial magnetogenesis

At all Universe scales, there is a detectable amount of magnetic field. This observed magnetic field has several probable origins, including the possibility that it was produced during the early Universe. There are several models for primordial magnetogenesis, and if the inflationary background is taken into account, breaking conformal symmetry is required to generate a sufficient amount of magnetic field. The conformal symmetry breaking is introduced either by new couplings between the electromagnetic field and the inflaton field or by adding higher derivative terms to the theory. To unify these different approaches in the literature, we propose an Effective Field Theory (EFT) approach, in which EFT parameters describe the magnetogenesis in the early Universe, and different choices of parameters correspond to different models. The approach also shows that conformal breaking alone is not a sufficient criterion for generating primordial magnetic fields.

## Email

ashukushwaha712@gmail.com

## Affiliation

Indian Institute of Technology Bombay, India

Authors: Mr KUSHWAHA, Ashu (Indian Institute of Technology Bombay, India); Dr NASKAR, Abhishek (Indian Institute of Technology Bombay, India)

**Co-authors:** Dr NANDI, Debottam (Department of Physics & Astrophysics, University of Delhi); Prof. S., Shankaranarayanana (Indian Institute of Technology Bombay, India)

Presenter: Mr KUSHWAHA, Ashu (Indian Institute of Technology Bombay, India)

Session Classification: Cosmology

Track Classification: Cosmology