

# Magnetogenesis and baryogenesis in pseudoscalar inflation

*Wednesday, 1 May 2024 15:00 (1 hour)*

Pseudoscalar inflation with Chern-Simons coupling to  $U(1)$  gauge fields generates helical magnetic field during inflation. If this  $U(1)$  gauge field is the Standard Model  $U(1)$  hypergauge interaction, the baryon (or  $B+L$ ) asymmetry is generated at the same time through the chiral anomaly in a way that the total chirality vanishes. We could expect that it explains the present Baryon Asymmetry of the Universe (BAU). However, it is not trivial if the BAU remains until today since the sphaleron washout and/or the annihilation of magnetic helicity and baryon (chiral) asymmetry through the chiral magnetic effect may erase the baryon asymmetry. On the other hand, the baryogenesis from the hypermagnetic helicity decay at the electroweak symmetry break would also take place in this scenario. In this talk, I will explain all these ingredients and clarify how the present BAU can be explained in the pseudoscalar inflation. Implication on the intergalactic magnetic fields are also discussed.

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