

Magnetogenesis from vorticity in the primordial universe

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I explore the speculation that a physical mechanism underlying primordial magnetogenesis could arise from the vorticity field in the quark-gluon plasma (QGP) phase of the early universe. This possibility is motivated by the recent discovery of giant rotating filaments connecting the cosmic web in the large scale structure (P. Wang et al., Possible observational evidence for cosmic filament spin, *Nature Astronomy*). The process of generation of angular momentum at such cosmic scales is unknown as is the seeding mechanism of the intergalactic magnetic field. Could both share a common or related origin (s) in the microsecond old universe when the QGP phase filled it? I address this question using relativistic hydrodynamics. The rich interplay of mechanical rotation and magnetic field in the extreme arena present in the primordial universe is the main subject of enquiry in the context of magnetogenesis and a critical comparison with observations is the goal.

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