

# Transport Phenomena from Anomalous Symmetries: The Chiral Magnetic Effect in the Quark-Gluon Plasma

Sergio Morales Tejera <sup>1,\*</sup>, Karl Landsteiner <sup>1</sup>, Sebastian Grieneringer <sup>1</sup> and Jewel Ghosh <sup>2,3</sup>

<sup>1</sup> Institute of Theoretical Physics (Madrid); karl.landsteiner@csic.es (K.L.); sebastian.grieneringer@gmail.com (S.G.)

<sup>2</sup> Independent University Bangladesh; jewel.ghosh@iub.edu.bd

<sup>3</sup> International Centre for Theoretical Sciences (ICTS-TIFR)

\* Correspondence: sergio.moralest@estudiante.uam.es

**Abstract:** It goes without saying that symmetries are one of the cornerstones of natural sciences, in particular it has proved itself a key concept in quantum field theory (QFT). Within the frame of QFT it may happen that a symmetry present classically is broken once we take all quantum effects into account. Such symmetries are known as anomalous and lead, among other things, to macroscopic transport phenomena. We will focus here on the Chiral Magnetic Effect (CME), a current generated in a chirally imbalanced medium in the presence of a magnetic field stemming from the chiral anomaly, reviewing its key features. The CME is expected to be present in the quark-gluon plasma (QGP) and is at current search to two particle accelerators: LHC and RHIC. We will briefly discuss the state-of-the-art of this search. Finally, we construct a holographic model that correctly reproduces the CME and match our parameters to QCD so that we can draw lessons of possible relevance to the realization of the CME in the QGP generated in heavy ion collisions.

**Keywords:** Chiral Magnetic Effect; Quark-gluon plasma; Holography; Transport; Anomalies

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