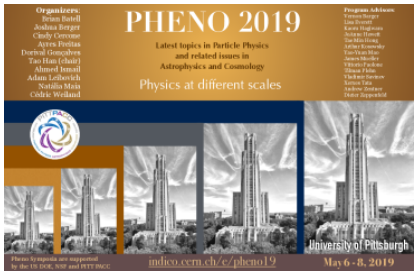

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A light complex scalar for the electron and muon anomalous magnetic moments

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The anomalous magnetic moments of the electron and the muon are interesting observables, since they can be measured with great precision and their values can be computed with excellent accuracy within the Standard Model (SM). The current experimental measurement of this quantities show a deviation of a few standard deviations with respect to the SM prediction, which may be a hint of new physics. The fact that the electron and the muon masses differ by two orders of magnitude and the deviations have opposite signs makes it difficult to find a common origin of these anomalies. In this work we introduce a complex singlet scalar charged under a Peccei–Quinn-like (PQ) global symmetry together with the electron transforming chirally under the same symmetry. In this realization, the CP-odd scalar couples to electron only, while the CP-even part can couple to muons and electrons simultaneously. In addition, the CP-odd scalar can naturally be much lighter than the CP-even scalar, as a pseudo-Goldstone boson of the PQ-like symmetry, leading to an explanation of the suppression of the electron anomalous magnetic moment with respect to the SM prediction due to the CP-odd Higgs effect dominance, as well as an enhancement of the muon one induced by the CP-even component.

Summary

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