



Contribution ID: 22

Type: Parallel Talk

A Flavored Peccei-Quinn Symmetry for Axions, Flavor, and Neutrino Masses

Recent measurements by several experimental collaborations have reported deviations from Standard Model (SM) predictions in diphoton final states, potentially hinting at the existence of intermediate scalar resonances above the electroweak scale. Such anomalies can be naturally accommodated within SM extensions featuring an enlarged scalar sector. In particular, multi-Higgs doublet frameworks arise in Flavored Axion Models (FAMs), which have been proposed to explain the texture zeros of quark mass matrices. These models provide a unified description of quark masses and the Cabibbo-Kobayashi-Maskawa (CKM) mixing matrix while simultaneously addressing the strong CP problem. In this work we study a concrete FAM realization augmented with Majorana masses for right-handed neutrinos, implementing a type-I seesaw mechanism. In this model the flavor structure is effectively determined by the vacuum expectation values of the scalar doublets and Yukawa couplings of order one. Within this framework, neutrino and axion mass scales are intrinsically connected, as the heavy right-handed neutrinos obtain their masses from the scalar field responsible for the spontaneous breaking of the Peccei-Quinn symmetry. We further explore the phenomenological implications of the model, including constraints from flavor-changing neutral currents derived from semileptonic decays, as well as current experimental limits on the axion-photon coupling obtained from axion search experiments.

Primary author: ROJAS PEÑA, Eduardo (Universidad de Nariño)

Presenter: ROJAS PEÑA, Eduardo (Universidad de Nariño)

Session Classification: Parallel Talks

Track Classification: Beyond the Standard Model