Contribution ID: **111** Type: **Talk**

Implications of the $(g-2)_\mu$ anomaly on the flavor structure of New Physics

Wednesday, November 9, 2022 4:00 PM (15 minutes)

The longstanding $(g-2)_\mu$ anomaly is one of the greatest puzzles in particle physics. If confirmed, it would be a clear indication for physics beyond the Standard Model. We discuss the implications of this anomaly on the flavor structure of its possible New Physics (NP) explanations. In particular, we investigate flavor alignment conditions that NP models need to satisfy in order to both satisfy the $(g-2)_\mu$ anomaly and, at the same time, be consistent with the tight bounds from $\mu \to e\gamma$. We analyze the problem in general terms within the Standard Model Effective Field Theory, considering the renormalization group evolution of all the operators involved. We show that semileptonic four-fermion operators, which are likely to generate a sizeable contribution to the $(g-2)_\mu$ anomaly, need to be tightly aligned to the lepton Yukawa couplings and the dipole operators in flavor space. While this tuning can be achieved in specific NP constructions, employing particular dynamical assumptions and/or flavor symmetry hypotheses, it is problematic in a wide class of models with broken flavor symmetries. We quantify this tension both in general terms, and in the context of explicit New Physics constructions.

Author: WILSCH, Felix (University of Zurich)

Presenter: WILSCH, Felix (University of Zurich)

Session Classification: High-intensity frontier

Track Classification: All