

# Phenomenology 2021 Symposium



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## Light Scalar and Lepton Anomalous Magnetic Moments

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Recent precise determination of the electron anomalous magnetic moment (AMM) adds to the longstanding tension of the muon AMM and together strongly point towards physics beyond the Standard Model (BSM). Here we present a solution to both anomalies via a light scalar that emerges from a second Higgs doublet and resides in the  $\mathcal{O}(10)$ -MeV to  $\mathcal{O}(1)$ -GeV mass range. A scalar of this type is subject to a number of various experimental constraints, however, as we show, it can remain sufficiently light by evading all experimental bounds and has the great potential to be discovered in the near-future low-energy experiments. In addition to the light scalar, our theory predicts the existence of a nearly degenerate charged scalar and a pseudoscalar, which have masses of the order of the electroweak scale. This scenario can be tested at the LHC by looking at the novel process  $pp \rightarrow H^\pm H^\pm jj \rightarrow l^\pm l^\pm jj + \cancel{E}_T$  via same-sign pair production of charged Higgs bosons.

### Summary

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