Contribution ID: **84** Type: **(a) Talk abstract only**

How large can the light Yukawa couplings be?

Tuesday 20 May 2025 10:30 (15 minutes)

So far, measurements of the Higgs boson's coupling to the electroweak gauge bosons, the third-generation massive fermions and the muon have confirmed the predictions of the Standard Model. However, the Yukawa couplings of the electron and the first and second generation quarks remain experimentally elusive due to their smallness and, in the case of the quark couplings, the difficulty of tagging the particles in detectors.
We identify and study simplified UV models with the ability to enhance the Yukawa couplings of the light quarks and the electron. Adopting the Standard Model Effective Field Theory framework, we consider the effective operators generated by the UV models and constrain them via flavour physics, direct searches, electroweak precision observables and Higgs Physics data. In the case of the light quarks, considering both current experimental results and projections for the FCC-ee, we show that the latter have the potential to significantly improve our ability to constrain possible enhancements of the light fermion Yukawa couplings. For the electron Yukawa coupling, we show how constraints from a dedicated FCC-ee run at the Higgs pole mass can compete with those from the electron anomalous moment.

Authors: ERDELYI, Barbara Anna (Università degli Studi di Padova and INFN Sezione di Padova); SELIMOVIĆ, Nudžeim (INFN Padova); GROEBER, Ramona (Università di Padova and INFN, Sezione di Padova)

Presenter: ERDELYI, Barbara Anna (Università degli Studi di Padova and INFN Sezione di Padova)

Session Classification: Physics, Experiments and Detectors

Track Classification: Physics, Experiments and Detectors: Physics/Theoretical Calculations