



Contribution ID: 49

Type: **Oral presentation**

## Recent developments in the theoretical description of $\mu \rightarrow e$ conversion in nuclei

*Friday 12 September 2025 11:30 (20 minutes)*

The rate for  $\mu \rightarrow e$  conversion in nuclei is set to provide one of the most stringent tests of lepton-flavor symmetry and a window into physics beyond the Standard Model. However, to disentangle new lepton-flavor-violating interactions, in combination with information from  $\mu \rightarrow e\gamma$  and  $\mu \rightarrow 3e$ , it is critical that uncertainties at each step of the analysis be controlled and fully quantified. In particular, nuclear response functions related to the coupling to neutrons are notoriously problematic, since they are not directly constrained by experiments. These shortcomings can be addressed by combining ab initio calculations with charge distributions from elastic electron scattering by exploiting strong correlations among charge, point-proton, and point-neutron radii and densities. In this talk, I want to discuss these recent developments, which now allow, for the first time, for a comprehensive consideration of nuclear structure uncertainties in the interpretation of  $\mu \rightarrow e$  experiments.

**Author:** NOËL, Frederic (ITP, AEC, Uni Bern)

**Presenter:** NOËL, Frederic (ITP, AEC, Uni Bern)

**Session Classification:** Session