

## Searching for Lepton Flavour Violation with the Mu3e Experiment

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The Standard Model of elementary particle physics is hugely successful at describing fundamental particles and their interactions. However, in order to explain observations like the presence of dark matter or the matter-antimatter asymmetry of the universe, "new physics" beyond the Standard Model are required. They can be searched for in direct production at high energies, e.g. at the LHC but also through their influence as virtual particles on rare processes.

The decay of a positive muon to two positrons and an electron is such a rare process which is suppressed to unobservable levels in the standard model but could be observable if new particles contribute. The Mu3e experiment is designed to find or exclude this process if it occurs more than once in  $10^{16}$  muon decays. The talk will discuss the challenges of such a high rate precision experiment and introduce some of the novel detector technologies that allow to tackle these challenges.