

## The Mu2e Experiment

The Mu2e experiment, based at Fermilab, will search for the coherent, neutrino-less conversion of a negative muon into an electron in the field of an aluminum nucleus, an example of Charged Lepton Flavor Violation (CLFV). Observation of CLFV at Mu2e would be an unambiguous signal of physics beyond the Standard Model (BSM). Mu2e aims to improve upon the previous upper limit by four orders of magnitude and reach an unprecedented single event sensitivity of  $3 \times 10^{-17}$  on the conversion rate. Mu2e is sensitive to a wide range of BSM models and will indirectly probe effective mass scales up to  $10^4 \text{ TeV}/c^2$ . To achieve its design goal, Mu2e will utilize an integrated system of solenoids to create an intense muon beam. The background will be kept at a sub-event level through careful detector design choices. The experiment is approaching a very important and exciting stage in its life cycle. Construction is almost complete. Commissioning is beginning and physics data-taking is scheduled for 2027. This talk will explore the theoretical motivations, design, and current status of the Mu2e experiment.

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