Contribution ID: **75** Type: **Oral**

The Mu2e Experiment at Fermilab

Tuesday 22 August 2023 15:00 (30 minutes)

The Muon-to-Electron-Conversion (Mu2e) Experiment is a high-precision, intensity-frontier experiment being developed at Fermilab which will search for coherent, neutrino-less muon to electron conversion in the presence of an atomic nucleus. Such a process would exhibit charged lepton flavor violation (CLFV), which has not yet been observed. Continuing the search for CLFV, Mu2e will improve the sensitivity by four orders of magnitude over the present limits. In the search for beyond the standard model (BSM) physics, Mu2e is uniquely sensitive to a wide range of models by indirectly probing mass scales up to the energy scale of 10ˆ4 TeV. While muon-to-electron-conversion is permissible in an extension of the standard model through neutrino oscillations, the rate is extremely low at about one event in 10ˆ52. By design, the background for the experiment will be well-understood and kept at a sub-event level, which will mean the observation of muon-to-electron conversion is a direct confirmation of BSM physics. The physics motivation, the design, and the current status of the experiment will be presented.

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Session Classification: parallel (room#301)

Track Classification: WG4: Muon Physics