

# The High-Efficiency Cosmic Ray Veto Detector for the Mu2e Experiment at Fermilab

*Friday, August 5, 2022 4:40 PM (30 minutes)*

The Mu2e experiment will search for the charged-lepton flavor violating neutrino-less conversion of a negative muon into an electron in the presence of a nucleus. The experiment's goal is to improve the previous upper limit by four orders of magnitude. Any observation of this process is a clear sign of new physics. The single 105-MeV electron that results from this process can be mimicked by electrons produced by cosmic-ray muons traversing the detector. An active veto detector surrounding the apparatus detects incoming cosmic-ray muons. To reduce the backgrounds to the required level, it must have an efficiency of about 99.99% and excellent coverage. The cosmic ray veto consists of four layers of scintillator counters, each with two embedded wavelength-shifting fibers, whose light is detected by silicon photomultipliers. The design and expected performance of the cosmic ray veto detector will be described. The potential use of very similar technologies in other experiments will be highlighted.

## Attendance type

In-person presentation

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**Session Classification:** Joint Session

**Track Classification:** WG4: Muon Physics