## FRONTIER DETECTORS FOR FRONTIER PHYSICS



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## The Calorimeter Project for the Mu2e Experiment.

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The Mu2e experiment at FNAL aims to measure the charged-lepton flavor violating neutrinoless conversion of of a negative muon into an electron. The conversion results in a monochromatic electron with an energy slightly below the rest mass of the muon (104.97 MeV). The calorimeter should confirm that the candidates reconstructed by the extremely precise tracker system are indeed conversion electrons. We therefore look for a calorimeter with a large acceptance, excellent energy resolution O(2%) and a reasonable position (time) resolution of few mm (<1 ns). Moreover, the calorimeter should also provide a trigger for the experiment and perform a powerful mu/e particle identification. Finally, it should be able to keep functionality in an environment where the background delivers a dose of ~ 200 Gy/year in the hottest area. It will also need to work immersed in 1 T axial magnetic field. The baseline version of the Mu2e calorimeter is composed of four homogeneous parallelepiped vanes with ~ 2000 rectangular LYSO crystals, 3x3x11 cm<sup>3</sup> dimension, each read out by two large area APDs. photodiodes (APD's). We show the calorimeter design, the results obtained at 100 MeV with a small size prototype and the excellent data-to-MC comparison for these data. We also show the simulation of the calorimeter in mu2e and the plans for R&D and calibration.

Primary author: LUCA, Alessandra (INFN - LNF)

Presenter: LUCA, Alessandra (INFN - LNF)

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