



## SÉMINAIRE DE PHYSIQUE CORPUSCULAIRE

**SUJET:** The Mu3e experiment

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### RÉSUMÉ:

The Mu3e experiment will search for the lepton flavor violating neutrinoless muon decay  $\mu \rightarrow e^+e^-e^+$  with a sensitivity of  $10^{-16}$ , a four order of magnitude improvement over previous experiments, using the world most intense muon beam at the Paul Scherrer Institute. This decay is strongly suppressed in the Standard Model, whilst several BSM models predict observable effects accessible to the new generation of LFV experiments.

The search for the  $\mu \rightarrow e^+e^-e^+$  decay requires a large acceptance detector capable of coping with rates of up to  $2 \times 10^{-9}$  stopped muons per second with excellent momentum, spacial, and time resolution to suppress backgrounds to below the  $10^{16}$  level. The required Mu3e detector performance is possible thanks to tracking detectors based on thin monolithic active silicon pixel sensors (HV-MAPS) in conjunction with an innovative tracking concept and very precise timing measurements using scintillating fibers and tiles coupled to silicon photo-multipliers. The recently approved Mu3e experiment is currently preparing for detector construction.

In this seminar I will briefly discuss the phenomenology of lepton flavor violation and the various models suggesting sizable LFV effects accessible to the next generation of muon experiments. I will overview the status of current LFV searches. Then I'll discuss in detail the principle and conceptual design of the Mu3e experiment and the experimental challenges associated with this search. Finally I will illustrate the various detector components and their expected performance.

INFORMATION : <http://dpnc.unige.ch/seminaire/annonce.html>

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