



COLLOQUIA DI DOTTORATO, A.A. 2025/2026

A101, Dipartimento di Fisica
Giovedì 21 maggio 2026 ore 16:00

Physics, New Physics and the Muon $g-2$

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The anomalous magnetic moment of the muon represents one of the most stringent tests of the Standard Model of particle physics. Thanks to both extremely precise theoretical calculations and high-precision measurements, this quantity provides a unique window into possible effects of physics beyond the Standard Model.

In the first part of the seminar, the concept of the muon magnetic moment and its anomalous contribution will be introduced. The quantum origin of the anomaly will be discussed, showing how electromagnetic, weak, and hadronic interactions contribute to the theoretical prediction of $(g-2)$. The role of possible contributions from new physics will also be highlighted, together with the current Standard Model prediction and its uncertainties.

The second part of the seminar will focus on the experimental determination of the muon anomalous magnetic moment, with particular emphasis on the Fermilab Muon $(g-2)$ experiment. The storage ring technique will be presented, together with alternative approaches which include a search for the muon electric dipole moment. The latest experimental results and their implications for searches for new physics will be discussed, as well as the future of this field of research.

The seminar is in presence up to the maximum occupancy of the lecture hall.