Hybrid-Kolloquium

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physikalisches Kolloquium

Chasing new physics with the magnetic moment of the muon

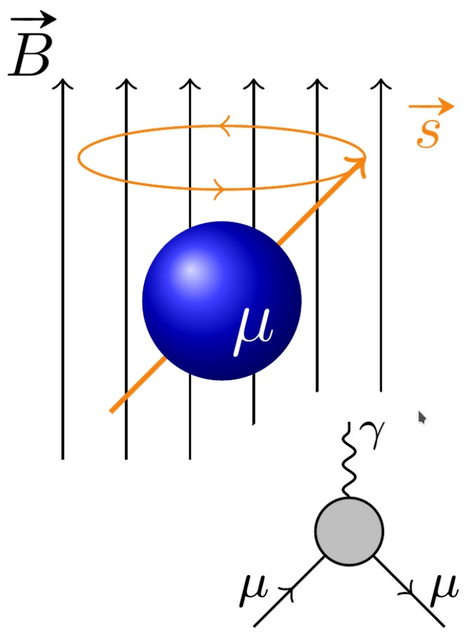
Mo. 4.7.22
16:00 Uhr
Ort: H34 &
go.ur.de/Koll

Answering questions such as "What is dark matter?" or "What happened directly after the Big Bang?" requires finding new physics, like not yet known particles or forces. Via quantum effects such new physics will contribute tiny amounts to properties of known particles and could be discovered by observing small deviations between experiments and theoretical predictions.

A promising quantity is the anomalous magnetic moment of the muon ("Muon g-2"), which describes the behaviour of a muon inside a magnetic field. A new experimental result released in April 2021 has further increased the discrepancy to the theoretical prediction, giving rise to a potential discovery.

So far, the theoretical prediction has been relying on replacing a part of the calculation by supplementary experimental data. However, a recent publication, where this part is numerically calculated using supercomputer simulations ("lattice QCD") leads to a result which is in tension with the previous determination and diminishes the discrepancy with the experimental result.

In this talk I will focus on discussing the status of the theory predictions for Muon g-2 with an emphasis on lattice QCD calculations.



Schematic of the precession of the muon's spin in a magnetic field (top) and the associated Feynman diagram (bottom).

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