



## Quantum Universe Lectures

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# “Muon g-2: Possible implications for physics beyond the Standard Model”

28 May, 11 and 18 June 2021 at 14.30h

Zoom:

<https://uni-hamburg.zoom.us/j/92293543262>

(Meeting ID: 922 9354 3262, Passcode: 97540703)

### Abstract:

Recently the Fermilab muon g-2 experiment has published its first results. They confirm the longstanding deviation from the Standard Model prediction and the hint for physics beyond the Standard Model (BSM). The current significance is  $4.2 \sigma$  and the prospects for further improvements are excellent.

What are the implications for BSM physics? How are BSM scenarios constrained by the result? Which models can accommodate it, given other constraints from LHC or dark matter? Such questions are the underlying theme of the three talks. The talks will cover general properties of g-2 and its complementarity to other observables. In fact, the deviation is larger than the contributions from the SM weak interactions. For this reason, only BSM scenarios with specific enhancement mechanisms are able to accommodate the deviation, and such scenarios typically involve intriguing connections to the muon mass generation mechanism and/or to dark matter.

The talks will also cover the current situation of BSM physics in general. In fact, answers to the above questions are less obvious than in the past because BSM scenarios are now strongly constrained: LHC searches have not found evidence for BSM particles, and e.g. dark matter searches have not found evidence for WIMPs. We will finally consider concrete BSM scenarios and discuss the impact of all existing constraints on possible explanations of g-2, highlighting scenarios which are now excluded and scenarios which emerge as promising.

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