Plenary Talk PV VI Thu 9:00 HBR 14: HS 1

The muon $g-2$ and the role of hadron physics — •Hartmut Wittig — PRISMA+ Cluster of Excellence and Institute for Nuclear Physics, Johannes Gutenberg University Mainz, Mainz, Germany

The anomalous magnetic moment of the muon, also called the muon $g-2$ parameterises the fraction of the muon's interaction strength with a magnetic field due to quantum corrections. It is a sensitive probe of the Standard Model and play a crucial role in the quest for new physics that may be able to explain the dark matter puzzle or the observed disparity between matter and antimatter. In particular, the observation of a non-zero deficit between experimental measurement and theoretical prediction would signal a quantitative failure of the Standard Model. In this contribution I review the status of lattice QCD calculations of the hadronic contributions to the muon $g-2$ moment, focussing on the hadronic vacuum polarisation contribution which dominates the uncertainty of the Standard Model prediction. This quantity exhibits a tension between recent lattice QCD results and the traditional data-driven dispersive method. I discuss the implications for the running of the electromagnetic coupling and the consistency of global fits using electroweak precision data.