International Physics School on Muon Dipole Moments and Hadronic Effects in memoriam Simon Eidelman

Monday 30 August 2021 - Thursday 2 September 2021

Online

Scientific Programme

Scientific Programme of the School

A large excess of the measured value of the muon anomalous magnetic moment over the Standard Model prediction has been causing great interest of the high energy physics community for more than 10 years. Earlier this year, the Muon g-2 experiment at Fermilab released their long awaited result which, to everyone's excitement, showed a strengthening of the discrepancy with the Standard Model (in total 4.2 standard deviations) and hence fortifying the possibility of New Physics. The theoretical prediction of this quantity in the Standard Model is based on the dispersive approach and involves cross sections of electron-positron annihilation into hadrons. Thus, a solution of the problem will require combined efforts of both experimentalists who have to perform new high-precision measurements and theoreticians who have to calculate hadronic effects and higher-order corrections at the unprecedented level of accuracy.

The idea of the School is to bring together two communities of young researchers (master and PhD students, young postdocs), one involved in new direct measurements of the muon anomalous magnetic moment (Fermilab, USA and J-PARC, Japan) and another performing experiments on e+e- annihilation into hadrons (BESIII in Beijing, China, CMD3 and SND in Novosibirsk, Russia, BelleII in Tsukuba, Japan) and the measurement of meson transition form factors (MAMI in Mainz and the e+e- experiments mentioned above). Those measurements can be used in the calculation of hadronic effects necessary for the theoretical prediction in the Standard Model. The school will provide unique experiences of exchange among young researchers and to learn about the other experiments working in the same or similar research field. Given the high accuracy required for the two direct g-2 experiments and for the measurements of hadronic form factors, the interchange of methods and ideas between experimentalists and theoreticians is furthermore essential. We also include closely related research fields, like atomic physics experiments, aiming for physics quantities which are complementary to g-2. While the focus will be on the physics of muon dipole moments, the school allows to get an overview of the broad field of technological and theoretical challenges which need to be overcome for a full interpretation of the upcoming results.

Topics and Speakers

Muon Magnetic Moment Experiment Graziano Venanzoni (INFN Pisa, Italy)
Muon Magnetic Moment Theory Daisuke Nomura (KEK, Japan)
Hadronic Light-by-Light Phenomenology Bastian Kubis (Bonn, Germany)
Data Input to Hadronic Vacuum Polarization Ivan Logashenko (Novosibirsk, Russia)
Data Input to Hadronic Light-by-Light Christoph Redmer (JGU Mainz, Germany)
Lattice QCD Theory Marina Marinkovic (LMU Munich, Germany)
New Physics Contributions to g-2 Svjetlana Fajfer (Ljubljana, Slovenia)
Atomic Physics Precision Experiments Klaus Blaum (MPI Heidelberg, Germany)