Dottorato di Ricerca in Fisica dell'Università degli Studi di Messina

25 Gennaio 2012, ore 15.00, Aula E. Majorana, Dip.to di Fisica,
V.le F. Stagno d'Alcontres 31, S. Agata, Messina

Seminar title:

The first crack of the Standard Model : the muon anomalous magnetic moment

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Abstract

The muon anomalous magnetic moment "(g-2)" is one of the most precisely measured quantities in particle physics. Recent high precision measurements (0.54ppm) at Brookhaven reveal a discrepancy by about 3 standard deviations from the Standard Model which could be a hint for an unknown contribution from physics beyond the Standard Model. A new muon g-2 experiment with a fourfold improvement in accuracy is planned at Fermi lab. The dominating uncertainty of the prediction, caused by strong interaction effects, could be reduced substantially, due to new hadronic cross section measurements in electron-positron annihilation at low energies.

After an introduction and a brief description of the principle of the experiment, it will be presented the status of the theoretical prediction and discuss the role of the hadronic vacuum polarization effects and the hadronic light-by-light scattering contribution. Prospects for the future will be briefly discussed.