



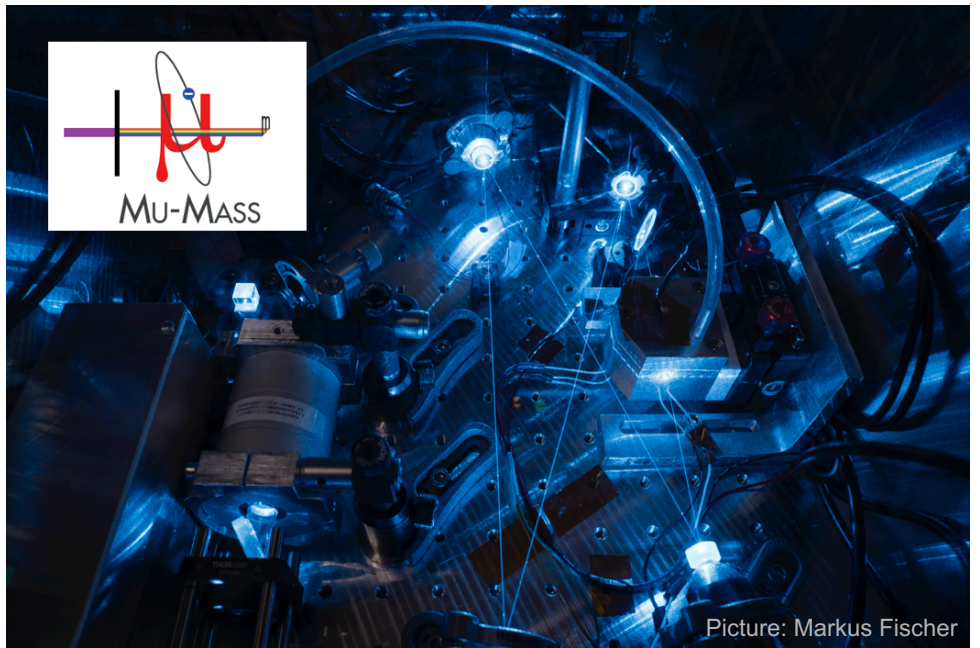
The Mu-MASS experiment at PSI.

Tuesday, 21 February, 2023

Auditorium & Webcast 16:00 h

Paolo Crivelli (ETH Zürich)

In this seminar I will present the overview of the Mu-MASS experiment which aims for a 1000-fold improvement in the determination of the 1S-2S transition frequency of Muonium (M). This substantial improvement beyond the current state-of-the-art relies on the novel cryogenic M converters we developed, the tremendous advances in generation of UV radiation, as well the unique low-energy-muon (LEM) beamline at PSI. Such a measurement will provide the most accurate value of the muon mass to 1 ppb. Combining our result with an improved determination of the ground state hyperfine structure of M ongoing at JPARC will yield the Rydberg constant to 4 ppt free of finite size effects, and provide one of the most stringent test of bound state QED to the ppb level. I will report our recent results on a precise determination of the M Lamb shift. Since our measured value matches the theoretical calculations within one standard deviation, we could set stringent limits on Lorentz/CPT violation in the muonic sector, as well as on new physics coupled to muons and electrons which could provide an explanation of the muon $g-2$ anomaly. I will conclude highlighting the prospects of the High intensity muon beam (HIMB) upgrade at PSI, e.g. how this could allow for an independent and competitive determination of the muon $g-2$ from M spectroscopy.



Picture: Markus Fischer

Coffee, Tea and refreshments will be served at 15:30 in the foyer.

This is a HYBRID colloquium

Meeting ID: 996 1652 8733

Meeting Password: 733220