

# TESTING THE STANDARD MODEL WITH THE LEPTON G-2

Massimo Passera

*INFN Sezione di Padova, 35131 Padova - Italy*

I will start by discussing the present status of the long-standing discrepancy between the Standard Model prediction of the muon anomalous magnetic moment (the muon g-2) with the experimental value, and a connection between the muon g-2 and the bounds on the Standard Model Higgs boson mass. I will then argue that the electron g-2 ( $a_e$ ) can be used to probe new physics. I will show that the present bound on new-physics contributions to  $a_e$  is  $8 \times 10^{-13}$ , but the sensitivity can be improved by about an order of magnitude with new measurements of  $a_e$  and more refined determinations of alpha in atomic-physics experiments. Tests on new-physics effects in  $a_e$  can play a crucial role in the interpretation of the observed discrepancy in the muon g-2. I'll conclude discussing opportunities and challenges offered by the study of the g-2 of the tau lepton.