

# High-precision mass measurements on highly charged ions with the PENTATRAP Penning-trap experiment

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The PENTATRAP experiment at the Max Planck Institute for Nuclear Physics in Heidelberg is a high-precision Penning-trap mass spectrometer that utilizes a cryogenic environment, a stable magnet, and an image current detection system to determine mass ratios of stable and long-lived highly charged ions with relative uncertainties in the few parts per trillion regime. The data acquired by this state-of-the-art apparatus contributes to different fields of fundamental physics, e.g., fifth force search, neutrino physics, and highly charged ion clocks. In this contribution I will present recent measurements on long lived electronic states,  $Q$  values of neutrino physics, and isotope shifts followed by future perspectives of PENTATRAP.

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