

HK 46: Hauptvorträge II

Zeit: Donnerstag 11:00–12:30

Raum: S1/01 A1

Hauptvortrag HK 46.1 Do 11:00 S1/01 A1
Charmonium(like) Spectroscopy — ●ZHIQING LIU — Johannes Gutenberg University Mainz, Mainz, Germany

Since its discovery in 1974, charmonium spectroscopy has always been an important probe to study strong interactions and the structure of hadronic matter. Below open-charm threshold, the charmonium spectrum is well established now. Also our understanding of charmonium states above the open-charm threshold has seen a big progress during recent years. However, the most surprising was the discovery of charmoniumlike states, which have a similar mass scale as charmonium states but can not be classified as conventional states easily. Indeed, charmoniumlike states are good candidates for the so-called exotic hadron states, i.e. particles with a quark content different from normal mesons and baryons, such as multi-quark states, hybrid states or molecule states. Although neutral charmoniumlike states are more difficult to be identified, the observation of charged states provide us a convincing evidence. In this talk, I'll review the recent progress on charmonium and charmoniumlike spectroscopy from BESIII, Belle, BABAR, CLEO-c and LHCb and the prospect for future experiments at Belle II and PANDA.

Hauptvortrag HK 46.2 Do 11:30 S1/01 A1
Ever-changing proton radius?! — ●MIHA MIHOVILOVIC — Institut für Kernphysik, Johannes-Gutenberg-Universität, Johann-Joachim-Becher-Weg 45, D-55128 Mainz, Germany

The discrepancy between the proton charge radius extracted from the muonic hydrogen Lamb shift measurement and the presently best value obtained from elastic scattering experiments remains unexplained and represents a burning problem of today's nuclear physics. Therefore, several new experiments are underway, committed to provide new insight into the problem. High-precision electron scattering experiments are in progress at the Jefferson Lab and the Mainz Microtron. As a

counterpart to these measurements, a muon-proton scattering experiment is envisioned at the Paul Scherrer Institute. Together with the nuclear scattering experiments, new atomic measurements are underway at the Max Planck Institute in Garching, which aim to further improve also the spectroscopic results on electronic hydrogen. These experiments are complemented by extensive theoretical efforts focused on studying various processes contributing to the atomic Lamb shift measurements that could explain the difference, as well as on pursuing different ways to interpret nuclear form-factor measurements, which could lead to a consistent value of the radius.

In this presentation the currently best proton radius measurements will be summarized, and the importance of the observed inconsistency between the hydrogen and the muonic-hydrogen data will be discussed. Selected new experiments dedicated to remeasuring the radius will be described, and the results of the MAMI experiment will be presented.

Hauptvortrag HK 46.3 Do 12:00 S1/01 A1
Towards HISPEC@FAIR: Opportunities and first results with AGATA — ●CHRISTIAN STAHL — Institut für Kernphysik, TU Darmstadt, Germany

The Advanced GAMMA Tracking Array (AGATA) will be the central instrument for the in-beam γ -ray spectroscopy experiment HISPEC at the future FAIR facility. The technique of γ -ray tracking and the position-sensitivity of the AGATA detector array will provide unprecedented sensitivity for the spectroscopy of fast-moving, exotic nuclei and facilitate novel experimental approaches and refinements of well-established techniques. This talk will introduce the opportunities for γ -spectroscopy arising from AGATA for FAIR, discuss novel experimental techniques and present first results obtained with AGATA in in-beam γ -ray spectroscopy experiments at various experimental setups.

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