

## HK 12: Invited Talks II

Time: Tuesday 11:00–12:30

Location: HSZ/0002

**Invited Talk** HK 12.1 Tue 11:00 HSZ/0002  
**Baryon spectroscopy at ELSA and MAMI** — ●FARAH AFZAL  
 for the CBELSA/TAPS-Collaboration — HISKP, Uni Bonn

To improve our knowledge of the exact dynamics between the constituents of baryons and to better understand quantum chromodynamics (QCD) in the non-perturbative regime, the baryon excitation spectrum is investigated.

Experimentally, it can be probed with a real photon beam by studying photoproduction reactions. Partial wave analyses are performed to extract the baryon resonance parameters from the experimental data. For an unambiguous solution it is not enough to only measure the unpolarized cross section, but several single and carefully chosen double polarization observables are essential as well.

Worldwide, various experimental facilities have dedicated programs to measure these polarization observables in different photoproduction reactions using polarized photon beams and polarized targets. Two of the leading experimental facilities are located in Germany, the CBELSA/TAPS experiment at the accelerator facility ELSA in Bonn and the Crystal Ball experiment at the accelerator facility MAMI in Mainz. Both experiments are excellent at measuring neutral mesons in the final states, using electromagnetic calorimeters covering almost the full angular range, while exploring complementary beam energy regions. This talk will give an overview about recent results in non-strange baryon spectroscopy at ELSA and MAMI.

**Invited Talk** HK 12.2 Tue 11:30 HSZ/0002  
**ALICE upgrades, status and perspectives for ALICE-3** — ●ROBERT MUENZER  
 for the ALICE Germany-Collaboration — Institut für Kernphysik, Goethe Universität Frankfurt, Deutschland

The ALICE experiment at CERN has undergone a major upgrade in preparation of LHC Run 3. A new Inner Tracking System and a system of new trigger detectors were installed while the Time Projection Chamber was upgraded with GEM-based readout chambers. The

muon system was extended by the Muon Forward Tracker. In addition, the readout of all detectors and the computing infrastructure have been redesigned for continuous readout including a synchronous reconstruction. The whole system was running successfully during the first year of LHC Run 3. For the next long shutdown, a further upgrade of the inner tracking systems and an installation of a forwards calorimeter is planned. For the operation in LHC Run 5 and 6 a next-generation experiment named ALICE 3 is proposed to address unresolved questions about the quark-gluon plasma by precise measurements of heavy-flavour probes and thermal radiation. In order to achieve the best possible pointing resolution and the required particle identification performance a concept for the installation of a high-resolution vertex tracker in the beam pipe, surrounded by a silicon-pixel tracker, a combination of time-of-flight system and a Ring-Imaging Cherenkov detector is foreseen. Further detectors, such as an electromagnetic calorimeter, a muon identifier, and a dedicated forward detector for ultra-soft photons, are being studied. In this presentation, the status of the ALICE upgrades as well as the future perspectives will be presented.

**Invited Talk** HK 12.3 Tue 12:00 HSZ/0002  
**Nuclear parton distribution functions** — ●MICHAEL KLASSEN —  
 University of Münster, Münster, Germany

Investigations of the nuclear structure at high energies are not only important for our theoretical understanding of the fundamental quark and gluon dynamics in protons and neutrons bound in nuclei and of the initial conditions for the formation of the quark-gluon plasma, but also for precise predictions of scattering processes studied at the LHC and the future EIC. In this talk, we will review the recent rapid progress in global determinations of nuclear parton distribution functions (PDFs) from neutral- and charged deep-inelastic scattering, the Drell-Yan process and various hard probes at the LHC. Theoretical developments with respect to correlations with the underlying proton PDFs, saturation, shadowing, short-range correlations of nucleon pairs, higher-order perturbative and lattice QCD will also be briefly discussed.