HK 35: Hauptvorträge III

Zeit: Mittwoch 8:30–10:00 Raum: HG X

Hauptvortrag HK 35.1 Mi 8:30 HG X

ALICE "First Day" Physics — •Yvonne Pachmayer for the ALICE Collaboration — Physikalisches Institut, Universitaet Heidelberg

The world's highest energy particle accelerator, the Large Hadron Collider (LHC) at CERN, produced its first collisions in November 2009. ALICE (A Large Ion Collider Experiment) [1] is the dedicated heavy-ion experiment at LHC. It is designed to exploit the full potential of the LHC experimental program including both nucleus-nucleus and proton-proton collisions. Besides an overview of the current status of the ALICE experiment we will point out its physics capabilities by discussing some selected examples. In particular, first results obtained in the first weeks of p-p collisions will be presented. These are a glimpse of the wealth of physics to be extracted from the ALICE program over the next several years.

[1] ALICE Collaboration, J. Phys. G 30 (2004) 1517 and J. Phys. G 32 (2006) 1295

Hauptvortrag HK 35.2 Mi 9:00 HG X

Recent results from COMPASS and HERMES — •Gunar Schnell — DESY Zeuthen

Deep-inelastic lepton scattering has for a long time been a valuable tool to examine the structure of nucleons. Both the COMPASS and the HERMES collaborations have followed up on this long tradition by scattering charged leptons from polarized and unpolarized targets. The recent results from both experiments will be reviewed and, when applicable, compared; with emphasis given to polarized quark distributions and 3D nucleon tomography.

Hauptvortrag HK 35.3 Mi 9:30 HG X

Multi-reference energy density functional theory: The description and role of fluctuations in collective degrees of freedom models of nuclear structure based on self-consistent mean fields — •Michael Bender — Centre d'Etudes Nucleaires de Bordeaux Gradignan, France

At present, methods based on self-consistent mean-field approaches are the only microscopic nuclear structure models that can be applied to all nuclei but the very lightest ones irrespective of their mass and neutron-to-proton ratio. Within this framework, a universal effective interaction set-up in the form of an energy density functional of Skyrme, Gogny, relativistic mean-field, or other type, provides a simultaneous description of bulk properties and many features of the excitation spectrum. This presentation will discuss for which nuclides, observables, and phenomena it is advantageous, even necessary, "to go beyond the self-consistent mean field", taking into account correlations that originate in fluctuations of a finite-size system in collective degrees of freedom through the restoration of symmetries and configuration mixing in the framework of the Generator Coordinate Method. The current state-of-the-art will be illustrated for two examples. One is the spectrum of excited collective states and their transition moments of nuclei in the neutron-deficient Pb region exhibiting multiple shape coexistence, the other is the systematics of masses and mass differences of even-even nuclei. An outlook will sketch necessary and/or desirable further developments.