SYCC 2: Colorful and Colorless QCD II

Zeit: Mittwoch 11:00–12:30 Raum: Audimax

Hauptvortrag SYCC 2.1 Mi 11:00 Audimax

Exotic hadrons with heavy quarks — •Tomasz Skwarnicki — Department of Physics, Syracuse University, Syracuse, NY 13244, USA

A plethora of heavy hadronic structures with unusual properties have been discovered in the past fifteen years. A large number of experiments have contributed to these developments. The present status and future prospects of exotic heavy flavor spectroscopy will be reviewed.

Hauptvortrag SYCC 2.2 Mi 11:45 Audimax

Towards a new paradigm in hadron spectroscopy — •Ulf-G. Meissner — Univ. Bonn / FZ Jülich

Understanding the hadron spectrum is one of the premier challenges in particle physics. For a long time, the quark model has served as an ordering scheme and brought systematics into the hadron zoo. However, many new hadrons that were observed since 2003 do not conform with quark model expectations. Here, we demonstrate that if the lightest scalar, the $D_{s0}^*(2317)$, and axial-vector, the $D_{s1}(2460)$, states are assumed to owe their existence to the nonperturbative dynamics of Goldstone-Boson scattering off D and D^* mesons, various puzzles in the spectrum of the charm mesons find a natural resolution. Most importantly the ordering of the lightest strange and nonstrange scalars becomes natural. Furthermore it is demonstrated that the well constrained amplitudes for Goldstone-Boson scattering off charm mesons are fully consistent with recent high quality data on the $B^- \to D^+\pi^-\pi^-$ final states provided by the LHCb experiment at CERN. This implies that the lowest quark-model positive-parity charm mesons, together with their bottom cousins, do not form the ground-state multiplet. In a broader view, the hadron spectrum must be viewed as more than a collection of quark model states.