

T 39: Eingeladene Vorträge 1

Zeit: Dienstag 13:45–16:15

Raum: M.10.12 (HS 14)

Eingeladener Vortrag T 39.1 Di 13:45 M.10.12 (HS 14)
Measurements of Electroweak parameters at LHC — ●ANDREA DI SIMONE — Albert-Ludwigs-Universität Freiburg

In the context of the physics programs of the LHC experiments, precision tests of the Standard Model play a crucial role. In particular, several measurements allow to access the fundamental parameters of the model. For example, both ATLAS and CMS have already published measurements of the weak mixing angle based on the forward-backward asymmetry of Z-boson decays. A review of the analyses will be presented, together with a discussion of the main results and their implications for future measurements.

Eingeladener Vortrag T 39.2 Di 14:15 M.10.12 (HS 14)
Search for Sterile Neutrinos in Tritium Beta Decay — ●SUSANNE MERTENS — Nuclear Science Division, Lawrence Berkeley National Laboratory, Berkeley, CA, USA

Sterile neutrinos in the keV mass range are a prime candidate for dark matter. In particular, this form of dark matter, as opposed to weakly interacting massive particles (WIMPs), can act as warm dark matter, the existence of which would reconcile recent structure observations from sub-galactic to larger scales.

A unique way to search for sterile neutrinos in a model-independent laboratory experiment is via tritium β -decay. A sterile neutrino would manifest itself as a kink-like signature and a spectral distortion in the β -decay spectrum.

In this talk the sensitivity of a KATRIN-like experiment to keV-scale sterile neutrinos will be presented. Furthermore, the first steps towards an upgraded detector system that would allow KATRIN to extend its physics reach from probing the neutrino mass in the sub-eV range to look for sterile neutrinos in the keV mass range will be discussed.

Eingeladener Vortrag T 39.3 Di 14:45 M.10.12 (HS 14)
The Crab pulsar and its nebula: Surprises in gamma-rays — ●ROLF BÜHLER — DESY, Platanenallee 6 15738 Zeuthen, Germany

The Crab nebula and its pulsar (referred to together as Crab) have historically played a central role in astrophysics. True to their legacy, several unique discoveries have been made recently. The Crab was found to emit gamma-ray pulsations up to TeV energies, beyond what was previously expected from pulsars. Strong gamma-ray flares, of dura-

tions of a few days, were discovered from within the nebula, while the source was previously expected to be stable in flux on these time scales. In this presentation I will review these intriguing and suggestive developments. I'll give an overview of the observational properties of the Crab and our current theoretical understanding of this system.

Eingeladener Vortrag T 39.4 Di 15:15 M.10.12 (HS 14)
Parton Distribution Functions and Constraints from LHC data — ●RINGAILE PLACAKYTE — DESY, Notkestr. 85, 22607 Hamburg

A precise knowledge of the Parton Distribution Functions (PDF) of the proton is essential in order to make predictions for Standard Model (SM) and beyond the Standard Model (BSM) processes at hadron colliders. Moreover, the PDFs uncertainties often are a limiting factor in the accuracy of theoretical predictions for both, SM and BSM.

The knowledge of proton PDFs mainly comes from the deep inelastic scattering HERA, fixed target, Tevatron and, increasingly precise LHC data. Recent ATLAS and CMS results which are sensitive to PDFs including the Drell-Yan, jet and top quark production data, are presented. HERAFitter, an open-source package which provides a framework for the determination of the PDFs and has been used in many LHC analyses to assess the impact of new data on PDFs, is also introduced.

Eingeladener Vortrag T 39.5 Di 15:45 M.10.12 (HS 14)
Transition form factors and distribution amplitudes of pseudoscalar mesons — ●NILS OFFEN — Institute for theoretical physics, University of Regensburg

Hard exclusive processes are dominated by wave functions at small transverse separation, the so called distribution amplitudes. The $\pi \rightarrow \gamma\gamma^*$ and $\eta^{(\prime)} \rightarrow \gamma\gamma^*$ transitions constitute gold plated modes to extract or at least constrain these distribution amplitudes.

Experimental data from the Belle and Babar collaboration in recent years has given rise to a flurry of theoretical activity, debating if the theoretical uncertainties in hadronic hard exclusive reactions are under control.

I will present recent calculations at next to leading order including SU(3) flavour violation and anomalous contributions. A comparison with experimental data and a discussion of occurring theoretical issues will be given.