T 81: Eingeladene Vorträge 3

Zeit: Donnerstag 13:45–16:15 Raum: M.10.12 (HS 14)

Eingeladener Vortrag T 81.1 Do 13:45 M.10.12 (HS 14)
CheckMATE: Checkmating new physics at the LHC — •Jamie Tattersall — Institute for Theoretical Physics, University of Heidelberg

In the first three years of running, the LHC has delivered a wealth of new data that is now being analysed. The two multi-purpose detectors, ATLAS and CMS, have performed many searches for new physics but theorists are eager to test their own particular model. We present the program CheckMATE (Check Models At Terascale Energies) that helps to automise this procedure. In addition, if new physics begins to appear, CheckMATE offers the possibility to quickly determine the model that best fits the data.

Eingeladener Vortrag T 81.2 Do 14:15 M.10.12 (HS 14)
Turning every stone in the search for SUSY — •Michael Flowerdew — Max-Planck-Institut für Physik, München

Searching for new phenomena not predicted by the Standard Model is a primary goal of the Large Hadron Collider. To increase the chance of a new discovery, or to convincingly rule it out, it is important to consider a wide range of potential experimental signatures. While many searches for supersymmetry focus on a "missing E_{T}" signature, nature may have chosen a different path. For example, one or more supersymmetic particles may be metastable, or they may decay entirely to Standard Model particles. In this talk, results from the ATLAS experiment in these scenarios will be discussed, along with the associated challenges, from an experimentalist's perspective.

Eingeladener Vortrag T 81.3 Do 14:45 M.10.12 (HS 14)
Search for sterile neutrinos with SOX-Borexino — •Matteo Agostini for the Borexino-Collaboration — Physik Department and Excellence Cluster Universe, Technische Universität München, Germany

The aim of the SOX-Borexino project is to unambiguously discover or refute eV-scale sterile neutrinos. Hints for eV-scale sterile neutrinos are provided by experiments with neutrinos from accelerators (LSND and MiniBoone), radioactive sources (Gallex and SAGE), and reactors (reactor-anomaly). An electron anti-neutrino source (^{144}Ce) will be placed next to the Borexino detector (LNGS, Italy) to search for short-baseline oscillations of active-to-sterile neutrinos. With an initial source activity of 100 kCi and after 1.5 yr of data taking, Borexino will detect more than 10^4 anti-neutrinos interacting via inverse beta-decay with negligible background contributions. The sought-after signature of sterile neutrinos is an oscillatory pattern in the neutrino interaction rate as a function of the neutrino energy and distance from the source. The delivery of the anti-neutrino source is scheduled for the end of 2015 and first results are expected already in 2016. This work is partially supported by the DFG cluster of excellence "Origin and Structure of the Universe".

Eingeladener Vortrag T 81.4 Do 15:15 M.10.12 (HS 14)
Magnetic micro-calorimeters for neutrino physics — •Loredana Gastaldo — Kirchhoff Institute for Physics, Heidelberg University

Metallic magnetic micro-calorimeters are energy dispersive detectors operated at temperatures below 0.1 Kelvin. Their resolving power $E/\Delta E$ approaching 5000, the intrinsic response time well below 1 μs and the excellent linearity make magnetic micro-calorimeters very attractive for numerous experiments.
With such detectors we have performed the first high resolution calorimetric measurements of the ^{163}Ho electron capture spectrum. The achieved performance motivated the formation of the international collaboration ECHo (Electron Capture in ^{163}Ho) to investigate the electron neutrino mass in the sub-eV range using the ^{163}Ho.
For the search of neutrinoless double beta decay in ^{100}Mo with scintillating crystals, we have developed photon and phonon detectors based on metallic magnetic calorimeters to be used in the experiments AMoRE and LUMINEU.
In this talk, the ECHo experiment as well as the other applications of metallic magnetic calorimeters for neutrino physics will be discussed.

Eingeladener Vortrag T 81.5 Do 15:45 M.10.12 (HS 14)
Precision measurements of top-quark properties in view of New Physics — •Alexander Grohsjean — DESY, Hamburg, Germany

The discovery of the top quark in 1995 at the Fermilab Tevatron collider completed the quark sector of the Standard Model (SM) of particle physics and was a remarkable confirmation of this theory.

Due to its high mass and its Higgs Yukawa coupling close to one, the top quark may also play a special role in electroweak symmetry breaking and it is an excellent candidate to find New Physics beyond the SM. The complete dataset of the Tevatron collider as well as the large samples collected by the LHC allow for measurements of top-quark properties to unprecedented precision, challenging the accuracy of theoretical predictions and representing a high sensitivity to sources of New Physics.

In this talk, I present high-precision measurements of top-quark properties with special emphasis on the potential to discover New Physics. Final measurements from the Tevatron collider as well as recent results from the LHC experiments at a centre-of-mass energy of 7 and 8 TeV are discussed.