

T 40: Eingeladene Vorträge 2

Zeit: Dienstag 13:45–16:15

Raum: K.11.24 (HS 33)

Eingeladener Vortrag T 40.1 Di 13:45 K.11.24 (HS 33)
ORCA - Neutrino Physik in der Tiefsee — •THOMAS EBERL
 — Erlangen Centre for Astroparticle Physics, Universität Erlangen-Nürnberg

Eine der wichtigsten offenen Fragen der Neutrino Physik ist die Bestimmung des Massenspektrums der drei Neutrinos des Standardmodells. Durch die Messung der energie- und zenitwinkelabhängigen Oszillationswahrscheinlichkeit von atmosphärischen Neutrinos, die die Erde durchquert haben, kann unterschieden werden, ob die Massenhierarchie der Neutrinos normal oder invertiert ist. ORCA (Oscillation Research with Cosmics in the Abyss) ist ein zukünftiger Wasser-Cherenkov-Detektor der KM3NeT-Kollaboration zum Nachweis atmosphärischer Neutrinos im Energiebereich von 1 - 50 GeV in der Tiefsee des Mittelmeeres. Im Vortrag wird die Technologie und der Status von ORCA vorgestellt und die erzielbare Sensitivität auf die Bestimmung der Massenhierarchie sowie der Oszillationsparameter diskutiert.

Eingeladener Vortrag T 40.2 Di 14:15 K.11.24 (HS 33)
JUNO: Determination of the neutrino mass hierarchy using reactor neutrinos — •BJÖRN WONSAK — Hamburg University, Inst. Exp.Phys., Hamburg, Germany

The Jiangmen Underground Neutrino Observatory (JUNO) is a medium-baseline reactor neutrino experiment located in China. Its aim is to determine the neutrino mass hierarchy at more than 3 sigma significance after six years of data taking by using a 20kt liquid scintillator detector. To achieve this goal, an energy resolution of less than $3\%/\sqrt{E}$ is necessary, creating strict requirements on the detector design and the liquid scintillator. Moreover, JUNO will be the only experiment in the near future able to measure the solar mixing parameters with a precision of better than 1%. This is at the same level as our current knowledge on flavour mixing in the quark sector, marking an important milestone of neutrino physics. In addition, supernova neutrinos, geoneutrinos, sterile neutrinos as well as solar and atmospheric neutrinos can be studied. JUNO was approved in 2013 and the construction of the underground facility started early this year. In this talk the status of the experiment and its prospects will be discussed.

Eingeladener Vortrag T 40.3 Di 14:45 K.11.24 (HS 33)
Measurements of $H \rightarrow WW^*$ decays and their impact on Higgs-boson parameters — •KARSTEN KÖNEKE — Albert-Ludwigs-Universität Freiburg, Freiburg, Germany

The $H \rightarrow WW^*$ decay channel plays an essential role for establishing the Higgs mechanism and for determining the parameters of the model.

This process had already contributed significantly to the discovery of the Higgs-boson in the 2012 ATLAS discovery paper.

Since these days, the ATLAS collaboration has considerably improved the analysis methods in this decay channel, resulting in large improvements to the sensitivity. The new ATLAS $H \rightarrow WW^*$ results will be presented, including evidence for the vector-boson-fusion production-process of the Higgs boson. Furthermore, their impact on our understanding of the Brout-Englert-Higgs sector of the Standard Model will be discussed.

Eingeladener Vortrag T 40.4 Di 15:15 K.11.24 (HS 33)
Statistics in HEP: Theory and Practice — •JOCHEN OTT — Universität Hamburg, Hamburg, Germany

Statistics plays a crucial role for the interpretation of analyses in HEP. While the mathematical principles of the statistical methods are known for many decades, their application to problems in HEP requires some adaptations.

This talk introduces important statistical methods in theory and discusses their application in realistic problems as they appear in many LHC analyses. In particular, this includes model building, interpretation and handling of systematic uncertainties, and approximate methods.

The application of statistical methods to problems with a large number of systematic uncertainties and channels can lead to numerical instabilities and long turn-around times, which impedes reproducibility and re-evaluation with different assumptions. These challenges are addressed by the fast and robust framework *theta*, which has been developed by the speaker.

Eingeladener Vortrag T 40.5 Di 15:45 K.11.24 (HS 33)
Towards First Physics at Belle II — •TORBEN FERBER for the Belle II-Collaboration — DESY, Hamburg, Germany

The Belle II Experiment at the Super-KEKB collider in Japan is scheduled to start data taking in the next years. This unique Super-B facility includes major upgrades of both the Belle detector and the KEKB accelerator which will be described briefly in this talk. The Belle II experiment is designed to collect a factor of 50 more data than the previous Belle experiment which will provide unprecedented sensitivity to new physics signatures. This talk will review aspects of the Belle II physics program that reach beyond B-physics including dark sector searches and electroweak precision physics. Special emphasis will be given on the physics program for the first year of data taking with modified trigger settings and a center of mass energy below the $Y(4S)$ resonance.