

T 99: Eingeladene Vorträge 4

Zeit: Donnerstag 14:00–16:15

Raum: H 3

Eingeladener Vortrag

T 99.1 Do 14:00 H 3

Photons at ultra-high energies - a new window to the universe — ●DANIEL KUEMPEL — III. Physikalisches Institut A, RWTH Aachen University

The observation of ultra-high energy photons with energies > 100 PeV would extend the observed electromagnetic spectrum to highest energies and open a new window to the universe, with possible impact on astrophysics, particle physics, cosmology and fundamental physics. Current and planned air shower experiments, particularly the Pierre Auger Observatory, offer an unprecedented opportunity to search for such photons and to complement efforts of multi-messenger observations of the universe. In this talk I will summarize motivation, achievements, and prospects of the search for ultra-high energy photons.

Eingeladener Vortrag

T 99.2 Do 14:27 H 3

First results from TAIGA HiSCORE — ●MARTIN TLUCZYKONT — Institut für Experimentalphysik, Luruper Chaussee 149, 22761 Hamburg

TAIGA is implementing a new, unique observation method, based on a combination of the imaging air Cherenkov telescope (IACT) technique, and the HiSCORE concept (shower front sampling or timing technique). TAIGA aims at opening up the so far only poorly explored gamma-ray energy regime from few 10s of TeV to several 100 TeV. This energy range is particularly important to spectrally resolve the cutoff regime of the long-sought Pevatrons, the cosmic-ray PeV accelerators. TAIGA currently consists of an array of 28 wide angle (0.6 sr) air Cherenkov timing stations distributed over an area of 0.25 km^2 , and an IACT with a diameter of 4.75 m and a field of view of 10° . Further 17 stations are currently in deployment, and a second IACT is planned in the next two years. Data from one observation season with the first stage of the experiment are available for comparison to simulations. In this presentation, these comparisons, first results, and a serendipitous discovery of a pulsed laser on-board the international space station will be addressed.

Eingeladener Vortrag

T 99.3 Do 14:54 H 3

Suche nach neuen Phänomenen mit Jet Substruktur Methoden und hochenergetischen Topquarks beim ATLAS Experiment — ●CHRISTOPH ANDERS — Physikalisches Institut, Universität Heidelberg

Das Topquark als schwerstes bekanntes Teilchen und seine damit verbundene starke Kopplung an das Higgs-Boson spielen eine zentrale Rolle in vielen Erweiterungen des Standardmodells. Die erhöhte LHC Schwerpunktsenergie von 13 TeV erlaubt die Suche nach Anzeichen neuer Phänomene auf der TeV-Skala in den von ATLAS in 2015 und 2016 aufgezeichneten pp -Kollisionsdaten. Bei entsprechend hohen zu erwartenden Impulsen lassen sich hadronisch zerfallende Topquarks in einem Jet mit grossem Radiusparameter rekonstruieren, wobei von Gluonen und leichten Quarks induzierte Jetuntergründe mit Hilfe von Jet Substruktur Methoden unterdrückt werden können.

Exemplarisch werden einige Analysen, die diese neuen experimentellen Methoden und Suchen nach neuen Phänomenen mit Topquarks verbinden, wie beispielsweise in Topquarkpaare zerfallende schwere Resonanzen, vorgestellt.

Eingeladener Vortrag

T 99.4 Do 15:21 H 3

Exotic Hadrons with Hidden Charm — ●SEBASTIAN NEUBERT for the LHCb-Collaboration — Physikalisches Institut Heidelberg, INF226, 69120 Heidelberg

The spectrum of confined systems of strongly interacting particles, especially those containing charm quarks, is ripe with surprise. The latest generation of experiments is expanding a series of discoveries and precision studies of new exotic resonances in the meson sector and lately in the baryon sector as well. This talk will review the status of the spectroscopy of these enigmatic hadrons with hidden charm and discuss recent experimental results from the pentaquark candidates to the evidence for multiflavor states.

Eingeladener Vortrag

T 99.5 Do 15:48 H 3

QCD measurements at the CMS experiment — ●PAOLO GUNNELINI — DESY, Notkestrasse 85, 22607 Hamburg

Jets, which are the signatures of quarks and gluons in a detector, can be described by Quantum Chromodynamics (QCD) in terms of parton-parton scattering. Jets are abundantly produced at the high energy scales reached by the Large Hadron Collider. Measurements of inclusive jets, dijets and multijets can be used to test perturbative QCD predictions and to constrain parton distribution functions. Various jet measurements performed with the CMS experiment in proton-proton collisions are presented and their interpretation in view of the current theoretical models is shown.