T 68: Eingeladene Vorträge (Invited Topical Talks) III

Time: Thursday 14:00–16:00 Location: H-Aula

Invited Topical Talk T 68.1 Thu 14:00 H-Aula
Assembling the flavour jigsaw (2020 edition) — •Oscar Cata — Theoretische Physik 1, Universität Siegen, Walter-Flex-Str. 3, D-57068 Siegen

I will discuss the different flavour puzzles that we are currently facing in the bottom, charm and strange sectors, in the light of recent experimental data. I will also report on the most recent theoretical ideas to tackle them. Interestingly, the revival of low-TeV leptoquarks in the last years suggests a stronger link between the flavour puzzles in the quark and lepton sectors. These broader theoretical frameworks suggest new directions for future experimental searches, and indicate that new insights on the flavour problems might be just around the corner.

Invited Topical Talk T 68.2 Thu 14:30 H-Aula
Precise predictions for vector-boson scattering at the LHC — •Mathieu Pellen — Cavendish Laboratory, University of Cambridge, United Kingdom

Vector-boson scattering (VBS) processes have just started to be measured at the Large Hadron Collider (LHC). This is particularly exciting because this class of processes has been thought to be a possible window to new physics. But VBS is also interesting in its own right because it probes the Standard Model in extreme phase-space regions at high energy. The measurement of such processes is particularly challenging due to their low rates and large background. In this talk, I review necessary theoretical inputs to perform such measurements.

Invited Topical Talk T 68.3 Thu 15:00 H-Aula
Hunting dark matter on earth and in the sky — •Kai Schmidt-Hoberg — DESY, Hamburg

I will discuss recent developments in dark matter research with a particlar focus on light dark matter. After a quick overview I will concentrate on complementary search strategies including astrophysical as well as collider based experiments with a particular focus on the complementarity between different searches.

Invited Topical Talk T 68.4 Thu 15:30 H-Aula
Probing cosmic magnetism and fundamental physics with γ-ray propagation — •Manuel Meyer — ECAP, University of Erlangen-Nuremberg, Erlangen, Germany

The observation of high-energy γ rays produced in distant galaxies offers the unique opportunity to search for an intergalactic magnetic field (IGMF) and dark-matter particle candidates. During their propagation, γ rays interact with background radiation fields and produce e^+e^- pairs. These pairs in turn up-scatter photons of the cosmic microwave background to γ-ray energies, initiating a cascade. The morphology of this cascade signal will depend on the IGMF since it deflects the e^+e^- pairs. On the other hand, γ rays could oscillate into axion-like particles (ALPs), leaving distinct features in γ-ray energy spectra. I will review the latest results in the search for an IGMF and ALPs and give an outlook over the capabilities of future γ-ray telescopes.