

SYDM 1: Symposium Dark Matter

Zeit: Mittwoch 14:00–16:20

Raum: H 1

Hauptvortrag SYDM 1.1 Mi 14:00 H 1
Effective field theories for dark matter direct detection —
•MARTIN HOFERICHTER — Institute for Nuclear Theory, University of
Washington, Seattle

In the interpretation of direct detection experiments scales ranging from the appearance of physics beyond the Standard Model down to nuclear energy levels matter, and for each energy region the appropriate degrees of freedoms need to be considered to extract robust constraints on the nature of dark matter. This task can be achieved by matching a tower of effective field theories that delineates how the dark matter properties are encoded in a handful of couplings accessible in experiment. In the talk I will give an overview over this approach, concentrating on the nuclear and hadronic physics required to turn limits on the direct detection rates into constraints on the dark matter parameter space.

Hauptvortrag SYDM 1.2 Mi 14:35 H 1
Direct dark matter detection — •MANFRED LINDNER — Max-
Planck-Institut für Kernphysik, Heidelberg

Direct detection is a main route in searching for and identifying the nature of dark matter. The presentation will cover the status and results of different direct detection experiments for WIMPs, axions, ALPs and keV neutrinos. Prospects of on-going and planned experiments will be put in the context of generic theoretical expectations.

Hauptvortrag SYDM 1.3 Mi 15:10 H 1

A search for the invisible: Dark Matter and LHC — •MONICA
DUNFORD — Kirchhoff-Institute for Physics, Heidelberg University

The nature of dark matter is one of the biggest open questions in both cosmology and particle physics today. If dark matter is a weakly interacting massive particle, as favored in many cosmology and particle physics theories, it can be produced and studied at the Large Hadron Collider (LHC) at CERN. This proton-proton machine is now operating at its near-design luminosity of 13 TeV. During 2016, the data-taking run was wildly successful, producing eight times more data compared to the previous year. This talk will discuss the latest dark matter searches at the LHC using this large data sample and will specifically focus on several new and novel techniques aimed at improving the sensitivity to dark matter candidates over the full GeV to TeV mass spectra.

Hauptvortrag SYDM 1.4 Mi 15:45 H 1
Indirect detection of dark matter - status and perspectives
— •JAN CONRAD — Stockholm University

Indirect detection of dark matter, i.e. the attempt to detect dark matter annihilation or decay products produced in space, is one of the three pillars of particle dark matter detection, the others being detection of dark matter scattering (direct detection) and collider production. In my contribution I will review the recent status, comparatively discuss different approaches, put them into context to the other detection techniques and attempt an outlook at the next decade.