

T 23: Hauptvorträge (Invited Talks) I

Time: Tuesday 9:45–12:30

Location: Tb

Invited Talk T 23.1 Tue 9:45 Tb
Physics Beyond Colliders — •JOERG JAECKEL¹ and VARIOUS PHYSICS BEYOND COLLIDERS STUDY GROUP² — ¹ITP Heidelberg, Heidelberg, Germany — ²Various

Physics Beyond Colliders is a study group mandated by CERN management to explore the options for future experiments complementary to those at colliders. In this talks we consider the experiments discussed in this context over the last few years with a particular focus on the fundamental physics questions that they could explore and hopefully answer.

Coffee Break 30 min

Invited Talk T 23.2 Tue 11:00 Tb
Going the Extra Mile to Push the Frontier — •ALEXANDER MANN — Ludwig-Maximilians-Universität München

With the completion of the Run-2 dataset, a major checkpoint in the LHC physics program has been reached. For several years, this dataset will be the largest ever taken at the high-energy frontier and enable searches for physics beyond the Standard Model to explore new regions of phase space.

The wealth of data increases the sensitivity to the many models already under consideration, but the more important boost typically arises from new and refined analysis techniques that allow more challenging scenarios to be tackled, which are characterized by small cross sections or low signal acceptance or require dedicated reconstruction algorithms. With the Run-2 dataset many new and interesting models

can be studied for the first time — in this presentation, we will look at the overall status of the LHC searches and at the highlights from some selected recent results in detail.

Invited Talk T 23.3 Tue 11:45 Tb
Cosmic Nucleosynthesis, a Multi-Messenger Challenge — •ROLAND DIEHL — Max Planck Institut für extraterrestrische Physik, Garching, Germany

The origin of cosmic elements and isotopes is one of the fundamental questions in astrophysics. Identifying signatures clearly attributed to specific atomic or nuclear species is the main tool of the associated astronomy, and commonly applied to starlight. In stellar explosions, gas however is highly ionized and not in thermal equilibrium, making identifications more challenging. Moreover, nucleosynthesis in stars and explosions occurs through reactions among often unstable isotopes, and elemental information is ambiguous. In this talk, we review the astronomical messengers towards an understanding of cosmic nucleosynthesis, in their diversity. Observations of cosmic nucleosynthesis, direct and less direct, in gaseous and solid materials will be compared. The decay of unstable isotopes that are ejected from such sources provides a new tool from gamma-ray spectroscopy; more-common optical spectra, but also stardust or cosmic ray compositions within the solar system can be analysed with high precision, but are also offset in time and space from the nucleosynthesis event. We will discuss how these multiple messengers of cosmic nucleosynthesis complement each other, addressing specific events such as the kilonova/gravitational-wave event GW170817, and examples of core-collapse and type Ia supernovae.