T 63: Invited Overview Talks III

Time: Thursday 11:00–12:30 Location: ZHG011

Invited Overview Talk T 63.1 Thu 11:00 ZHG011
Neutrino properties from the laboratory and the cosmos — •Thomas Schwetz-Mangold — Karlsruhe Institute of Technology, Karlsruhe, Germany

This talk reviews the present knowledge about neutrino properties, focusing on the determination of neutrino masses and PMNS mixing angles. I will review the implications of global data on neutrino oscillations and discuss the results of latest global fits, and I comment on expected near-term developements. For the determination of the absolute neutrino mass, complementary inforamtion is needed. In particular, recent results from cosmology lead to stringent upper limits on the sum of neutrino masses which start to be in slight tension with the lower bound implied by oscillation data. I will review the present status of this emerging tension and possible near future scenarios in light of upcoming data from DESI and EUKLID. A corroborated neutrino tension may be a sign of new physics in the cosmological model and/or in neutrino physics.

Invited Overview Talk T 63.2 Thu 11:30 ZHG011
Highlights from Standard Model physics at the LHC in the precision era — •Daniel Savoiu — Universität Hamburg

With the first two runs of the Large Hadron Collider (LHC) successfully completed, and Run 3 currently underway at an unprecedented center-of-mass energy of 13.6 TeV, the experiments at the LHC continue to collect a wealth of data for physics analysis. Following the discovery of the final component of the Standard Model (SM)—the Higgs boson—in 2012, the LHC physics program has entered an era of precision, aiming to measure the fundamental parameters of the SM and the properties of its constituent particles to the most precise extent possible. The quest for precision is complemented by a vast array of searches for phenomena beyond the SM (BSM), which directly benefit from the improved knowledge of the SM. In this contribution, I will present a selection of recent results from the ATLAS and CMS collaborations, focusing on SM electroweak and QCD physics, and touching upon searches for BSM phenomena.

Invited Overview Talk T 63.3 Thu 12:00 ZHG011
Cosmological results from the Dark Energy Spectroscopic Instrument — •Daniel Gruen — University Observatory, Faculty of Physics, Ludwig-Maximilians-Universität, Scheinerstr. 1, 81679 München

The Dark Energy Spectroscopic Instrument (DESI) is conducting by far the most comprehensive survey of galaxy distances to date. Its primary goal is a precision measurement of the expansion of the Universe over the past 10 billion years. This expansion may reveal more about the nature of one of the biggest mysteries of modern physics, the late-time accelerating effect called Dark Energy.

I will review the results of Baryonic Acoustic Oscillation measurements, which provide a 'standard ruler' of fixed physical scale that can be observed to track expansion from the embryonic to the adult universe. The first year of DESI data, together with cosmic microwave background and supernova observations, has provided tantalising evidence that Dark Energy indeed is not a constant vacuum energy density. The analysis of three years of DESI galaxy observations, potentially concluded by Göttingen25, will again sharpen what we know about the recent past and the future of our cosmos.