T 25: Invited Overview Talks 3

Time: Tuesday 11:45–12:45 Location: Geb. 30.95: Audimax

Invited Overview Talk T 25.1 Tue 11:45 Geb. 30.95: Audimax

Extensive air shower simulations – successes and challenges — •Tim Huege — Karlsruhe Institute of Technology, Institute for Astroparticle Physics, Karlsruhe, Germany — Vrije Universiteit Brussel, Astrophysical Institute, Brussel, Belgium

Monte Carlo Simulations of extensive air showers are an essential foundation of many experimental projects in Astroparticle Physics, be it in imaging atmospheric Cherenkov telescopes, particle detector arrays measuring cosmic rays, or radio detectors for high-energy cosmic rays and neutrinos. The CORSIKA code in particular has shaped the field for over 20 years, yet new challenges arising in ever-more complex detectors are increasingly driving it to its limits. In this talk, I will review the successes and relevance of air-shower simulations, discuss open issues (such as the "muon puzzle") and current limitations, before describing how the independent re-implementation of air-shower simulation functionality in the modern CORSIKA 8 framework will allow us to tackle new challenges as well as profit from new results from particle physics experiments.

Invited Overview Talk T 25.2 Tue 12:15 Geb. 30.95: Audimax

The muon anomalous magnetic moment — •Christoph Lehner — University of Regensburg

The precise study of the Landé g-factor has lead to significant advances in our understanding of elementary particles ever since the first measurement by Stern and Gerlach for the electron.

Recently, the Fermilab E989 experiment has significantly improved upon the experimental precision of the muon's g-factor which offers an unprecedented view into the inner workings of elementary particle physics. Some challenges remain to match this experimental result with an equally precise theory value.

I will review the current status of both experiment and theory and will give an outlook on new developments to be expected in the coming years.