

Prize Talk

PV X Wed 12:30 HSZ/AUDI

News from the Flavour Expedition to the Zeptouniverse —
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After finding an important cornerstone of the Standard Model (SM) through the Higgs discovery, particle physicists are waiting for the discovery of new particles either directly with the help of the Large Hadron Collider (LHC) and its upgrade (HL-LHC) or indirectly with the help of experiments like LHCb, NA62 and Belle II through quantum fluctuations causing certain rare processes with a change of quark flavour to occur at different rates than predicted by the SM. While

the latter route is very challenging, requiring very precise theory and experiment, it allows the resolution of short distance scales as short as the Zeptometer corresponding to energies of order 100 TeV or even shorter scales. In the coming flavour precision era, in which the accuracy of the measurements of rare processes and of the relevant theory calculations will be significantly improved, this goal could be reached. The main strategies for reaching this goal will be explained in simple terms including the most recent advances. We will summarize the present status of deviations from SM predictions for a number of flavour observables and discuss possible explanations of these so-called anomalies. A short outlook for coming years will be given.