News from the LHCb experiment

Dr. Yasmin Sara Amhis

CERN, Genf

The observed baryon asymmetry of the universe is one of the biggest unresolved questions in fundamental physics. Within the Standard Model of particle physics, matter-antimatter (CP) asymmetries in the quark sector are encoded by the imaginary parameter of the Cabibbo–Kobayashi–Maskawa matrix. Despite the tremendous experimental success of the CKM mechanism in describing quark mixing, its CP asymmetry is around ten orders of magnitude too small to explain the observed baryon asymmetry. The LHCb experiment at CERN's Large Hadron Collider is one of the most sensitive instruments for seeking CP asymmetry sources beyond the Standard Model, with unparalleled reach for baryonic matter and hadrons containing charm quarks in particular. In this talk I will dive into LHCb's quest for indirect evidence of physics beyond the Standard Model through the study of b→sll processes mediated by penguin loops. I will discuss both the model-independent characterisation of muonic penguin decays, with particular attention to LHCb's recent legacy measurement of the B→K*mumu decay, the model-dependent characterisation of long-distance Standard Model contributions in these decays, as well as electron-muon lepton universality tests.