

# **Flavor physics as a window to new physics**

**(The same yet not the same -- how flavors make particles interesting and what we know about them)**

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## **Abstract**

One of the most fascinating phenomenon of particle physics is the generational structure of fundamental matter, of quarks and leptons. We discuss the corresponding quantum numbers "flavors" and what we know about them. We discuss recent developments in the search for physics beyond the standard model with flavor physics. In particular, implications of the exciting hints for lepton-nonuniversality seen in ratios of rare B-decays into muons and electrons at the LHCb-experiment are discussed.

If indeed true and confirmed with more data in the future at the LHC and Belle II (KEK, Japan), this would constitute a spectacular breakdown of the standard model: it would tell us that leptons are more different from each other than we thought, which offers intriguing links to, ultimately, the flavor puzzle.

Model explanations, broader experimental search strategies at colliders, LFV, and beyond are discussed.