Crisis in flavour physics?

What we promised in 2000:

The B factory experiments BaBar and Belle will reveal indirect effects of new physics mediated by the BSM particles to be discovered afterwards by the LHC.

→ turned out true, but not in the desired sense

But: flavor anomalies

3.2σ discrepancy in combination of $B \to D\tau\nu$, $B \to D^*\tau\nu$ branching fractions, supported by $B_c \to J/\psi\tau\nu$ and D^* polarization data, built up since 2012, seen by BaBar, Belle, LHCb

→ new physics in $b \to c\tau\nu$?

NP scenarios favored over Standard Model by up to 5.6σ in combination of several observables in $B_s \to \phi\ell^+\ell^-$ and $B \to K^{(*)}\ell^+\ell^-$, built up in LHCb data since 2013

→ new physics in $b \to s\mu^+\mu^-$ and $b \to se^+e^-$?

Crisis in flavour physics?

Predictions from the 1990s: $b \to c\tau\nu$ probes a charged Higgs boson H^+

$b \to s\mu^+\mu^-$ and $b \to se^+e^-$ probe γ, Z or Z' vertices or box diagrams,

with everyone assuming universal couplings to e and μ

Postdictions favored until 2022: leptoquarks with masses around 3 TeV for $b \to c\tau\nu$

and 30 TeV for $b \to s\mu^+\mu^-$ and $b \to se^+e^-$.

Why? leptoquarks have a sufficiently small effect on B mixing,

H^+ explanation in conflict with B_c lifetime and

LHCb claimed violation of lepton-flavor universality in $b \to s\mu^+\mu^-$ vs. $b \to se^+e^-$

2012: data on $B \to D^{(*)}$ shifted → H^+ explanation revived

lepton-flavor universality restored in $b \to s\mu^+\mu^-$ vs. $b \to se^+e^-$ after LHCb

corrected a bug in the electron ID

→ Model classes proposed before the measurements are back in the game.