

# Bethe Colloquium

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## The same, yet not the same – how to crack a paradigm

The behavior of matter is ruled by the standard model of particle physics -- really? Old puzzles and new evidences from precision measurements are lurking and pose challenges to standard theory. Deviations in processes as rare as one in a billion suggest that electrons and muons are more different than thought: they should behave the same according to the standard model, yet, recent data from the Large Hadron Collider in Geneva finds them to behave differently. If taken at face value, this anomaly heralds a very loud breakdown of the standard model, and requires out-of-the-box new physics. Intriguingly, cracking this with lepto-quarks, i.e., new particles which share features from quarks and leptons alike, also open doors into the notorious and longstanding flavor puzzle.

This talk reports on the rise of the anomalies in flavor physics, rare decays of beauty quarks and further cracks in the building.

Lecture Hall I – Physikalisches Institut – Nussallee 12 – 53115 Bonn

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