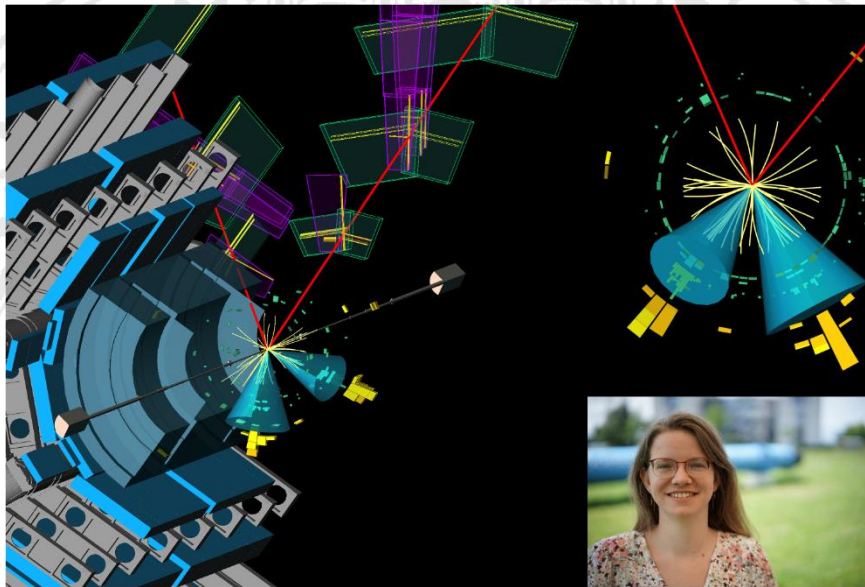


# SONDERKOLLOQUIUM

AM 9. JULI 2024 UM 12:30 UHR  
BIBLIOTHEK, WESTBAU PHYSIK



## Beautiful & Charming Higgs Bosons: Probing Higgs boson couplings in decays to bottom and charm quarks

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The Higgs boson, a new particle discovered in 2012, plays an integral role in the mass generation mechanism of fundamental particles and could hold a crucial key to discovering new physics effects. It is intrinsically linked to the evolution of our universe. Therefore studying the Higgs boson's properties and its interactions with great precision is of utmost importance. Of particular interest are the couplings of the Higgs boson to fundamental fermions. These couplings have been added as ad-hoc assumptions to the theory.

I will present the latest results on Higgs boson couplings to bottom and charm quarks, which not only offer sensitivity to Higgs boson couplings to fermions but also provide insights on the hierarchy of quark masses. These results have been obtained using proton-proton collision data of the LHC at a collision energy of 13 TeV recorded by the ATLAS experiment. I will discuss the experimental challenges of these measurements and introduce new developments to overcome them. In addition, I will demonstrate how the excellent precision achieved in this measurement lends itself to measure the differential cross section of Higgs boson production in association with a W or Z boson.