



KCETA Colloquium

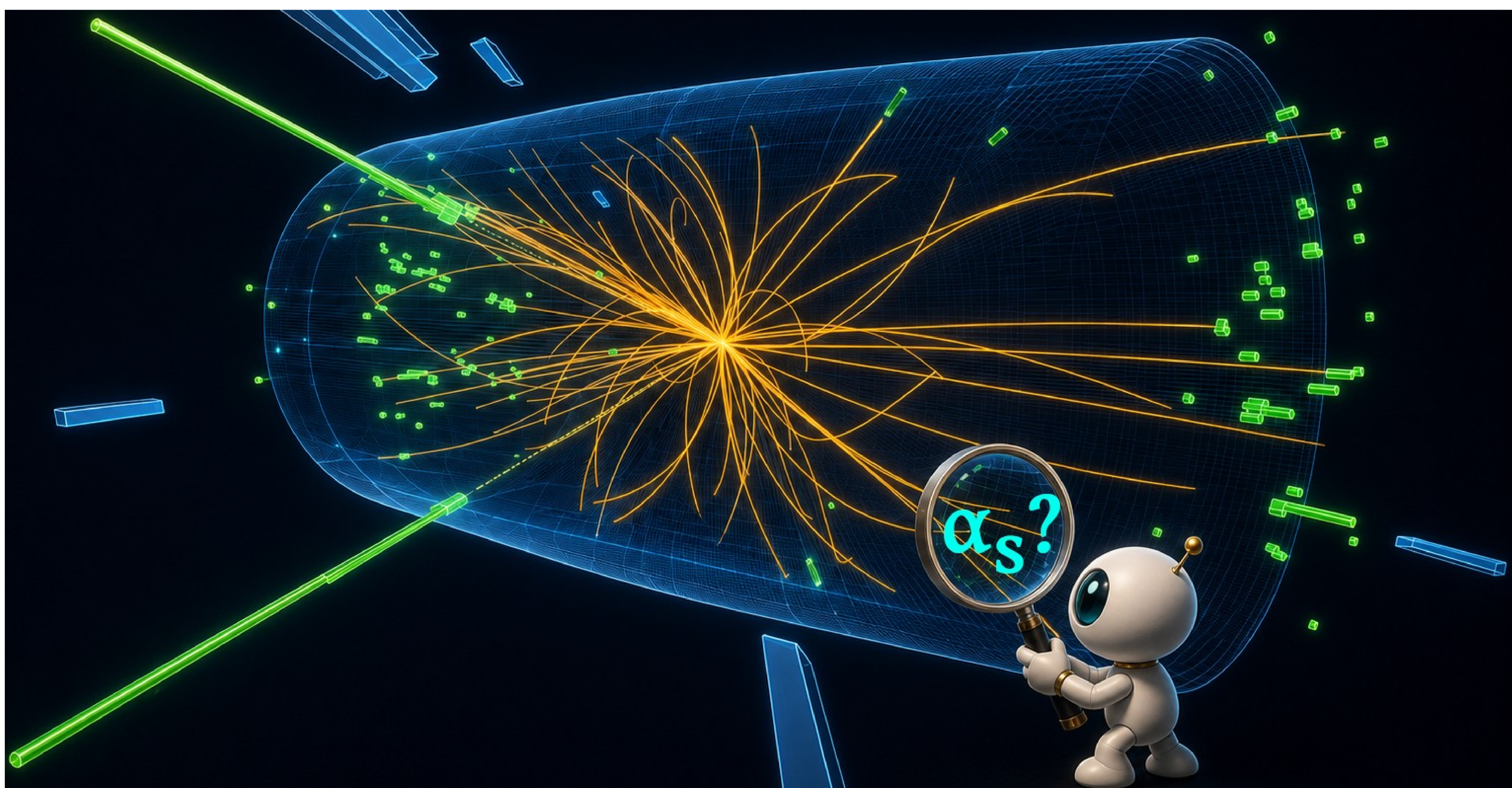
How strong is the strong force?

Thursday, June 11, 2026

Kleiner Hörsaal A (CS) 15:45 - 17:00

Prof. Gherardo Vita (CERN Theory Department (Staff))

The strong coupling constant is one of the fundamental parameters of the Standard Model and the least precisely known of its gauge couplings. Its value governs the strength of QCD interactions and the confinement scale, influencing a remarkable range of physics, from the structure of neutron stars and the dynamics of heavy flavors to the production of the Higgs boson and jets at the LHC. In this colloquium, I will discuss determinations of the strong coupling from high-energy collider data with examples ranging from jets, electroweak-boson production, energy correlators, and PDF fits at the LHC to event-shape observables at lepton colliders. I will highlight how precise determinations of the strong coupling constant bring together the full machinery of precision collider phenomenology: from multiloop fixed-order calculations and state-of-the-art resummation, to the treatment of non-perturbative physics associated with proton structure and final-state hadronization, as well as robust uncertainty estimation, clever observable definitions, and increasingly precise experimental measurements. Together, these examples illustrate why the strong coupling is a benchmark for the precision collider programme and a crucial playground for the challenges that will increasingly define collider physics in the precision era.



Please note: The colloquium will also be live-streamed to B401 SR 410 (CN).

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