Tanjona Rabemananjara – HEP Seminar – March 10, 2026
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Title: Towards Developing Universal Tools for High-Energy QCD Predictions

Abstract: Precision phenomenology in QCD increasingly demands flexible, process-agnostic, and computationally efficient infrastructures capable of supporting next-generation collider analyses. In this seminar I will discuss recent progress toward developing universal and flexible tools for high-energy QCD predictions. In the first part, I will present new developments in the PineAPPL fast-interpolation library, highlighting its extended support for a wide range of physical processes beyond Single Parton Scattering (SPS) and its ability to handle an arbitrary number of hadronic convolutions, making it a process-agnostic framework for precision collider phenomenology. In the second part, I will introduce NeoPDF, a new library for interpolating general non-perturbative QCD functions, with support for collinear and transverse-momentum PDFs, as well as more general objects such as TMDs and GPDs. I will show that NeoPDF achieves significantly improved performance and accuracy compared to LHAPDF and TMDlib, thanks to a more efficient and accurate Chebyshev interpolation strategy tailored to future precision physics applications.