Savvas Zafeiropoulos – HEP Seminar – September 28, 2021
Aix Marseille University, France

Title: Parton distribution functions from Ioffe time distributions

Abstract: The light-cone definition of Parton Distribution Functions (PDFs) does not allow for a direct ab initio determination employing methods of Lattice QCD simulations that naturally take place in Euclidean spacetime. In this presentation we focus on pseudo-PDFs where the starting point is the equal time hadronic matrix element with the quark and anti-quark fields separated by a finite distance. We focus on Ioffe-time distributions, which are functions of the Ioffe-time v, and can be understood as the Fourier transforms of parton distribution functions with respect to the momentum fraction variable x. We present lattice results for the case of the nucleon addressing the physical point and continuum extrapolations. Results for the pion will also be demonstrated. We also incorporate our lattice data in the NNPDF framework treating them on the same footing as experimental data and discuss in detail the different sources of systematics in the determination of the non-singlet PDFs.