

Michael Wagman – HEP Seminar – October 6, 2026
FNAL

Title:
The Collins-Soper Kernel from Lattice QCD

Abstract:

The quark and gluon Collins-Soper (CS) kernels are universal functions describing how the QCD vacuum evolves with energy. They enter theory predictions for a wide variety of electroweak processes at colliders, precision measurements of the W boson mass, and neutrino-nucleus scattering cross sections. Although the CS kernel has been computed to high orders in perturbation theory, current and future experiments are reaching the point where nonperturbative QCD effects in the CS kernel are required for theory to match the precision of experimental predictions. I will present lattice QCD results for the quark CS kernel, which have fully quantified uncertainties and have now been used to improve the precision of global fits of the CS kernel by a factor of two, and exploratory results for the gluon CS kernel.