

Pavel Nadolsky – HEP Seminar – February 15, 2024
Southern Methodist University

Title: Reinventing CTEQ for 2050's

Abstract:

I will discuss opportunities for novel collaborations of theorists and experimentalists working together on particle phenomenology. Using the examples from my own research on CTEQ-TEA (Tung Et Al) parton distributions, I will outline my vision toward promises and challenges in this major research area, including its impact on electroweak precision measurements. For many years, The Coordinated Theoretical-Experimental Project on Quantum Chromodynamics (CTEQ) has spearheaded the versatile support for the analyses of groundbreaking experiments at the Tevatron, HERA, LHC, and RHIC colliders. In the era of the High-Luminosity LHC and the Electron-Ion Collider, the interface of theory and experiment must evolve to implement multi-loop QFT calculations, refined models of hadron structure, parton showering, inputs from nonperturbative and lattice QCD, and reliable uncertainty quantification. I will review some of the outstanding questions.