

Stefan Hoeche – HEP Seminar – April 21, 2026  
FNAL

Title: "Virtual particle smashers for current and future colliders"

Abstract: "Over the past decades, high-energy experiments at the world's collider physics laboratories have unraveled many mysteries of our universe, and confirmed Quantum Field Theories as the leading theoretical framework for the description of elementary particles and their interactions. The Large Hadron Collider (LHC) and the Future Circular Collider (FCC) hold the potential to unlock the remaining secrets of the Higgs boson, in particular the form of its potential and the fate of our universe. Probing nature at the extreme energy and intensity of an LHC or FCC requires extraordinary investments from both experiment and theory. Connecting the two are computer simulations, which allow to convert the aesthetic beauty of a Lagrange density into observable predictions for experiments. This talk will discuss the development of such simulations at a level of precision needed to fully exploit the expected datasets available from the world's colliders on the 2040-2050 time scale."