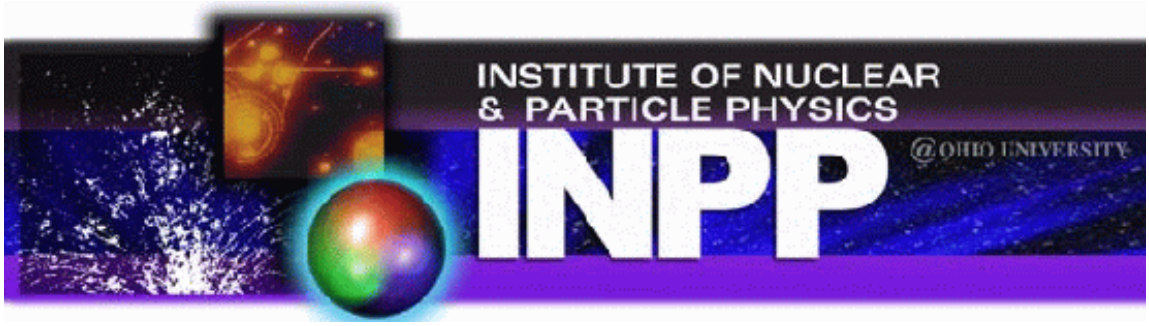

Advancing Nuclear Tomography: Integrating Theory, Experiment, Data Science, and High-Performance Computing in the exascale computing era

Nobuo Sato
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Nuclear tomography, achieved through hard semi-inclusive and exclusive processes in electron-proton scattering, represents a significant scientific endeavor in ongoing experimental programs such as COMPASS at CERN, Jefferson Lab 12 GeV, and future plans for the Electron-Ion Collider (EIC). The complexity of this problem necessitates an upgrade to traditional methodologies used for extracting the internal structure of nucleons. This upgrade is crucial in order to effectively handle the large amounts of data generated by these facilities and to merge theoretical frameworks with experimental simulations within a unified workflow. This integration will capitalize on the latest developments in artificial intelligence/machine learning (AI/ML) and exascale computing. In this presentation, I will discuss our efforts towards achieving this goal of seamlessly combining theory, experiment, data science, and high-performance computing. By leveraging these advancements, we aim to enhance our understanding of the internal structure of nucleons and enable more precise and comprehensive nuclear tomography.

Tuesday, November 7th, 2023

4:00 pm

Lindley Hall room 321