Nuclear Femtography - A New Emerging Frontier of Science and Technology

The proton and neutron, known as nucleons, are the fundamental building blocks of all atomic nuclei that make up essentially all the visible matter in the universe, including the stars, the planets, and us. More than 50 years of study has revealed that nucleons are composed of elementary particles called quarks and gluons, whose interactions and dynamics are governed by Quantum Chromodynamics. However, many profound questions remain. In this talk, I will demonstrate that the newly upgraded CEBAF facility at Jefferson Lab and the future Electron-Ion Collider, which US Department of Energy recently approved for construction at Brookhaven National Lab, are two complementary and necessary facilities that are capable of exploring the inner structure of nucleons and nuclei at sub-femtometer distance, enabling a new emerging science and technology - Nuclear Femtography. These facilities will help address the most compelling unanswered questions about the elementary building blocks of our visible world, taking us to the next frontier of the Standard Model of physics.