

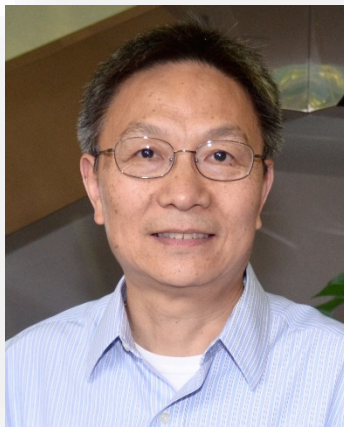
UCLA Department of Physics & Astronomy

# COLLOQUIUM

Thursday, October 8, 2020 at 4 p.m.

## Nuclear Femtography - A new frontier of science and technology

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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. Nucleons have a complex internal structure. Within Quantum Chromodynamics, nucleons emerge as strongly interacting and relativistic bound states of quarks and gluons. Both theory and experimental technology have now reached to a point where we are capable of exploring the inner structure of nucleons and nuclei at sub-femtometer distance, leading to the newly emerging science of nuclear femtography. In this talk, I will demonstrate that the newly upgraded CEBAF facility at Jefferson Lab and the Electron-Ion Collider, which the US Department of Energy recently approved for construction at Brookhaven National Lab, will be two complementary and necessary facilities for exploring the science of nuclear femtography. They are powerful tomographic scanners and/or microscopes able to precisely image the inner structure of nucleon and nuclei with a sub-femtometer resolution. They will help us address the most compelling unanswered questions about the elementary building blocks of our visible world, and are capable of taking us to the frontier of the Standard Model of physics.