Dear Colleagues,

Major progress in the theoretical formalism of the internal structure of the nucleon over the last 15-20 years has led to breakthroughs in our understanding of the theory of quarks and gluons. At the same time, the technical advances in particle accelerator and state of the art experimental detection technologies along with dramatic developments in computing power and algorithms, have brought us to the threshold of a new science of nuclear femtography. Large amounts of raw data (~PB per week) will need to be analyzed to provide the experimental input to 3D nucleon imaging. This analysis will involve reconstruction of physical quantities from the raw data and integration of different datasets from different experiments into physical observables that encapsulate the information related to the 3D distributions. The production of experimentally determined distribution functions will involve substantial computation in order to derive the most probable distributions and to estimate their uncertainties. It is likely that machine learning techniques will play a major role in understanding the correlations within the data and in finding the optimal solution. The characterization and visualization of these distributions is an additional challenge. We believe that expertise in data science, imaging, and visualization developed for other fields of science are needed to carry out this program.

The Commonwealth of Virginia has recognized nuclear-femtography science to be an emerging thrust in a new era of science and technology in which it can play a pre-eminent role at the international level. The Commonwealth has funded the initial phase of the establishment of a Center for Nuclear Femtography (CNF). This center will provide an opportunity to bring together a broad range of expertise and to facilitate the multidisciplinary approach that is needed to address this important problem in fundamental nuclear physics.

The activities in support of the CNF commenced with a highly successful symposium at the University of Virginia in December that demonstrated the enthusiasm for the project and the broad range of expertise across the many fields that can contribute to its success. The symposium brought together scholars and researchers from universities and research institutes from around the world to discuss recent developments and future opportunities in the imaging and visualization of scientific data across a spectrum of disciplines and how these could be applied to advance nuclear femtography.

As the next step, we are now soliciting applications for near-term projects that can both seed future activities at the CNF and can contribute to a future proposal to the Commonwealth of Virginia aimed at the long-term establishment of a world-leading center. These projects include, but are not restricted to:

1. The construction of a QCD-inspired reference model for the nucleon, including that of the Wigner Distribution, that can serve as synthetic input for the activities below.

2. The development of images of the nucleon through fitting to experimental data with theoretical input, reflecting constraints arising from limitations both in experiment and theory.
3. The use of visualization, both as a means of imaging the nucleon and of refining our analysis methodology.
4. Applications of machine learning to data analysis, interpretation and classification.
5. The development and application of computational and mathematical methods and the associated computational infrastructure.

Preference will be given to activities that are interdisciplinary in nature. For full consideration, applications should be received by **February 15th.** While there is no restriction as to who can receive support, the PI of an application should be at an institution in the Commonwealth of Virginia. Applications should consist of the following:

1. Summary sheet that includes the project title and names of PIs and co-PIs
2. Executive Summary
3. Narrative describing the proposed work (maximum of two pages)
4. Deliverables and timeline
5. Proposed budget (maximum $50k) and budget justification
6. CVs of PI and co-PIs (maximum two pages each)

It is important to note under the timeline that near-term activities should include a deliverable and mid-term report due July 1st, with the final report and deliverables due September 30th. This timeline is driven by the need to construct a proposal for the long-term future of the CNF, but we anticipate a call for future, follow-on activities later in the year. The allocated funds can be spent on the following items: 1) Personnel (stipend, consultant fees, including graduate students and undergraduate students); 2) Travel support; 3) Other expenses.

Informal enquiries should be directed to Latifa Elouadrhiri (latifa@jlab.org) or David Richards (dgr@jlab.org), and the applications should be sent to Betty Jean-Pierre (bjp@jlab.org) by COB on February 15th.

Latifa Elouadrhiri (co-Chair)
David Richards (co-Chair)

For the CNF steering Committee