Faculty Position in Experimental Nuclear Physics and Artificial Intelligence

The Physics Department at The Catholic University of America seeks to fill a tenure-track position in Experimental Nuclear Physics and Artificial Intelligence, to begin in Fall 2023.

Our research focuses on detector design and carrying out and further developing our experimental program at the Jefferson Lab 12 GeV (JLab) and the US-based Electron-Ion Collider (EIC), as well as exploring new avenues with Artificial Intelligence for Nuclear Physics. The CUA group has a strong history of involvement at JLab, and in particular studies of the multi-dimensional structure of hadrons and the design and construction of large-scale detectors. Our JLab science program aims at deepening the understanding of the lightest mesons – the pions and kaons - their form factors and structure functions, and at providing measurements to validate the framework for 3D (spatial) hadron imaging and the intriguing possibility of discovery of exotic mesons with gluons. CUA built and is responsible for the SHMS Aerogel Cherenkov detector, leads the construction of the Neutral Particle Spectrometer (NPS) in Hall C, and is involved in the DIRC detector in GlueX at JLab. Artificial Intelligence can provide new insights and discoveries from experimental data and there is a clear synergy with our studies of multi-dimensional hadron structure at JLab. We have been incorporating AI into the design optimization from materials to complex detectors, as featured in the EIC Conceptual Design and EIC Yellow Report. These efforts benefit from strong collaboration with IAIFI/MIT and developers of the software frameworks for EIC detector simulations. We are also engaged in the educational efforts of AI4EIC, e.g., through Hackathons and Schools. The CUA group has been involved for over a decade in the development of the EIC science program and detector research and development. Our science program aims at deepening the understanding of the origin of hadron mass, one of the main science motivations of the EIC as identified by the National Academy of Sciences report, through the emergent structure of the lightest mesons – the pions and kaons. Our group has been leading the design and development of homogeneous EM Calorimeters and particle identification detectors for the EIC. Our efforts include the development of novel detector materials, e.g., scintillating glass and aerogel composites.

We are searching mainly for candidates with a primary interest in the program of hadronic and nuclear physics carried out at JLab, as well as an interest in the US-based EIC. Experience in data science and design optimization leveraging on Artificial Intelligence is beneficial. The successful candidate will have a strong commitment to excellence in teaching and will be expected to build a strong research program that will enhance the current Nuclear Physics program at the Catholic University of America. We plan to hire at the assistant professor level, but will also consider particularly qualified more senior applicants.

We seek candidates who understand, are enthusiastic about, and will make a significant contribution to the mission of the University, which can be found here: *https://www.cua.edu/about-cua/mission-statement.cfm*].

Applicants should have a Ph.D. in physics or a related field, have demonstrated the ability to initiate and lead research, have an established record of publications in scientific journals, and have good teaching skills. Applicants should submit curriculum vitae, three reference letters, a

publication record including citation information, research plan, teaching plan, and a one- to two-page personal statement indicating how the candidate, through her or his research, teaching, and service, would make a distinctive contribution to advancing the University's mission and to the vision of Catholic education outlined in the Apostolic Constitution on Catholic Universities *Ex Corde Ecclesiae*.

The University will perform background checks on all new faculty hires prior to making the final offer of employment.

Contact: Tanja Horn (email: hornt@cua.edu)

The Catholic University of America is an Equal Opportunity Employer.