Contribution ID: **24** Type: **Invited Plenary talk**

The Future Program of PRad and Dark Sector Searches at JLab

The PRad-II and X17 Experiments are planned to run in Jefferson Lab's Hall B in 2026. The common experimental setup includes a large-volume vacuum system, two planes of GEM tracking detectors for improved vertex and angle reconstruction, and a high-resolution calorimeter (HyCal). These experiments strive to give definite answers to long-standing questions in hadron physics. PRad-II is addressing the discrepancy in elastic electron-proton scattering at momentum transfers between 0.01 and 0.06 GeV^2 that are seen between the world's most complete data set taken with focusing magnetic spectrometers on the one side and the data set from the first proton charge radius experiment at Jefferson Lab (PRad).
PRad-II will provide a measurement of the proton electric form factor at momentum transfers down to $Q^2 \approx 10^{-5}$ GeV^2 and improve the overall precision on the proton charge radius by about a factor of three compared to PRad. The X17 experiment is searching for a hypothetical light boson with a mass of about 17 MeV/c^2 that has been discussed to explain some anomalous nuclear transition data.
The HyCal could be re-used in the mid-term future as one of the calorimeter blocks for the Beam Dump eXperiment (BDX), an electron-beam thick-target experiment aimed to search for the existence of light Dark Matter particles in the MeV−GeV mass region at Jefferson Lab. BDX will be able to lower the exclusion limits by one to two orders of magnitude in the parameter space of dark-matter coupling versus mass.

Author: ACHENBACH, Patrick (Jefferson Lab)

Presenter: ACHENBACH, Patrick (Jefferson Lab)

Session Classification: Conference Talks