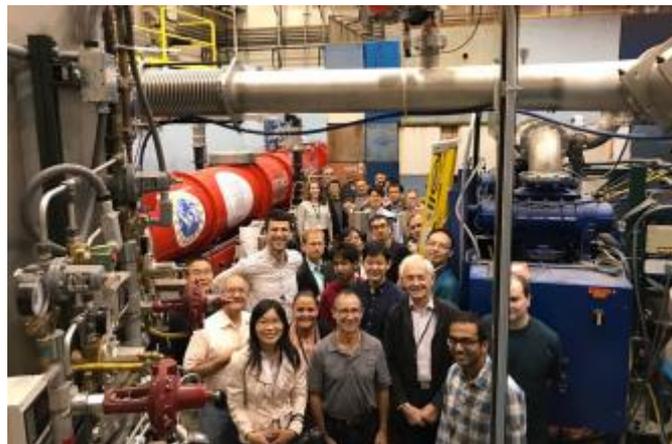


**John Adams Institute for Accelerator Science Seminar Series
Joint Seminar with ISIS Neutron & Muon Source**

Wednesday 6th December 2017 at 4:15 pm
Dennis Sciama Lecture Theatre, Denys Wilkinson Building

The Cornell-BNL ERL Test Accelerator: Status and Opportunities



Steve Peggs
CBETA Project Director, BNL

The Cornell-BNL ERL Test Accelerator (CBETA) is under construction at the Cornell Laboratory for Accelerator-based ScienceS and Education (CLASSE). Electrons pass through an SRF cryomodule 4 times during acceleration from 6 MeV to 150 MeV, and then decelerate 4 times. Most of the 70 m circumference consists of a return loop with a single beam pipe, using Halbach-style permanent magnet quadrupoles configured with very strong FFAG optics to enable a very large momentum acceptance.

CBETA will be the first accelerator to combine all four of its key features – 4 passes, SRF, FFAG optics, Halbach magnets – although these have all been successful, individually, in other accelerators. The FFAG optics are unique in demonstrating low-symmetry adiabatic transitions from arc to straight. These technologies could be used in a next generation Electron Ion Collider (EIC) if it is sited at BNL as eRHIC.

A Fractional Arc Test will be performed with beam during March and April 2018, with final “phase 1” beam commissioning in late 2019 and early 2020. A later “phase 2” CBETA development, if funded, could be used to perform user-based experiments at Cornell. There are opportunities for accelerator physics collaboration, in phase 1 beam commissioning, in the design of CBETA phase 2 (and similar ERLs), and in EIC.

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https://www.classe.cornell.edu/CBETA_PM