## The Beams and Applications Seminar Series

# Electron Beam Ion Source Development at Brookhaven


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## BNL


## Bldg. 203, Rm. R-150
## Thursday, February 5, 10:00 am

**(please note special day, time and room)**

Host: Petr Ostroumov, PHY


**At Brookhaven, a high current Electron Beam Ion Source (EBIS) has been developed as part of a new preinjector that is under construction to replace the Tandem Van de Graaffs as the heavy ion preinjector for the RHIC and NASA experimental programs. This preinjector will produce milliampere-level currents of essentially any ion species, with q/A ≥ 1/6, in short pulses, for injection into the Booster synchrotron. In order to produce the required intensities, this EBIS uses a state-of-the-art, 10A electron gun, and an electron collector designed to handle 300 kW of pulsed electron beam power. The EBIS trap region is 1.5 m long, inside a 5T, 2m long, 8" bore superconducting solenoid. The vacuum in the trap region is low 10-10 Torr. The source is designed to switch ion species on a pulse-to-pulse basis, at a 5 Hz repetition rate. Singly-charged ions of the appropriate species, produced external to the EBIS, are injected into the trap and confined until the desired charge state is reached via stepwise ionization by the electron beam. Ions are then extracted and matched into an RFQ, followed by a short IH Linac, for acceleration to 2 MeV/A, prior to injection into the Booster. An overview of the preinjector will be presented, along with experimental results from the prototype EBIS, where all essential requirements have already been demonstrated. Design features and status of construction of the final high intensity EBIS will also be presented.**


## For more information visit

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(mnolasco@aps.anl.gov, 630-252-6159) to arrange for a gate pass.