Description of the Need:
The NRL Radiation Effects Section (within the Electronics Science and Technology Division) requires an ion-gun/Wien velocity filter system along with all of the required power supplies, cables, connections, and cooling unities to operate such a system. The general use of the system involves the generation of charged ionic species (atomic or molecular) in the ion-gun (or ion-source) region, acceleration of the ionic species to the kinetic energies between 1 eV and 1,000 eV, unique selection of a specific energy and charge of ionic species (with energy resolution better than 1 eV), alignment of the selected ionic species into the remainder of the experimental apparatus (remainder of the apparatus not supplied). To achieve ionic beam currents with sufficient fluxes (> 100 pA), the system may accelerate the ionic species above the desired energy to improve extraction and focusing efficiency and subsequently decelerate the selected and focused beam as required. The system must be able to uniquely select one specific ionic species and kinetic energy while rejection/excluding other ionic species and kinetic energies.

Detailed Specifications:
System shall generate energy and charge selected ion beams in the energy range of 1 eV to 1000 eV.
System shall have an energy resolution of 1 eV or better (less) in the energy range of 3 eV to 100 eV.
System shall be capable of generating ionic species of the following elements: B, C, N, O, Ne, Ar, He, and Fe, Co, Ni. The system may require reconfiguration of the ion source to achieve these different ionic species and those parts must be included.
The beam current for energy/mass filtered beams in the energy range of 3 eV to 100 eV must be 100 pA or greater.

Assembly and Training:
System shall be assembled on site and incorporated into pre-existing ultra-high vacuum system.
An ion beam must be generated to satisfy installation with the following attributes:
- Greater than 50 pA current
- Controlled spot size
- Variable energy from 10 eV to 500 eV

Full training course to include:
- Gaseous and solid ion source precursors
- Ion beam focusing
- Ion beam steering
- Ion beam deceleration
- Ion beam flux quantification
- Ion beam spot size quantification
- Ion beam mean energy and energy spread