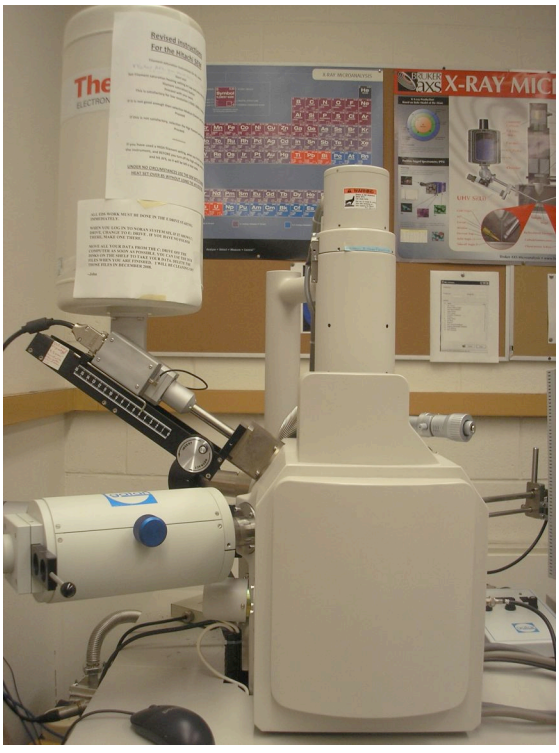
G777 Lab 1: Introduction to SEM and Hitachi S3400N operation

For the next several weeks you will be learning about the proper operation of the Hitachi Variable Pressure S3400N Scanning Electron Microscope in Weeks 308. Each student will have various opportunities, from "cold start up' to alignment and focusing and then imaging with the various detectors. Today we will set up and run in "normal" high vacuum mode.

I have distributed a 5 page set of some information which will be useful for you. However, the main point in lab is to pay attention and ask questions. I will be demonstrating a variety of operations, and then each one of you will be involved in doing some activities that will mainly be aimed at getting you "up to speed" for acquiring images. This week we will focus on setting up the column for "normal" high vacuum operation.

1. Orientation: On the picture to left, locate/label: Apertures, Faraday Cup, Environmental Secondary Electron Detector (ESED)

On the picture to right, locate/label:
EDS detector assembly, CL Detector, Apertures



In picture to left, locate/label: EBSD Detector, EDS, CL detector, Aperture

2. We will now go thru the various parts of the instrument, starting with the Gun: filament, Wehnelt

3. Insert sample

    a. Protection – software
    b. Vacuum setting
    c. Turn on chamberscope
    d. Raise sample
    e. Check that raster rotation off

4. Set up column:

    a. Set HV
    b. Brightness/contrast ABCC and focus AFC
    c. Saturation of filament
        i. Auto
        ii. Filament image
    d. Gun Bias
    e. Probe Current

5. Apertures
    a. Do not adjust more than 5-10 degrees!!

6. Stage controls
    a. Manual (on box)
    b. On Image (set modes for x,y)
    c. Stage settings (right panel)

7. Imaging
    a. Types
        i. SE

        ii. BSE
    b. Files
    c. Histogram:
        i. 8 bit images (256 gray scales)

8. Shutdown

Turn in next week:
Labeled images
1 short paragraph on instrument and detectors
1 short paragraph on column setup and alignment
1 short paragraph on imaging