Introductory Scanning Electron Microscopy Training

Policy Statement

Each individual must pass the Introductory Scanning Electron Microscopy training at CharFac in order to independently use the facility’s SEMs.

A given offering of the training will focus upon one of the facility’s three SEMs (JEOL 6500; Hitachi S-4700; Hitachi SU-8230) and one dual beam focused ion beam SEM (FEI Helios G4 UX). See “Which SEM is best for you to train on?” below to help make your decision. Hanseung Lee (leex3870@umn.edu) and Nick Seaton (seato008@umn.edu) can help to further direct you if necessary. JEOL 6500 and FEI Helios G4 US are located in Shepherd Laboratories and Hitachi S-4700 and SU-8230 are located in Nils Hasselmo Hall.

Please contact Characterization Facility front office (charfac@umn.edu) to schedule the training.

The Introductory Scanning Electron Microscopy course is a prerequisite for training in: Energy Dispersive Spectroscopy; BackScatter Electron; Diffraction; Cathodoluminescence; and Cryo-SEM.

Individuals who pass the introductory training on one of the SEMs and wish to use another of the facilities SEMs can contact Hanseung Lee or Nick Seaton for individual training. The charge will be staff and instrument time. The total time needed for the student to show competence on the new instrument will be determined by the instructor.

It is expected that students assimilate the information in the “Scanning Electron Microscopy Primer” prior to the hands-on training. The primer can be found in the “Education” section of the CharFac website (http://www.charfac.umn.edu/).

The Introductory Basic Scanning Electron Microscopy course will have a maximum of 3 students. The course will consist of 6 hours of hands-on training on the microscope as a group (two 3-hour sessions). In addition, each student will subsequently have to arrange for a “one-on-one” session with the instructor within two weeks of the end of the group training. This session is included in the cost of the class and will require the student to pass a “driving test” on the microscope to demonstrate competence with sample loading, alignment, obtaining well focused and astigmatism corrected images, etc.

If the student fails the driving test, the instructor will determine whether the student must schedule more assist time or retake the entire course.

Which SEM is best for you to train on?

• The Helios G4 UX, 6500, S-4700, and SU-8230 can be considered as multipurpose SEMs
• If you are subsequently interested in doing EDS (elemental analysis): 6500 or SU-8230
• If you are subsequently interested in doing EBSD or Cathodoluminescence: 6500
• If you are interested in high resolution imaging of conductive (or insulating)samples (or insulating) with an in-lens detector you may want to consider the Helios G4 UX, SU-8230, and S-4700
• If you are interested in high resolution backscatter imaging: S-4700 and SU-8230
• If you are subsequently interested in doing cryo-SEM: SU-8230 • Note: SU-8230 users must first train on S-4700.

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