JEOL JSM-7200F Field-Emission Scanning Electron Microscope Training

The new JEOL FE-SEM in Scientific Technical Services is open for business. The FE-SEM is located in CF-22. New users can train and gain access to the new SEM by following the steps outlined below. Please contact STS staff if you have any questions.

**Step 1: Use FOM to sign up for an initial 2-hour orientation session.** These sessions are open to any user who has already received training on the Tescan (see below for a description of what to expect and how to prepare for your orientation session). If you have not yet been trained on the Tescan SEM, you will need to complete that training first. Numerous orientation offerings will be scheduled over the next several weeks, with ongoing opportunities after that. Orientation sessions will begin November 1. Please sign up for only one orientation session. Using FOM, schedule a time on Monday through Friday (excluding holidays) during one of these time slots: 8-10, 10-12, 12-2 or 2-4. Each session can accommodate 2 – 3 users. We ask that you try to sign up with other users—for example, another one or two researchers or students from your department. The individual scheduling orientation training on FOM must indicate in the FOM Comments the first and last names of other users who will be attending with you. STS staff reserves the right to schedule additional individuals to accompany you at your orientation if you are signed up for orientation by yourself.

**Step 2: After completing the orientation session, you may sign up for individual supervised access (ISA) sessions.** ISA sessions provide more in-depth training involving users’ own samples, and can include instruction in advanced imaging techniques and EDS analysis. During the roll-out period, ISA sessions will initially be limited to a maximum of 3 hours in duration, and depending on demand, limits may be placed on the number of ISA sessions per user per week. Before signing up you must consult with STS staff about your sample and analysis goals to make sure they are compatible with the JEOL FE-SEM.

**Step 3: Signing up for unsupervised access.** After you have demonstrated proficiency to the satisfaction of STS staff by successfully completing multiple ISA sessions, you will be allowed to sign up for unsupervised access, including after-hours access. Our goal is to enable users to become proficient and independent as quickly as possible. How long this takes may vary, depending on the user and application. After-hours access may be granted users who have gained sufficient experience with the FE-SEM and demonstrated their ability to operate the system for their intended analyses without assistance from STS staff.

**What to expect at your orientation session.** Orientation sessions last about two hours and can accommodate 2 – 3 participants. You will learn the basics of field-emission SEM instrumentation, and gain hands-on experience with basic operational procedures such as sample loading, standard imaging modes, common sample preparation guidelines, and safety procedures. We will also cover access, allowed sample types, and use guidelines for the JEOL FE-SEM. The JEOL instrument is more complex than the Tescan and will take longer to...
learn. Advanced operations, such as EDS analysis, STEM, low-vacuum mode, and through-the-lens imaging will be covered during subsequent ISA sessions, according to the requirements of individual users. The JEOL SEM normally operates at a lower vacuum than the Tescan, and demands a pristine sample chamber environment, and hence sample preparation and loading must be performed carefully and may take longer than you are used to. There may also be certain restrictions on the types of samples allowed. For these reasons, we will use standard STS specimens for all orientation sessions. You are encouraged to bring a sample with you to the orientation session to determine if the sample is appropriate for the FE-SEM and how to prepare a specimen for a subsequent ISA session. FE-SEM orientation sessions are intended for users who have already been trained on the Tescan. Before your session, please review this SEM guide from JEOL:
https://www.engr.uky.edu/emc/wp-content/blogs.dir/57/files/2014/03/JEOLSEMGuide.pdf
If you have any questions, contact STS staff before signing up.

**Additional resources/considerations:**

**Sample Analysis Without Training.** If you need to have samples analyzed but don’t want training, contact STS staff to arrange for a consultation. STS can analyze samples for you and provide you the data. Note however that for the several couple weeks, most staff time will be devoted to user training.

**Training on the RMC ultramicrotome.** This training is offered separately from SEM training. Contact STS staff to arrange for microtome training. You do not have to receive SEM training to use the microtome, or vice-versa. If you are not certain whether the ultramicrotome is right for your sample preparation needs, please arrange a consultation with STS staff. As with the FESEM, STS staff will work with you to prepare specimens for microtome sectioning, and can perform microtomy for you if you do not wish to be trained.