

# Libra

**Core Status:** New users must complete 2 trouble-free sessions and pass the drivers test to work independently during Core sessions.

**Flex Status:** Core users must complete 5 trouble free sessions to work during flex sessions.

**To reserve** a Libra session, go to [www.ncem.lbl.gov](http://www.ncem.lbl.gov), click on "Microscope Scheduling", use proposal number and password to log in. You may only sign up for 1 Core sessions and 1 Flex session at a time. **To cancel** a session, email your request to the technical staff in charge of the microscope.

## CORE LICENSE TEST

### Safety

- Understand emergency shut down procedure
- Know emergency contact numbers
- Know where liquid N2 protective equipment is
- Know where the operating instructions are
- Check the log book for recent comments on instrument status
- Find your current user level on the approved operators list

### Instrument Preparation

- Check Gun Valve closed and CCD in cooling
- Check all vacuum levels in normal range
- Check HT on at 200kV and FEG on

### Fill up LN in ACD

- Check glass window covered
- Wear protective gear (goggles, mask, gloves) and pour safely using ladder and refill every 4 hours

### Load specimen in holder

- Know type of holders
- Remove holder from pre-pumping position in microscope
- Place holders properly on provided stand
- Load sample and tighten retaining screw (mini-type) gently
- Check sample snugness by gently tapping the big end the holder

### Insert holder

- Check column vacuum is below  $6 \times 10^{-7}$
- Check holder position X and Y sets at zero and all tilts at zero
- Insert sample to pre-pumping position
- Wait until red light goes off
- Rotate and insert holder into column properly

### Start filament

- Wait until column vacuum is below  $5 \times 10^{-7}$
- Check all vacuums are in green region, and HT and FEG stay on
- Open the column valve



CORE LICENSE TEST (CONTINUED)

**Carry out basic alignments**

- Find beam and sample edge
- Set eucentric height
- Insert and adjust a condenser aperture
- Current centering
- Adjust objective stigmation
- Insert objective aperture and center
- Using objective aperture on phase plate requires separate training

**TEM operation for EELS and energy filtered images**

(separate training and qualification required)

- Insert and adjust fixed EF slits (variable EF slits require separate training)
- Acquire EELS spectra
- Energy filtered TEM imaging
- Understand the difference between binning, image, diffraction, EELS etc

**Recording images**

- Acquire images on CCD camera
- Understand CCD's upper limit of beam intensity

- Cover window

**Shut down**

- Know shut down procedures
- Remove all apertures used
- Reset delta E to zero, and reset III Shift
- Close gun valve
- Reset center X & Y and tilts of holder
- Remove holder properly, unload sample and put in back to the pre-pumping position

**Record session in log-book**

- Fill out e-logbook and describe any problems

**Name** \_\_\_\_\_

**Date** \_\_\_\_\_ **Proposal #** \_\_\_\_\_

**Pass** \_\_\_\_\_ **Fail** \_\_\_\_\_