

TEAM I

Core Status: new users must complete 2 training sessions and pass a sample exchange exam to work independently during Core sessions (regular work hours).

Flex Status: core users must complete 5 Core sessions and pass a driving test to work during Flex sessions (evening and weekend hours).

All TEAM I scheduling must be coordinated through Peter Ercius at PErcius@lbl.gov. You may only be assigned two sessions per month.

CORE LICENSE TEST

Safety

- Understand emergency shutdown procedure
- Understand potential X-ray hazards of the modified instrument and shielding
- Read and understand the Low Dose Machine Authorization document
- Recognize high voltage hazards with the TEAM stage
- Demonstrate handling of column valves
- Point out where emergency contact numbers are posted
- Know how to contact NCEM staff for support

Instrument Preparation

- Show how to check basic vacuum functionality and target pressures for valves
- Check gun operate "ON" and extraction voltage at 3700
- Check instrument status (image/diffraction, accelerating voltage, TEM/STEM, etc.)
- Understand which software controls which functionality
- Check liquid nitrogen level in dewar
- Record vacuum, extraction, proposal number in log book

Pre-setup

- Explain strategies to find the beam if not visible
- Demonstrate sample manipulation with the TEAM stage
- Demonstrate how to find Gaussian focus of the specimen
- Show electron-optical alignment procedures for "Direct Alignments" and "Stigmators"

Daily (basic) TEM operation

- Demonstrate how to align the TEM (C3 off) illumination
- Demonstrate how to align the parallel TEM (C3 on) illumination
- Understand the Flu-cam software and its operation

Daily (basic) STEM operation

- Demonstrate how to enter and align STEM mode

TEAM stage operation

- Understand steppers (gears, steps, etc.) and sliders
- Getting positions (x,y,z and a, g)
- Saving position

Closing the session

- Set TEM mode for next user
- Set magnification to 89kx
- Close column valves
- Complete log book

Name _____

Date _____ Proposal # _____

Pass _____ Fail _____

TEAM I

FLEX LICENSE TEST

Image corrector fine tuning

- Plane wobbling the image corrector
- Perform basic alignment on a cross-grating specimen
- Demonstrate how to set instrument conditions for tuning the image corrector (aperture, magnification, illumination set up, defocus, etc.)
- Know target values of aberration coefficients A1, A2, B2, C3, etc.
- Demonstrate iterative tuning procedure using corrector software

Probe corrector fine tuning

- Apply basic alignment on a cross-grating specimen
- Demonstrate how to set up instrument conditions for tuning of the illumination corrector (aperture, magnification, beam tilt angles, etc.)
- Know target values of aberration coefficients (A2, B2, S3, A3, etc.)

K-space navigator

- Connect to the stage software
- Load proper CIF file for your sample
- Demonstrate automated tilting using a diffraction pattern

Monochromator

- Demonstrate how to setup, align and optimize a monochromator setting
- Show procedure to form a monochromated illumination for TEM
- Demonstrate procedure to form a monochromated illumination in STEM

GIF tuning

- Align the energy filter for spectroscopy and filtered imaging
- Know the proper energy resolution to achieve for each dispersion value

TEAM detector (direct electron detection)

- a. Understand the insertion and operation of the TEAM detector with respect to the microscope software
- b. Show how to acquire gain and dark count images
- c. Demonstrate use of the TEAM detector software and remote operation

Name _____

Date _____ **Proposal #** _____

Pass _____ **Fail** _____