

CM300

Core Status: new users must complete 2 trouble-free training sessions, pass the Core driver's test and execute a sample exchange exam to work independently during Core sessions.

Flex Status: core users must complete 5 trouble-free sessions and pass the FLEX driver's test to work during Flex sessions.

To reserve a CM300 session, go to www/ncem.lbl.gov, click on "Microscope Scheduling", use proposal number and password to log in. You may only sign up for 2 sessions per month, regardless of which session. **To cancel** a session, email your request to the technical staff in charge of the microscope.

CORE LICENSE TEST

Safety

- Understand the emergency shut - down procedure: SHUT GUN VALVE.
- Point out where emergency contact numbers are posted.
- Know how to contact NCEM staff for support

Instrument Preparation

- Filling up LN
- Empty prior to filling.
- Safety glasses.
- Refill LN every 4 hrs.

Remove a specimen holder.

- Gloves worn.
- Gun valve checked.
- Holder centered.
- Front panel pressed, pulled holder slow and even.

Load a sample into the double tilt holder.

- A description of potential dangers must be given (sample thickness, stability, magnetic materials, contaminating materials).
- Sample properly loaded. (Proper height and snugness)
- The sample should be plasma cleaned (except grid samples with carbon support films).

Load the specimen holder

- Properly align and fully insert holder.
- Confirm holder type and cable connection.
- Check red light before rotation.
- Check vacuum after holder fully inserted.

CM300**CORE LICENSE TEST (CONTINUED)****Open Gun valve.**

- HT and FEG extracting voltage checked.
- 5 minutes waited after insertion of holder.
- Vacuum checked.
- Rotated the valve knob slow enough without crashing HT.
- Beam found.

Shut down

- Close Gun Valve.
- Reset Holder.
- Remove holder. Make sure the green plate is pressed while pulling out the holder.
- Remove sample.
- Insert holder for storage. LN2 to be left on microscope.
- Log in and turn off lights.

Name _____

Date _____ **Proposal #** _____

Pass _____ **Fail** _____

CM300

FLEX LICENSE TEST

Fully tune a moderately misaligned instrument

- Beam alignment, rot center, pivot points, 2 fold astigmatism, coma.
- C2 aperture aligned.
- Eucentric height found.
- Gun aligned.
- GIF tuned.
- Sample tilted to a zone axis.
- Minimum contrast found
- pivot points aligned.
- HT rotation center aligned.
- Objective stigmatism corrected.
- Coma free aligned
- A state-of-art Scherzer lattice image must be recorded
- The user must calibrate the image
- A focus series of 20 images must be recorded at Lichte defocus
- The user must measure defocus values from the lattice images
- The user must store his work on a CD
- The user must reconstruct his focus series to produce phase and amplitude images
- The user demonstrates her/his ability to simulate his crystal structure
- The user records energy filtered images and loss spectra
- The user records dark field TEM images
- The user switches between 150 and 300 kV operation

During qualifying test, the user must demonstrate ability in exchanging samples without looking at the notes. Notes are allowed during alignment procedures.

User may fail the test by making one major mistake during step 1-6, or accumulate 3 mistakes during alignments.

Name _____

Date _____ Proposal # _____

Pass ____ Fail ____