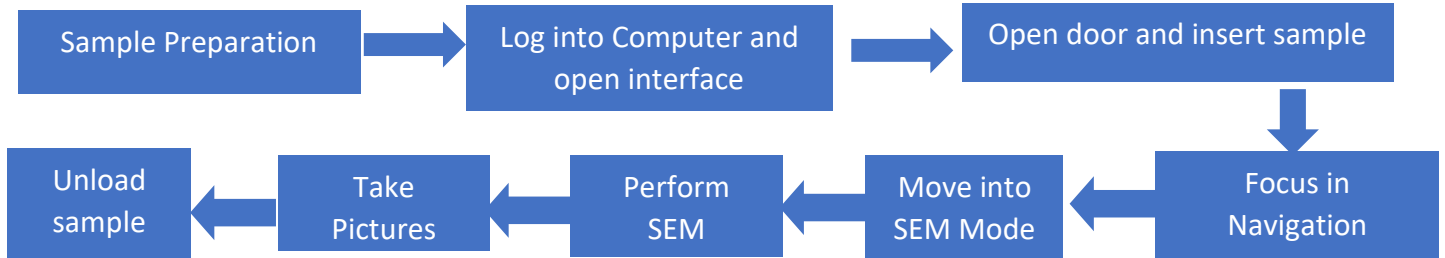# Phenom PROX SEM SOP

Phenom ProX is the benchtop SEM with CeB$_6$ electron gun source. EDS is integrated inside SEM chamber. This SEM is designated for imaging polymers, nanoparticles, and thin films from micro to nanoscale in a high vacuum and low vacuum environment.

Steps for Phenom ProX imaging:

Sample Preparation → Log into Computer and open interface → Open door and insert sample

Unload sample ← Take Pictures ← Perform SEM ← Move into SEM Mode ← Focus in Navigation

A. Prepare sample externally

1. Make sure your sample is dry and conductive
2. Firmly attach the sample on the stub using copper tape or caron tape
3. Use Nitrogen Spray to remove the loose debris or particles: very important
4. Dehydrate the wet samples using IR lamp
5. Select right sample holder and set proper sample height (**Figure 1**): Push down a stub with sample gently. Make sure that mounted sample is never above the top of the rim of sample holder. Rotate the top portion of sample cup until highest point of sample is flush (levelled) or slightly below the rim. Use black colored sample holder for high vacuum and grey sample holder for low vacuum charging sample.
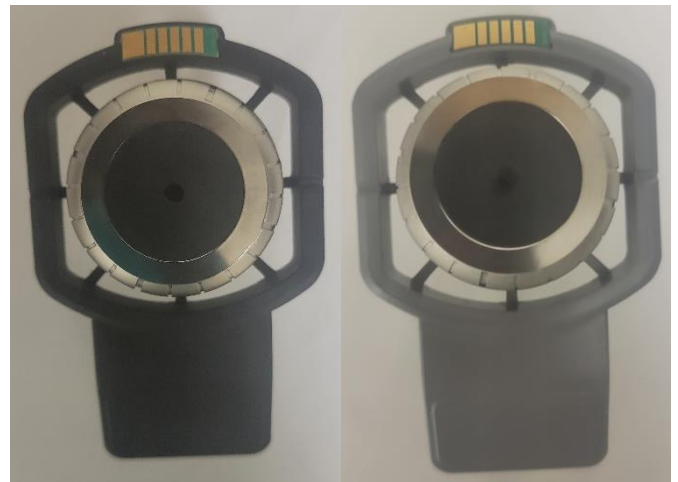
Figure 1: Sample holder and height
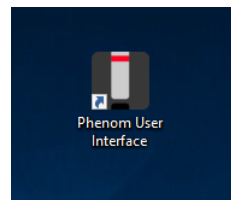

Figure 2: Software

Username: phenom-user
Password: Phenom01

1. To start the software, click **Phenom User Interface** (**Figure 2**). It is also pinned in the taskbar. Following interface appears (**Figure 3**).

C. Load sample

Door can be opened and Press load sample at lower left corner should be displayed. If the SEM has not been used for more than 45 minutes, system will be in standby system to protect source. Click the notification to restore the system
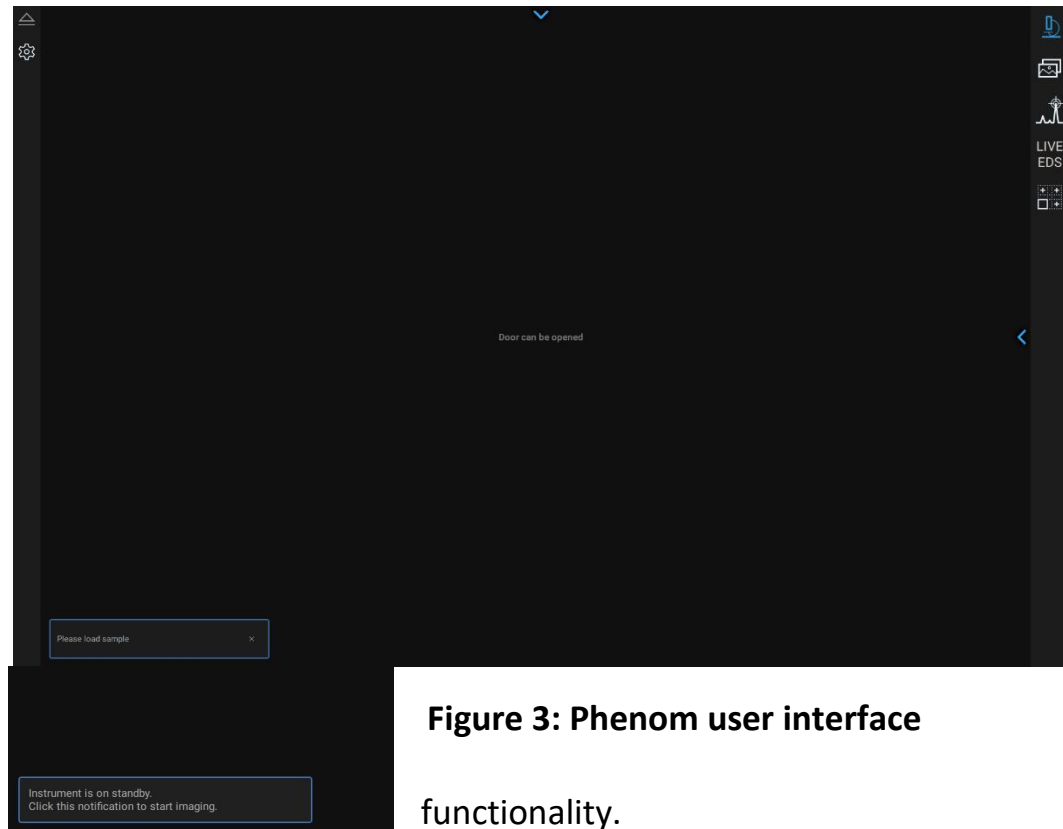
Figure 3: Phenom user interface

functionality.

2. Check the green light of phenom door is at unlocked position (red circle in **Figure 4**)
3. Slide up the door flap (**Figure 4** blue rectangle).
4. Insert sample holder gently in the sample compartment (**Figure 4 arrow**).
5. Slide down the sample door. Once the SEM detects sample, Navigation camera appears.

D. Focus on Nav Cam

Focus on the camera using **focus, contrast icon** at the left corner. Make sure that sample is in focus (**Figure 5**). Click **>** arrow at right of user interface to bring imaging controls menu.
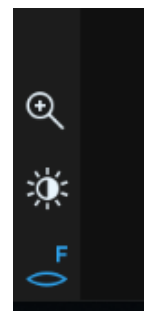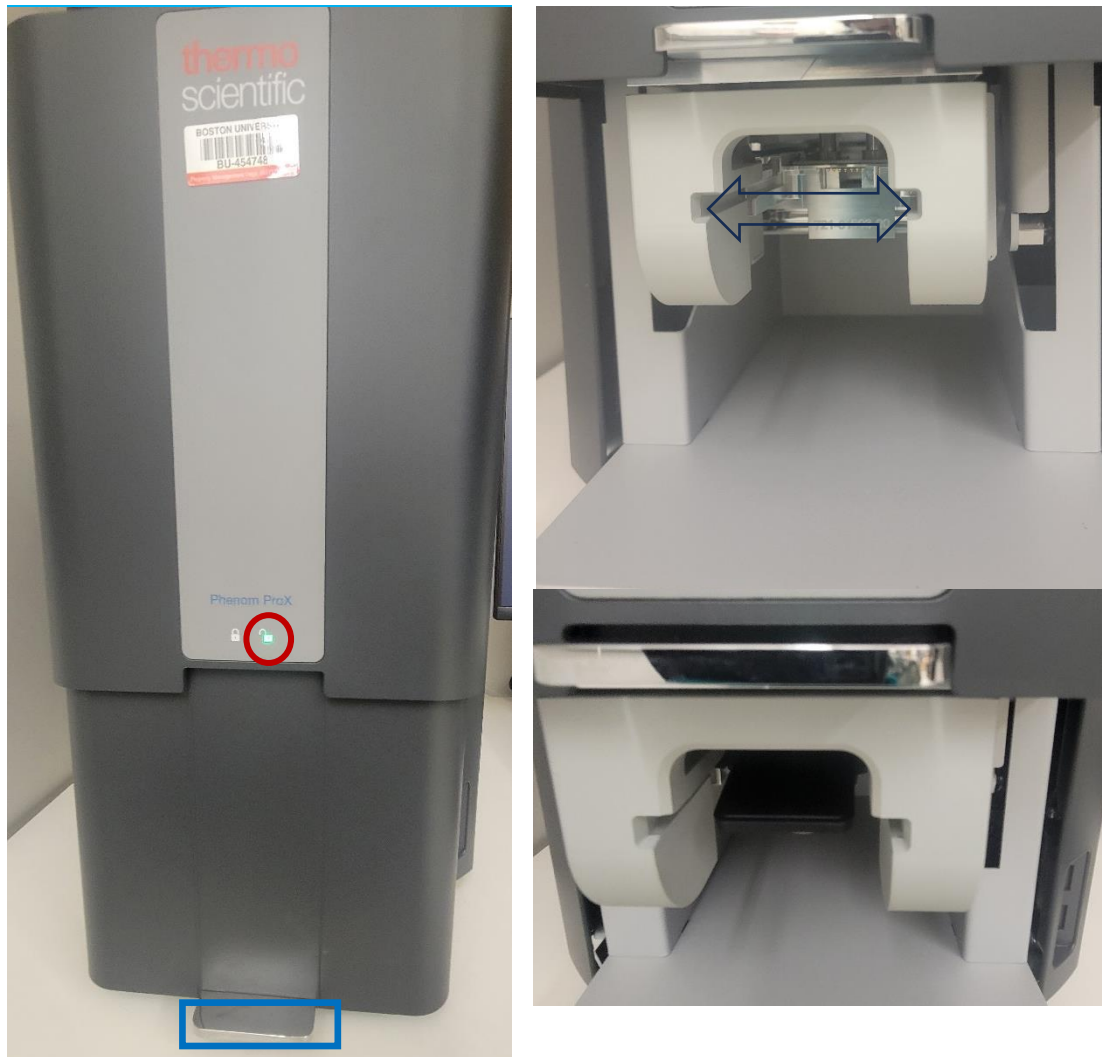
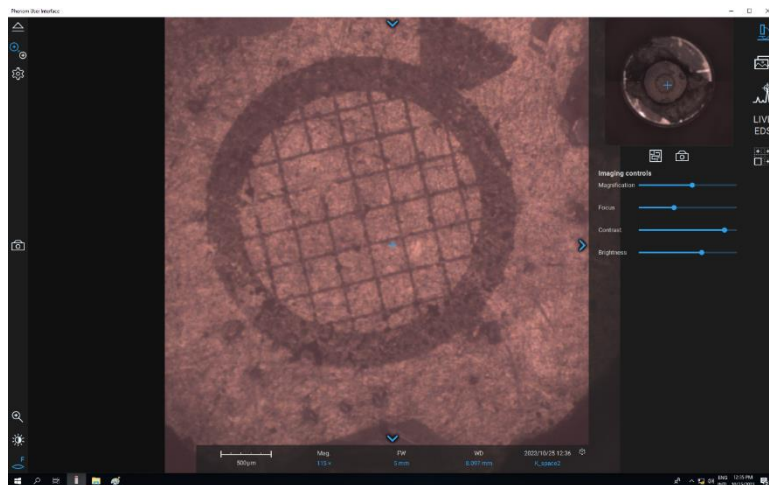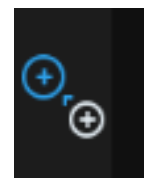**Figure 4: Sample door in instrument and sample compartment**


Figure 5: Navigation camera image

E. Move into SEM

Click following icon to **move into SEM**. System takes about 1 minute to pump and be ready for imaging

F. Preparation for imaging

1. **Selection of Accelerating voltage are limited to 5, 10 or 15 kV.**

2. Click icon to **focus.** Right click on mouse and select manual focus if auto focus does not work. **6-8** mm is appropriate working distance. Scroll mouse wheel to adjust working distance. Focus icon is activated when it is blue color.

3. Click **contrast icon** to adjust contrast. **A** over icon means auto contrast. Right click on mouse to manually adjust contrast.

4. To increase magnification use magnifying icon (**Figure 6**)

5. Use down arrow at the top middle of user interface to adjust the system
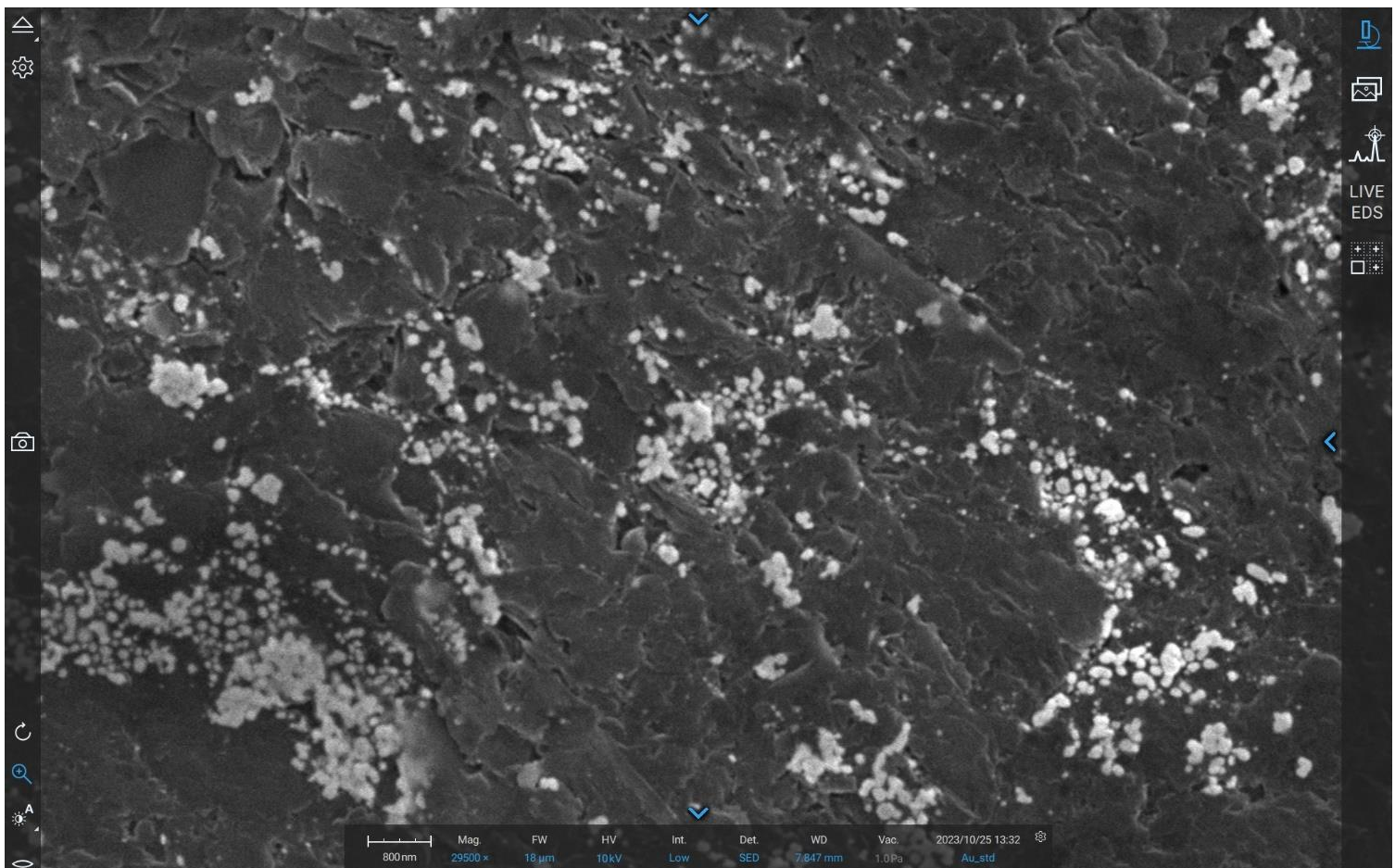
Figure 6: Imaging screen and selection of parameters in the ribbon

parameters (**Figure 6 and 7**) or you can change the parameters Magnification,
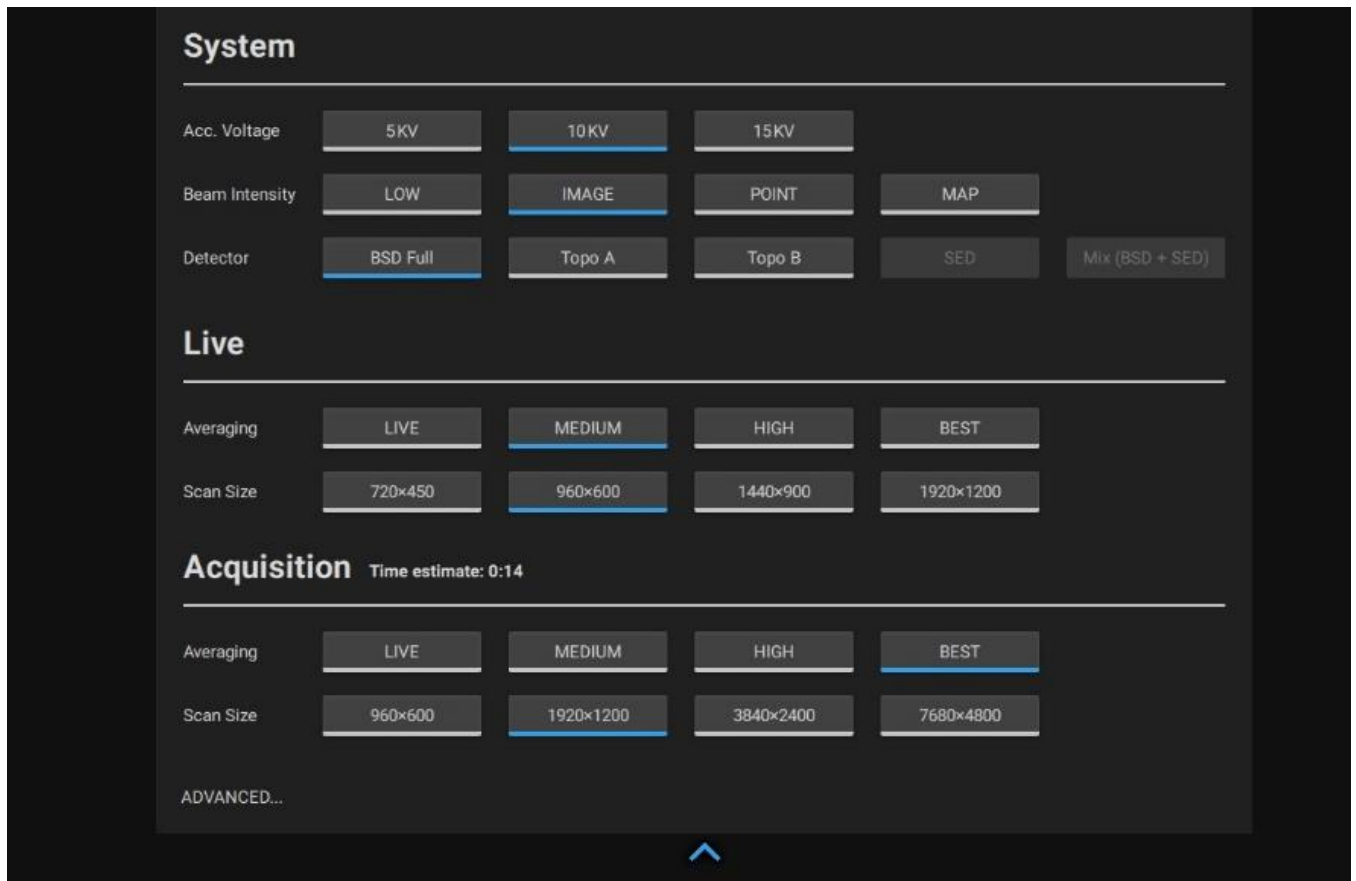
Figure 7: Parameters selection menu

High Voltage (HV), detectors (BSD, SED or Mix) from the ribbons in main panel (**Figure 6**).

6. Click setting and customize to select the file name.

G. Taking Picture and Saving image

1. Take picture using picture icon as shown in the left panel. Frame averaging can be changed under system option (**Figure 7**).
2. Click gallery icon to see the pictures (**Figure 8**).
3. Go back to live mode for more sample analysis
4. Click on image to see the parameters you have chosen.
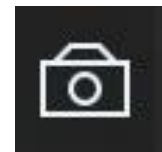
H. Unload sample

1. Select **unload** sample icon
2. You will be prompted to the message in user panel
3. select **yes** to unload
4. "Door can be opened" message display
5. Gently slide up the door
6. Remove your sample and close the sample door. Do not leave door open.
7. Clean up the area
8. Make sure you have entered your sample information and any error message you encountered in log book.
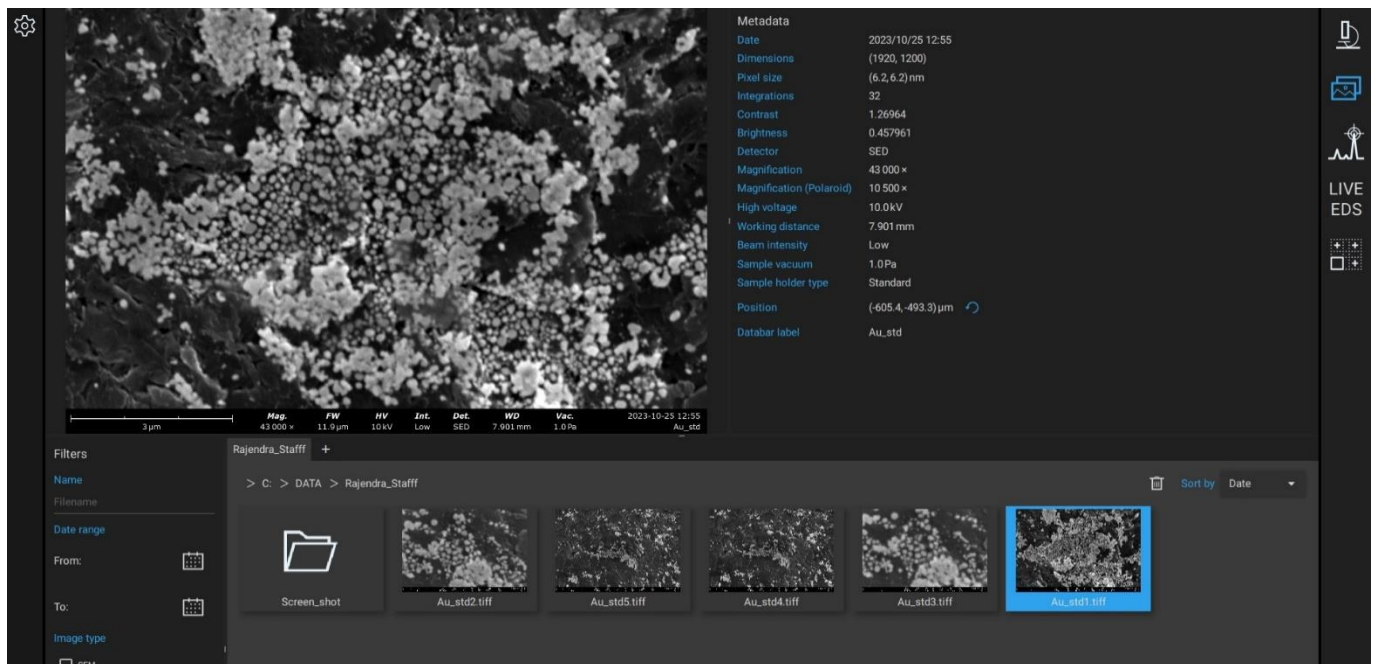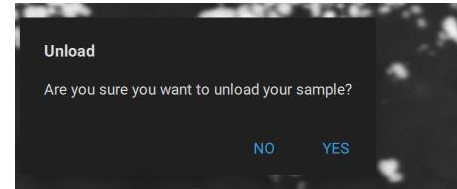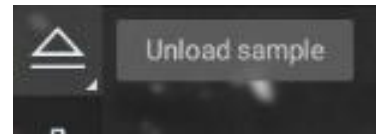

Figure 8: Image Gallery

In case you encounter any error, report error using following

➢ Take **Screen shot of an error message and email to lab manager**
➢ **Write in log book**