NDSU Electron Microscopy Center
Quick Tour of SEM on the JEOL 6490LV

1. **Locate.** Find the sample that you wish to examine:
    a. Click the 'Recipes' button for choices.
    b. Highlight the sample that sounds interesting to you. A thumbnail image and description will appear.
    c. Once you've decided, put the cursor on the 'Execute' button and left-click.
    d. Wait until the microscope moves to your sample and sets operating conditions.
2. **Power up.** Turn on the electron beam by clicking on the 'HT' button at top left.
3. **Move.** You can explore your sample and adjust the precise area that you want to view in several ways. You should be in Scan2 when moving. Try each of these techniques:
    a. **Click-center.** Move the cursor to the point or feature that you want to center in your field of view and double-click the left mouse button.
    b. **Scroll.** Move the cursor to one edge of the screen until it changes into a triangular arrowhead shape, then *push and hold* the left mouse button to scroll toward that side.
    c. **Drag.** Put the cursor on the screen, push down the left mouse button and hold it, then move the mouse to "drag" the image.
4. Increase the **magnification** by clicking on the 'Mag +' button at the left just above the image. Click the button repeatedly or hold it down by putting the cursor on it and holding down the left mouse button if you want to zoom in. Decrease the magnification using 'Mag-'.
5. **Focus**. First, try using the Autofocus button in the top row—it's marked 'AFC.' That should help, but sometimes the focus still won't be very sharp, so you will need to do some manual focusing. Do that using the 'Focus' button above the image, as follows.
    a. Put the cursor on the button and HOLD DOWN THE LEFT MOUSE BUTTON.
    b. On the left side of the screen, you'll see a rectangle that says "Fine."
    c. Move that rectangle up and down by moving the mouse, still holding down the left mouse button. See the image go in and out of focus as you move the mouse?
    d. Once the image appears focused to you, let up on the mouse button.
    e. It's helpful to focus at a higher magnification, then reduce the mag; the image will remain in focus at lower magnifications. The reverse is not true—if you go from lower to higher mag, you will need to focus
6. Adjust **contrast and brightness** of the image: use the 'ACB' button in the top row, right next to the autofocus button. Just put the cursor on it and click.
7. **Scan** modes – note that to change scans, you have to select a different one. If you are in Scan1 and you want Scan2, don't click the 'Scan1' button to try to turn it off, just click on the 'Scan2' button,
    a. Scan1 – reduced scan area. Useful for focusing
    b. Scan2 – general-purpose rapid scan. Try to stay in this scan most of the time for moving around within the sample, changing magnification, etc.
    c. Scan3 – slow scan for a higher quality image, used with 'Freeze' when taking a photograph
8. **Photograph.** To take a picture:
    a. Locate sample, find area of interest
    b. Adjust contrast and brightness (ACB), focus carefully
    c. Click 'Scan3' button and then 'Freeze' button
    d. Once the scan is completed, the image will freeze and an information panel will appear on the bottom of the image, giving a micron marker, magnification, etc. Above the image box is the message, "Frozen."
    e. Save your picture by pulling down the 'File' menu at top left and choosing 'Save Image File.'
    f. Name your image by typing in the box. You can choose either .jpg (for JPEG) or .tif image format.
    g. Click the 'Save' button at lower right of dialog box
    h. Click on 'Scan2' to leave the frozen image and return to viewing mode
    i. The EM staff will e-mail your images to your after your session ends.