

BEFORE YOUR SAMPLES ENTER THE LASER

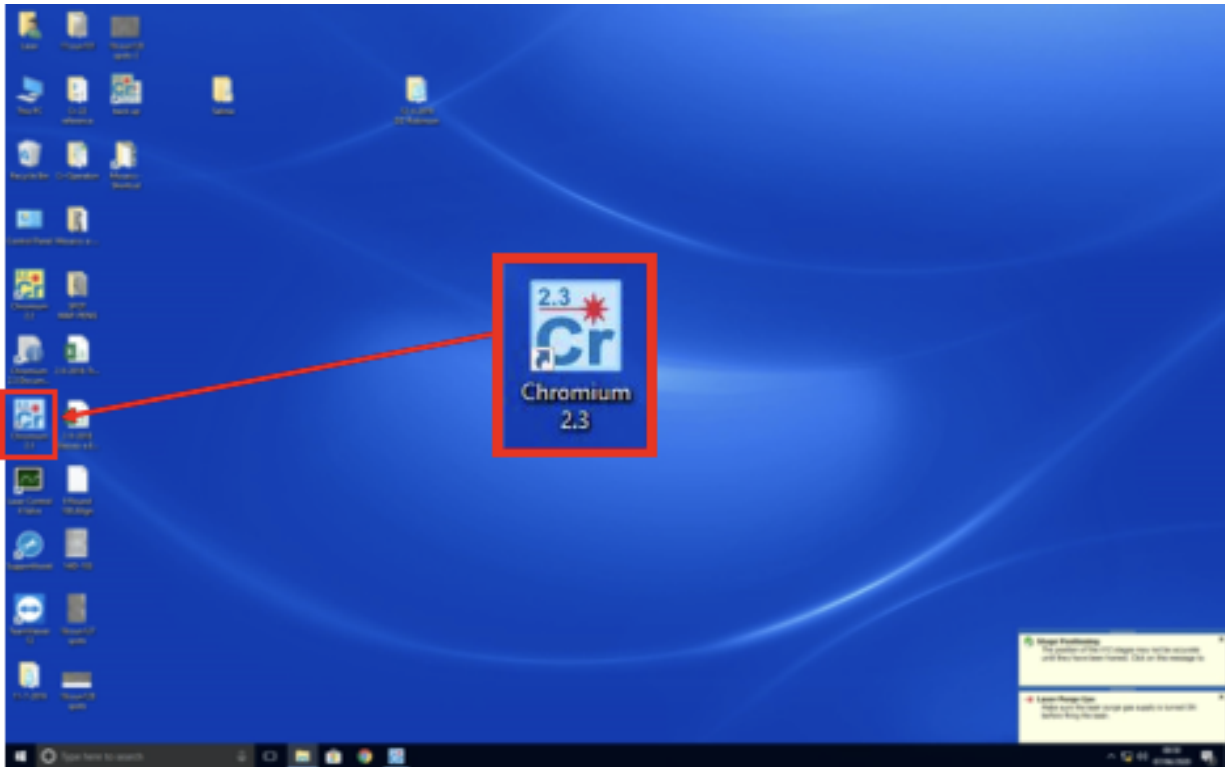
Prior to putting your samples in the laser and selecting spots, you will want to image the samples. For mineral grain mounts (e.g., zircon and titanite), do this with SEM-CL or BSE. For thin sections, make BSE image of your samples (to use as a map) and BSE/reflected light images of your selected grains. The location of the grains in the sample should ideally be marked on your BSE image. Navigating around the sample and locating the selected grains is what takes the longest; make it as easy on yourself as possible. See examples of thin section images below.

After putting your mount or thin section in the laser, create a reflected light mosaic of your sample. Zhan can help with this. This will create an image of the sample and how it is positioned in the laser. Keep in mind, however, the samples will be positioned vertical in the laser, so you may need to rotate your maps when navigating in the laser (these are shown horizontal above).



USING THE LASER PROGRAM – CHROMIUM 2.3

In the laser lab, the computer on the right controls the laser; use this one for picking spots (computer on the left controls the mass spectrometer). On the computer, open up Chromium2.3.

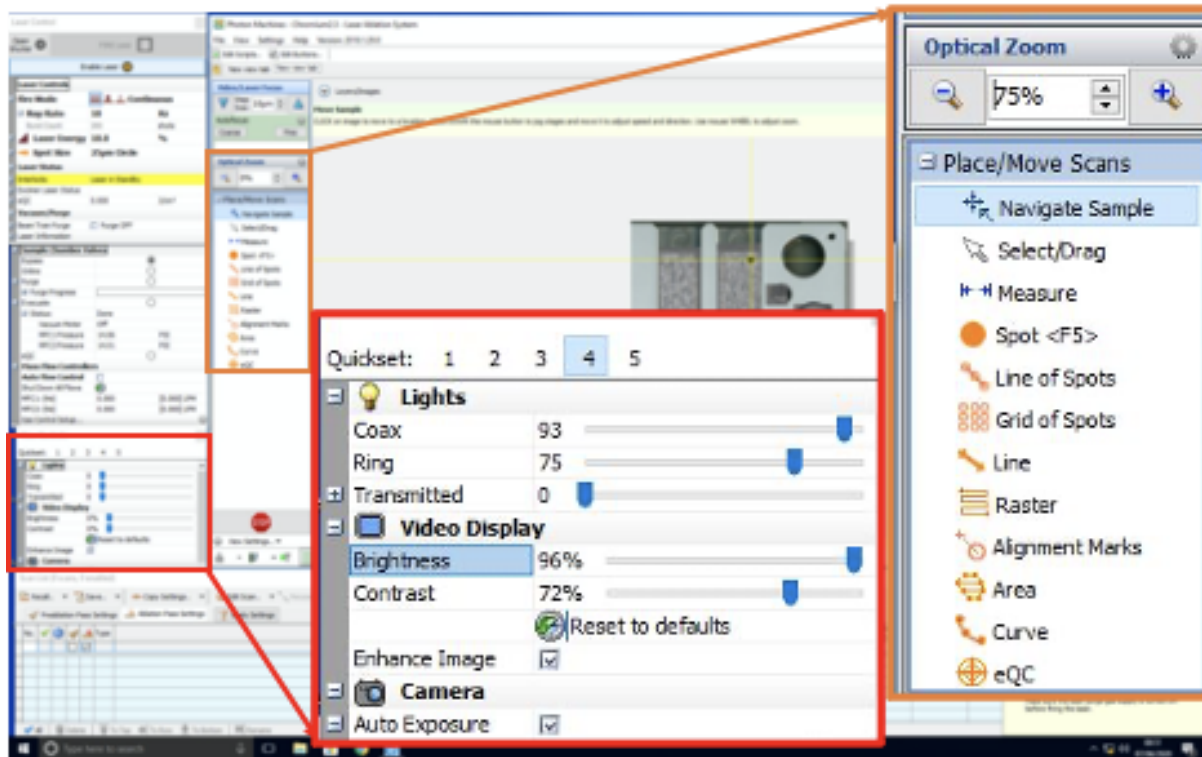


The image shown below is a representation of the stage, which is the metal piece that holds the samples and the standards. This is an image, not a live camera view. The live camera view box is the small square in the crosshairs.

Here is a diagram of the screen with labels indicating the different areas/commands you will be using. Refer back to this as you read through this guide.

VIEWING AND NAVIGATING YOUR SAMPLE

First, set the optical zoom to 75%, then turn on the lights. I prefer Quickset 4, as it most closely resembles the BSE/reflected light images we use to map out the samples and select the grains. However, you can try different Quicksets, or adjust the different lights (e.g. Coax, Ring, Transmitted) and settings (e.g. Brightness, Contrast) to whatever looks best to you in order to see your sample and recognize where you are on the thin section. Click the mouse in different areas to navigate the live camera view around the stage/samples. Use the scroll wheel on the mouse to zoom in and out on the live view. *Using the optical zoom will widen/narrow the area shown in the live view at once, whereas using the scroll bar will cause the live view box to become larger/smaller on the screen.* Adjusting the optical zoom will also affect how the lighting looks, and when using a lower optical zoom (e.g. 25%, wider field of view) you will need to reduce the brightness. If you ever move by pulling the side scroll bar, this will turn off 'Tracking', and the screen will stop following the live view box as it moves; by clicking 'Tracking', it will follow (track) the live view box again.

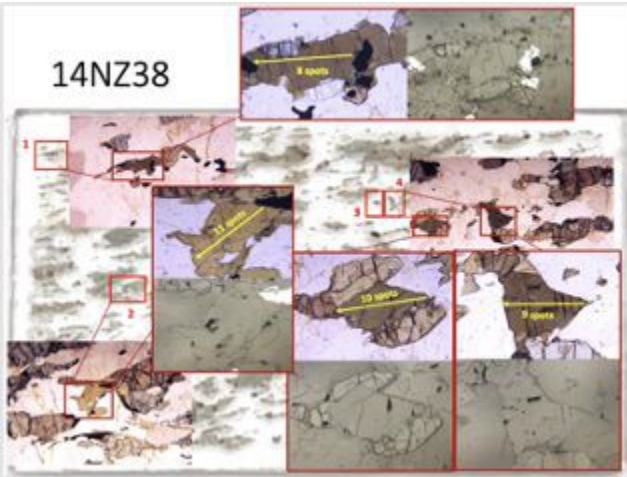


LOCATING YOUR GRAINS

When you are satisfied with the lighting settings, navigate around the stage to find your target sample (Zhan will have an image of the stage with labels showing relative positions of your samples), then navigate around the sample to find your grain of choice. This is where you might want to lower the optical zoom (and brightness), to try to see more of the sample at once to be able to identify different features in the sample that can help you locate your target grain. Once you have found the grain of choice, return the optical zoom to 75% and the lighting to your preferred settings. Decide on the ideal way to place your spots, generally a core to rim traverse (or rim to rim traverse on smaller grains), avoiding cracks and inclusions to the best of your ability. For your records, you will want to document the number of spots, the general orientation, and the direction of your traverse on an image of the grain.

PLACING YOUR SPOTS

When you are ready to place your spots, check the Scan List panel to verify that they are the size you need (usually 40 or 50 microns). If you adjust this in the 'Default Scan Settings' row you will not need to change it for each spot.



Under the Place/Move Scans panel, select Spot (you had previously been using 'Navigate Sample'). This will change your cursor to a circle and clicking it will place a spot for analysis. In order to get all of your spots placed ideally, you may have to switch between Spot (each click places a spot), Navigate Sample (to move and see parts of the grain that are out of the live viewbox), and Select/Drag (to adjust the spots after they have been placed). You want to try to fit as many spots as you can on the grain (more data more better!), so the spots should be close but not so close that they are touching. As you place the spots, they will appear in the Scan List panel at the bottom. Remember to avoid cracks/inclusions, place the spots using optical zoom at 75%, and you can best see the placement of each spot if the live view box is centered over the specific spot you are placing/adjusting. Clicking 'Go To' next to any spot will center it in the live view box. If you need to delete a spot, select the row for that spot and click delete at the bottom left.

NAMING YOUR SPOTS

Once you have placed your spots, rename them in the Description so you know the sample, grain, and spot number (e.g. 14NZ38 G1_S1).

If you want to verify your spots are named correctly, click Labels and change from 'Number' to 'Description'.

After each grain, save your experiment by clicking Save > Save Experiment > Select (or create) your folder, and name your experiment. On subsequent saves, the program will ask if you want to replace the file. Say yes, as it is essentially the same file but now with additional spots and data!

OTHER

Contact Zhan when you reach campus, he will meet you at the elevator and bring you up to the 4th floor. The elevator will not work without a code.

Don't forget to take your shoes off when entering the laser lab.

In the current times, the bathroom on the 4th floor (laser lab floor) is currently closed, so you will have to ask Zhan to take you down to the 1st floor to use the bathroom.

Also, the argon tanks may occasionally make a VERY loud hissing noise; this is not a cause for concern, it is a decompression valve.

If you'd like, you can also use the Snipping Tool program to capture images of the spots as they are placed on the grains and save them to your flash drive (the computer tower for the laser is on the back of the laser machine).