Zeiss Training Notebook

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MSE Fee-For-Service Facility
Materials Science and Engineering
University of California, Riverside

January 13, 2026 (rev. 1.0)

Before you begin…

- ❑ Complete the required safety training modules on UC Learning
  - ❑ Laboratory Safety Orientation (Fundamentals) 2013
  - ❑ Hazardous Waste Management
  - ❑ Compressed Gas Safety
- ❑ Submit a copy of your Training Transcript to Lab Manager
- ❑ Review the MSE Policies and Regulations
- ❑ Fill out the MSE 150, 250, 309 FAU Authorization Form with PI signature
- ❑ Provide your ENGR username to Lab Manger to set up Faces account
- ❑ Arrange a time for training with Lab Manager
- ❑ Schedule your reservation on Faces for your training

Zeiss Microscope Operation

I. Microscope Layout

II. Startup

III. EPI: Bright Field

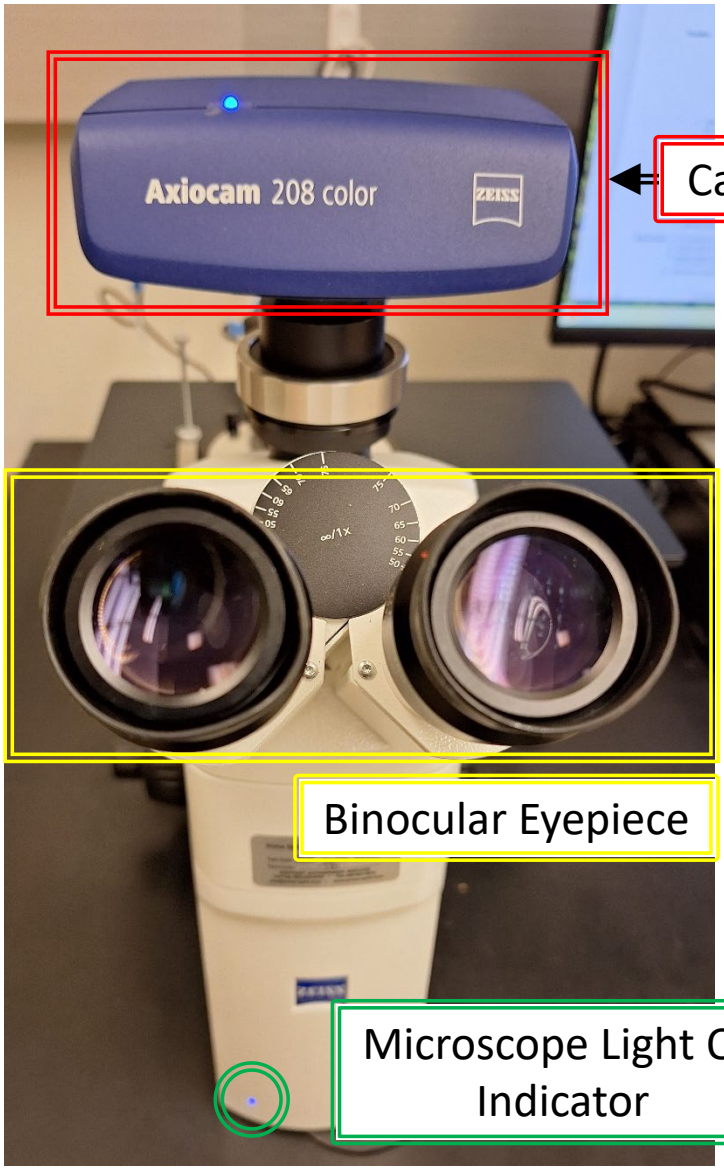
IV. EPI: Dark Field

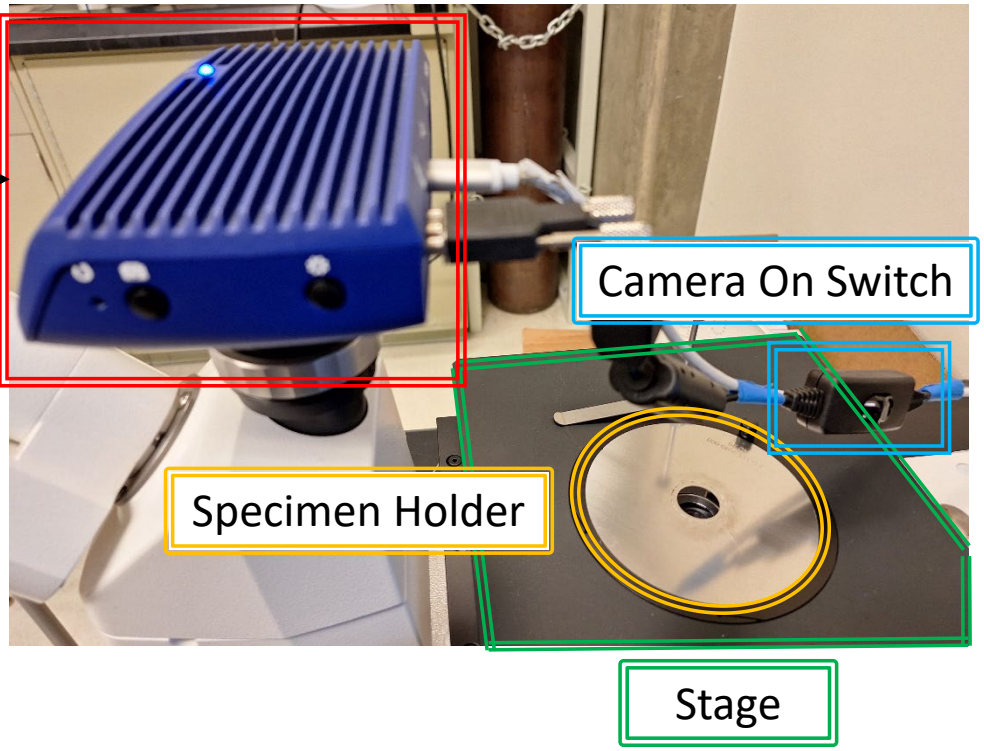
V. EPI: Circular Polarized Light-Differential Interference Contrast (C-DIC)

VI. Image Capture

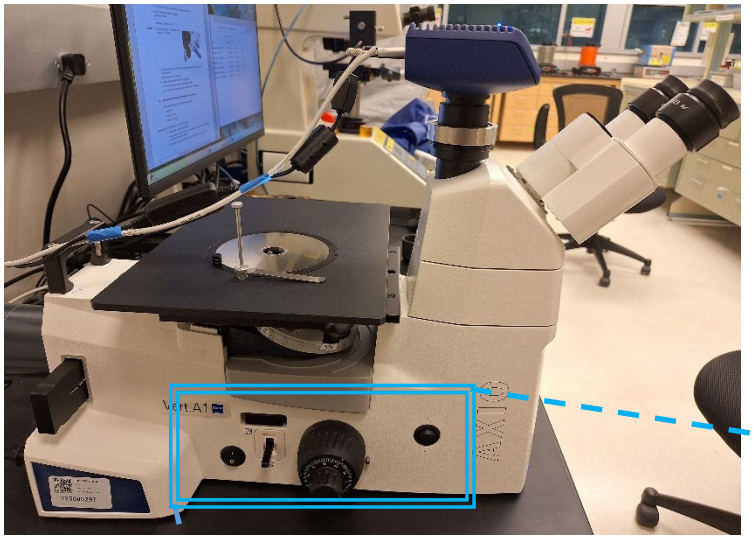
VII. Cleanup

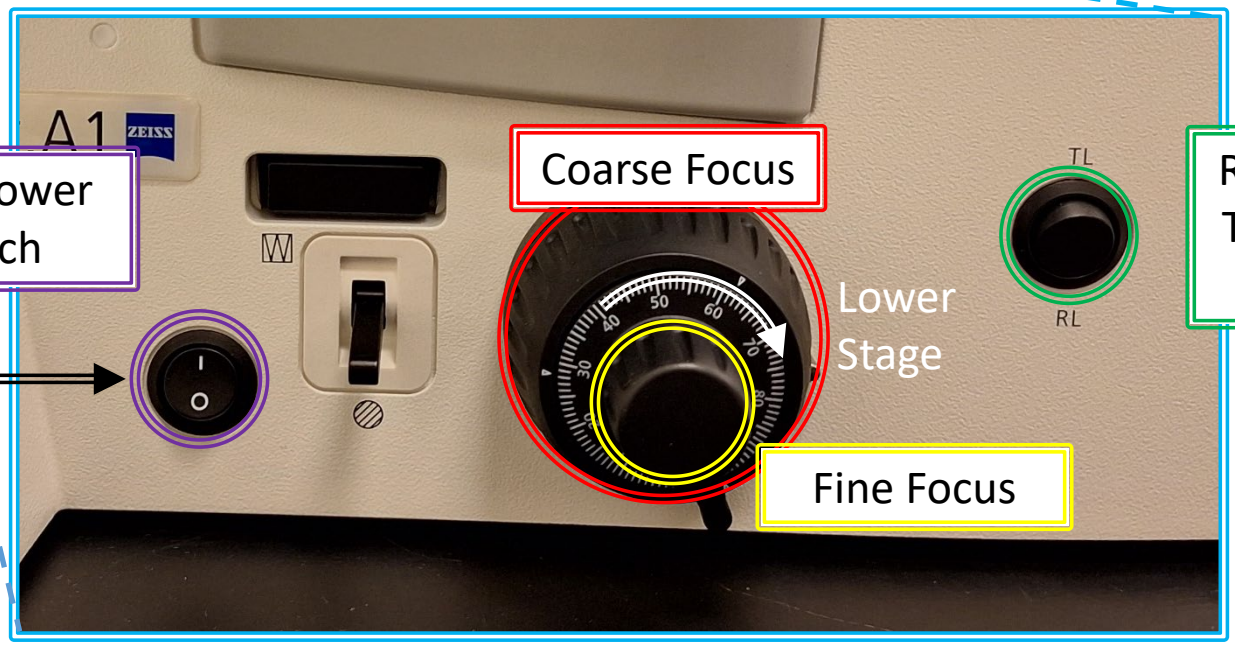
I. Microscope Layout – 1/4





I. Microscope Layout – 2/4

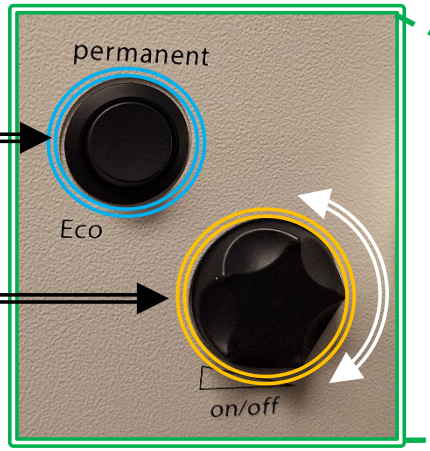




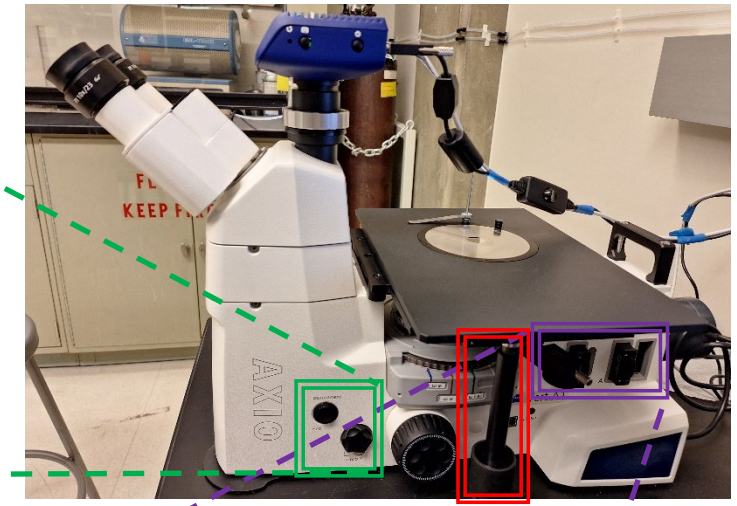
I. Microscope Layout – 3/4

Permanent or Eco Light Selector

Light On/Off Selector (Press)

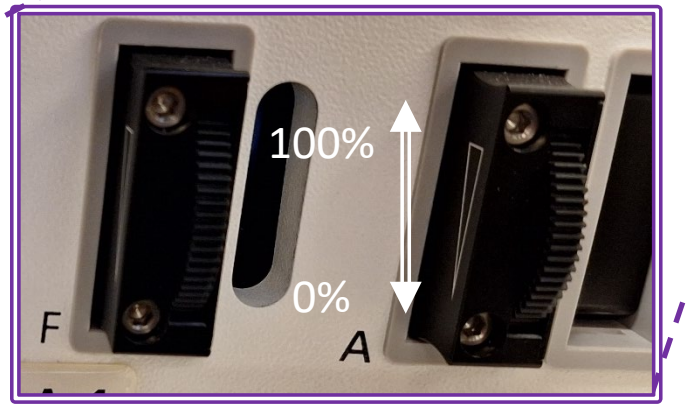


Light Brightness Knob (Rotate)



Stage Movement

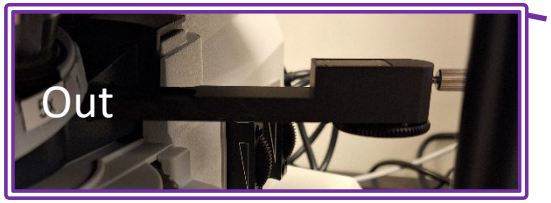
Field (F) Diaphragm Wheel

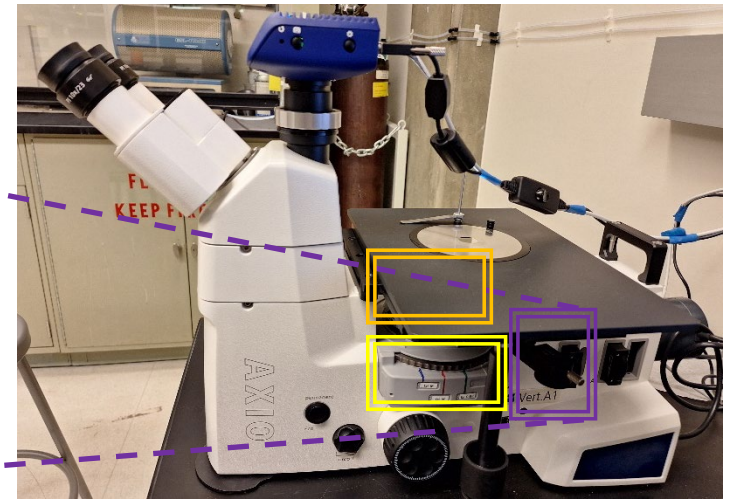


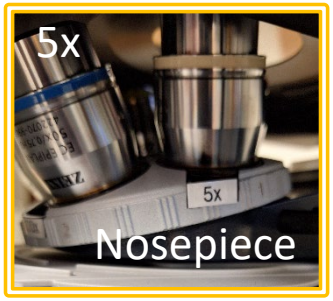
Aperture (A) Diaphragm Wheel

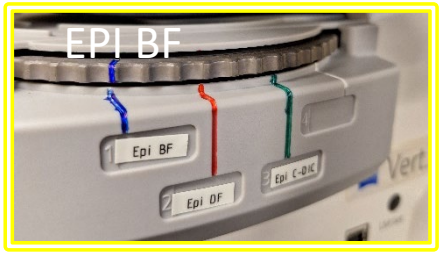
I. Microscope Layout – 4/4

C-DIC Slider Plate

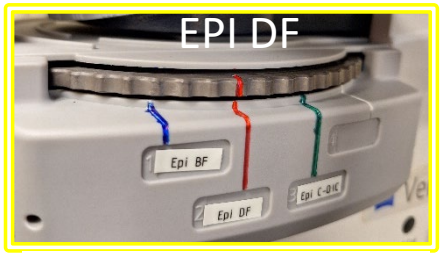




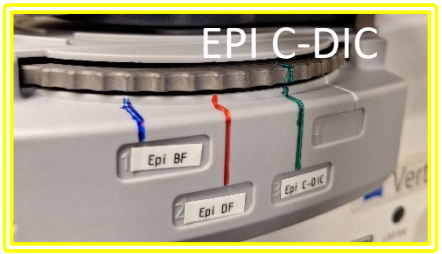




Bright Field (Blue)



Dark Field (Red)



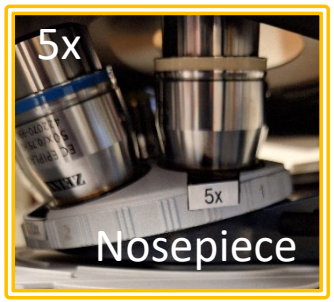
C-DIC (Green)

II. Startup – 1/6

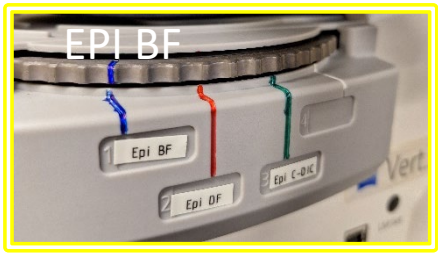
1. Turn the ***Light Power Switch*** to ***On (I)***

2. Confirm ***RL (Reflected Light)*** is selected

3. Rotate to ***5x*** magnification using ***Nosepiece***
(DO NOT TOUCH OBJECTIVES!)

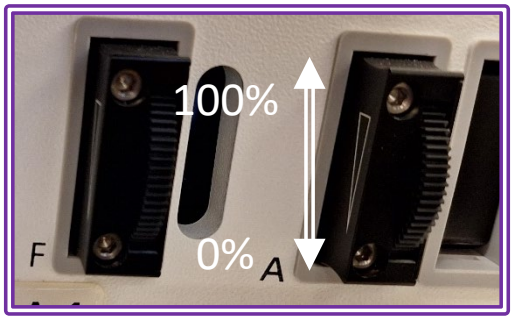


4. Rotate to the ***EPI BF (Blue)*** or ***Brightfield*** mode



5. Confirm ***C-DIC Slider Plate*** is ***Out***

6. Confirm both ***F*** and ***A Diaphragms*** are ***100% Open***



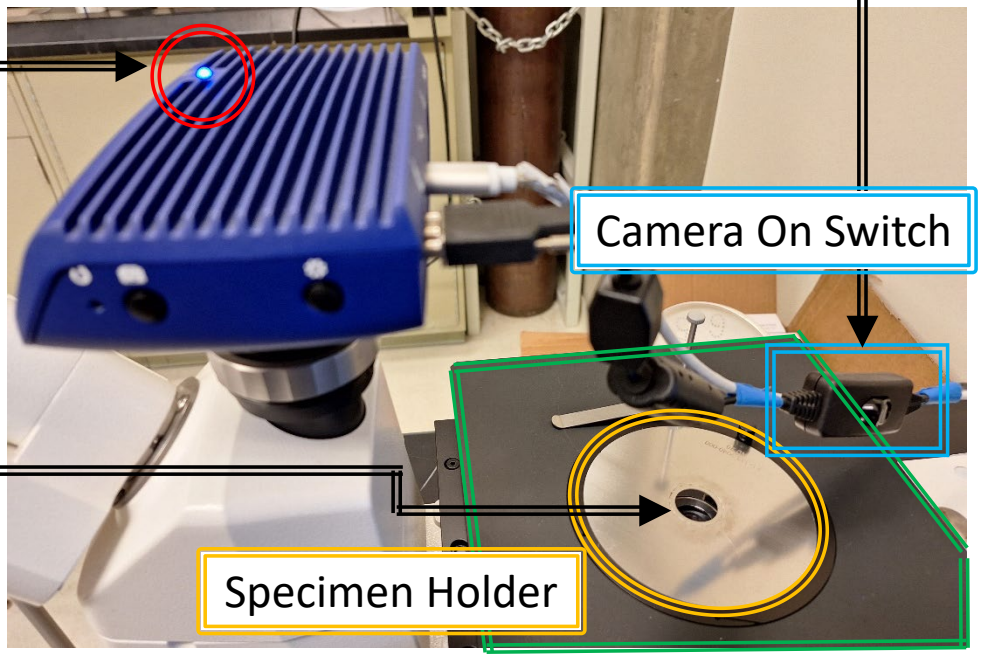
II. Startup – 2/6

7. Turn the ***Camera On*** (***Blue LED Indicator*** appears)

8. Use ***Stage Movement*** to position ***Objective Lens*** over ***Specimen Holder*** hole

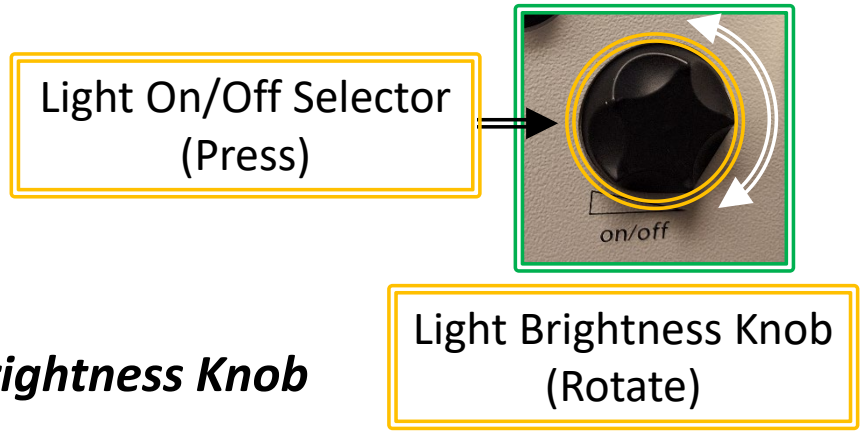
9. Place ***Specimen*** over hole on ***Specimen Holder***

10. Confirm ***Permanent Light*** is selected



II. Startup – 3/6

11. Press ***Light Selector*** to turn ***On*** the light

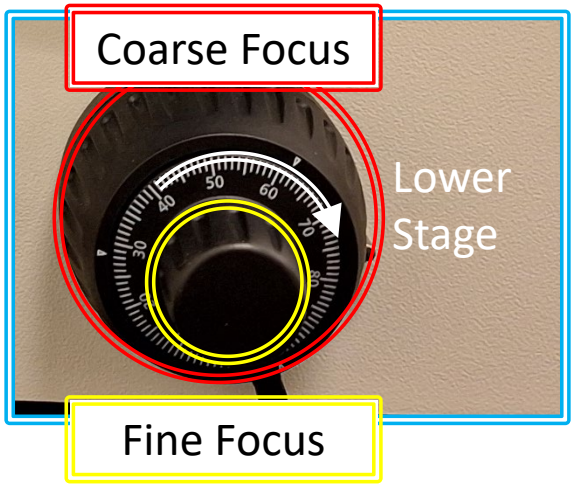


12. Adjust the ***Brightness*** by ***Rotating Light Brightness Knob***

Light Brightness Knob
(Rotate)

13. Slowly bring the image into ***Focus*** by adjusting the ***Coarse*** and ***Fine Focus***

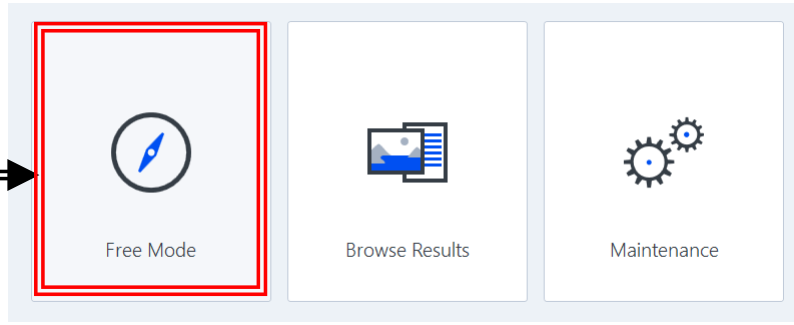
    (NOTE: Only use Coarse Focus with 5x objective lens!)



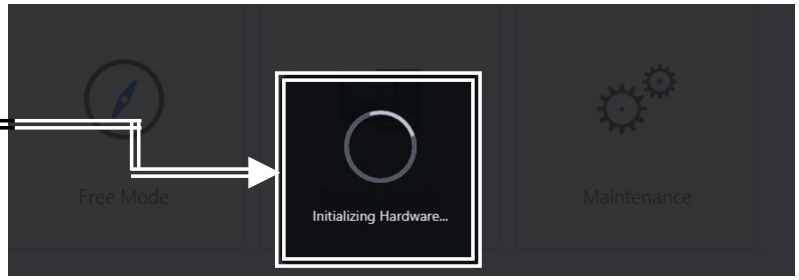
II. Startup – 4/6

14. Double-click on ***ZEN core 3.4***

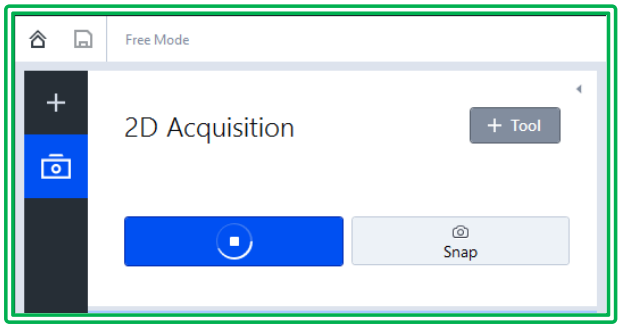
15. Select ***Free Mode***

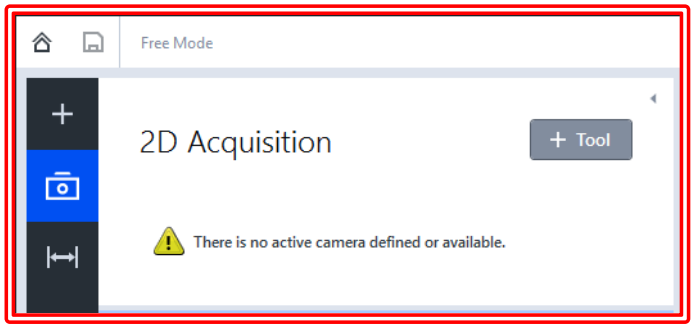


16. Wait for ***Initializing Hardware*** prompt



17. The ***Camera Tool*** should appear with ***Live View***



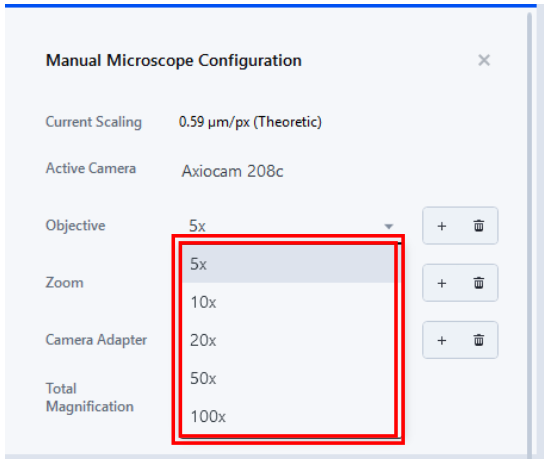


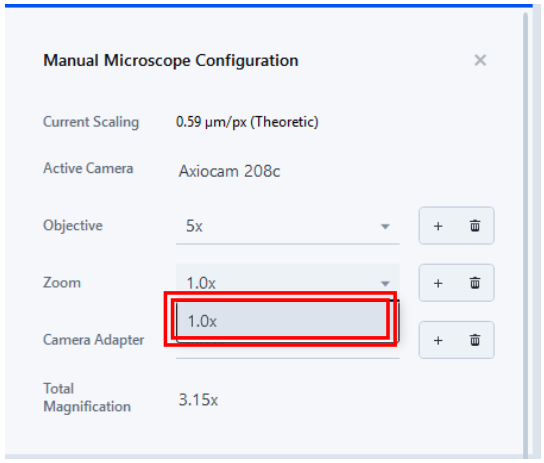
18. If ***No Active Camera*** appears, you did not turn on ***Camera*** first!

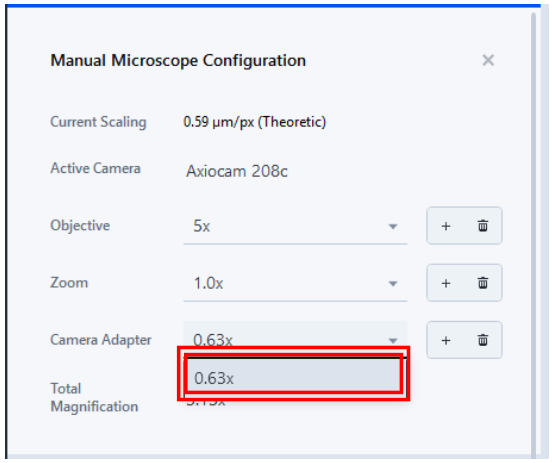
Exit out of ***Software***, turn ***On Camera***, then start at ***Step 14*** again

II. Startup – 5/6

19. Trash available ***Objectives*** until ***5x***, ***10x***, ***20x***, ***50x***, and ***100x*** remain (Optional)





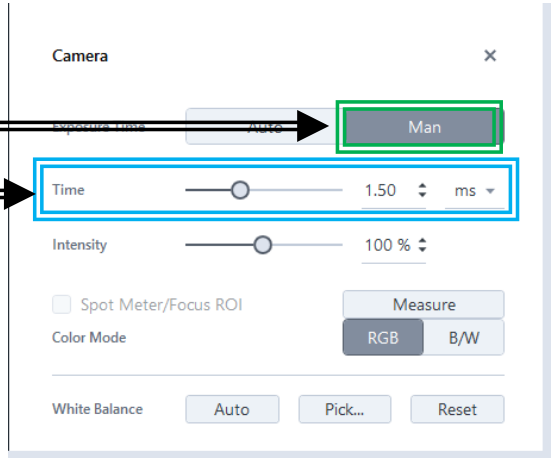


20. Trash available ***Zoom*** until ***1.0x*** remain (Optional)

21. Trash available ***Camera Adapter*** until ***0.63x*** remain (Optional)

22. Confirm ***Exposure Time*** is set to "***Man***" or ***Manual***

23. Adjust the ***Time*** if necessary to achieve desired ***Brightness***

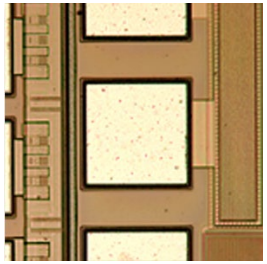


II. Startup – 6/6

24. Identify which microscope mode you wish to use:

    Episcopic Illumination ()

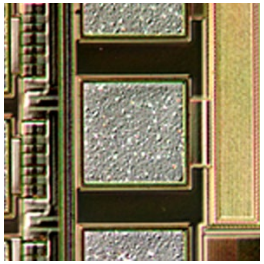
    III. Bright field

    IV. Dark field

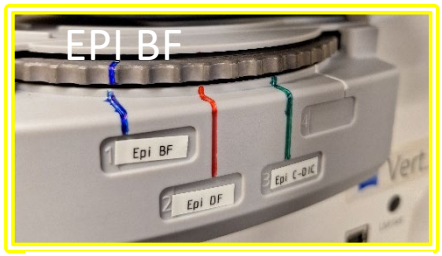
    

    V. Circular Polarized Light-Differential Interference Contrast (C-DIC)

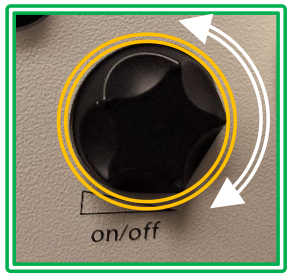
III. EPI: Bright Field – 1/2

1. Rotate ***Mode Selector*** to ***EPI BF*** or ***Bright Field*** (Blue)

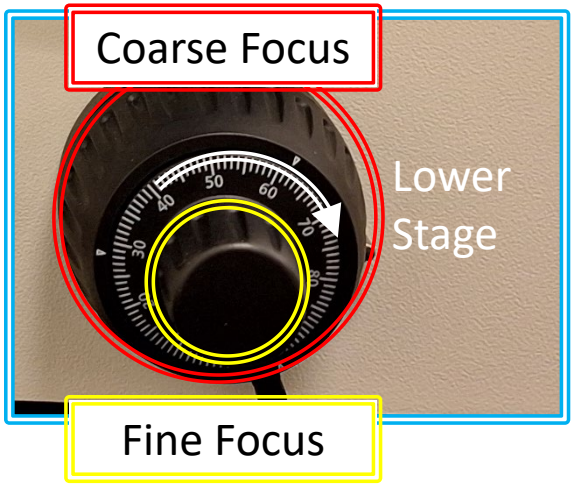


Bright Field (Blue)

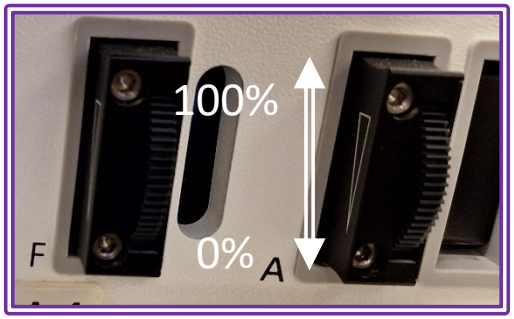
2. Adjust the brightness with the ***Brightness Control*** as necessary (***Exposure Time*** for ***Camera***)

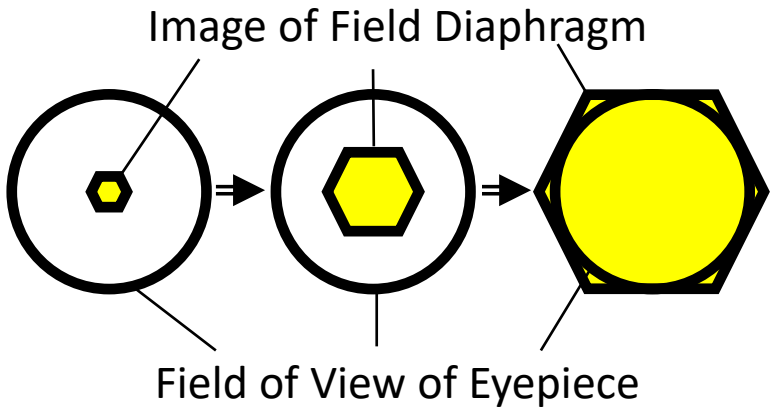


3. Focus on specimen by adjusting the ***Coarse/Fine Focus*** knobs as necessary



4. Adjust the ***F Diaphragm*** until ***Image of Field Diaphragm*** circumscribes the ***Field of View***

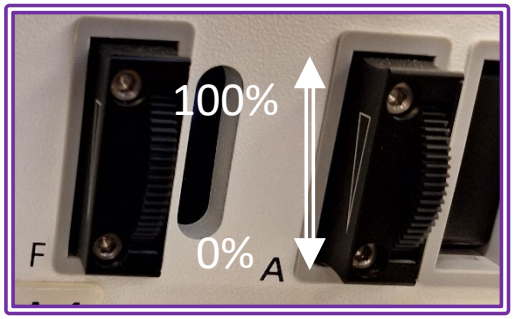


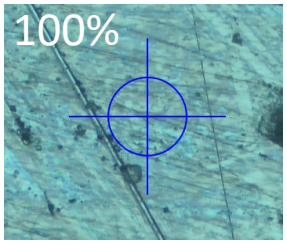


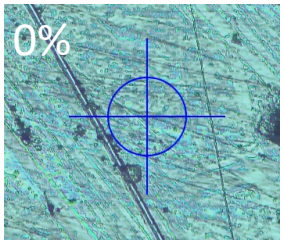
III. EPI: Bright Field – 2/2

5. Adjust the ***A Diaphragm***

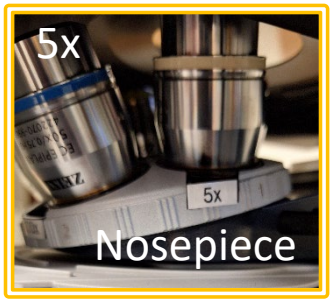
   to adjust ***Depth of Field***







6. Switch to higher magnification objectives if desired by rotating ***Nosepiece***
   (Note: Do not touch the ***Objectives*** when changing magnification!)

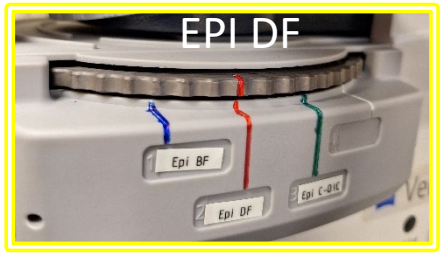


7. Repeat ***Steps 2-6*** until desired magnification and image quality is obtained

8. Go to ***Step VI. Image Capture*** when ready to acquire image

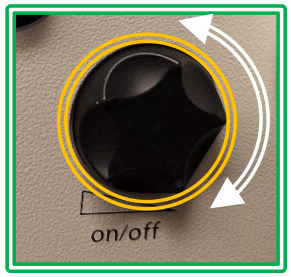
IV. EPI: Dark Field – 1/2

1. Rotate ***Mode Selector*** to ***EPI DF*** or ***Dark Field*** (Red)

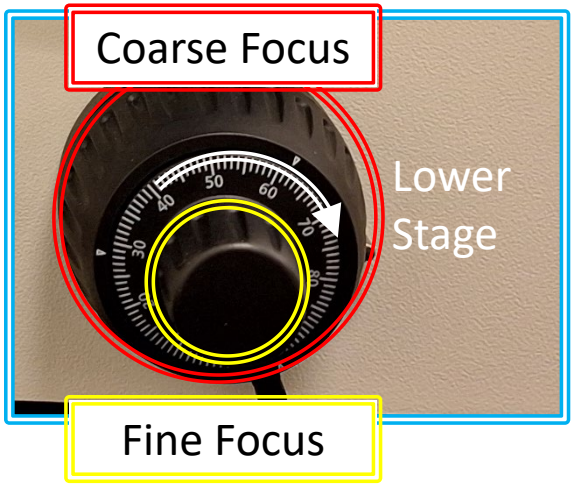


Dark Field (Red)

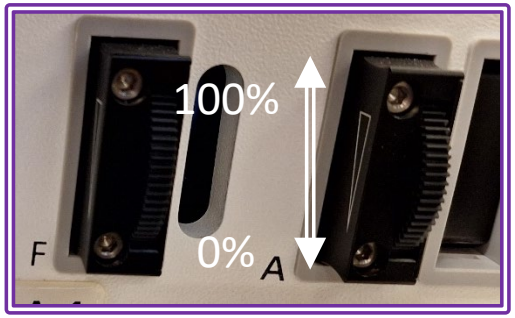
2. Adjust the brightness with the ***Brightness Control*** as necessary (***Exposure Time*** for ***Camera***)



3. Focus on specimen by adjusting the ***Coarse/Fine Focus*** knobs as necessary

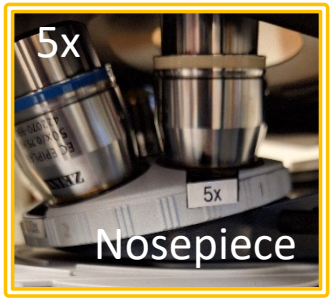


4. Adjust the ***F Diaphragm*** and ***A Diaphragm*** to ***100% Open***



IV. EPI: Dark Field – 2/2

5. Switch to higher magnification objectives if desired by rotating ***Nosepiece*** (Note: Do not touch the ***Objectives*** when changing magnification!)

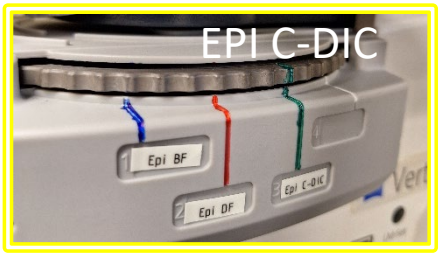


6. Repeat ***Steps 2-5*** until desired magnification and image quality is obtained

7. Go to ***Step VI. Image Capture*** when ready to acquire image

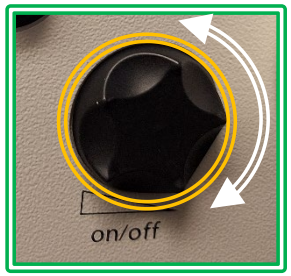
V. EPI: C-Differential Interference Contrast – 1/2

1. Rotate ***Mode Selector*** to ***EPI C-DIC*** or ***Circular Polarized Light-Differential Interference Contrast*** (Green)

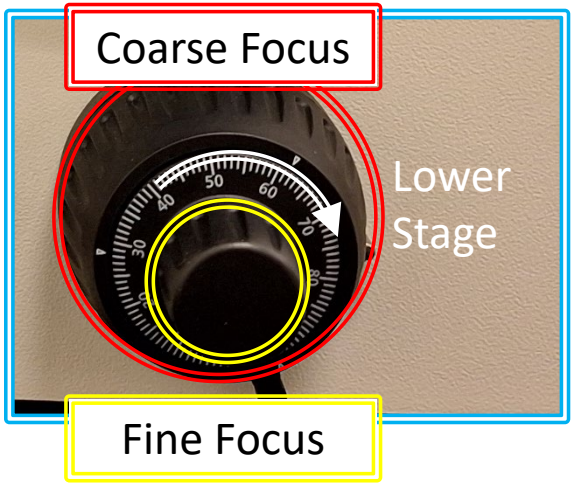


C-DIC (Green)

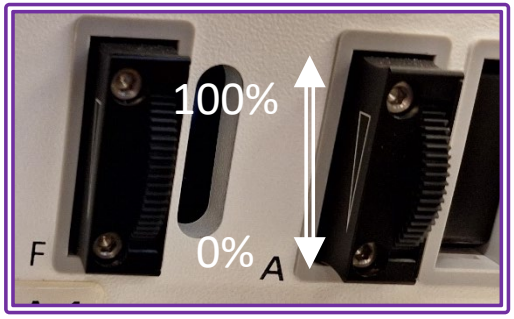
2. Adjust the brightness with the ***Brightness Control*** as necessary (***Exposure Time*** for ***Camera***)



3. Focus on specimen by adjusting the ***Coarse/Fine Focus*** knobs as necessary



4. Adjust the ***F Diaphragm*** and ***A Diaphragm*** to ***100% Open***

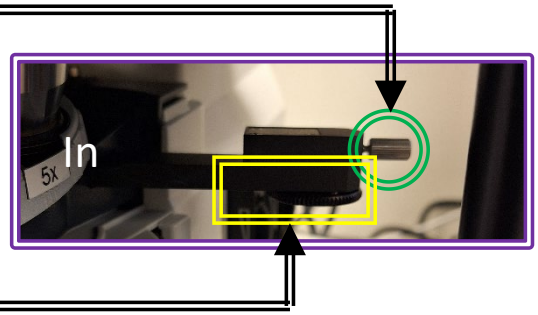


V. EPI: C-Differential Interference Contrast – 2/2

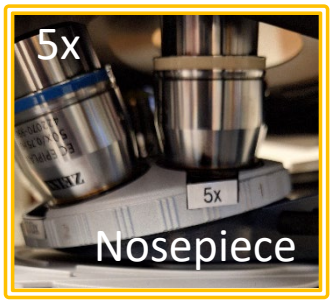
5. Insert the ***C-DIC Slider Plate*** to the ***In*** position

6. Optimize the contrast by turning the ***Setting Screw*** on the ***C-DIC Slider Plate***

7. Turn the ***Setting Wheel*** on the ***C-DIC Slider Plate*** to further maximize the contrast



8. Switch to higher magnification objectives if desired by rotating ***Nosepiece***
(Note: Do not touch the ***Objectives*** when changing magnification!)

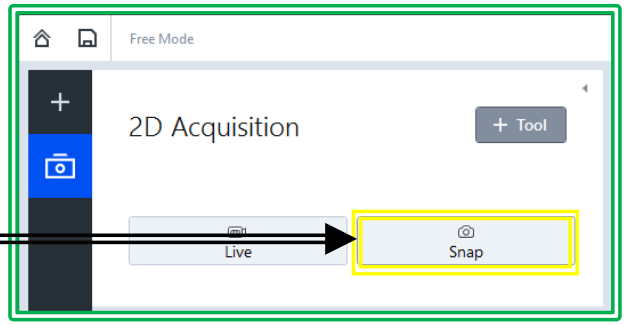


9. Repeat ***Steps 2-8*** until desired magnification and image quality is obtained

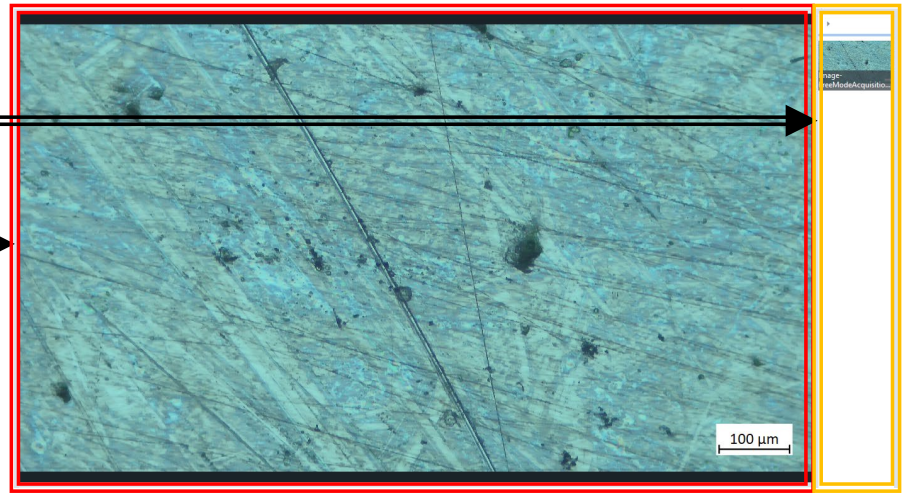
10. Go to ***Step VI. Image Capture*** when ready to acquire image

VI. Image Capture – 1/1

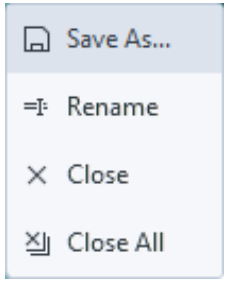
1. Click on the ***Snap Button*** to acquire an image



2. Acquired ***Image*** will appear in ***Main Window*** and in the ***Right Column***



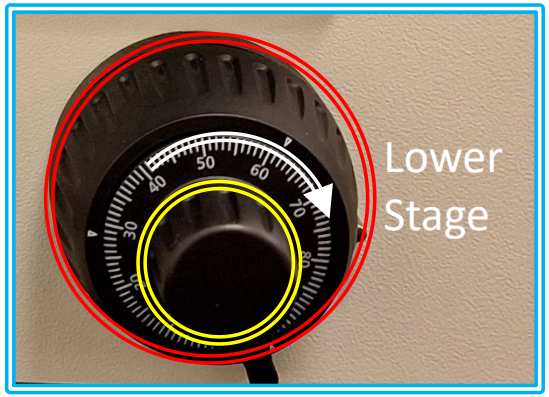
3. To ***Save Image***, ***Right-Click*** on ***Image*** and select ***Save As…***

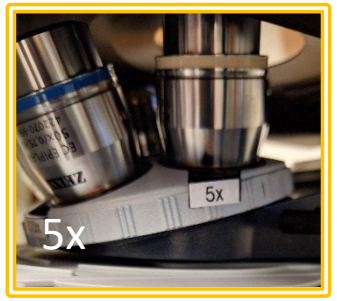


4. Save ***Image*** as ***Carl Zeiss Image (*.czi)*** for ***Post-processing*** and/or as ***Tagged Image File (*.tiff)*** for ***High-quality Images***

5. Recommend saving in ***C:\Zeiss Images\<Course Folder>***

VII. Cleanup – 1/1





1. Lower the ***Objectives*** by rotating the ***Coarse Focus*** knob **TOWARD** you
2. Rotate ***Nosepiece*** and place the ***5x Objective*** into position
3. Turn off ***Lamp Power Switch*** to ***Off (O)***
4. Turn ***OFF*** the software and confirm ***Yes***
5. Turn ***OFF*** the ***Camera Switch***
6. ***Log Out*** of your ***ENGR*** account
7. Clean up and dispose of any consumables used and return any tools back to its respective containers or bins
8. Place ***Cover*** over ***Microscope***