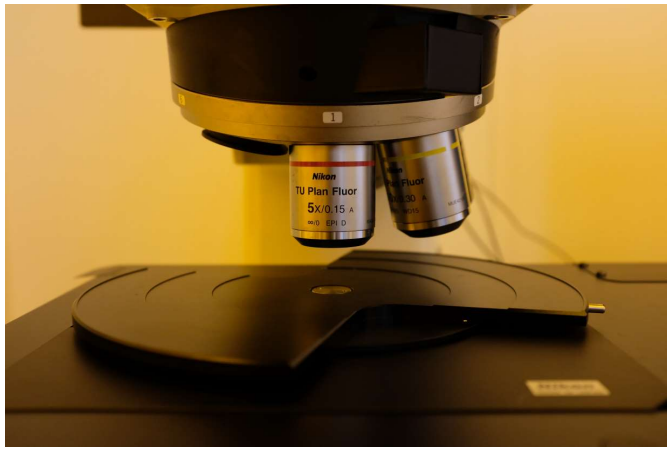
1

Nikon LV150

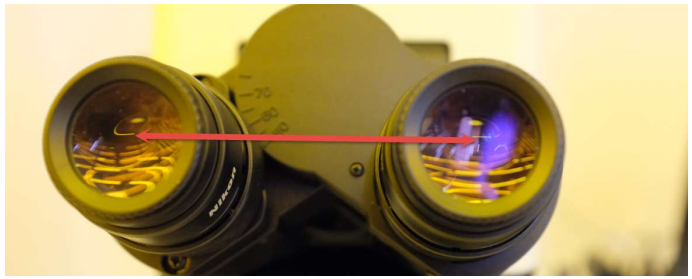
(motorized stage)

ALWAYS start and **end** with lowest power objective!

Goal – Do NOT touch sample with objective lens.
Why? – To avoid lens damage or sample damage (100x objective is $6K)
Lower power objectives generally have longer working distances (20X is an exception)



- **Adjust intraocular distance**



- **Adjust eyepiece focus if needed**



Taking Images With Elements Software

- Click on AE (Automatic Exposure) to have software automatically adjust shutter speed for good exposure when changing magnification
- Use Manual Exposure with maximum lamp illumination to reduce vibrations in image
- Fast shutter speed (<100mS) makes it easier to focus
- Focus using camera image not eyepiece for best image focus

Place sample on stage

2

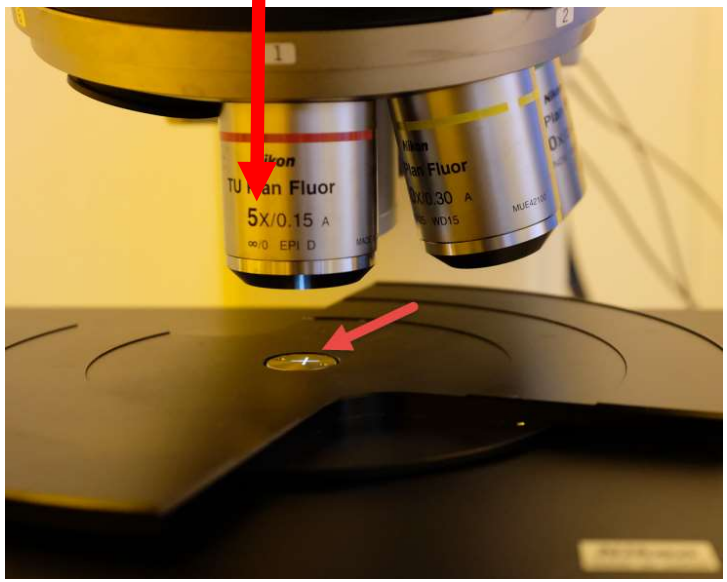
- Turn on LED lamp

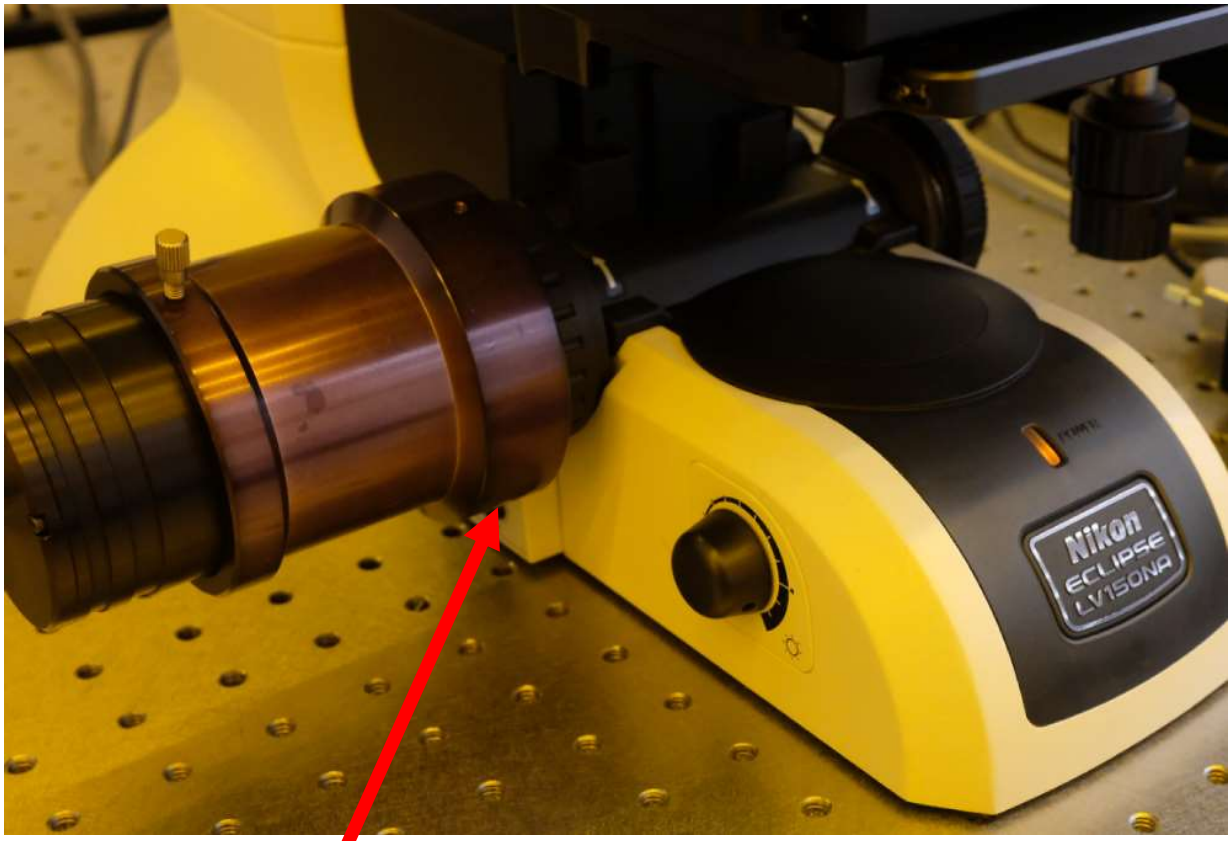


- Focus on substrate using semi-closed F Stop and lowest power objective

- Make sure Aperture is fully open
- Close F. Stop partially to cast shadow to find focus







Usually the stage is moved up or down with the control box to the right. For large stage moves it is possible to move the stage by rotating this

Use extreme care with the motorized stage, it is easy to crash the objective and also expensive.

Resets readout

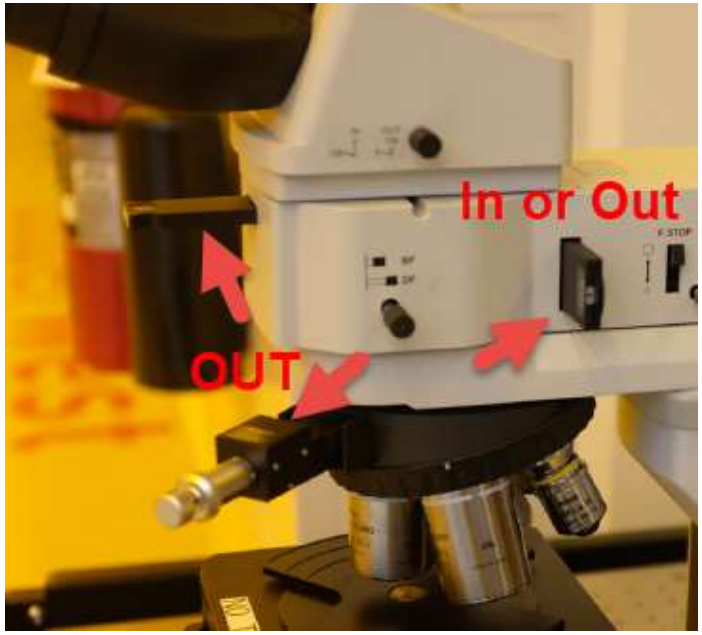


High Medium or Low speed

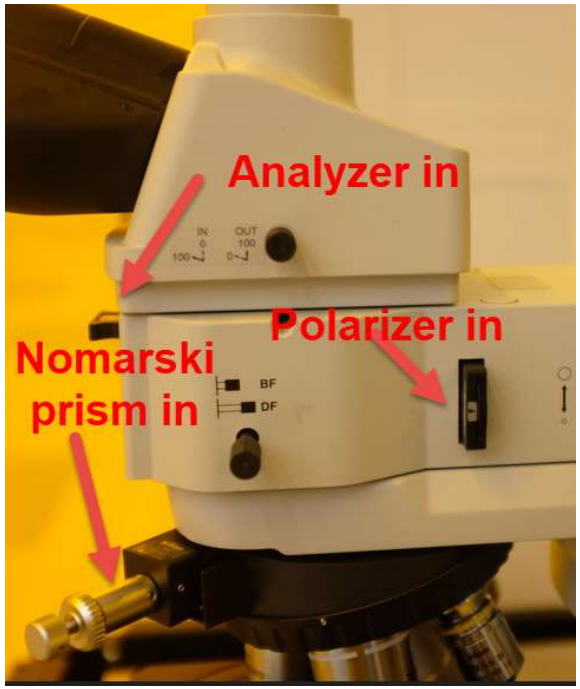
UP moves **STAGE DOWN** which increases the distance from your object

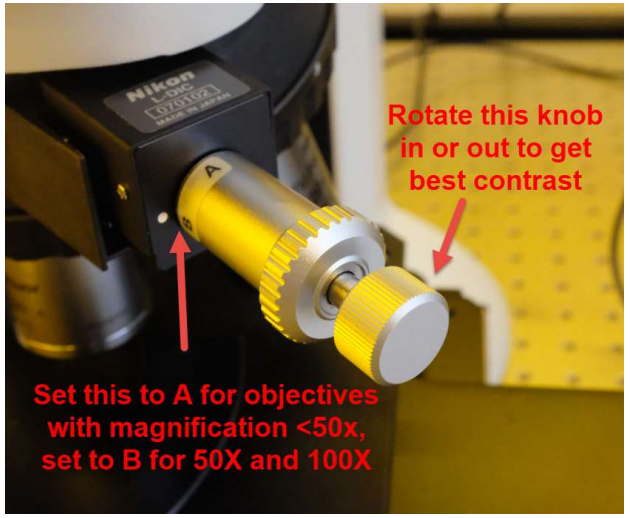
Fine movement for best focus

If NOT using DIC

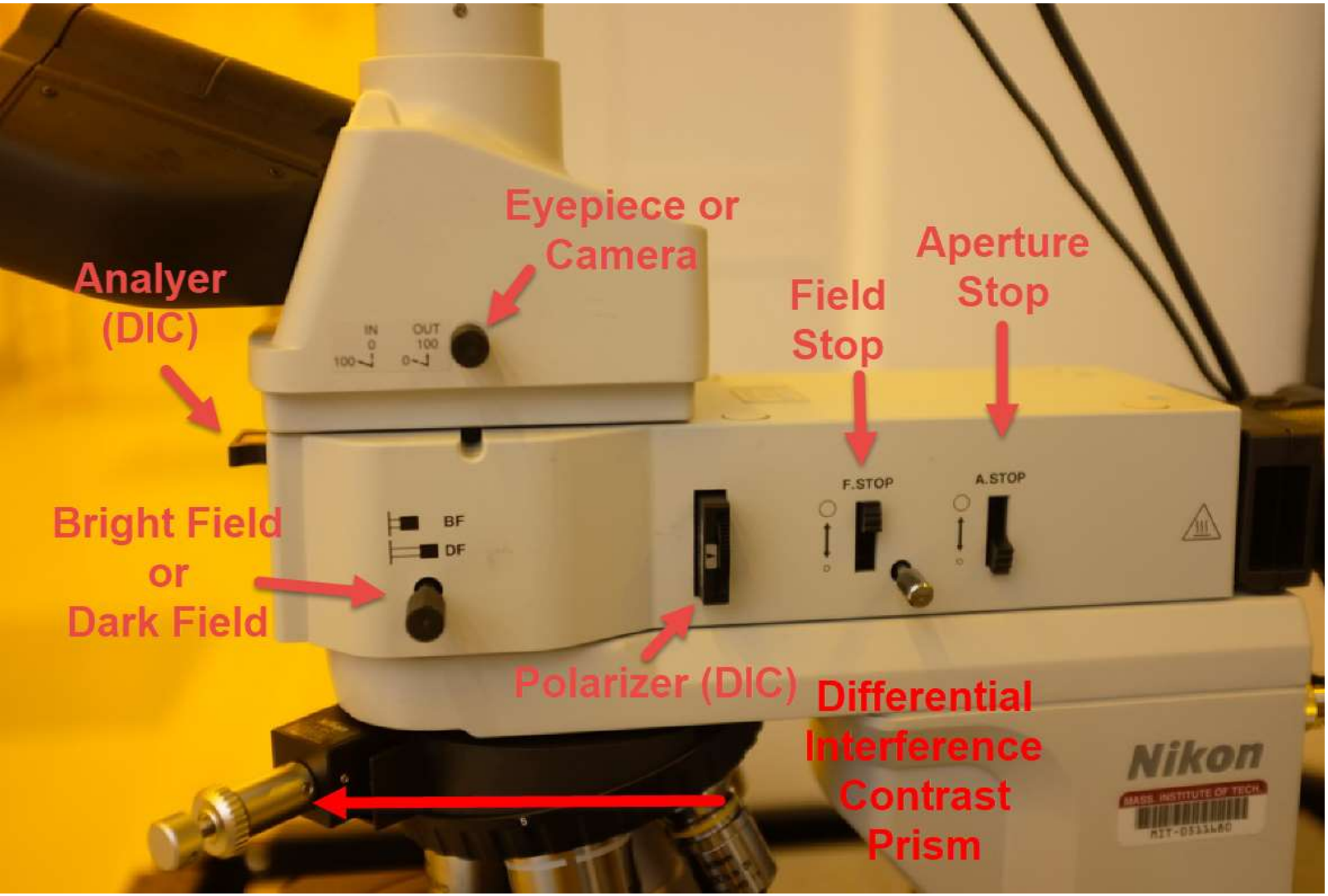


If using DIC



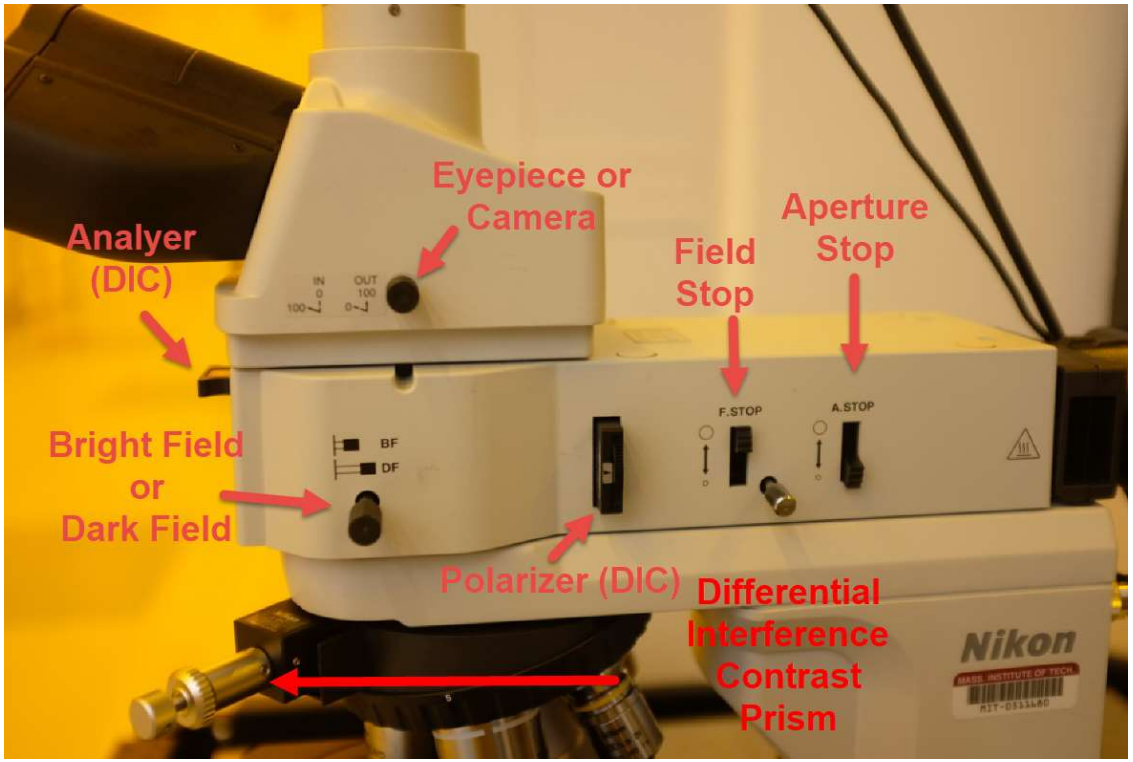






Steps to get an image

1. Rotate lowest power objective into place
2. Set mirror to Eyepiece or Camera
3. Push BF/DF rod in for Bright Field
4. Pull Analyzer, Polarizer and DIC Prism out of light path
5. Open Aperture stop (up)
6. Close F Stop and focus on shadow on substrate, then open F Stop back up.



Bright Field/Dark Field
When out (DF), illumination light travels outside the lens and illuminates the substrate at angles higher than the lens can collect, therefore only scattered light is collected. Useful to find particles and scratches.

DIC Prism
This prism separates the E and O polarized light so they are slightly offset at the substrate. On return the E ray is rotated to O so that interference can occur. Push the polarizer in and rotate knob to change contrast and color.

Aperture Stop
Limits ANGLE of illuminating light. Fully open = best resolution. Closing Aperture stop reduces stray light and can increase contrast for some spatial frequencies.

Field Stop
Limits field of view. Partially closed Field Stop will cast a shadow on a reflective substrate, allowing easy focusing. Start with low mag objective.

Polarizer
Limits illumination light polarization. Rotate to round dot for DIC. This can increase contrast, it will also reduce illumination light by 50%. Push in for DIC use.

Eyepiece/Camera
Mirror that directs 100% of light to either the camera or the eyepiece.

Analyzer (DIC)
Push in to light path for **D**ifferential **I**nterference **C**ontrast. DIC highlights very small changes in height. Useful for edges and finding roughness.