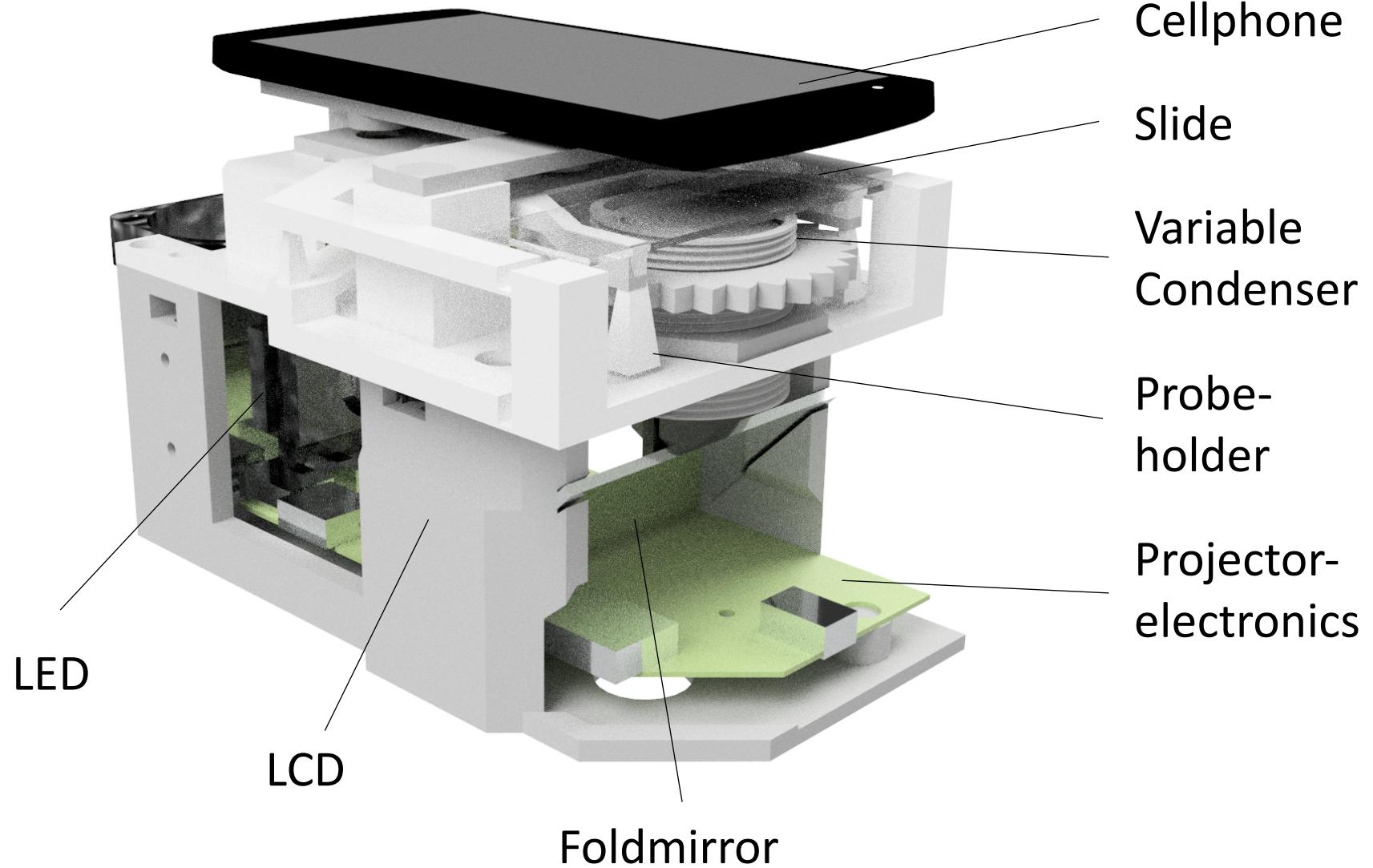


# Manual of the „Beamerscope“

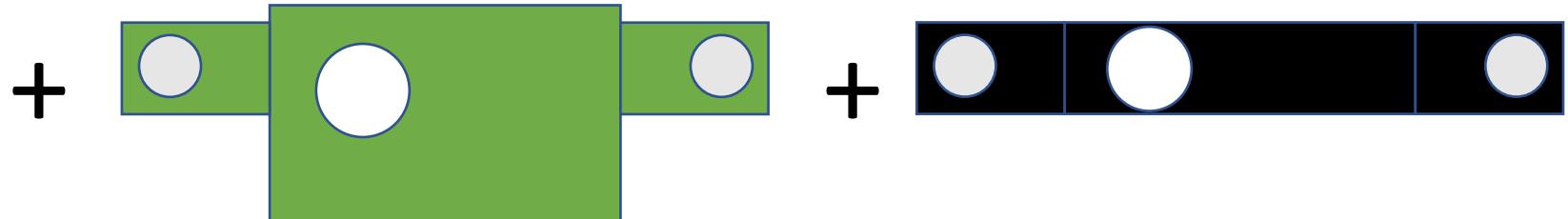
For further information please contact us on [nanoimaging.de](http://nanoimaging.de)



# Prepare Nexus (only for magnetic adapter)



Nexus 5



Mount 3D printed backplate with the magnetic  
Snap fit on the back of the Nexus using the screws

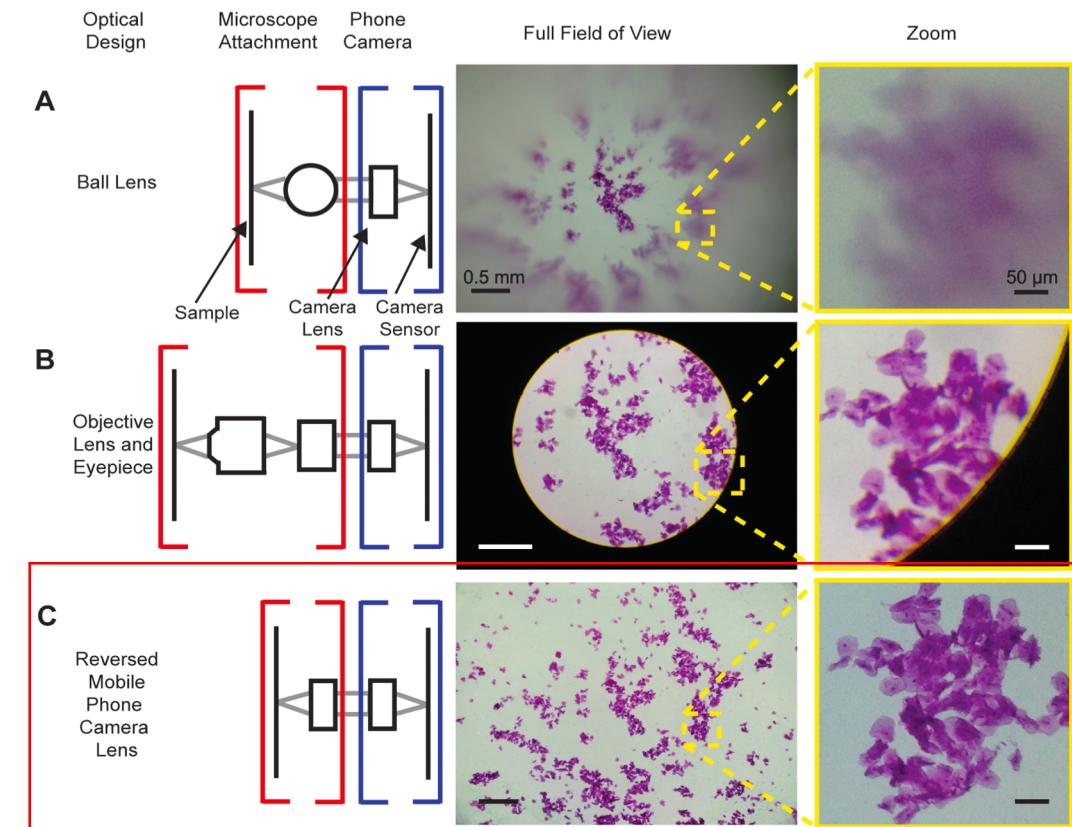
Place lens in the magnetic adpater and  
snap fit it on the back of the cellphone

# Prepare Nexus (no modification necessary)



Nexus 5

- Extract the lens from the iphone camera-housing (could be any cellphone lens in theory)
- Available for ~5€ at Ebay
- Double-sided sticky tape to make the lens sticking to the back of the phone

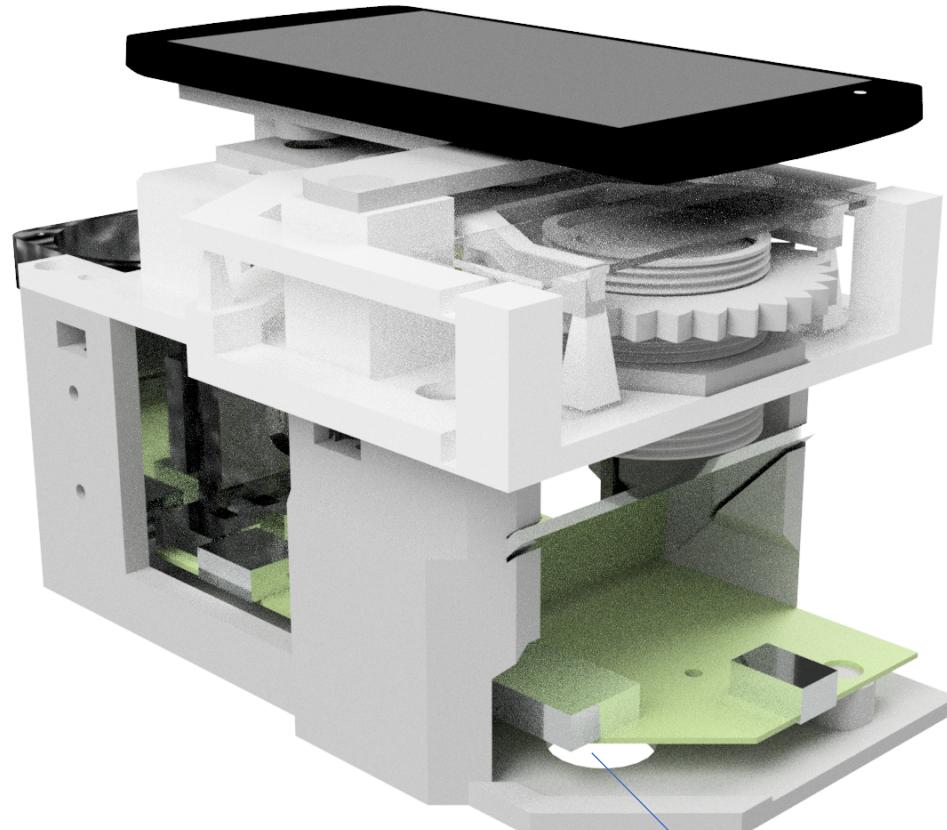


<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0095330>  
Low-Cost Mobile Phone Microscopy with a Reversed Mobile Phone Camera Lens

# Connect the Nexus using an USB-HDMI with the Beamerscope



# Switch on the Beamerscope

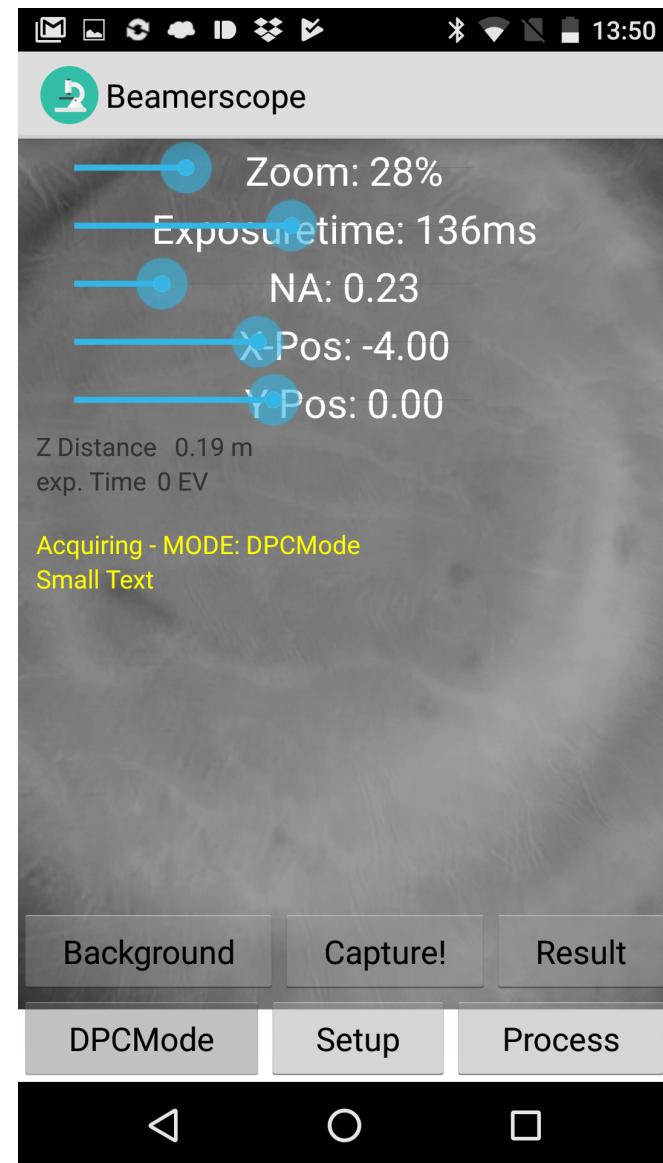


Unfortunately the power-switch is  
little hidden  
- better: use remote control

White LED is blinking 3x,  
Illumination starts after 5..10s

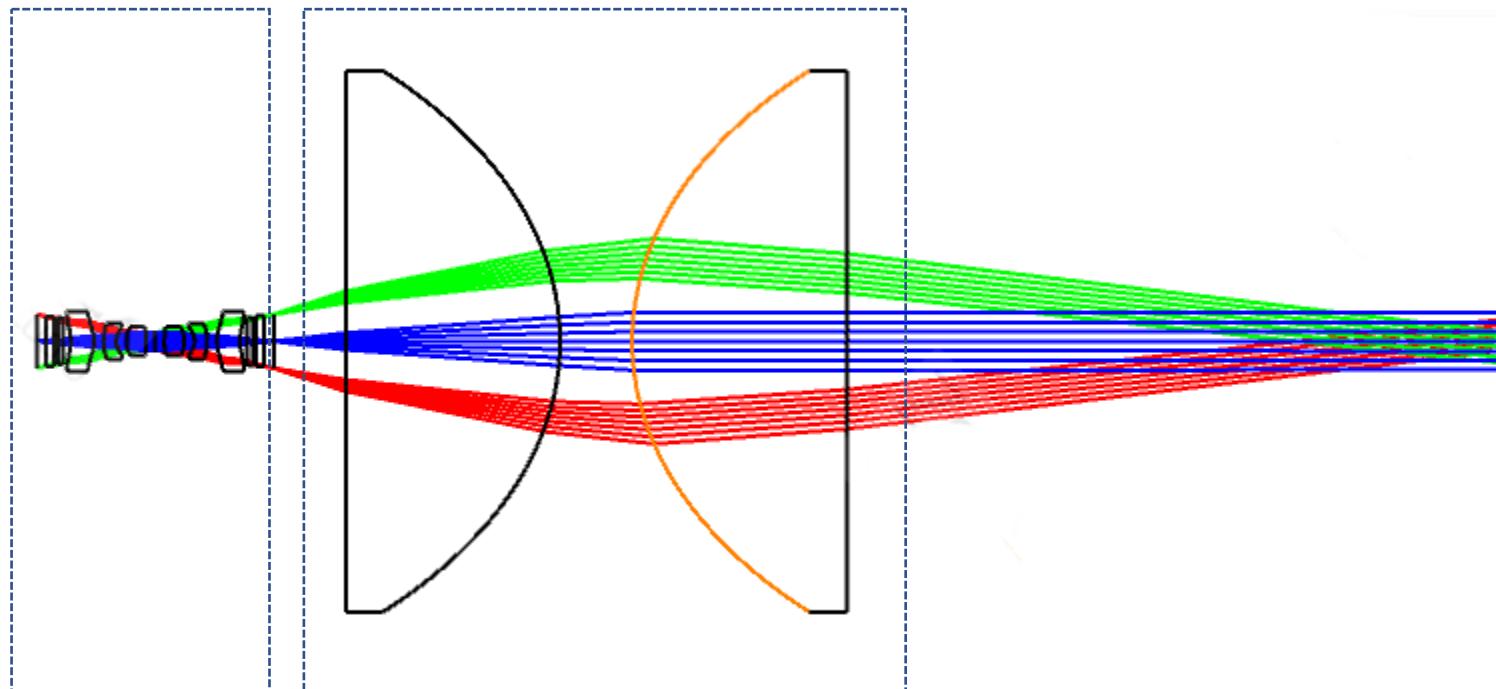
# Execute App on Nexus

- Start Beamerscope App
- Choose „Find best pattern“
- Default: DPC is activated
- Setup:
  - Choose BF, DF, DPC, FPM
- Slider: NA diameter
- X/Y Center Position



# Adjust Nexus and Beamerscope

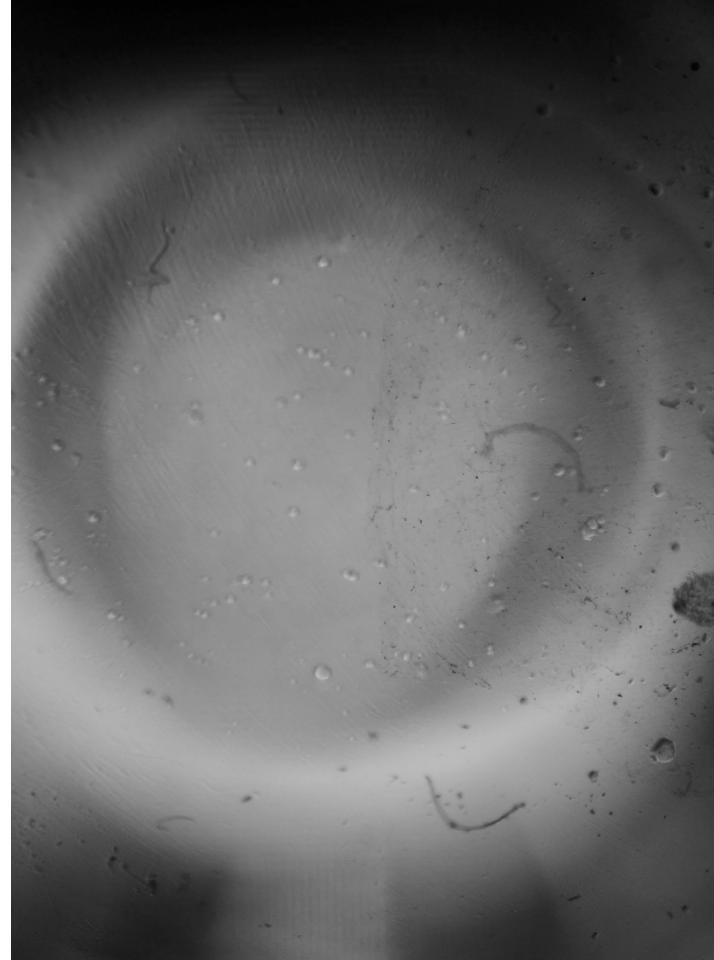
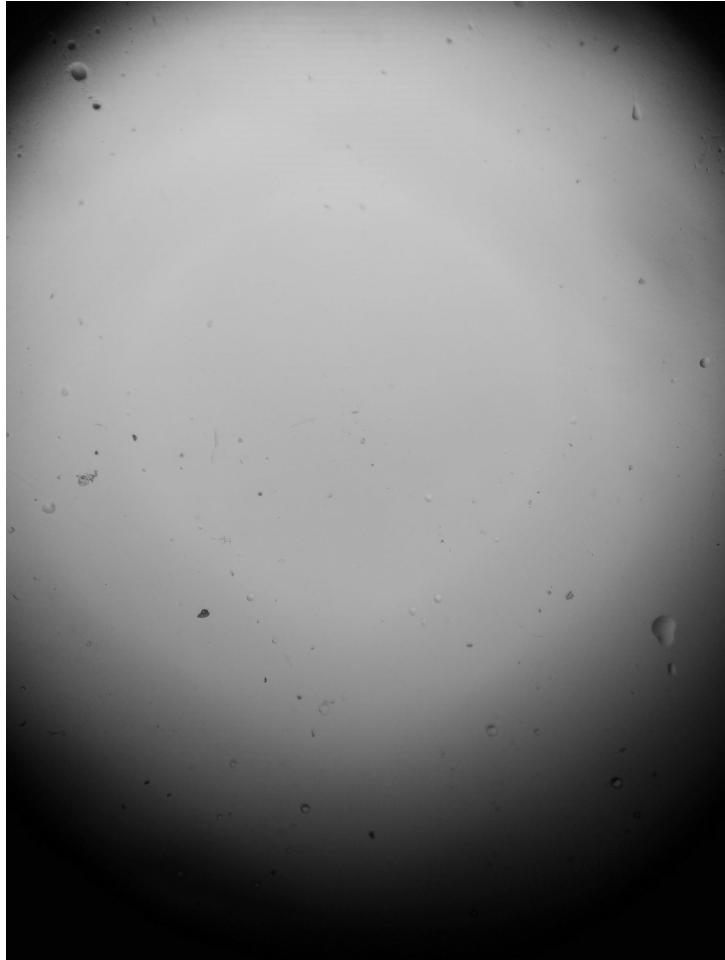
Vary height of Condenser using the thread



Handy + lens

Put cellphone on the beamerscope, so that the FOV is illuminated homogeneously

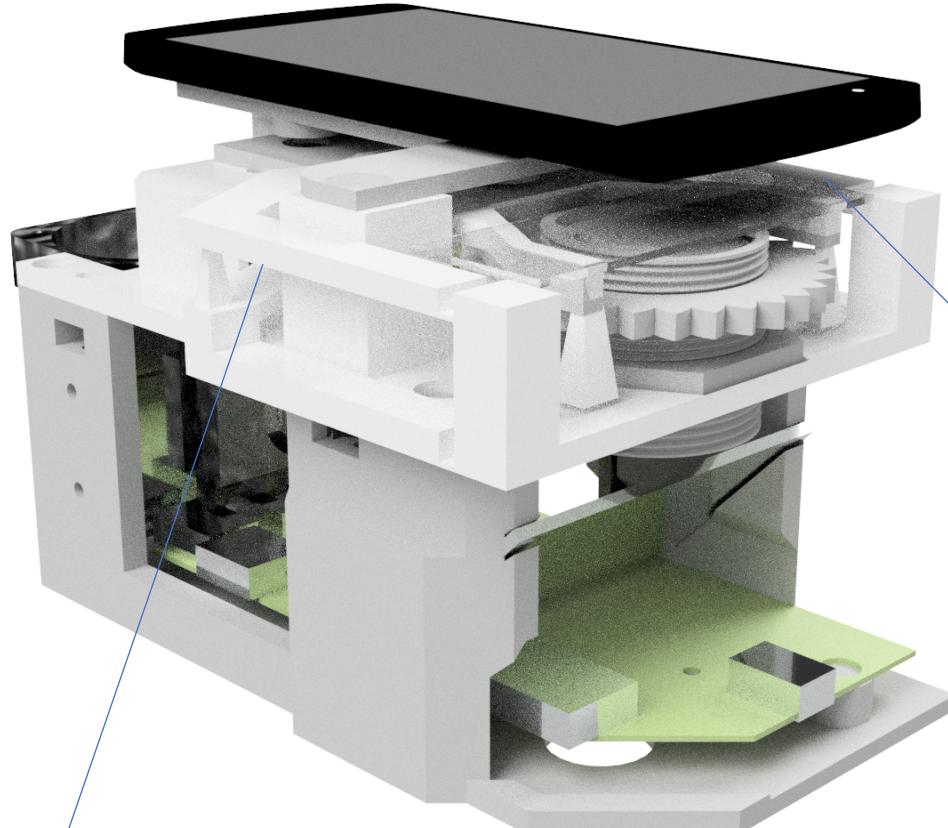
# Adjust Nexus and Beamerscope



Tip:

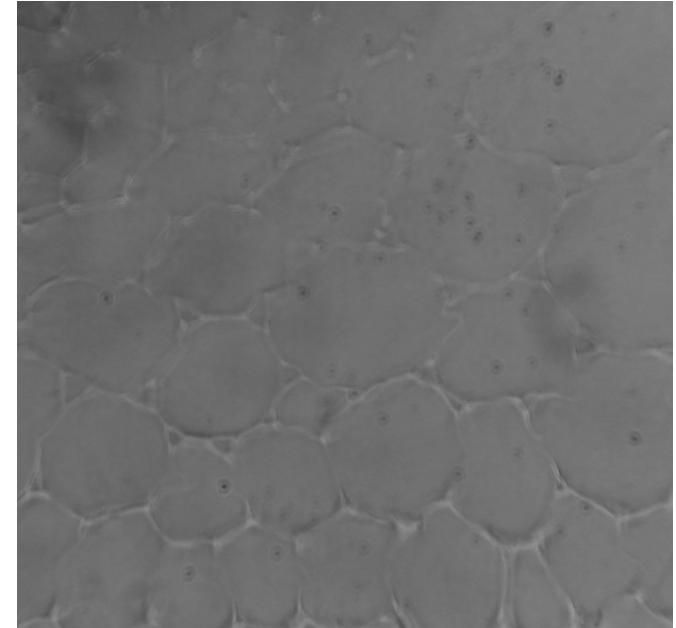
- Setup:
  - Select BF mode (Brightfield)
  - NA choose something smaller (NA 0.1)
- Move the phone about 10cm away from the condenser lens
- You can see the bright spot of the condenser
- Center mobile phone and video projector
- Place the mobile phone on the scannerscope and press on the double-sided adhesive tape
- Adjust brightness over shutter speed

# Put sample on the Z stage



Adjust the Z position using the knob

Sample goes here



In the case of phase sample e.g.  
with X / Y Pos realize an oblique  
illumination to see, for example,  
the phase gradient

# Optimale Beleuchtung realisieren

- Set up:
  - Select DPC Mode
- Eventually. Remove the sample
- Press Button: background (only once per measurement)
  - Series of wallpapers is being recorded
- Insert sample and focus
- Press Button: DPC mode
  - Series of object images is being recorded
- Press Button: Process
  - Calculates the phase image and feeds the NN (takes about 10..20 s)
  - Optimal light source is displayed on the projector
- Press Button: Result:
  - Displays phase image of the object (display problem due to Android data type - she looks funny)
- Press Button: Capture:
  - "Shoots" picture of picture just to be seen on the screen

