

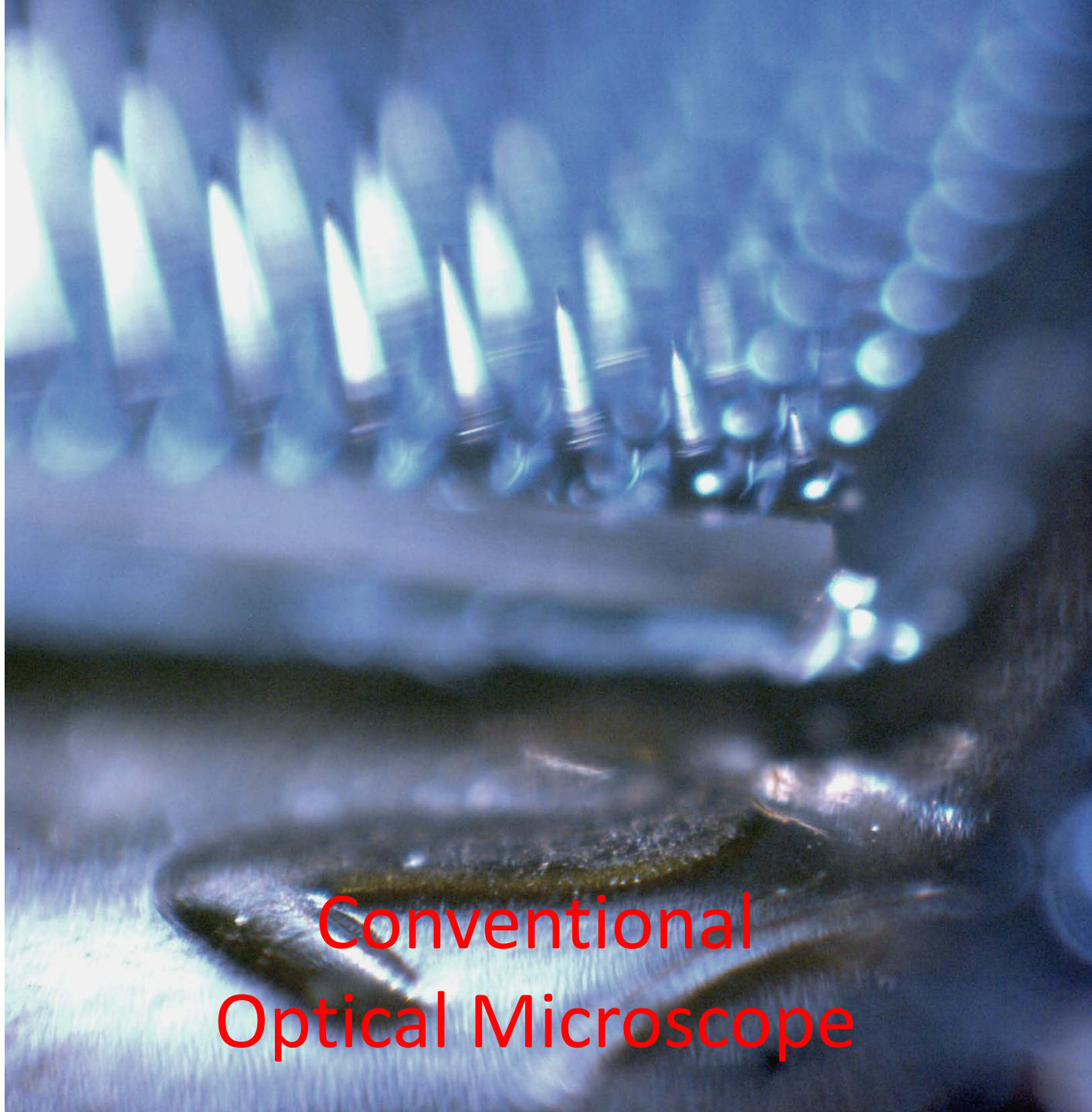


# New Nanofab Tool

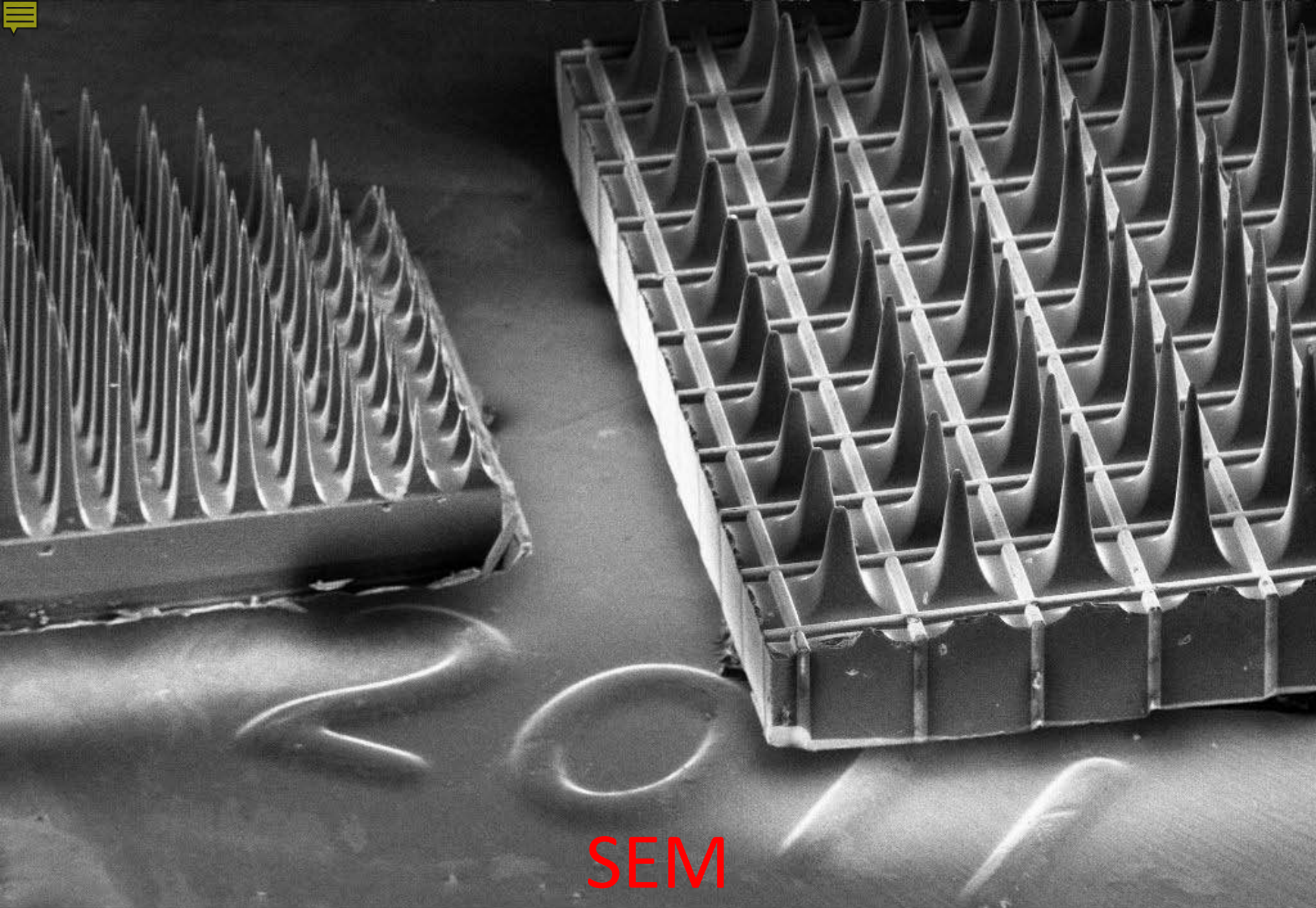
## Keyence 3D Optical Microscope

Brian Baker





Conventional  
Optical Microscope



SEM

EHT=15.00 kV      WD= 45 mm      Mag= 79 X  
Detector= SE1      I Probe= 150 pA      1. mm



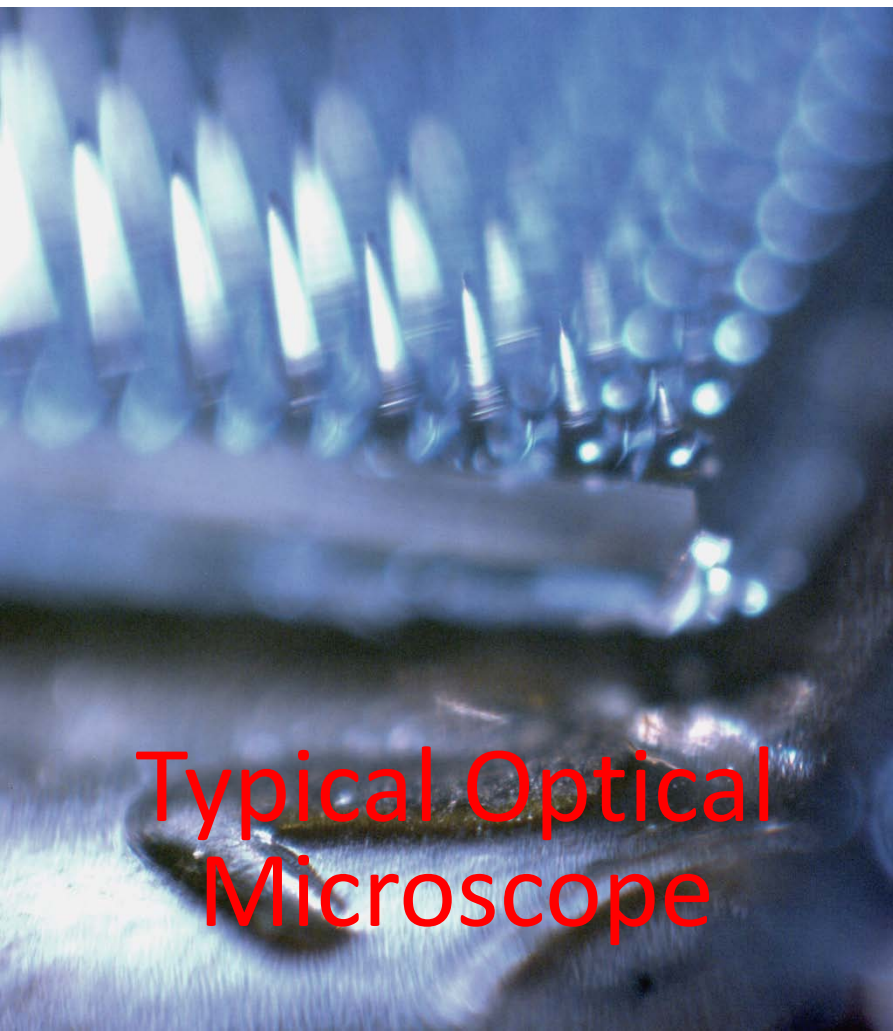
Keyence

Lens: Z20:X100

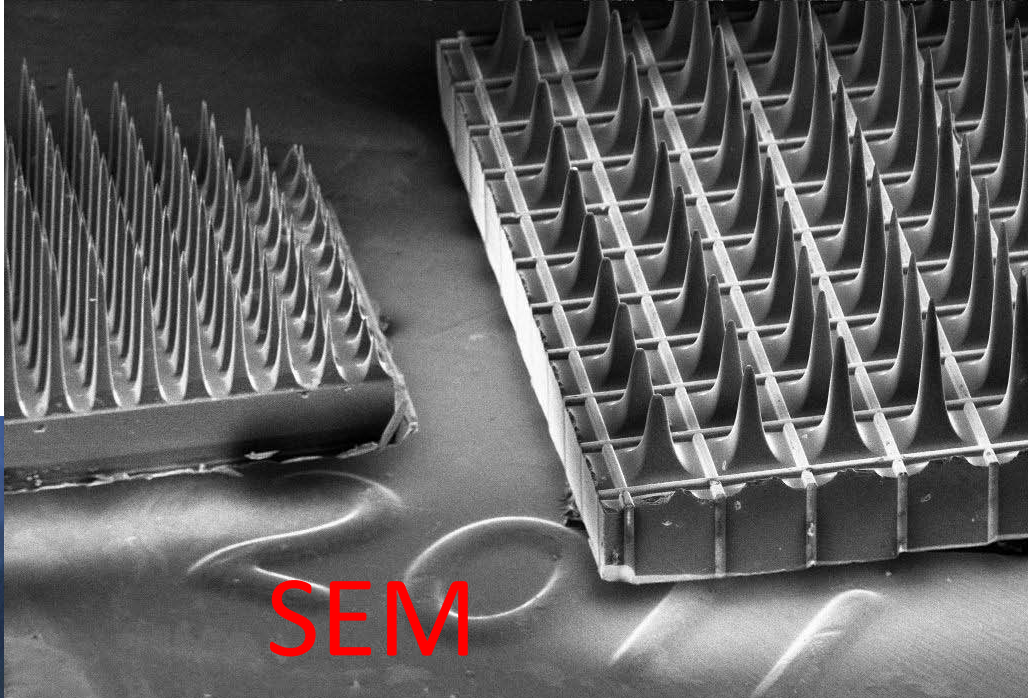
500.00µm



# Image Comparison



Typical Optical  
Microscope



SEM

EHT=15.00 kV WD= 45 mm Mag= 79 X  
Detector= SE1 I Probe= 150 pA 1. mm

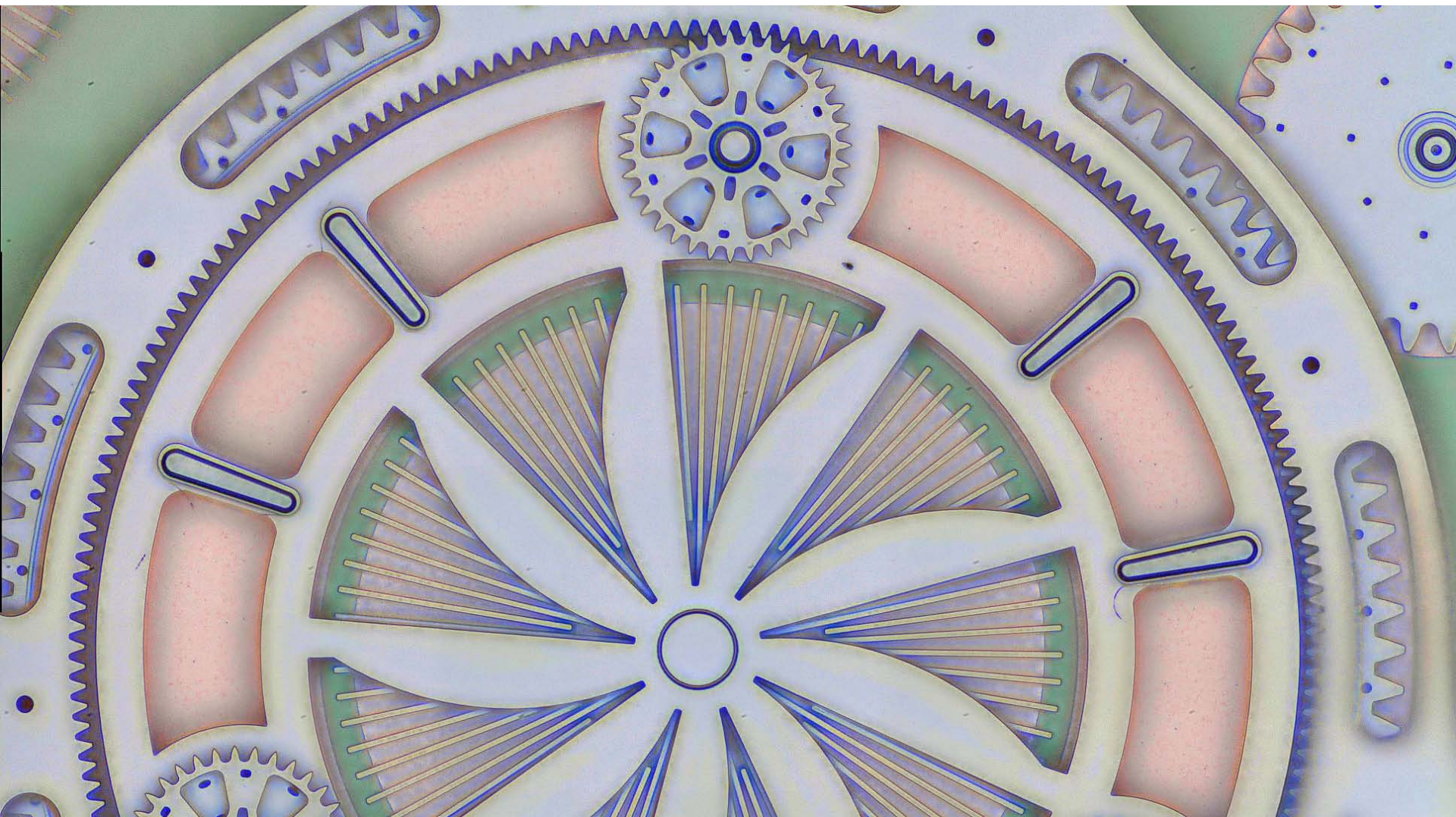


Keyence

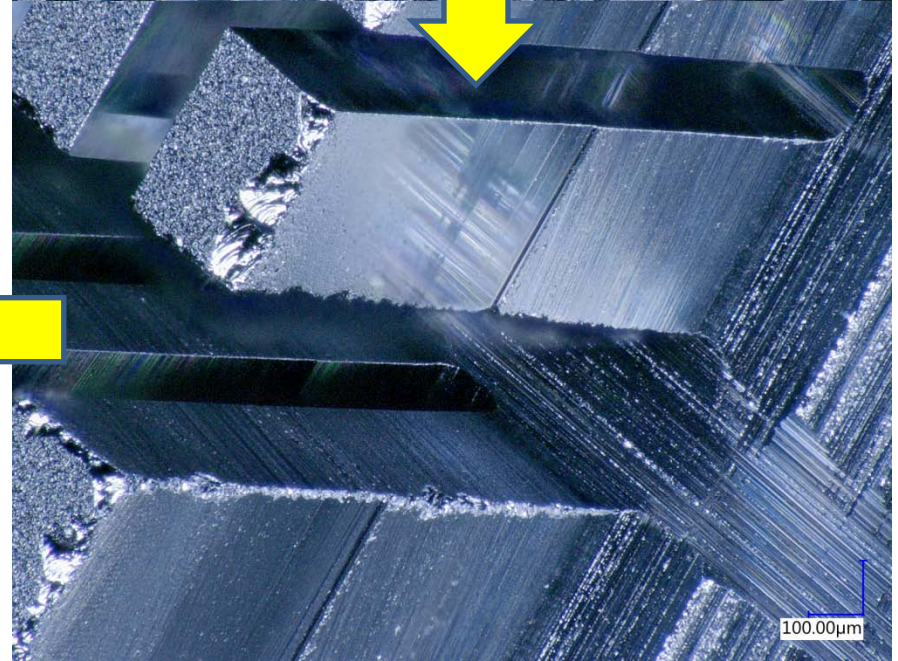
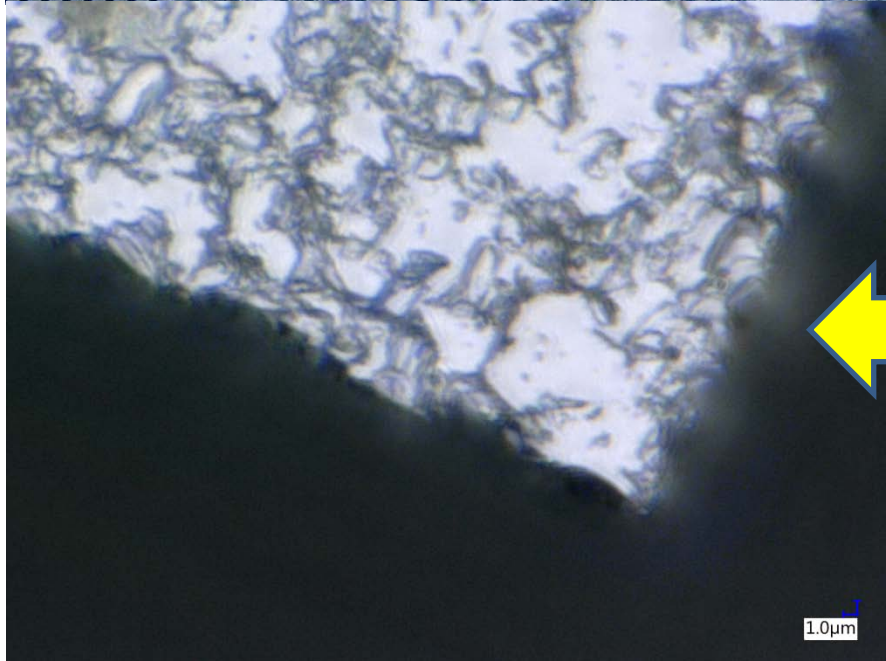
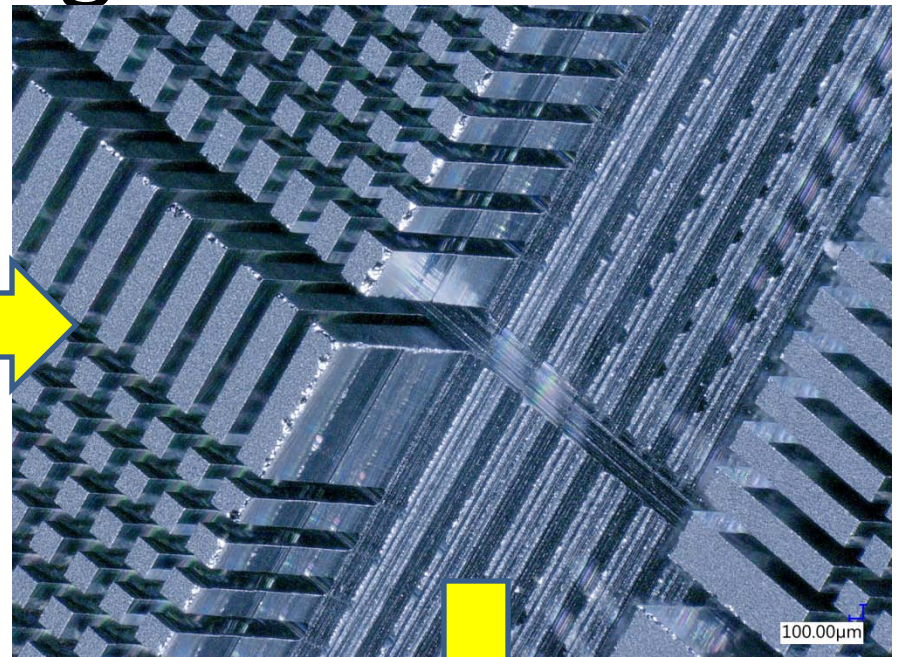
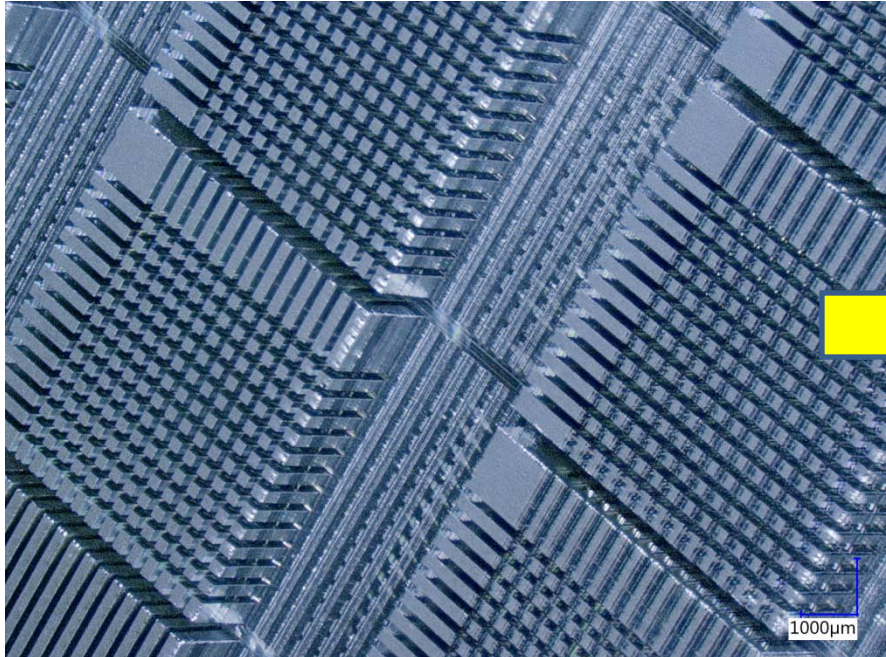
Lens: Z20-X100

500.00µm

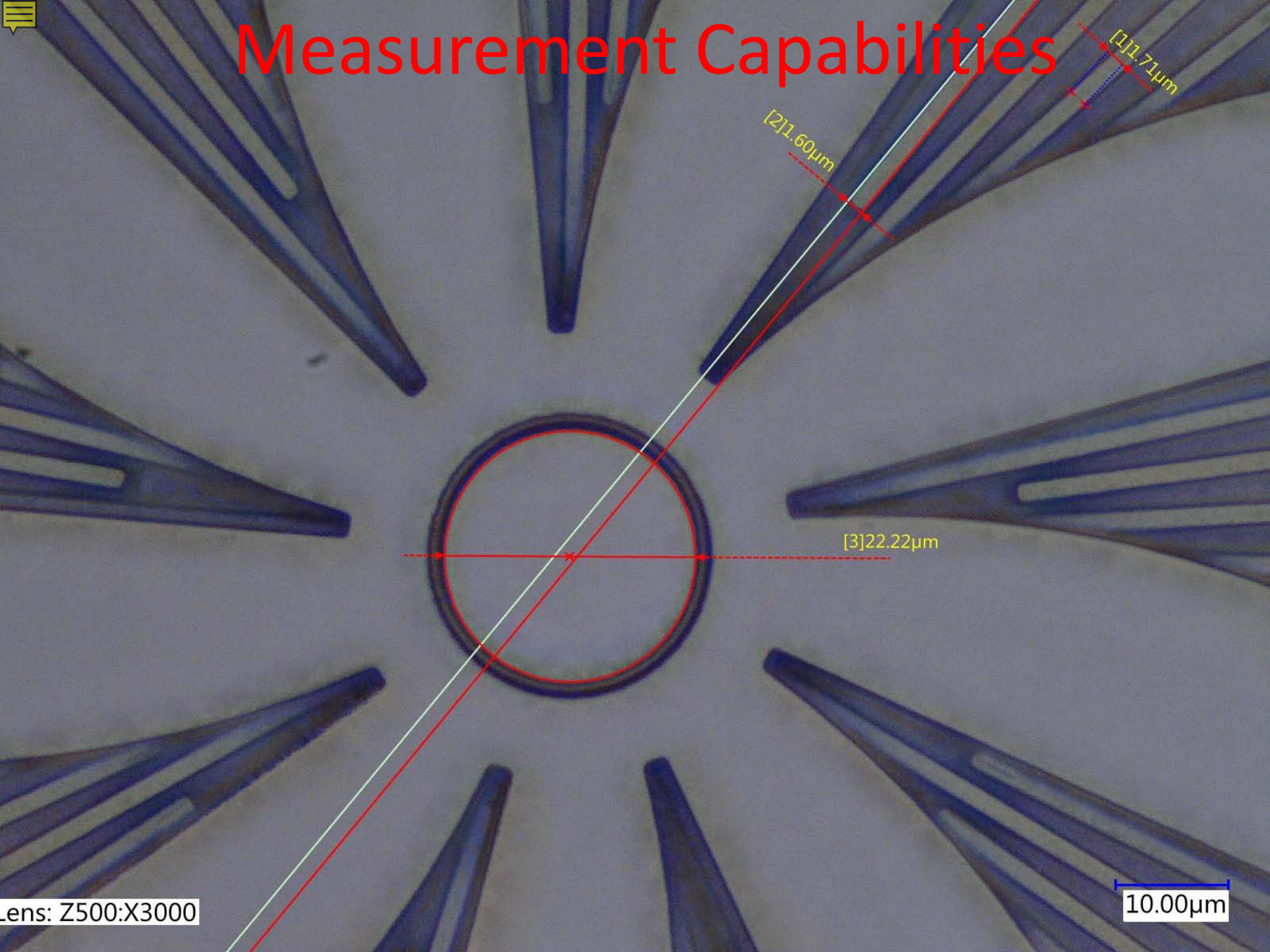
# High Resolution 50 Megapixel Full Color Images + Image Stitching



# 20-5000x Magnification



# Measurement Capabilities



[1]1.71µm

[2]1.60µm

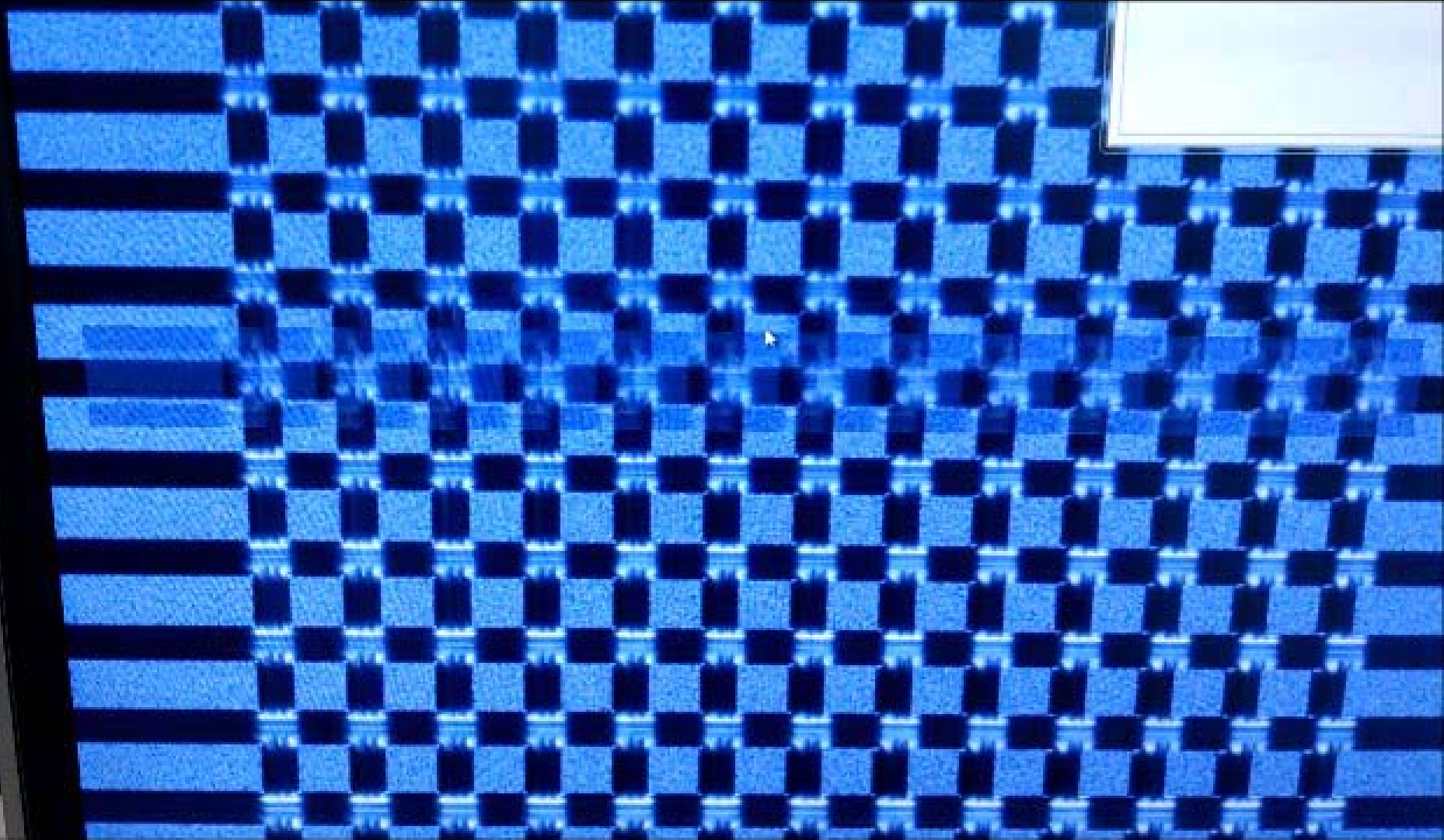
[3]22.22µm

10.00µm

Lens: Z500:X3000

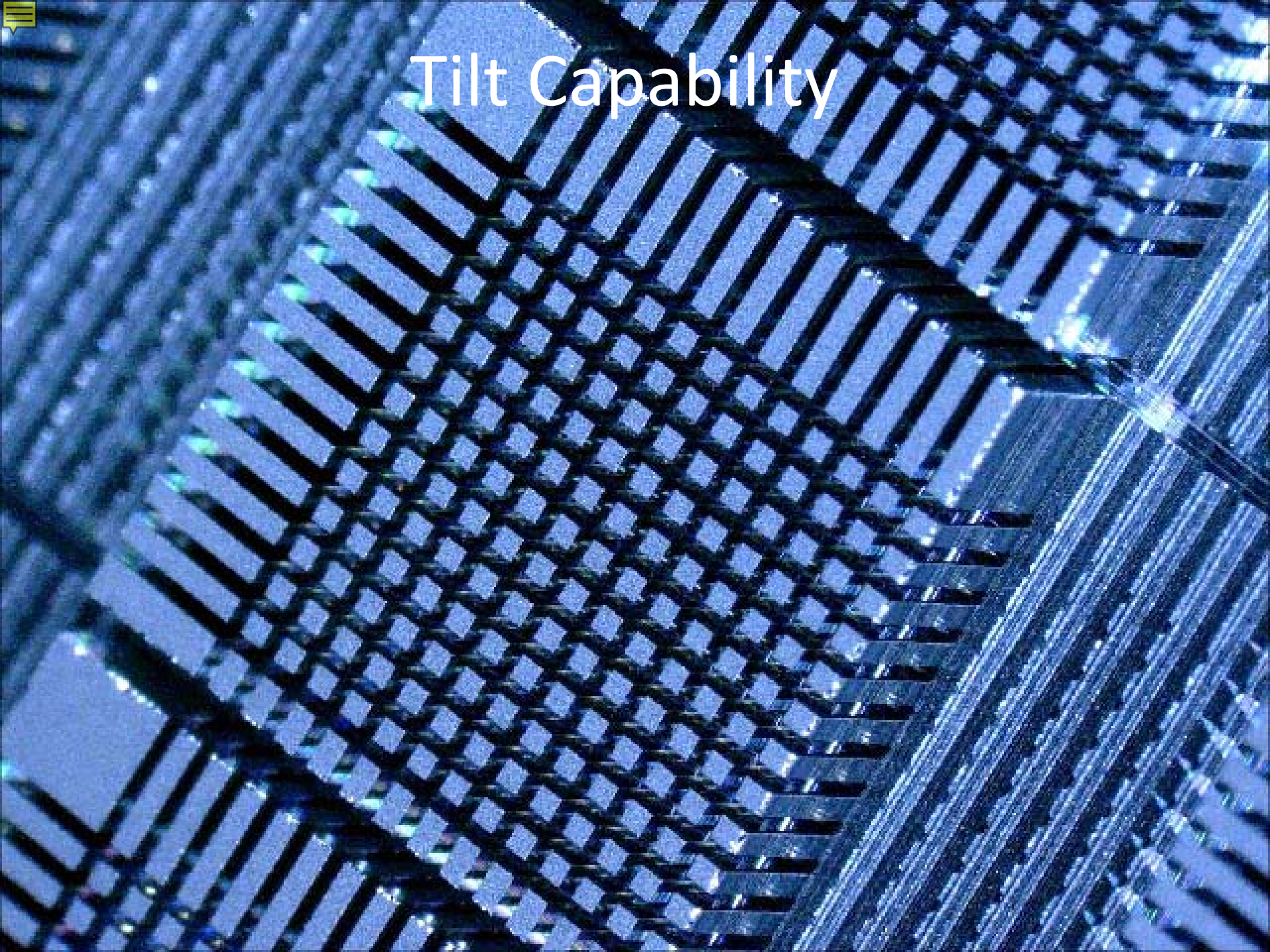


# Template Measurements

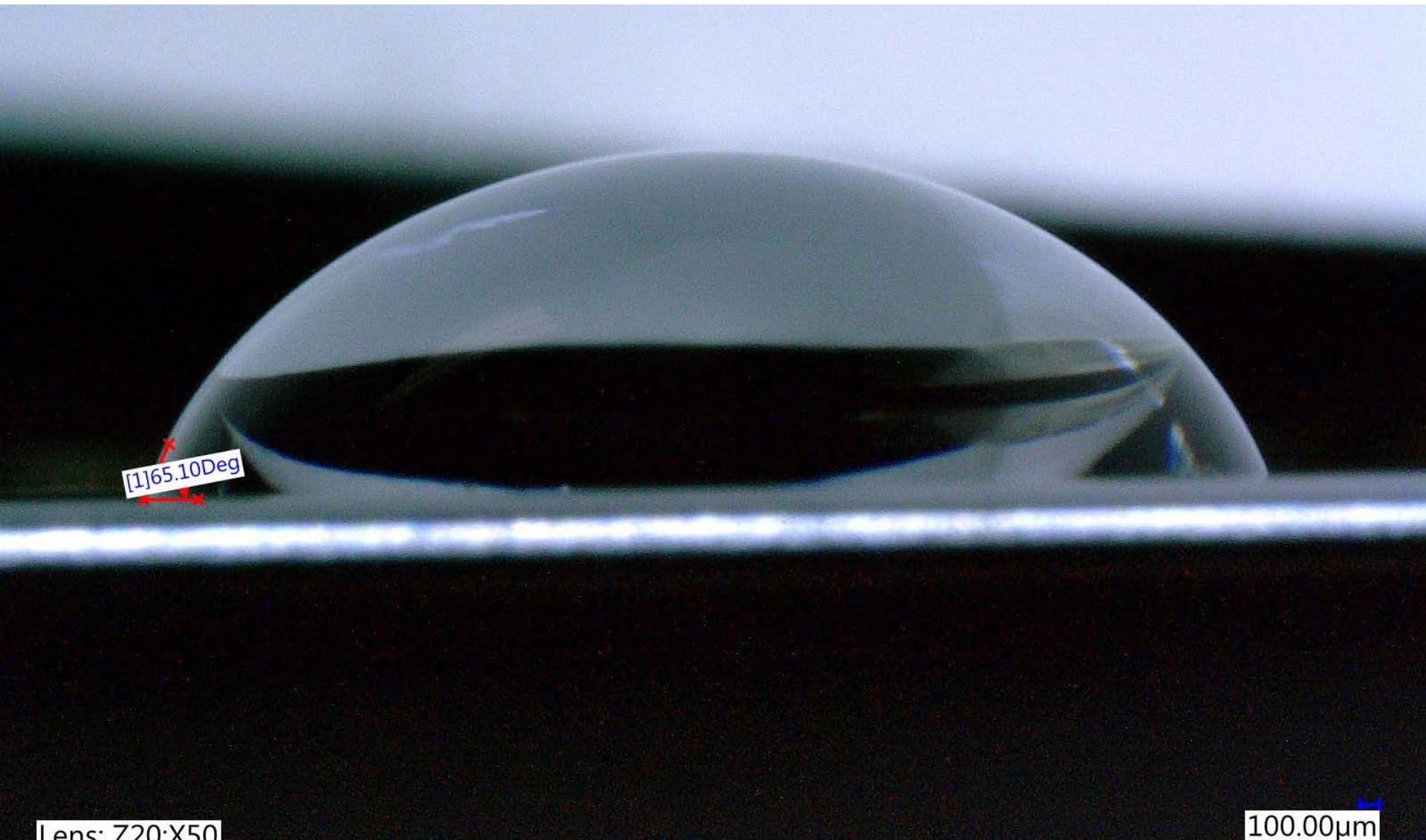




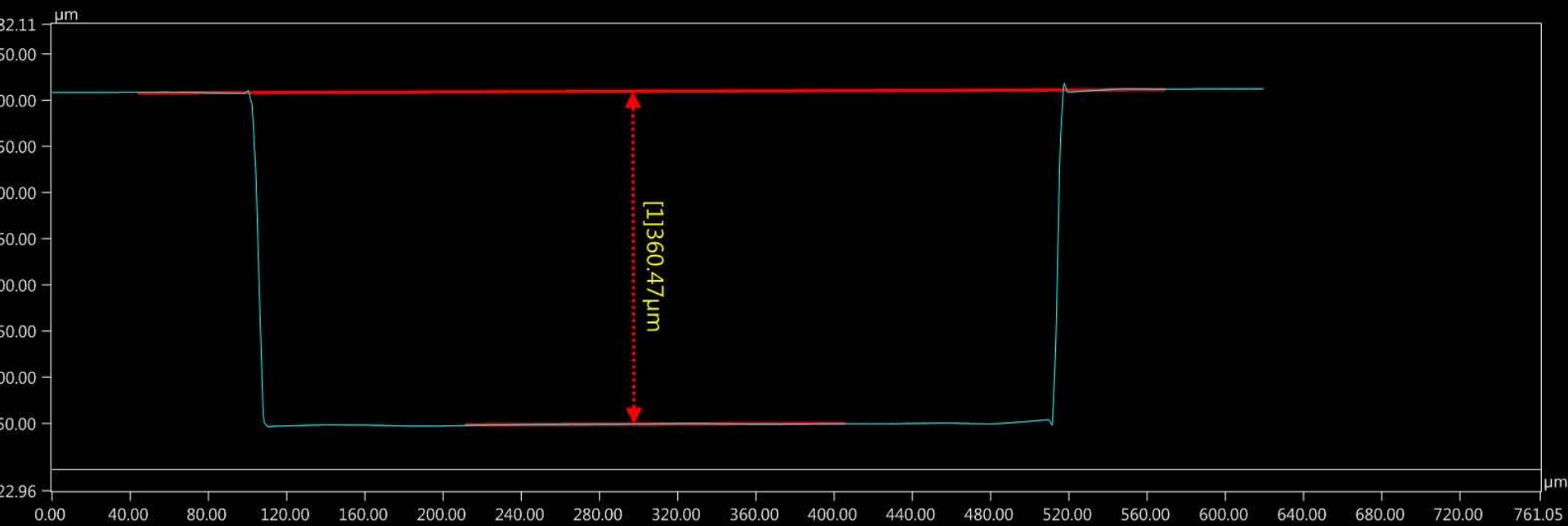
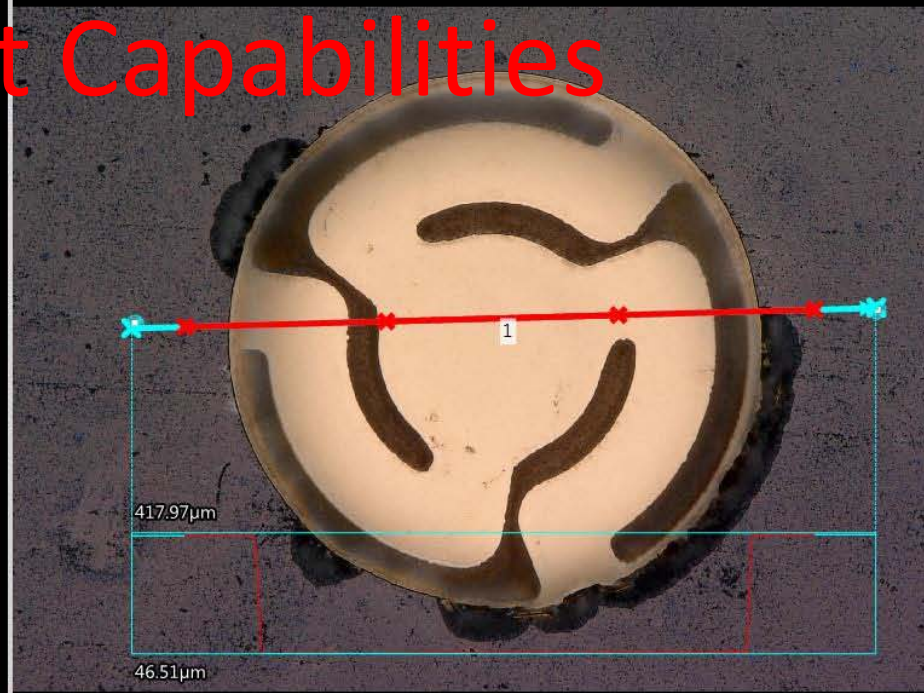
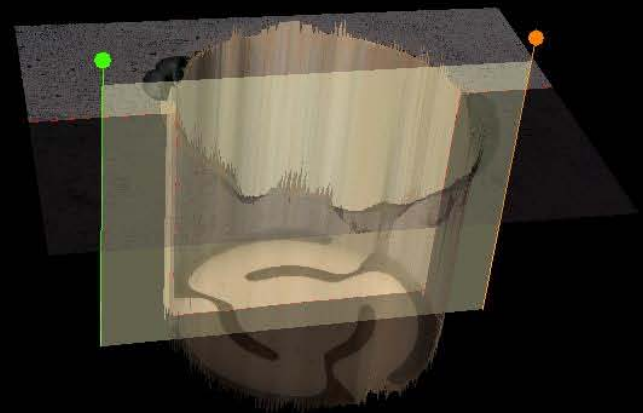
# Tilt Capability



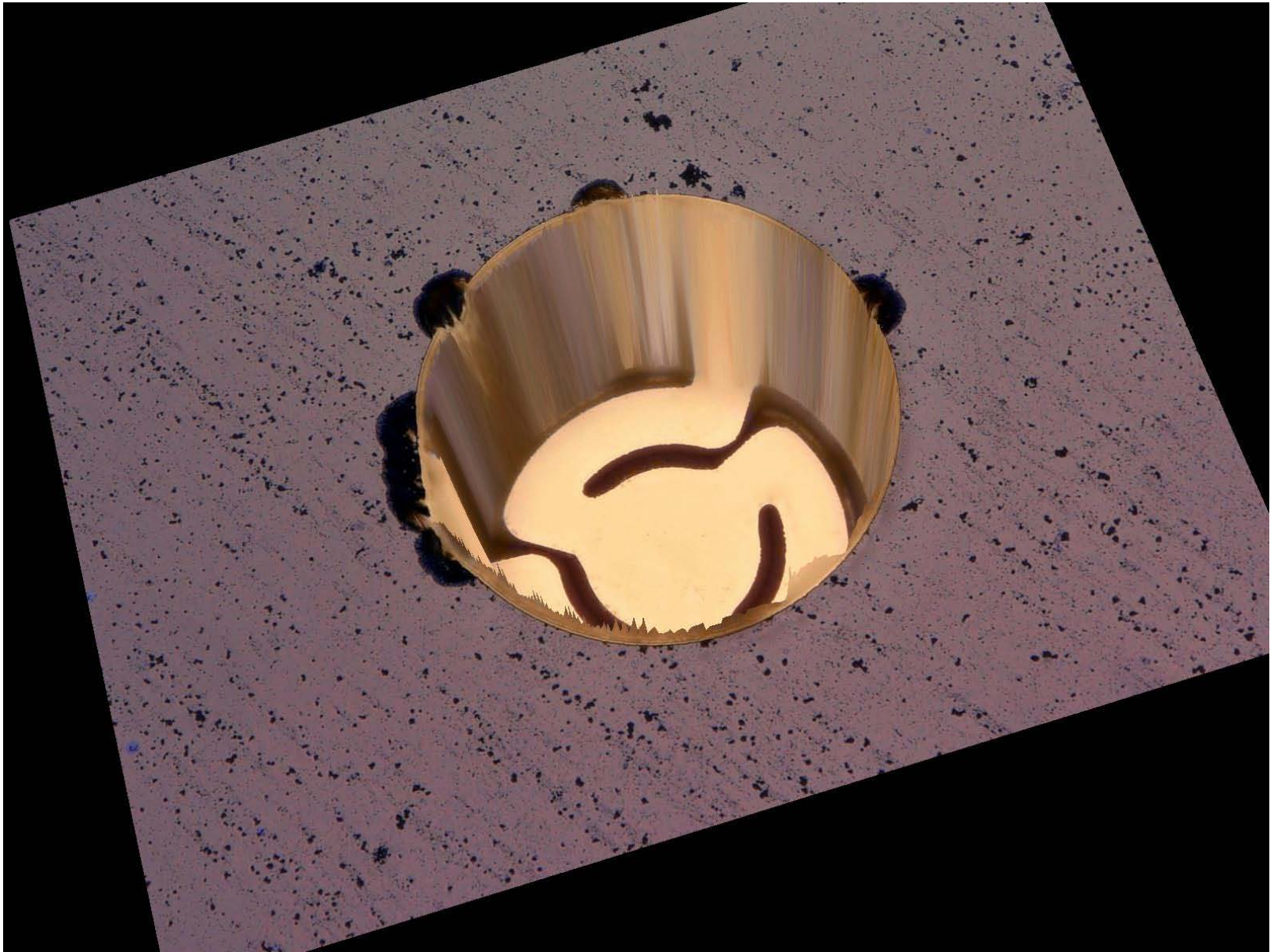
# Contact Angle Goniometry



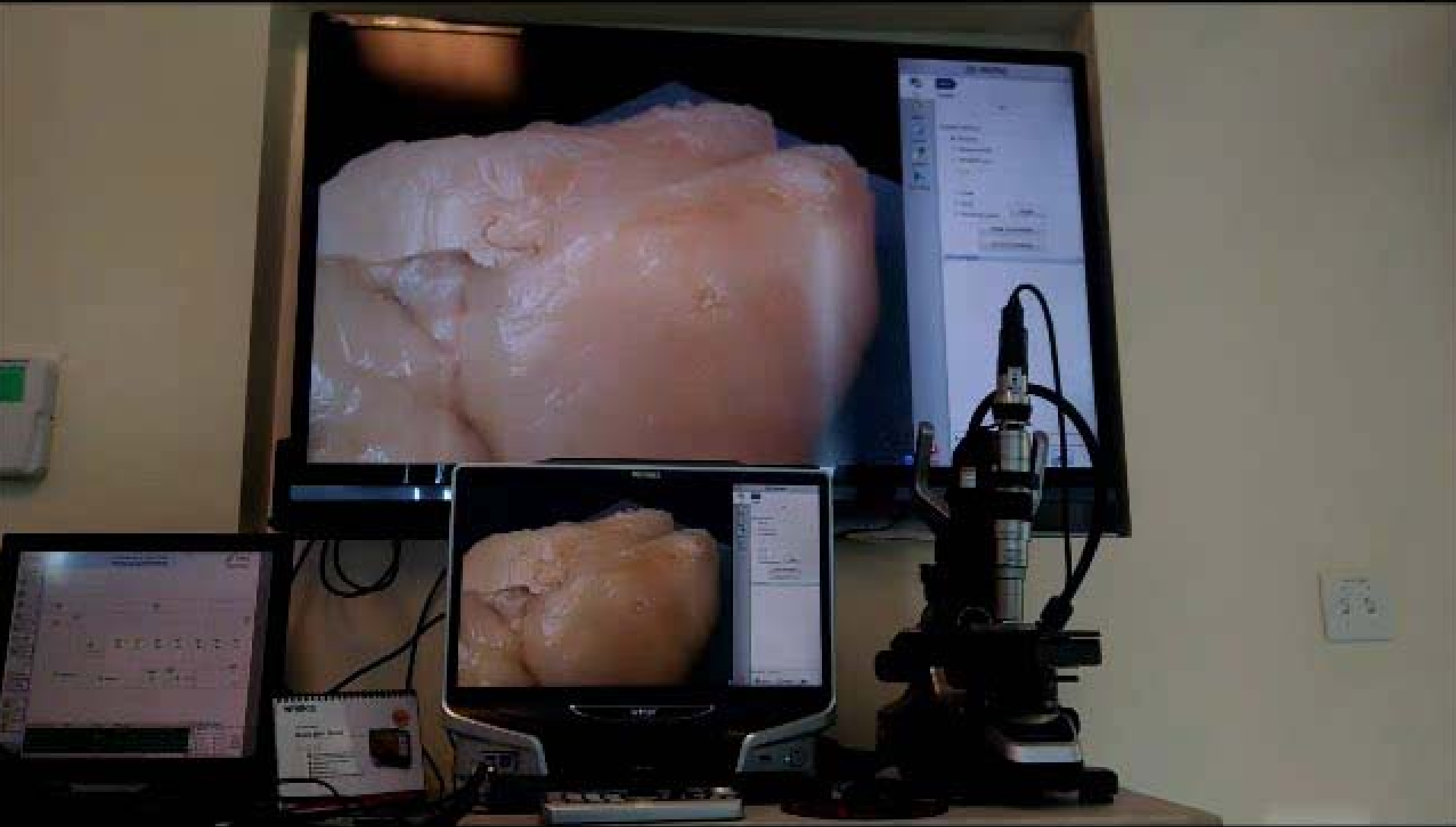
# Measurement Capabilities



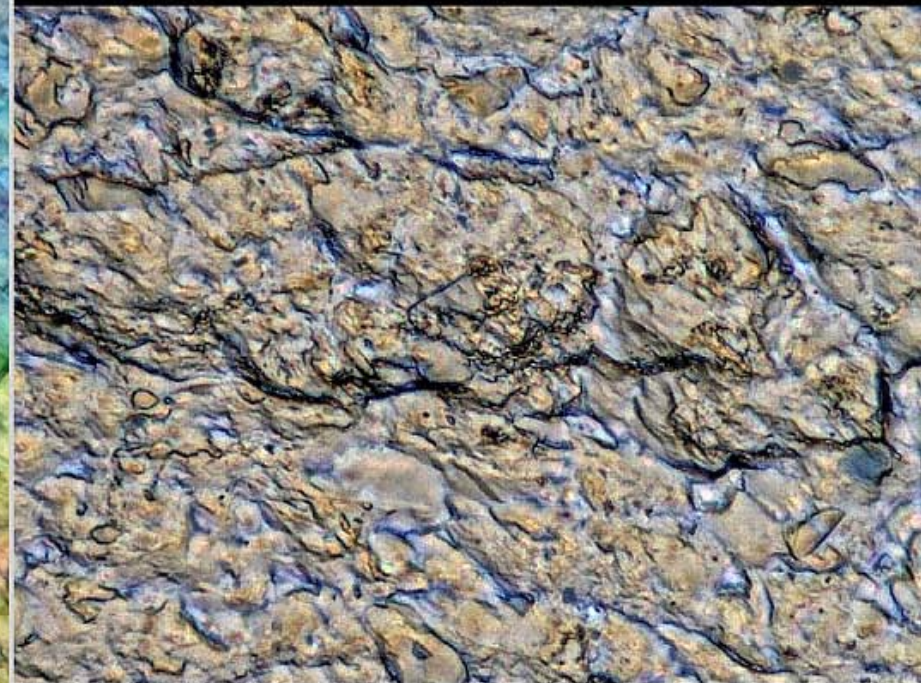
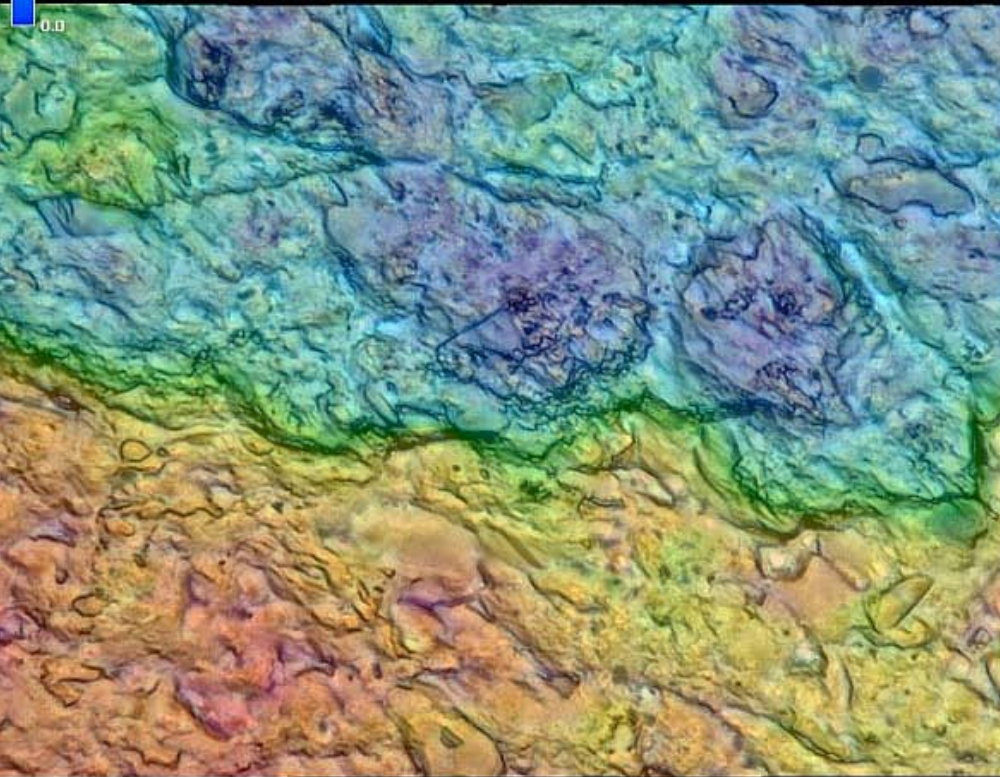
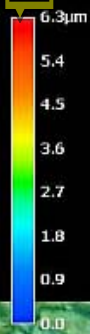
# 3D Surface XYZ Data Export



# 3D Surface Models



# Measurement Capabilities



# Glare Removal

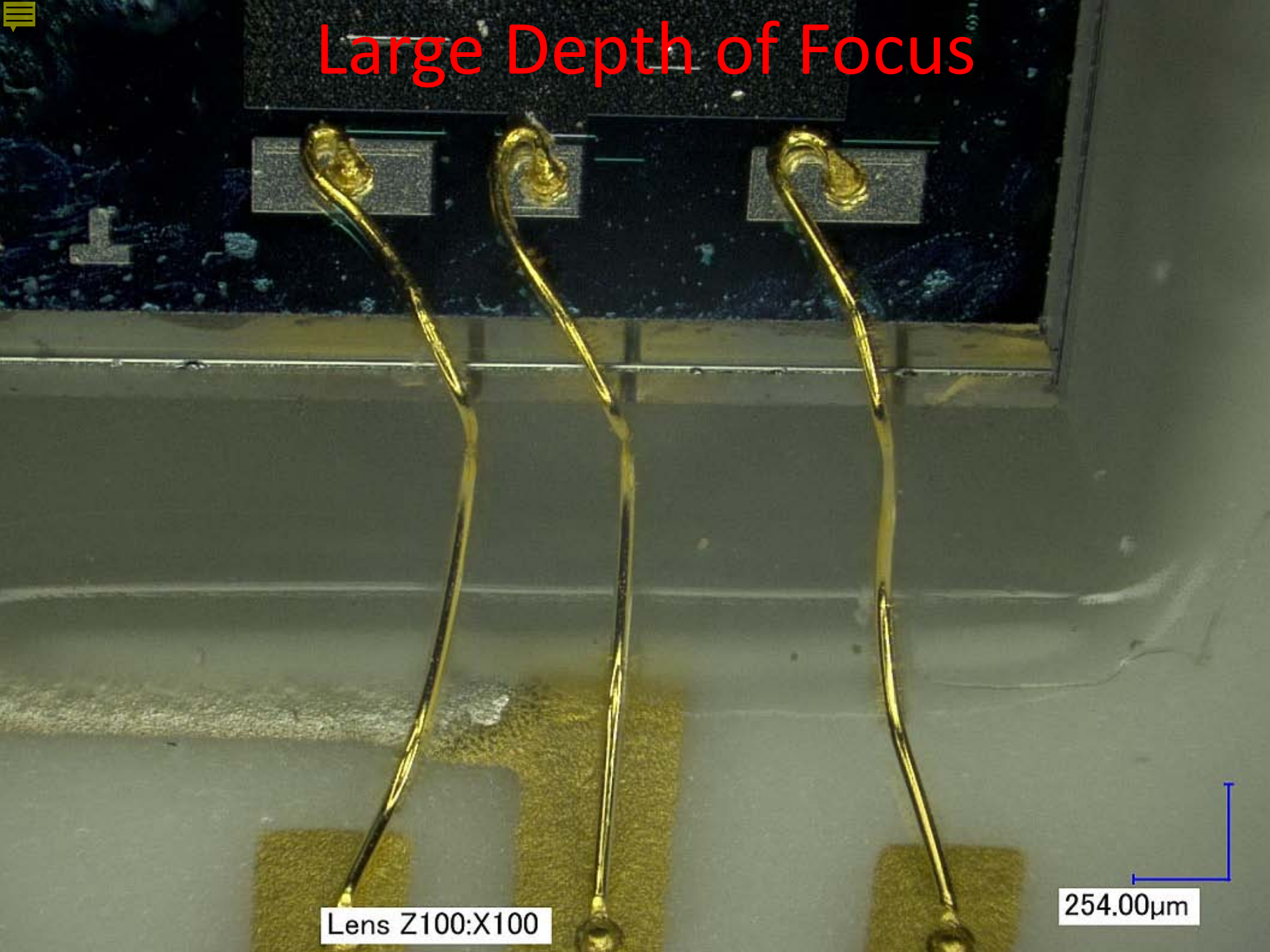


Lens Z100:X100

254.00μm



# Large Depth of Focus



Lens Z100:X100

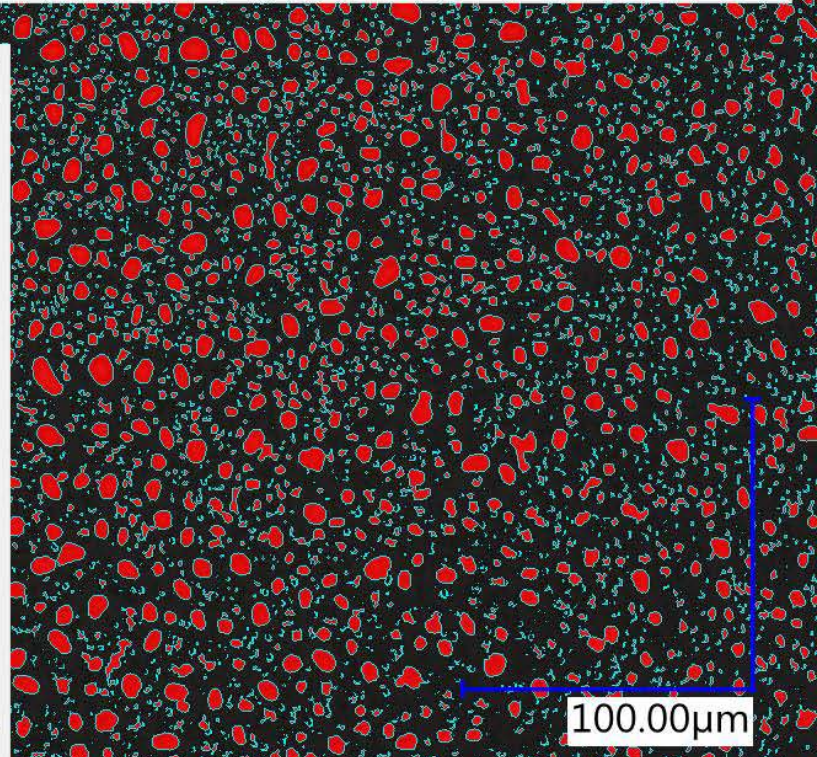
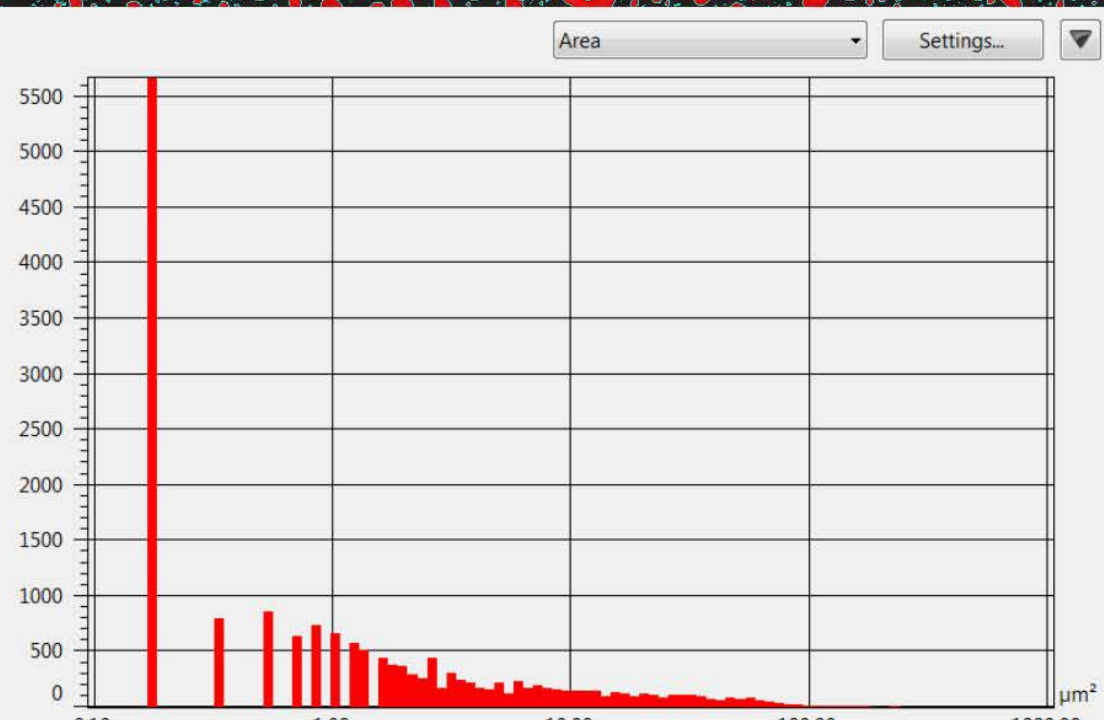
254.00μm

# Particle Counting

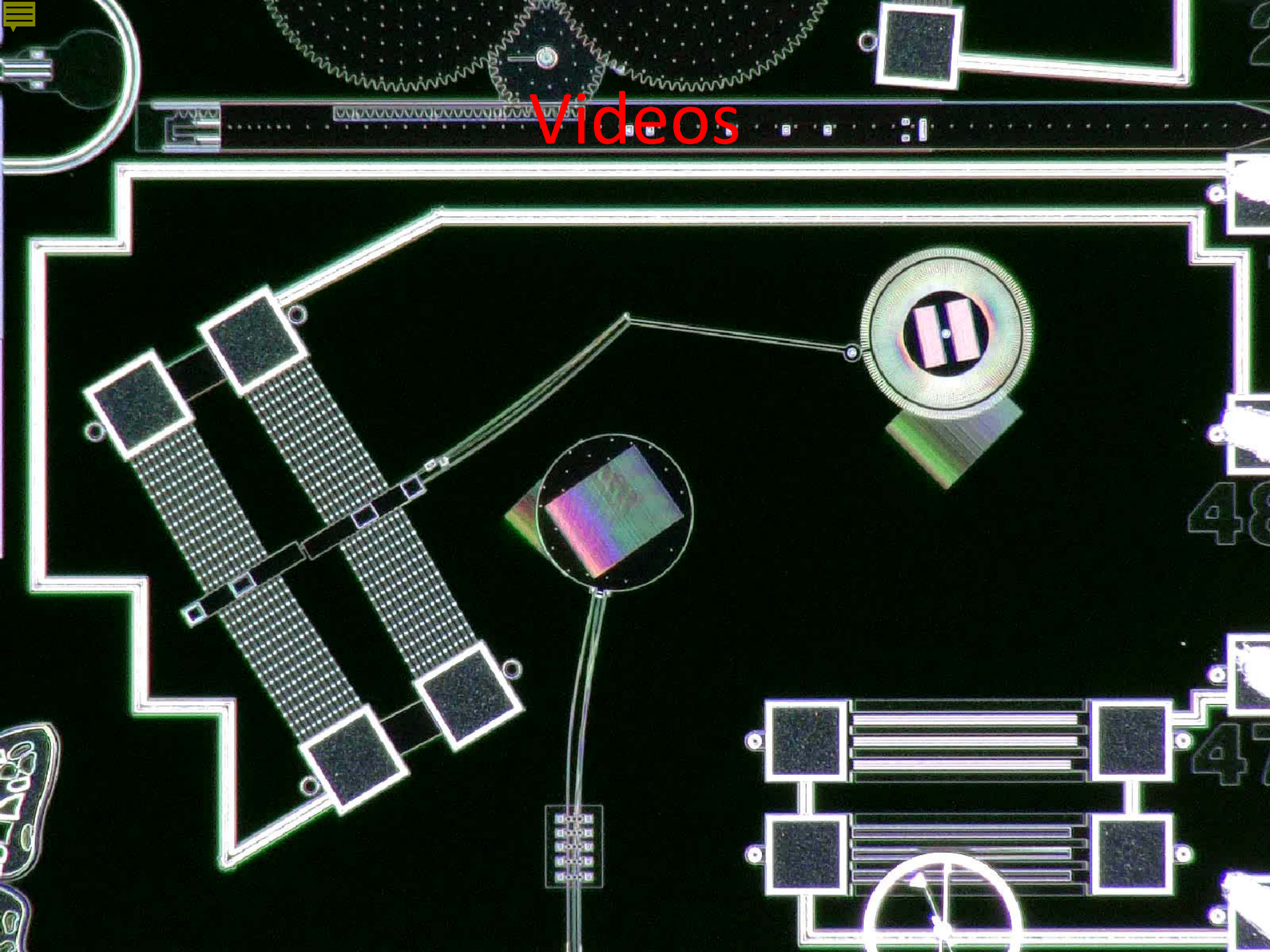
No.	Area	Perimeter	Max diameter	Min diameter
7503	70.18 $\mu\text{m}^2$	60.14 $\mu\text{m}$	16.68 $\mu\text{m}$	7.93 $\mu\text{m}$
10336	49.84 $\mu\text{m}^2$	41.15 $\mu\text{m}$	16.68 $\mu\text{m}$	4.55 $\mu\text{m}$
16180	124.34 $\mu\text{m}^2$	49.10 $\mu\text{m}$	16.89 $\mu\text{m}$	10.20 $\mu\text{m}$
1755	68.92 $\mu\text{m}^2$	41.75 $\mu\text{m}$	16.94 $\mu\text{m}$	6.44 $\mu\text{m}$
2775	133.52 $\mu\text{m}^2$	47.09 $\mu\text{m}$	16.94 $\mu\text{m}$	9.67 $\mu\text{m}$
4446	109.94 $\mu\text{m}^2$	44.36 $\mu\text{m}$	16.94 $\mu\text{m}$	7.59 $\mu\text{m}$
11450	78.45 $\mu\text{m}^2$	60.19 $\mu\text{m}$	17.19 $\mu\text{m}$	8.15 $\mu\text{m}$
Average	5.66 $\mu\text{m}^2$	5.81 $\mu\text{m}$	2.04 $\mu\text{m}$	1.20 $\mu\text{m}$
Standard Deviation	13.39 $\mu\text{m}^2$	8.55 $\mu\text{m}$	2.81 $\mu\text{m}$	1.78 $\mu\text{m}$
Max	214.13 $\mu\text{m}^2$	111.08 $\mu\text{m}$	41.29 $\mu\text{m}$	12.28 $\mu\text{m}$
Min	0.18 $\mu\text{m}^2$	0.00 $\mu\text{m}$	0.00 $\mu\text{m}$	0.00 $\mu\text{m}$
Total	101617.31 $\mu\text{m}^2$	104330.98 $\mu\text{m}$	36612.68 $\mu\text{m}$	21529.04 $\mu\text{m}$

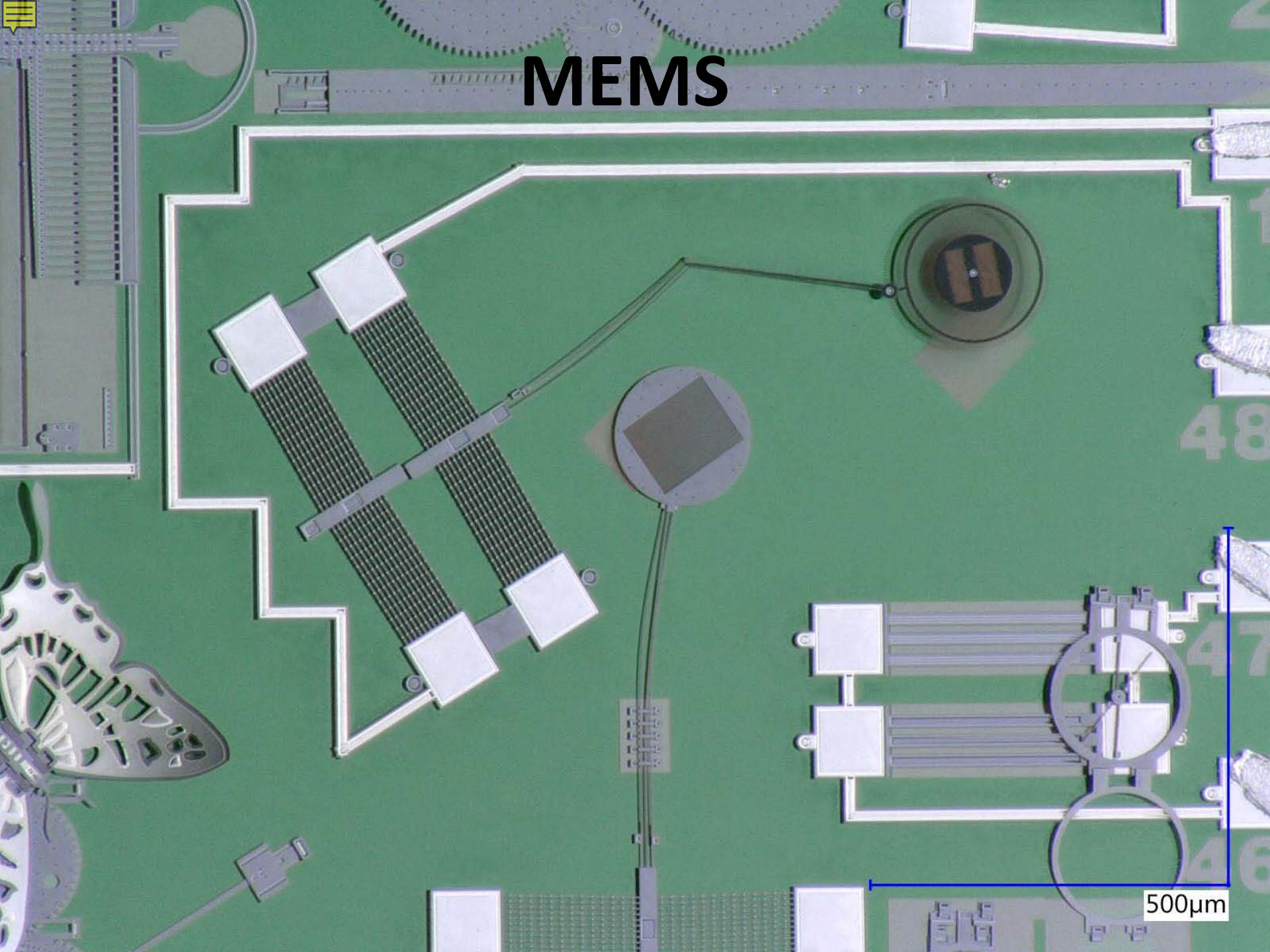
Count	Area	
17966 pcs	Total area	101617.31 $\mu\text{m}^2$
	Total region area	345489.61 $\mu\text{m}^2$
	Area ratio	29.41 %



# Videos

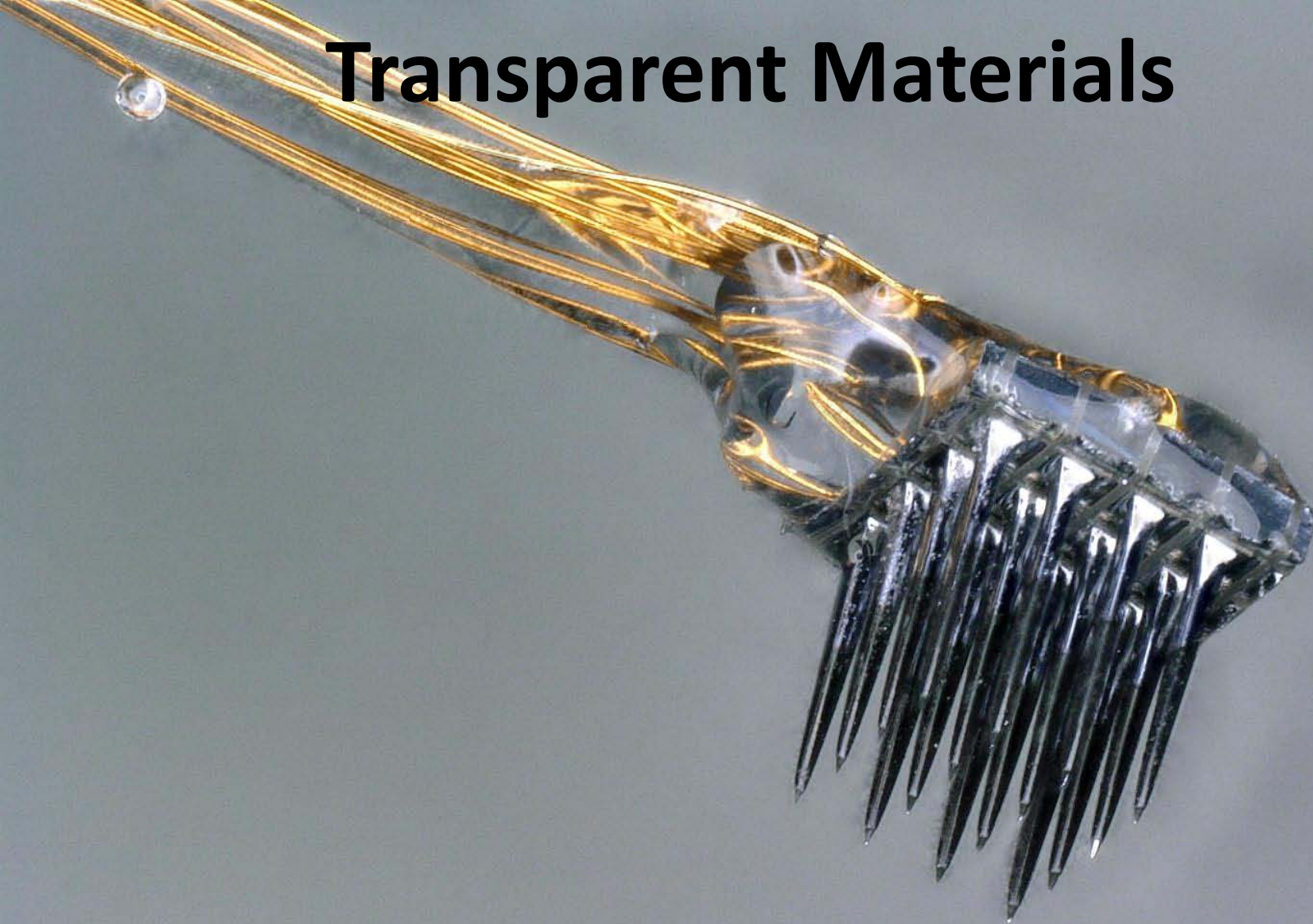


# MEMS



500µm

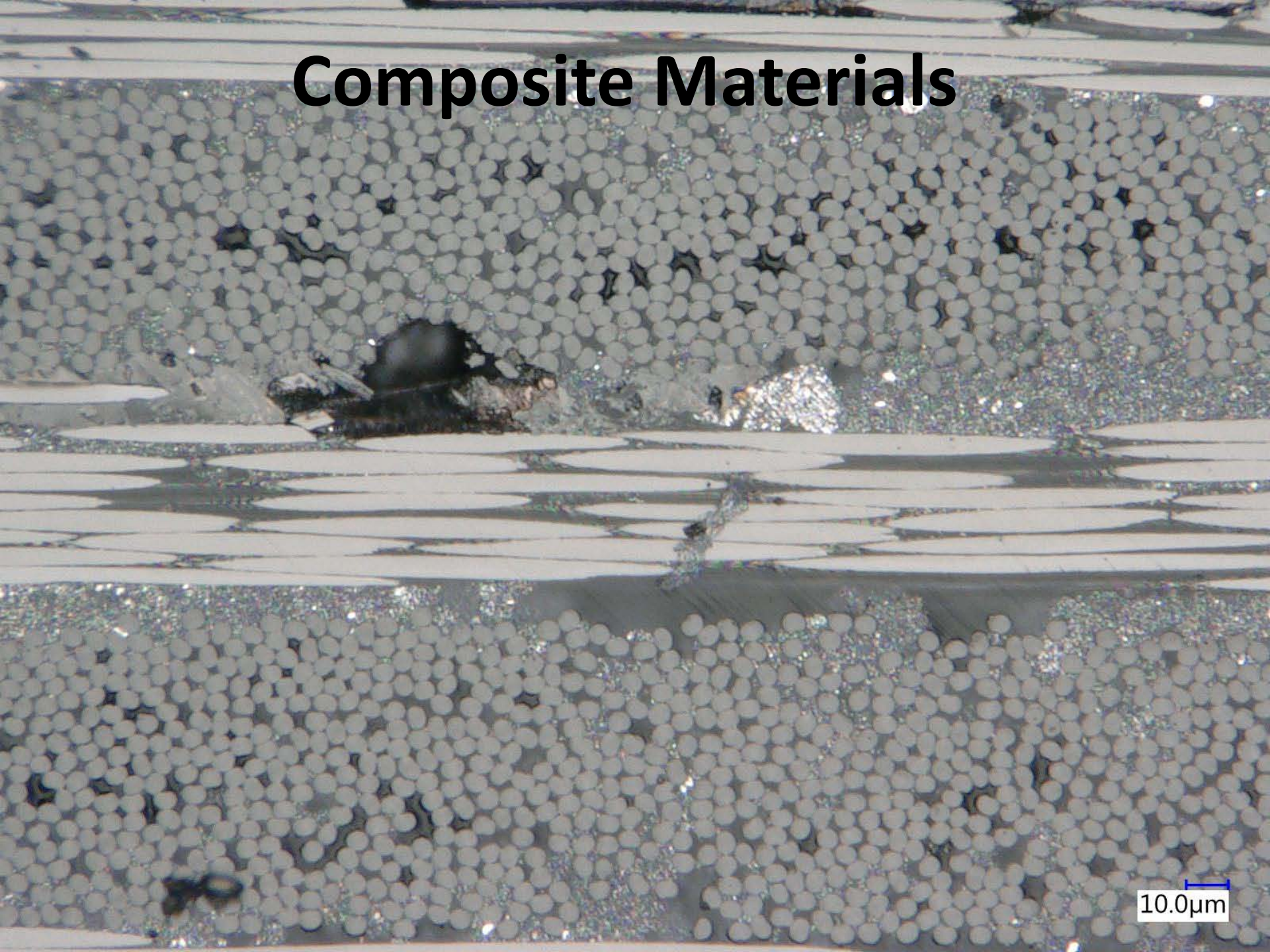
# Transparent Materials



Lens: Z20:X50

500.00μm

# Composite Materials



10.0 μm



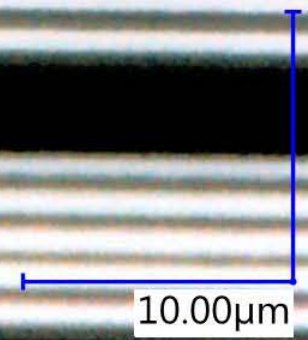
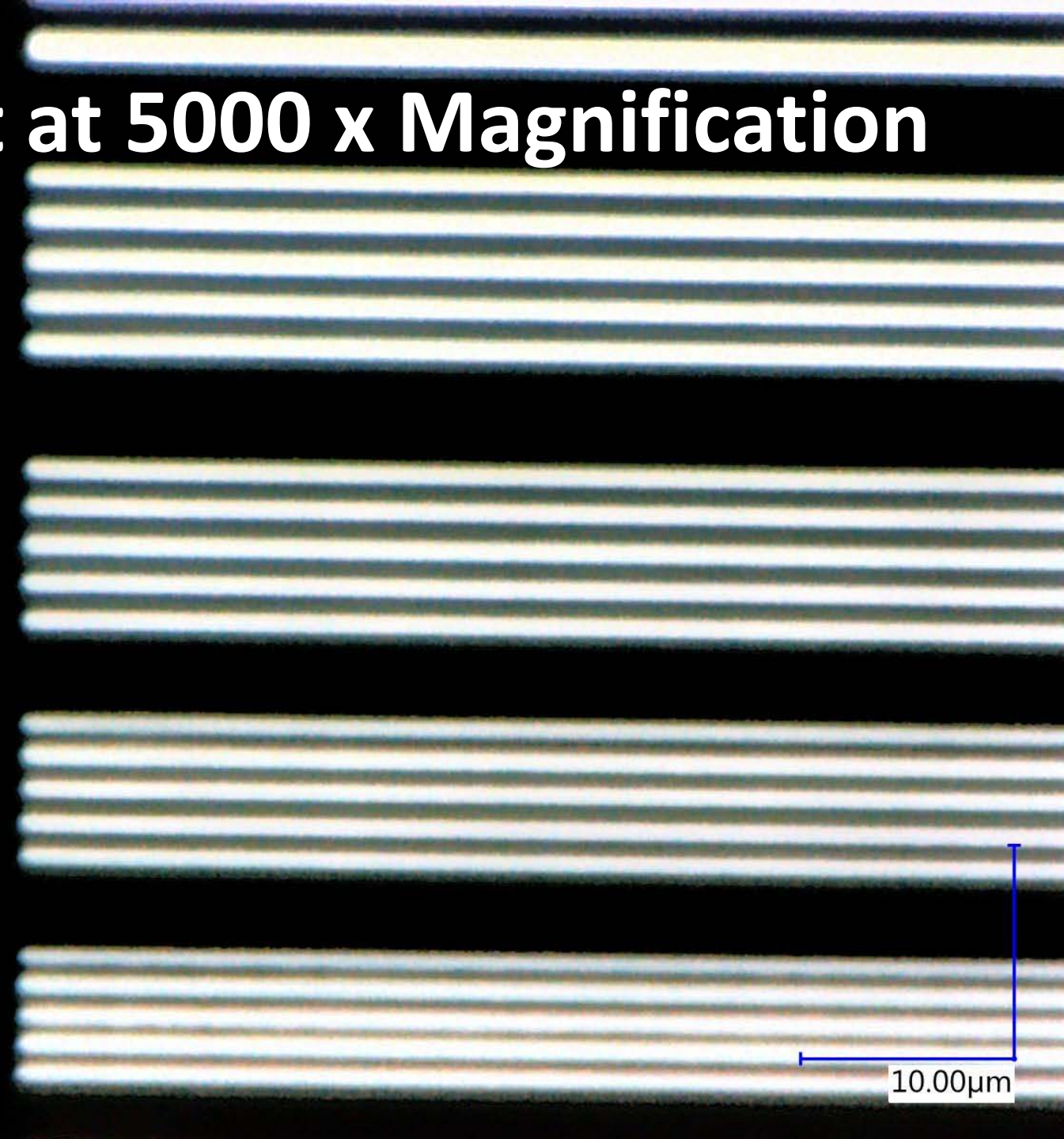
# Backlight at 5000 x Magnification

1

9

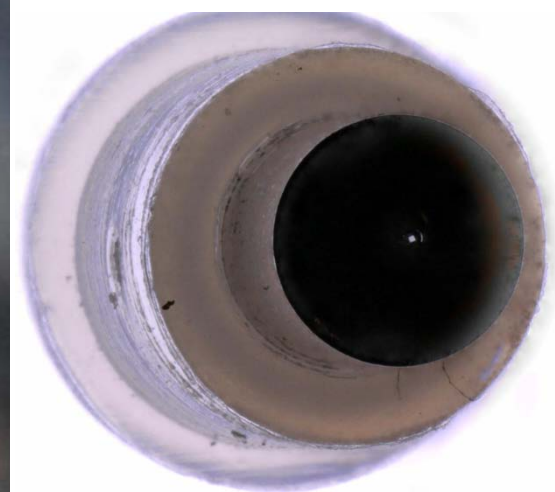
8

7



10.00 $\mu$ m

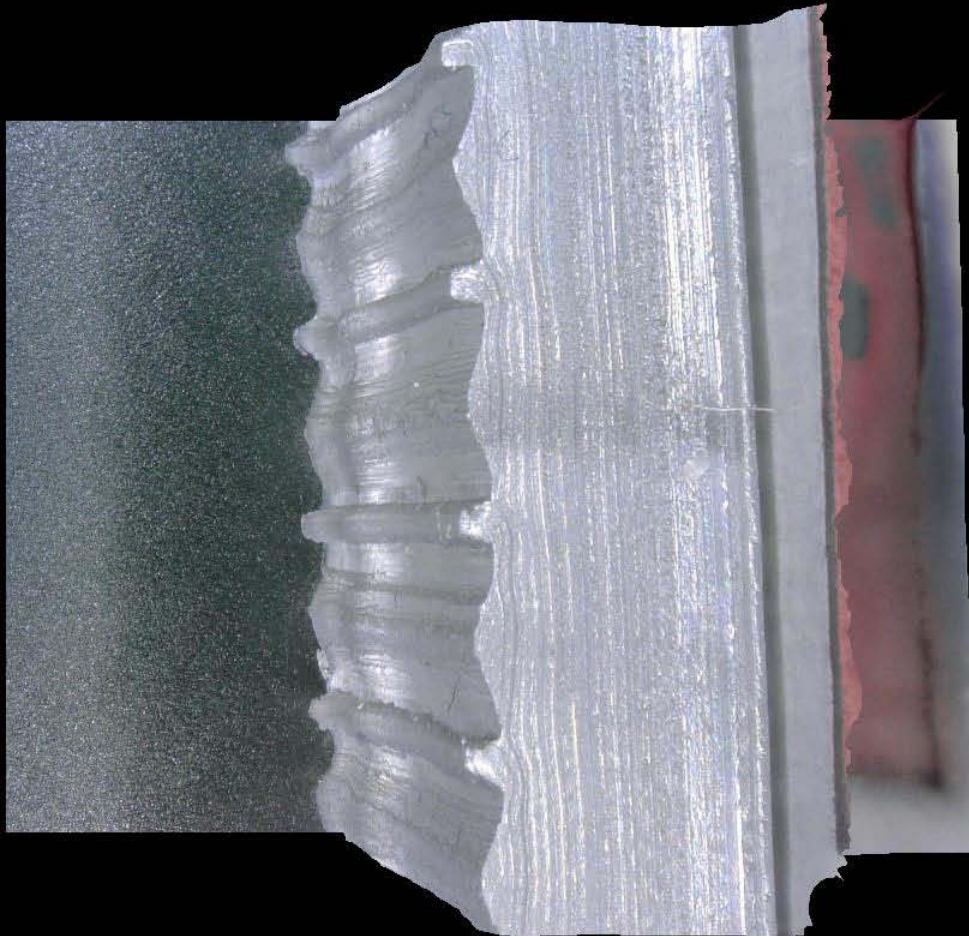
# Multiple Magnifications and Angles

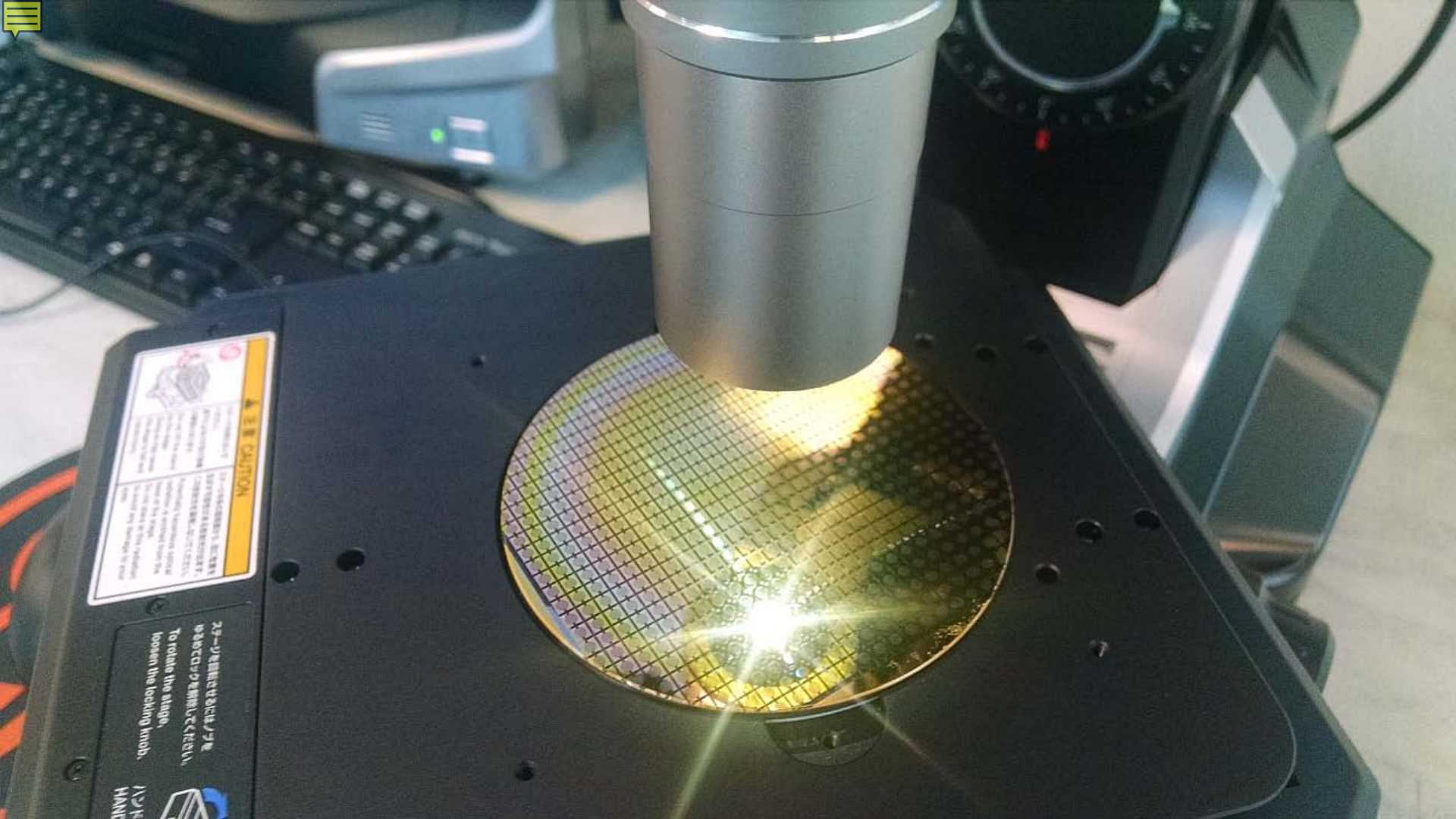






# Cross-Sections





**UTAH** NANOFAB