Fall 2016

Scanning Electron Microscopy Course Portfolio

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Scanning Electron Microscopy Laboratory Portfolio

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12/7/16

Submitted for

MCR 484/783 Scanning Electron Microscopy

Fall 2016

N.C. Brown Center for Ultrastructure Studies

State University of New York
College of Environmental Science and Forestry

These images were prepared as part of the class MCR 484 Scanning Electron Microscopy at SUNY College of Environmental Science and Forestry, Fall 2016,

All images were acquired on the JEOL JSM 5800 LV Scanning Electron Microscope in the N. C. Brown Center for Ultrastructure Studies

Joshua Gopeesingh

Major: Chemical Engineering

Career Goals: Conduct scientific research in a healthy environment where my skills could be utilized.

The images found in this collection are examples of the knowledge and skills I have developed through the MCR 783 Scanning Electron Microscopy course taken in the fall 0f 2016.

I took this course because I would like to attain the ability to perform electron microscopy on solid catalysis to observe its surface structure as it would be a useful tool for my doctoral research into catalysis

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The images I am presenting in this collection were chosen because they exemplify the knowledge and skills I have developed along with the care, quality, and concern for the work I produce.

Figure **Description**

Figure 1: My Best Image

I have chosen this as my best image because it shows excellent resolution and depth of field. The image is clear and sharp.

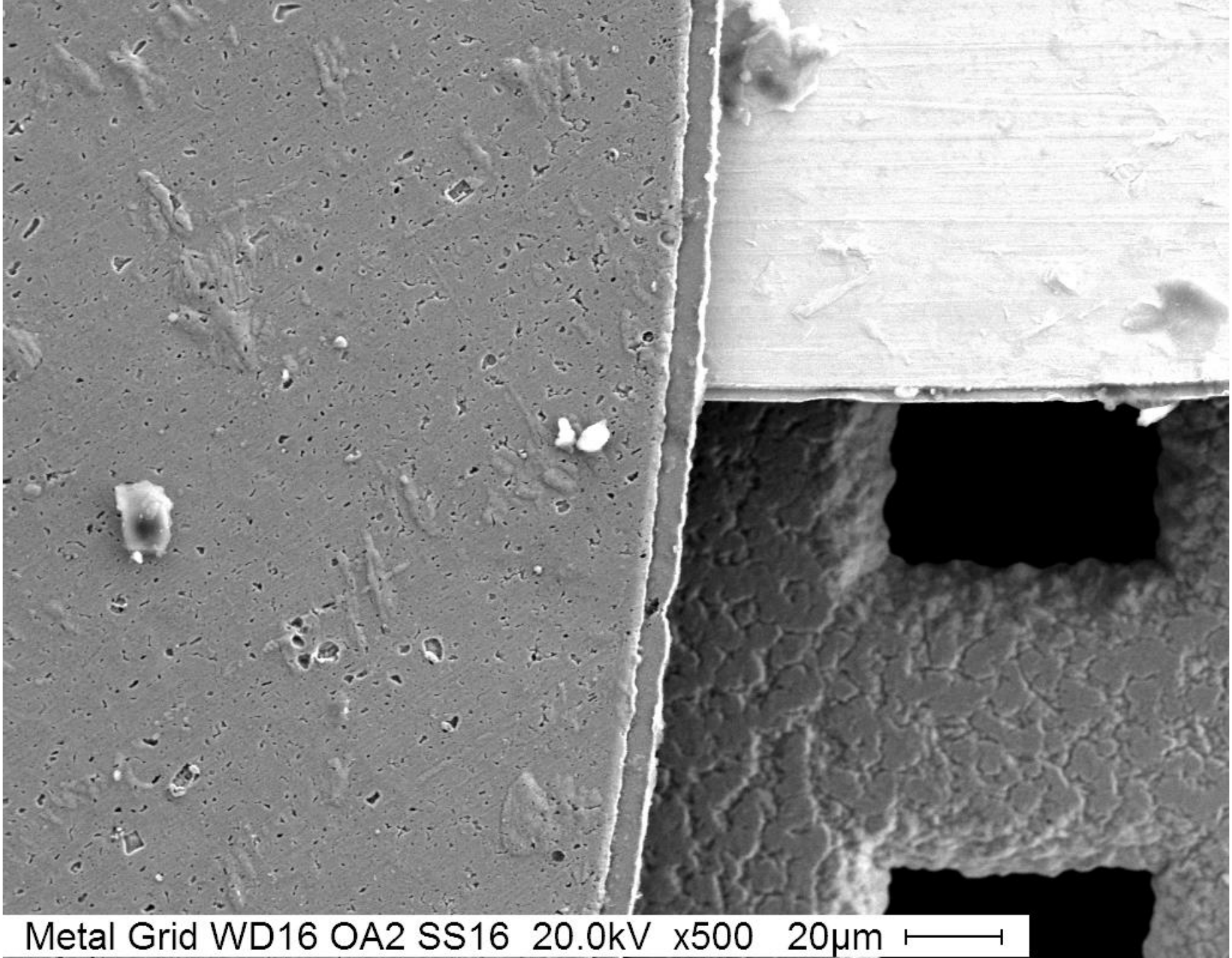
Metal Grid WD16 OA2 SS16 20.0kV x500 20µm

Figure 1. My Best Image: Scanning Electron micrograph of metal grids using primary mode. The image was taken with a working distance of 16, accelerating voltage of 20 kV, objective aperture 2, magnification of X500 and spot size of 16. The image has good resolution and sharpness as well as depth of field.

Figure 2: The Hardest Image to Capture

I have chosen this the hardest image to capture because it was taken at a very low accelerating voltage, which made acquiring a high resolution image quite difficult.


Lab 7 WD 13 OA1 SS23 0.5kV x600 20µm

Figure 2. Hardest Image to Capture: Figure 2. Scanning Electron micrograph of hairs and pollen particle on a wing. The image was taken with a working distance of 13, accelerating voltage of 0.5 kV, objective aperture 1, magnification of X600 and spot size of 23.

Figure 3: My Favorite Image

I have chosen this as my favorite because the idea of creating a three dimensional image from a scanning electron microscope seemed very revolutionary. The image itself is quite clear.

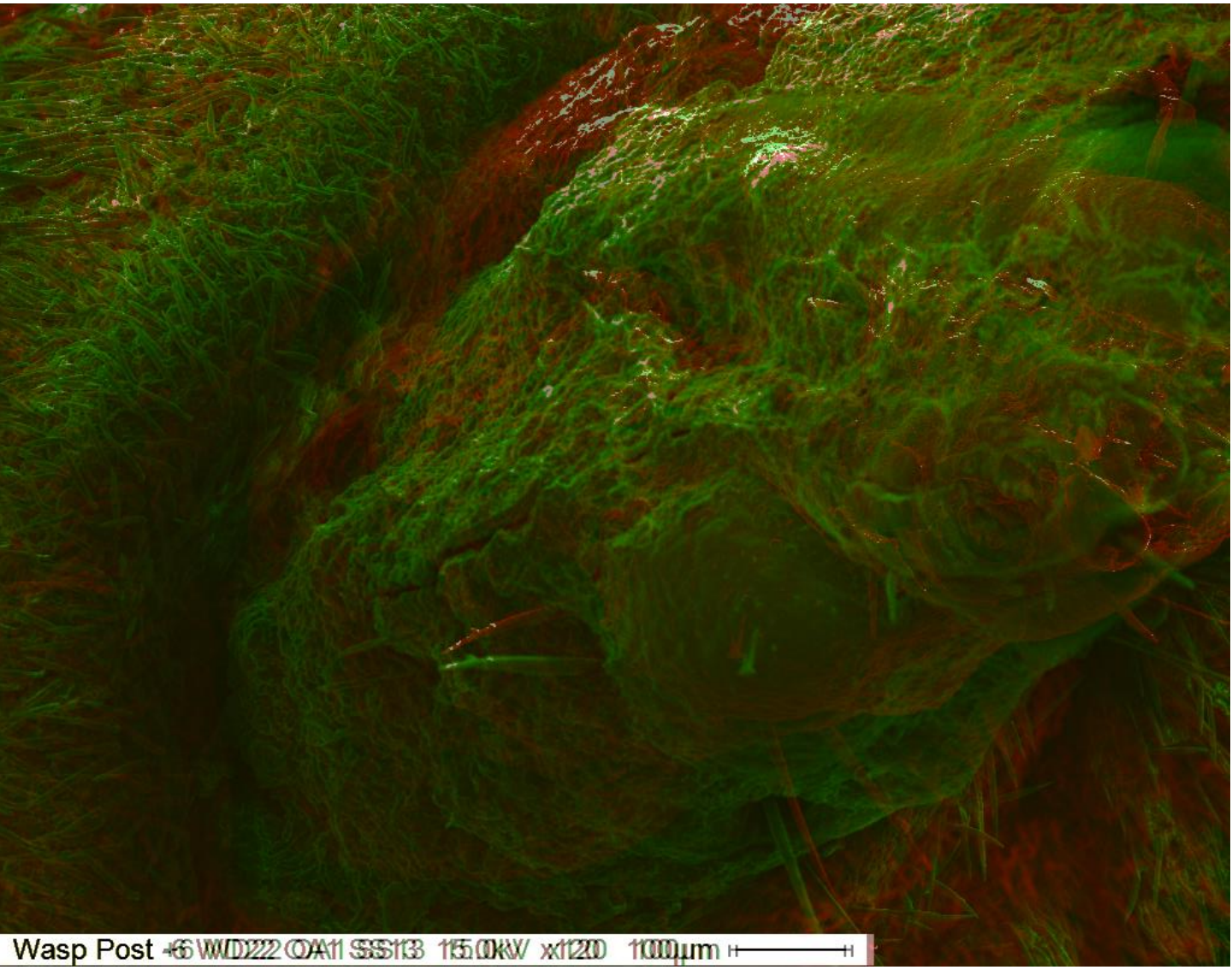
Wasp Post

Figure 3. Favorite Image: Two super imposed SEM images of a wasp's posterior 6 degree tilts apart . The image taken with a working distance of 15, accelerating voltage of 15 kV, objective aperture 1, magnification of X120 and spot size of 13.

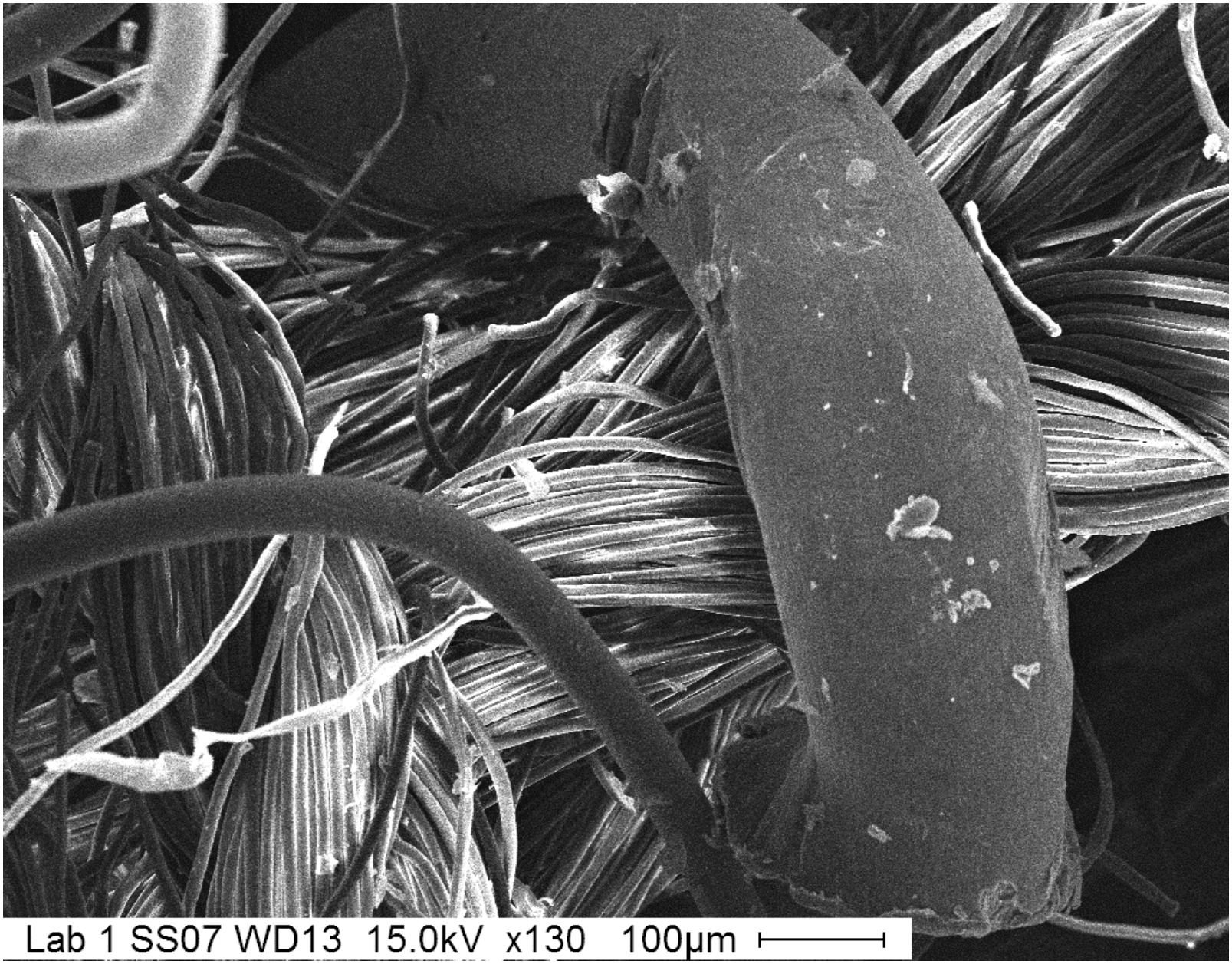

Figure 4. Secondary Electron Image and Probe diameter (spot size). Small Spot size 7. Uncoated Velcro sample

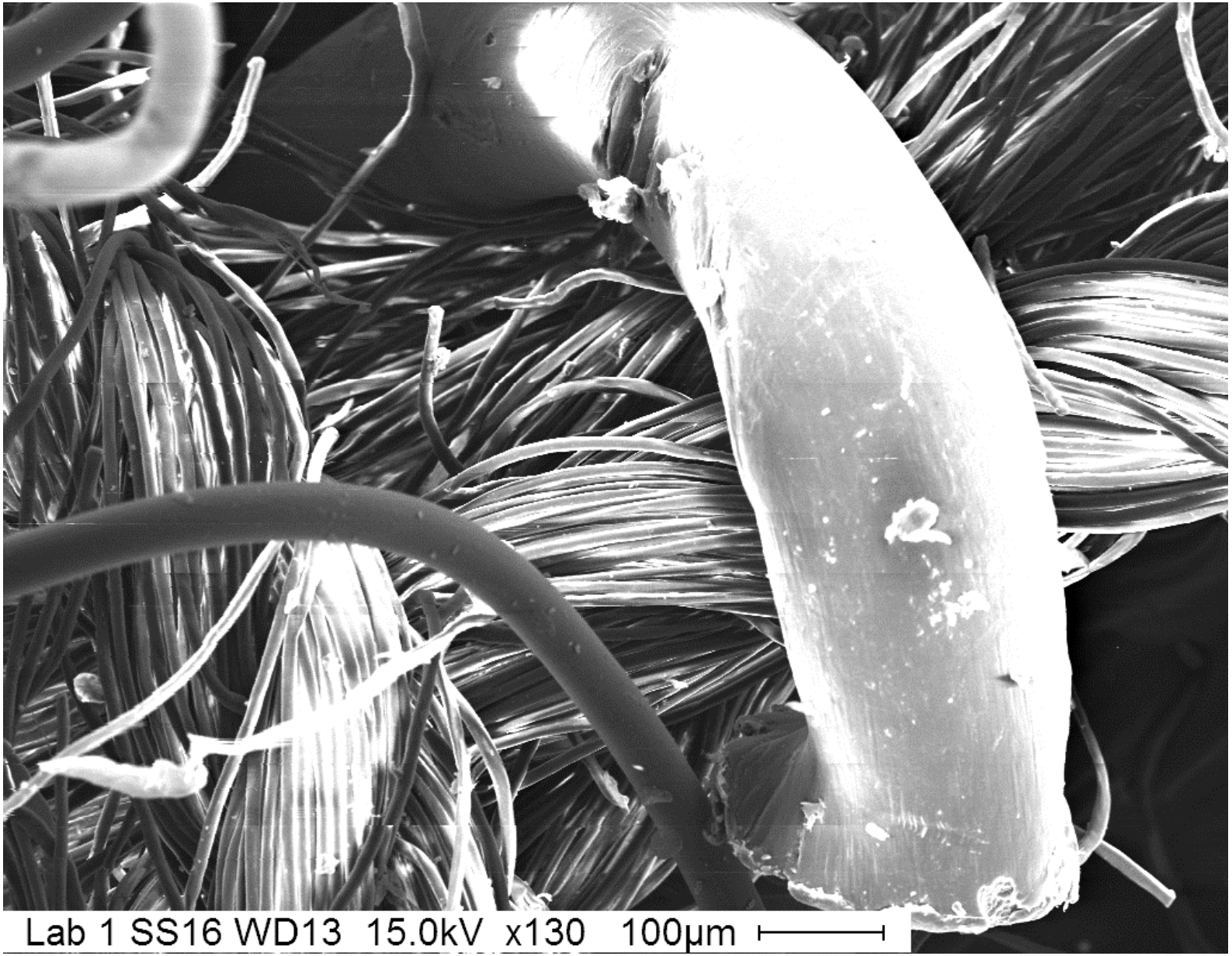

Figure 5. Secondary Electron Image and Probe diameter (spot size). Large Spot size 16. Uncoated Velcro sample

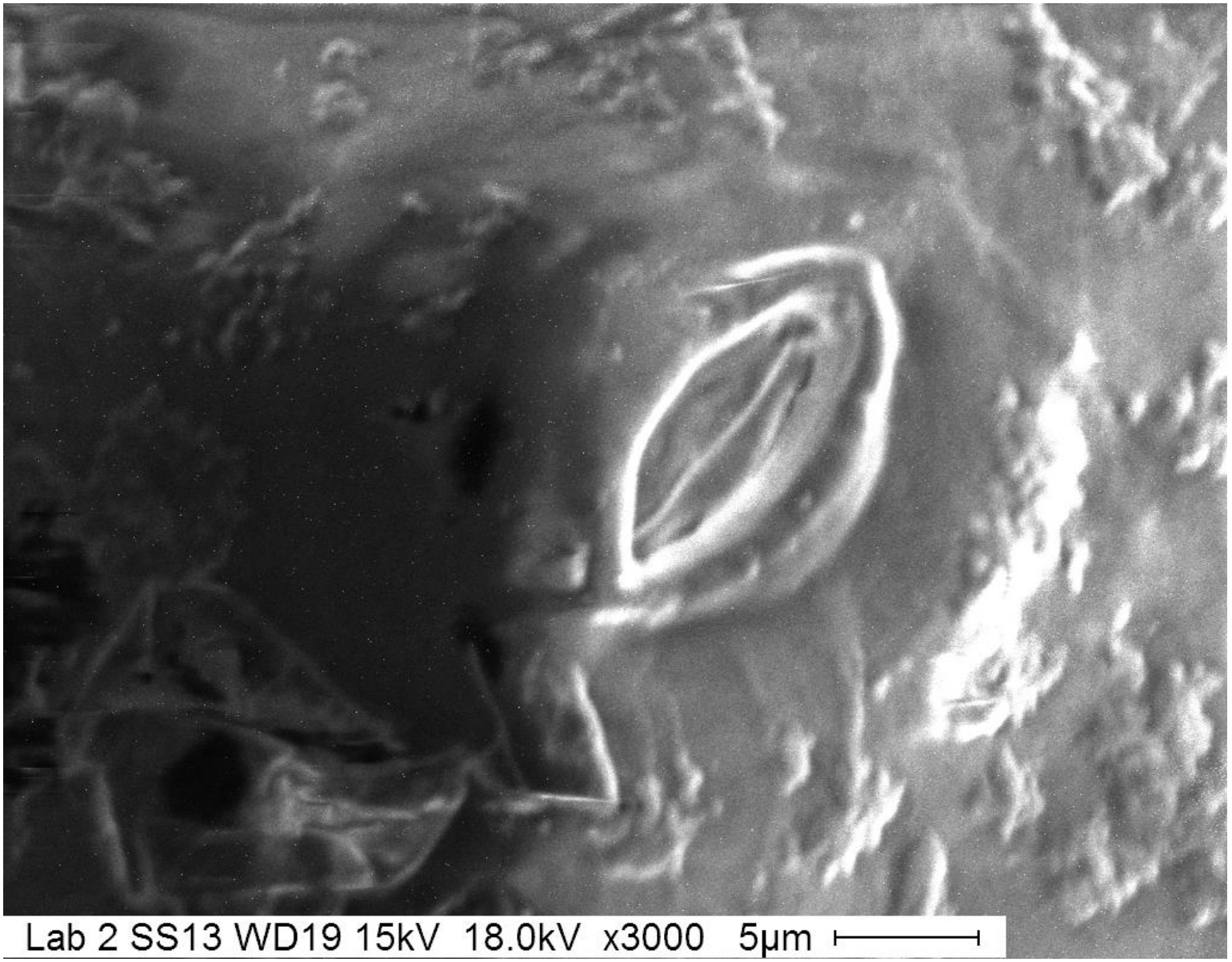

Figure 6. Specimen Preparation - Sputter Coating. Leaf- Sample 2 coated with Au/Pd for 45 seconds at 45 kV. Image was taken of a cell found in the leaf at a magnification of 3000X.

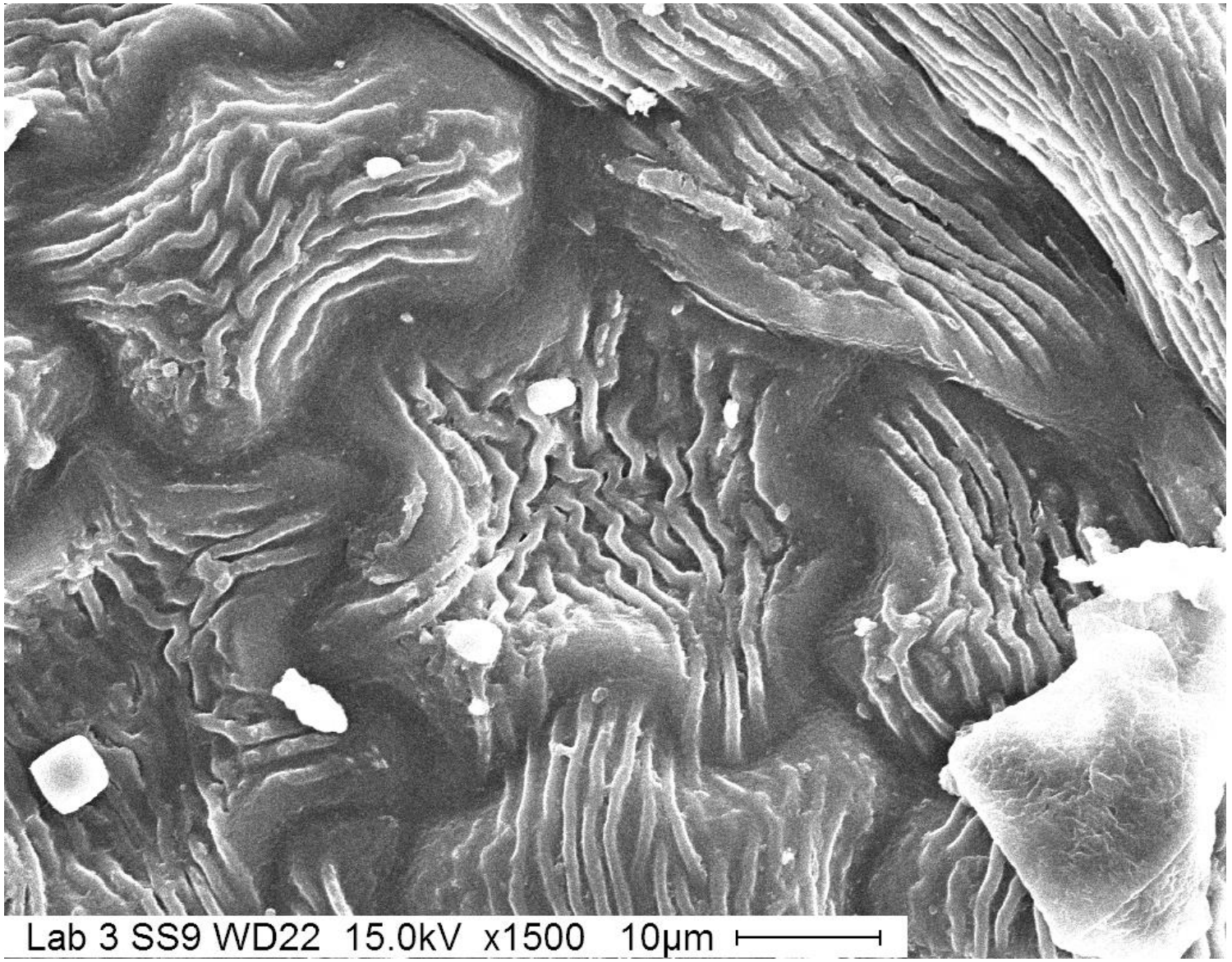

Figure 7. Specimen Preparation - Critical Point Drying. Scanning Electron micrograph of a Au/Pd coated maple leaf prepared using critical point drying. The image was taken with a working distance of 22, accelerating voltage of 15 kV, objective aperture 2, magnification of X1500 and spot size of 9.

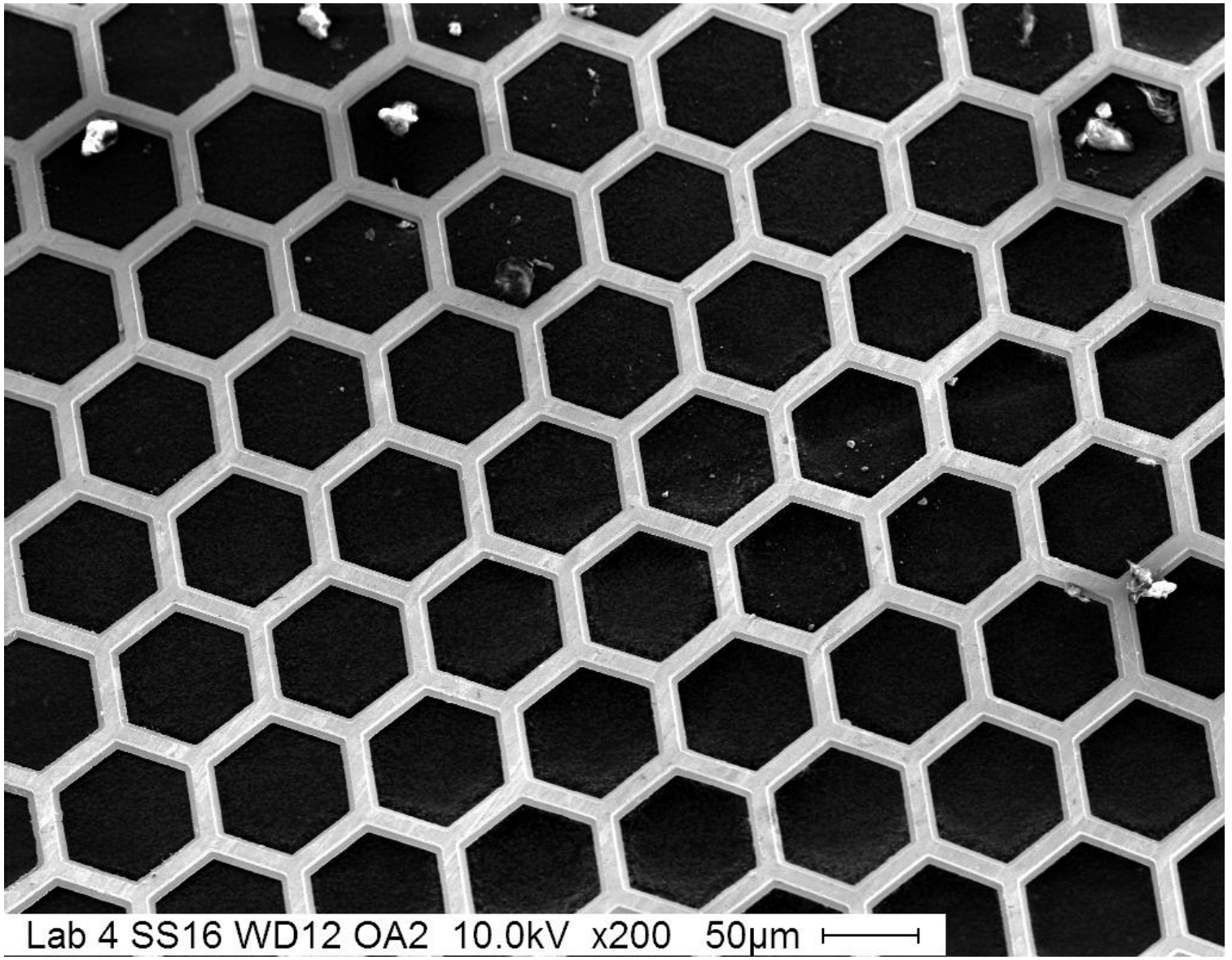

Figure 8. Image Quality I -Depth of Field. short WD, large aperture. Scanning Electron micrograph of a tilted TEM metal grid. The image was taken with a working distance of 12, accelerating voltage of 10 kV, objective aperture 2, magnification of X200 and spot size of 16.

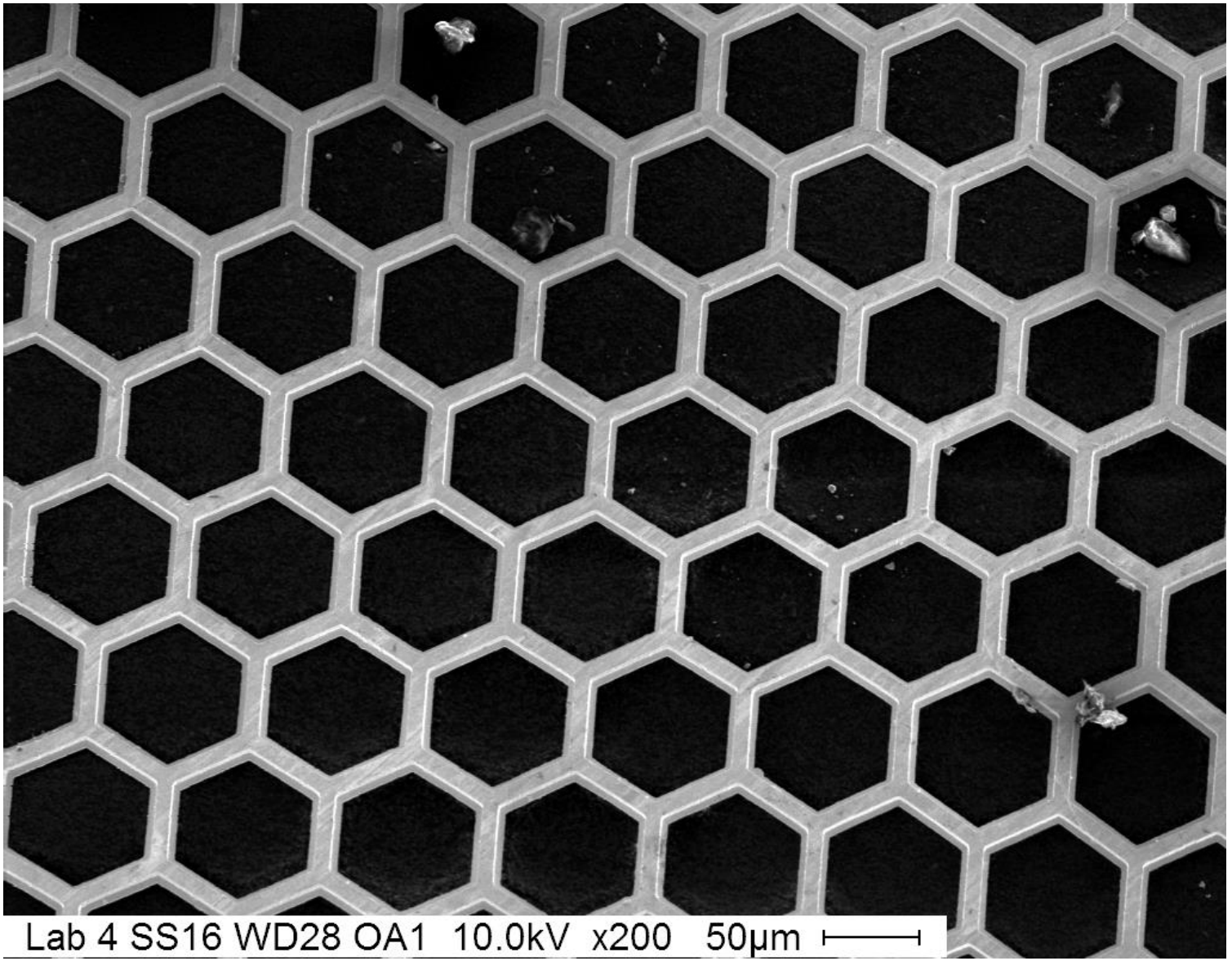

Figure 9. Image Quality I -Depth of Field. Long WD, small aperture. Scanning Electron micrograph of a tilted TEM metal grid. The image was taken with a working distance of 28, accelerating voltage of 10 kV, objective aperture 1, magnification of X200 and spot size of 16.

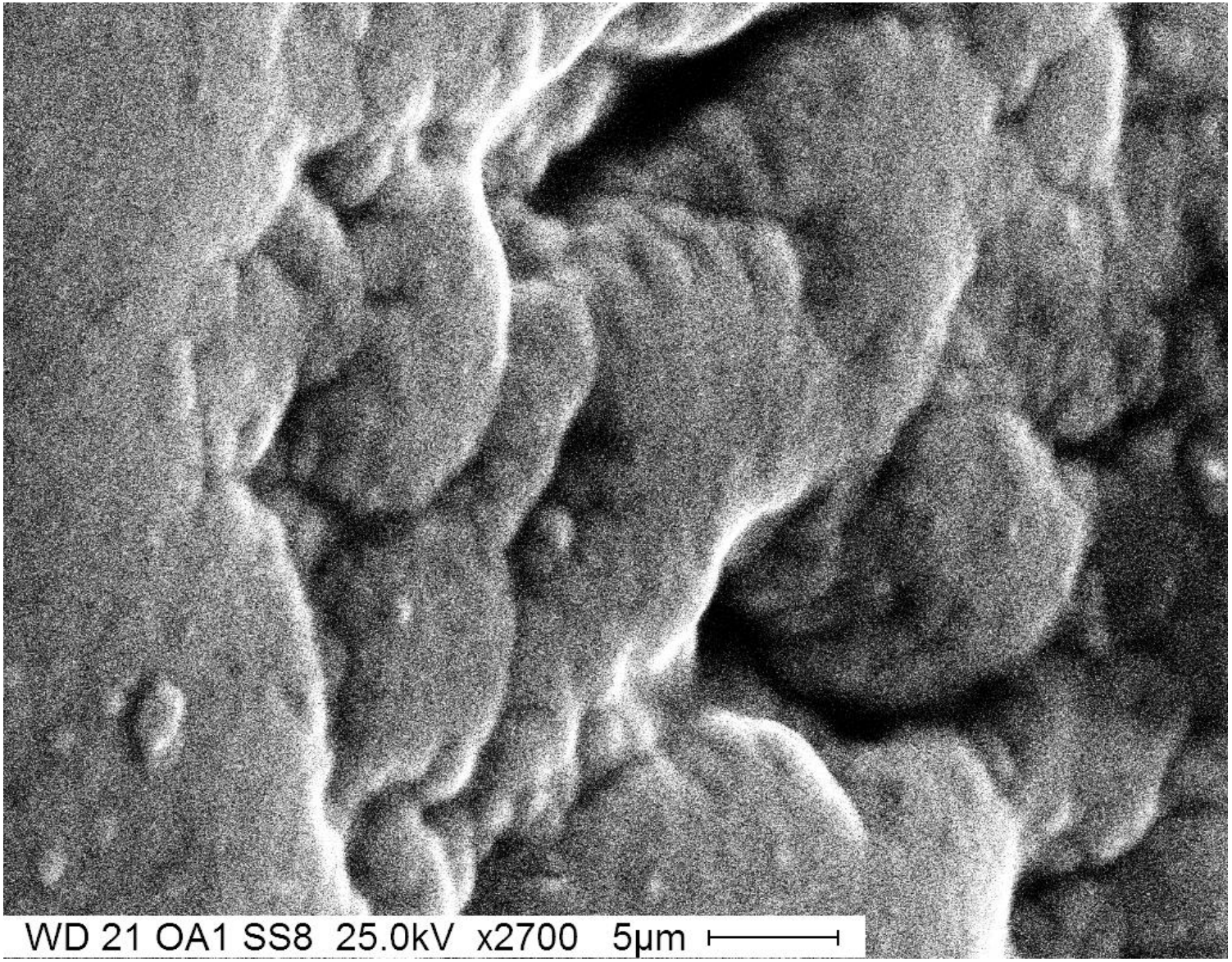

Figure 10. Image Quality II -Accelerating Voltage. A) 25 kV. Scanning Electron micrograph of a watch parts. The image was taken with a working distance of 21, accelerating voltage of 25 kV, objective aperture 1, magnification of X2700 and spot size of 8.

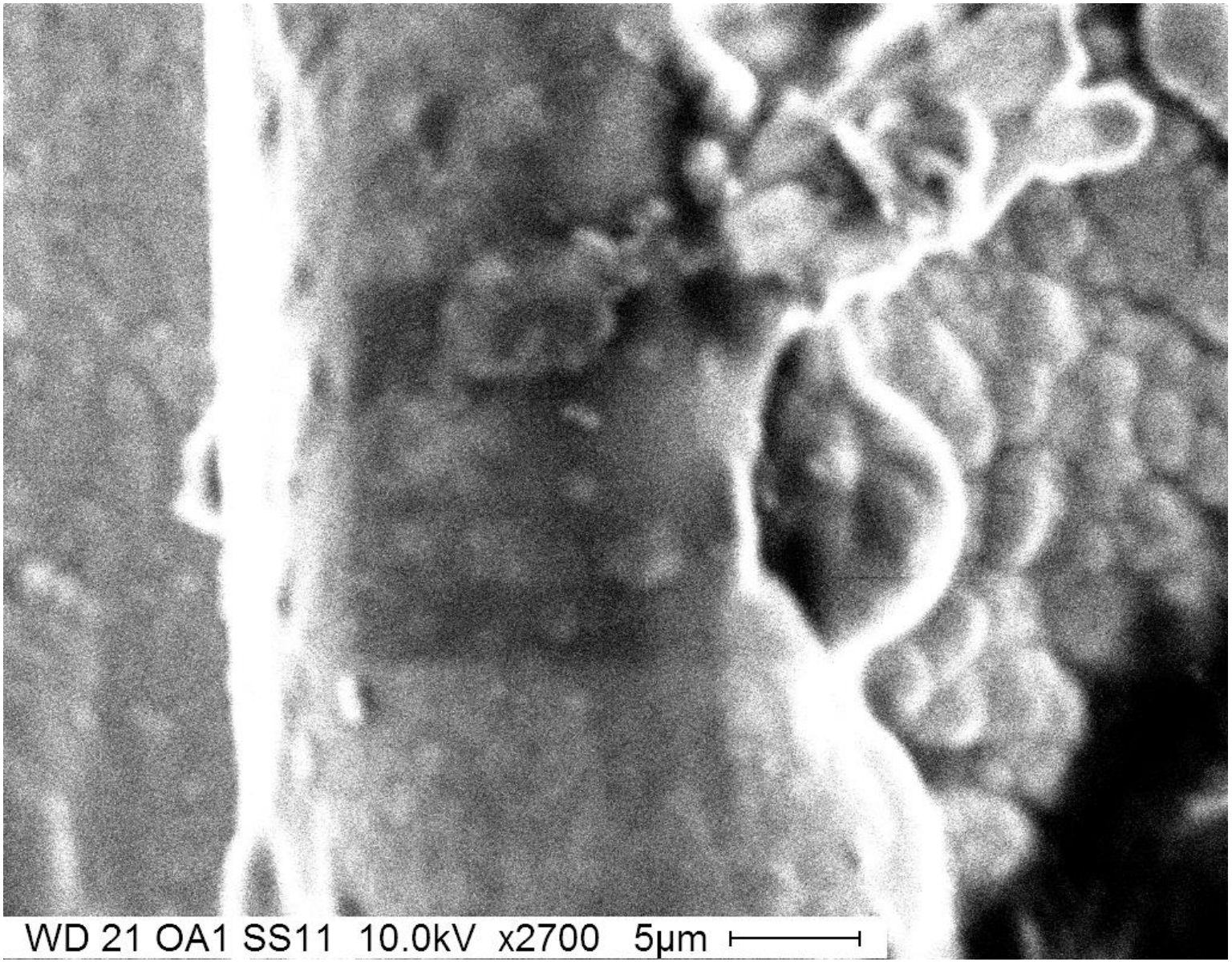

Figure 11. Image Quality II -Accelerating Voltage. B) 10 kV. Scanning Electron micrograph of watch parts. The image was taken with a working distance of 21, accelerating voltage of 10 kV, objective aperture 1, magnification of X2700 and spot size of 11.

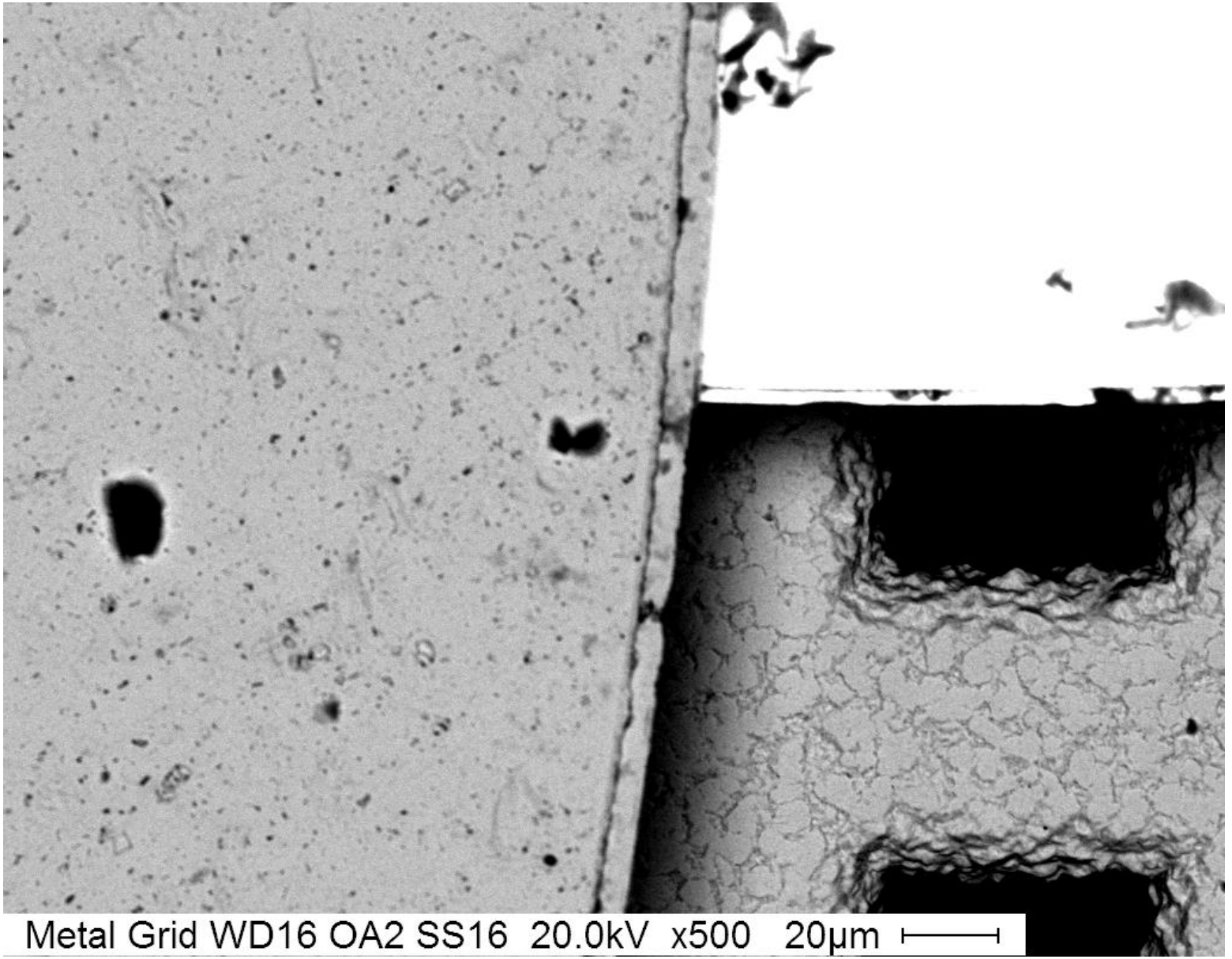

Figure 12. Backscattered Electron Imaging. B) BEI image. Scanning Electron micrograph of metal grids using BEI. The image was taken with a working distance of 16, accelerating voltage of 20 kV, objective aperture 2, magnification of X500 and spot size of 16.

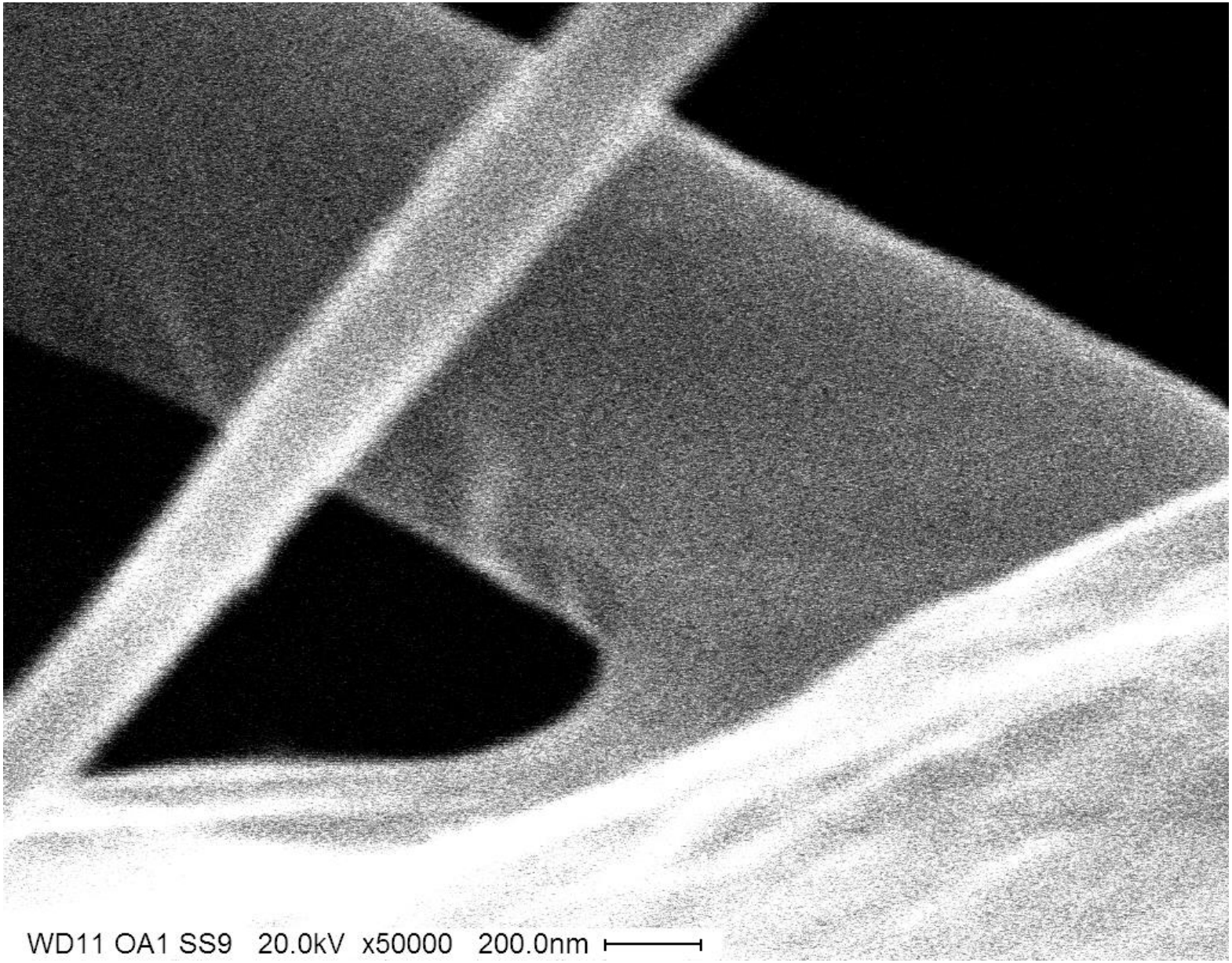

Figure 13. High Magnification. Scanning Electron micrograph of a mite's leg. The image was taken with a working distance of 11, accelerating voltage of 20kV, objective aperture 1, magnification of X50000 and spot size of 9.

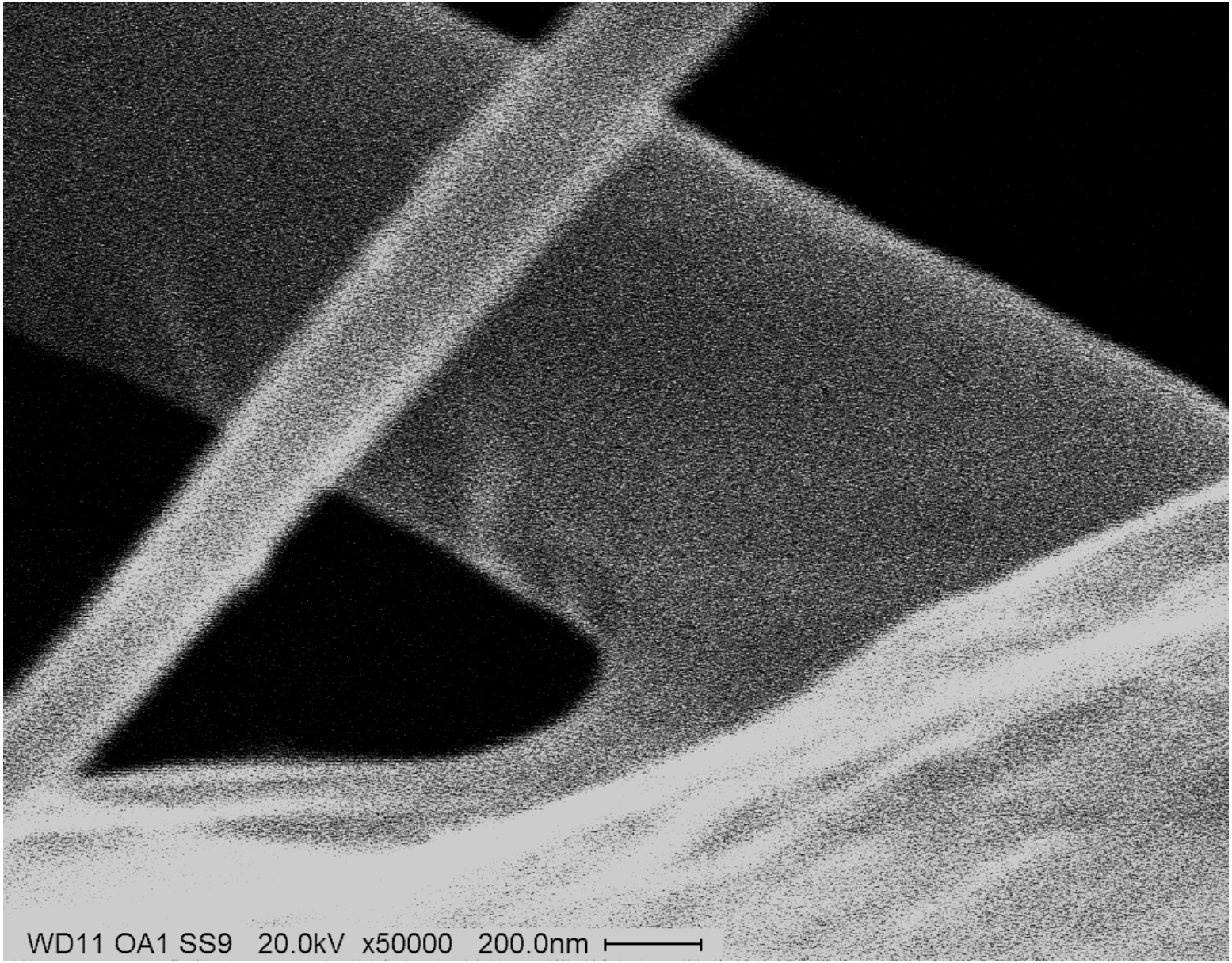

Figure 14. Digital Imaging. The image was taken with a working distance of 11, accelerating voltage of 20kV, objective aperture 1, magnification of X50000 and spot size of 9. The image was edited in Photoshop.