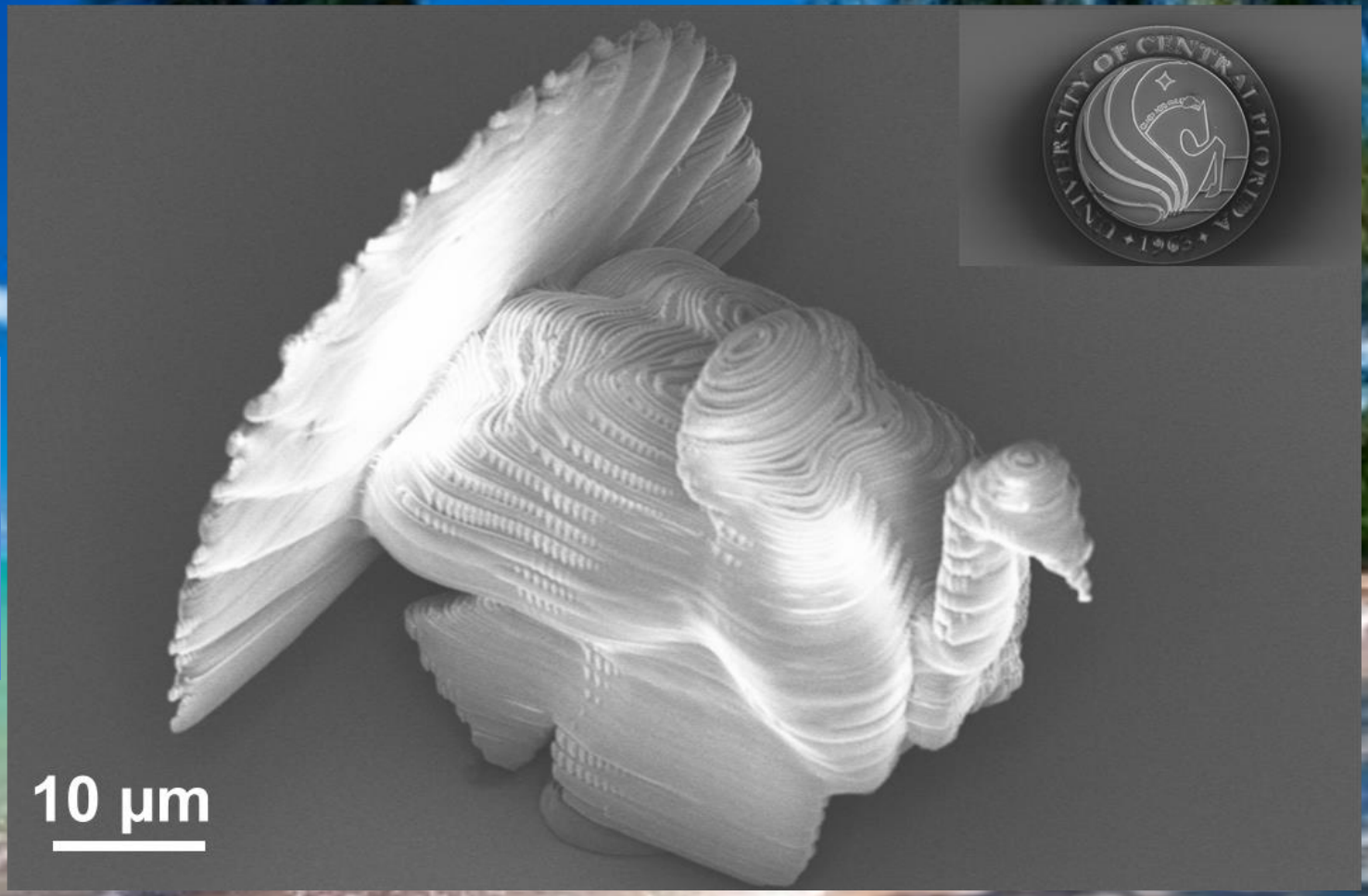
2018 EIPBN MicroGraph Contest

Micrograph Title:
Nano-Turkey

Description:
Description:
Two-photon polymerization based direct laser written 3D Turkey at the nanoscale.

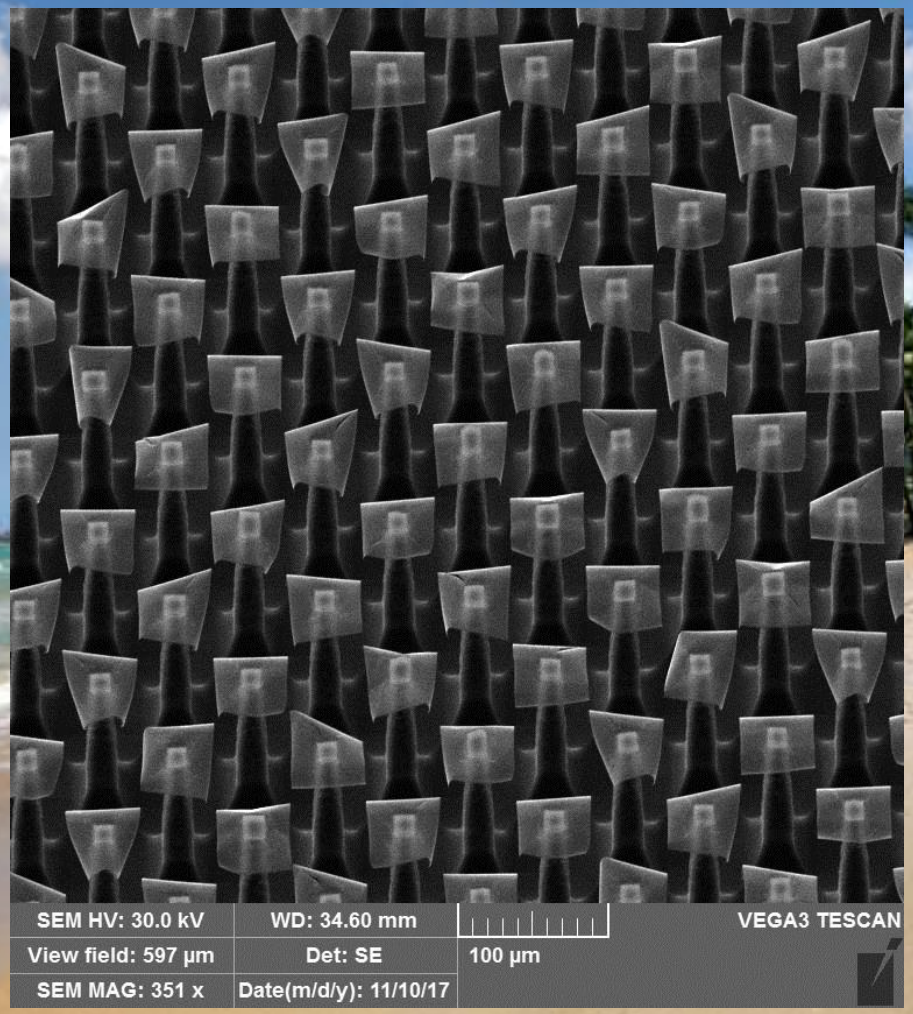


Magnification (3"x4" image): 596X
Instrument : DLW: NanoScribe GmbH, SEM: Zeiss ULTRA-55 FEG
Submitted by: Dr. Debashis Chanda **Affiliation:** Univ. of Central Florida
Florida, North America

2018 EIPBN MicroGraph Contest

Micrograph Title:
Micro-nuns praying for budget

Description:
Cr capped Si pillars after RIE etching

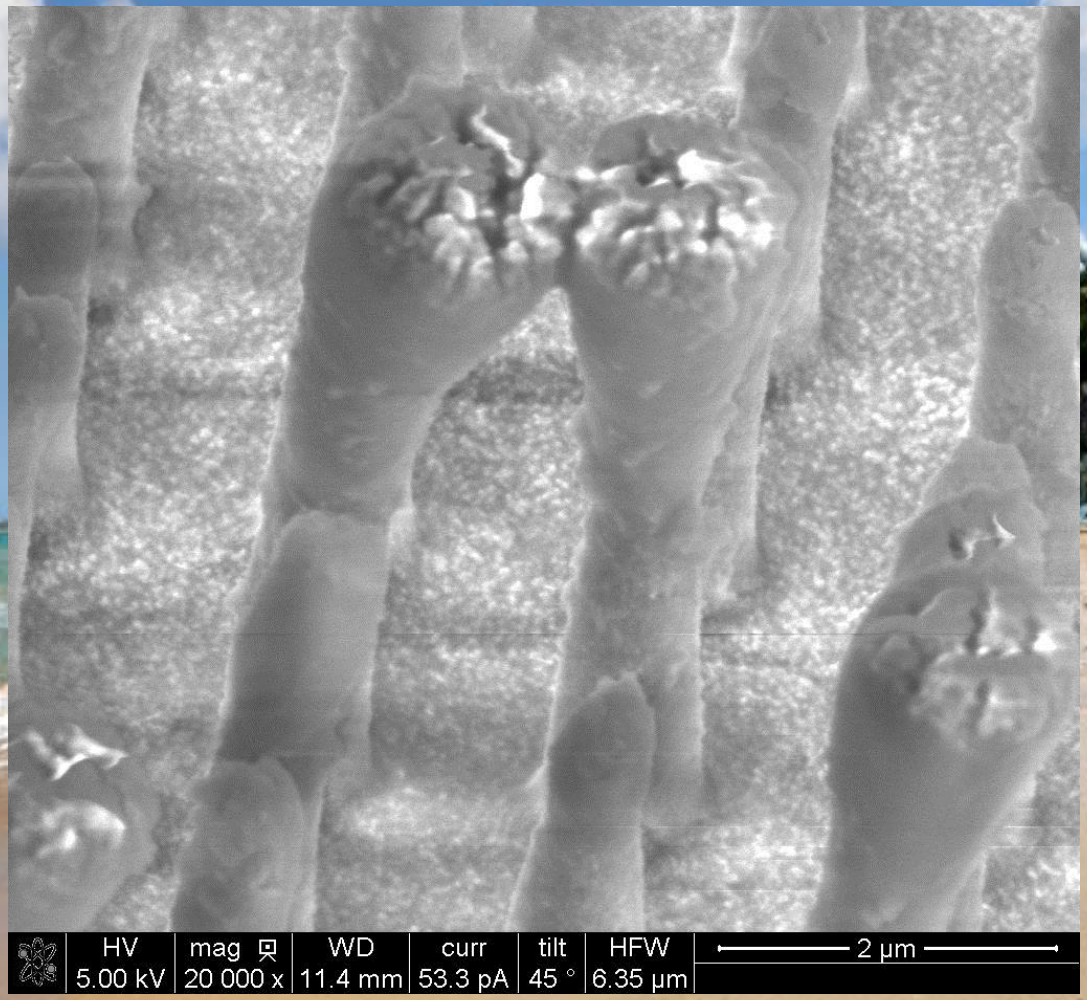


Magnification (3"x4" image): 351 X
Instrument : VEGA 3 TESCAN

Submitted by: Dr. Ralu Divan
Affiliation: Argonne National Lab.

2018 EIPBN MicroGraph Contest

Micrograph Title:
Boxing gloves



Description:
Magnetic tunable pillars: iron oxide nanoparticles bonded on the chains of Polydimethylsiloxane (PDMS). During RIE etching, two pillars bend toward each other.

Magnification (3"x4" image): 20 KX

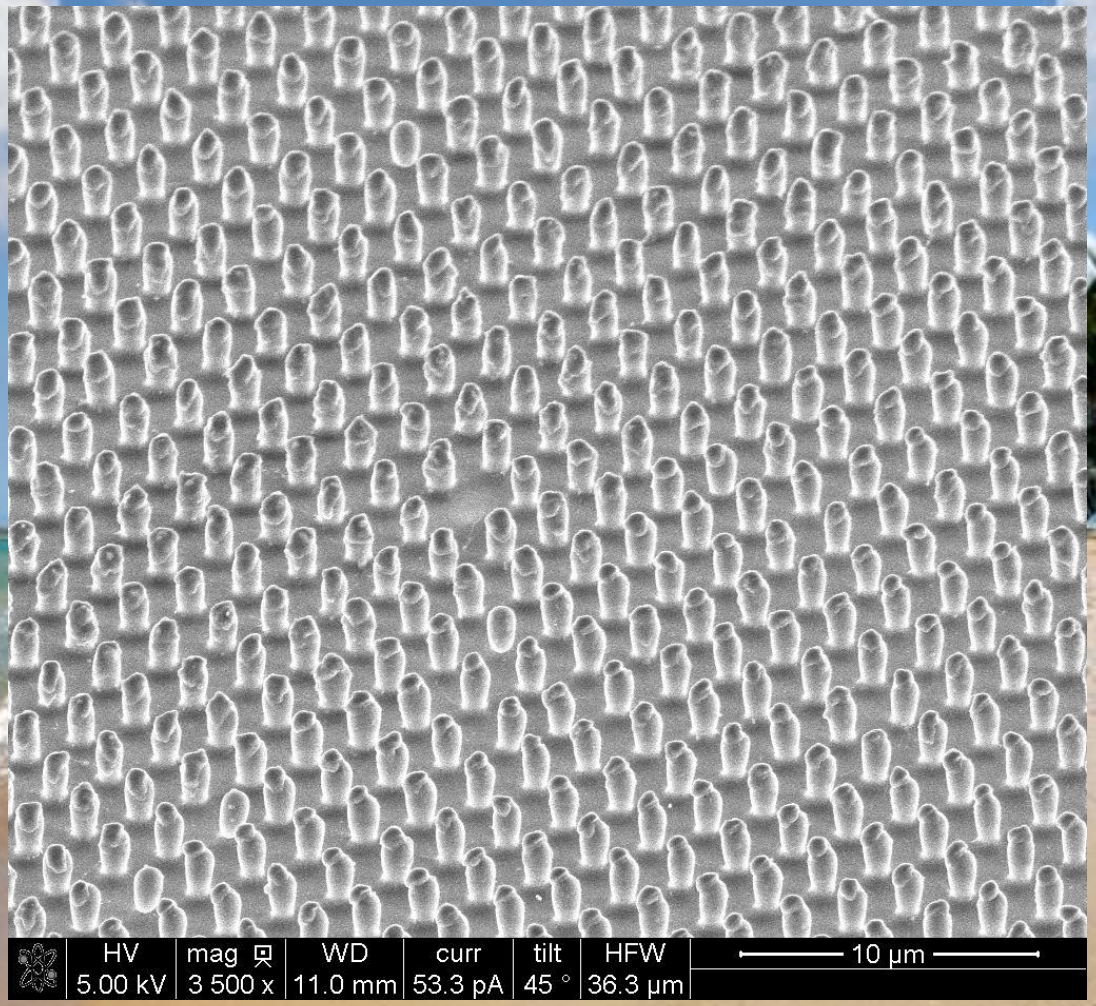
Submitted by: Zhiren Luo

Instrument : FEI Quanta 3D FEG

Affiliation: North Carolina State Univ. Raleigh, NC

2018 EIPBN MicroGraph Contest

Micrograph Title:
Worship



Description:
Magnetic tunable pillar array with an empty at the center. The Cobalt cap is deposited on the top of Polydimethylsiloxane (PDMS) pillars.

Magnification (3"x4" image): 3.5 KX

Instrument : FEI Quanta 3D FEG

Submitted by: Zhiren Luo

Affiliation: North Carolina State Univ.
Raleigh, NC

2018 EIPBN MicroGraph Contest

Micrograph Title:
Elvis plays the trumpet.

Description:
DIC imaging of a particle of schmutz on a lightly pitted oxide surface

Magnification (3"x4" image): 200X

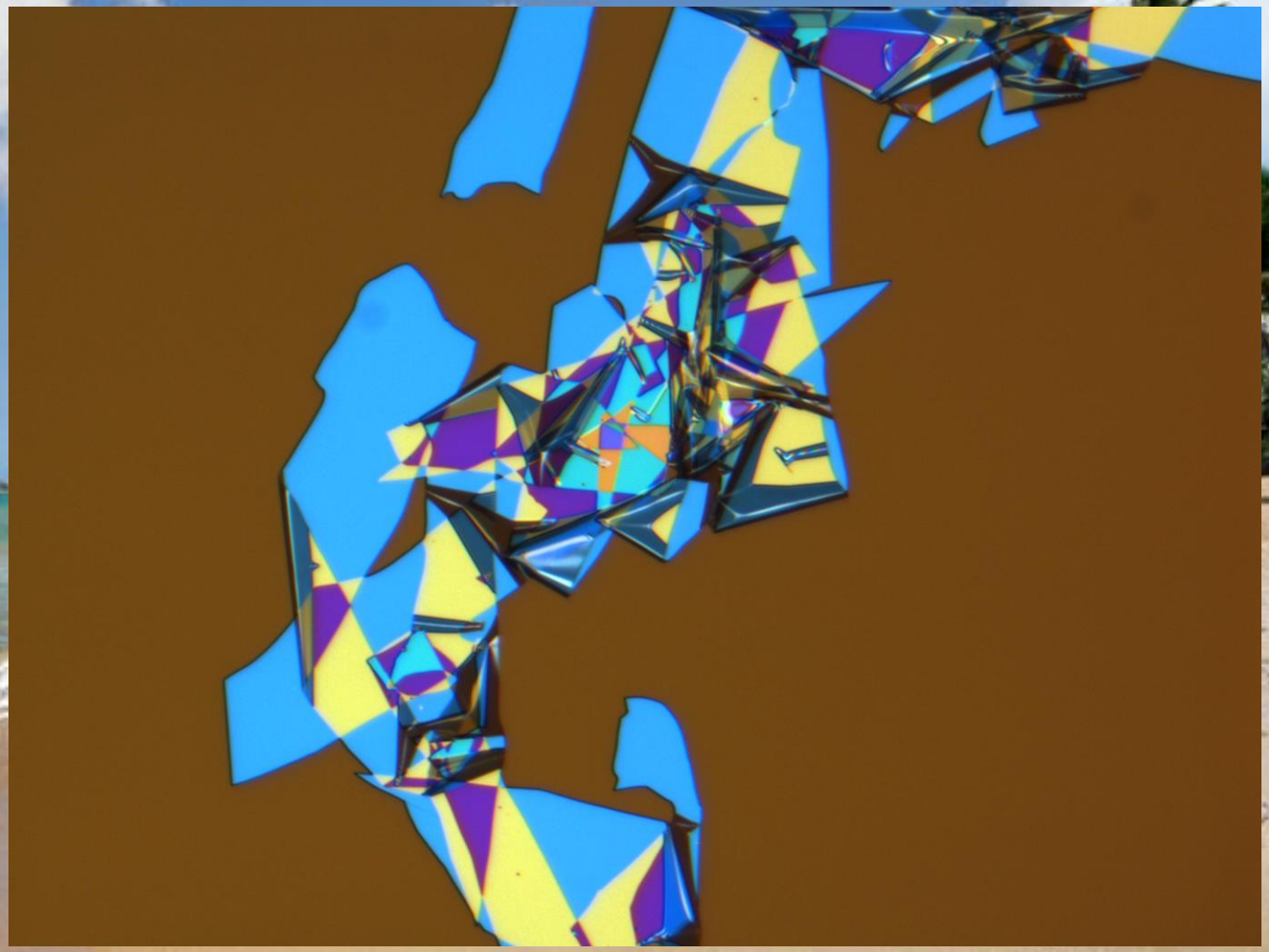
Instrument : Leica Polylite 88

Submitted by: Steve Hickman

Affiliation: Stratos Genomic

2018 EIPBN MicroGraph Contest

Micrograph Title:
What say you Sister Wendy?



Description:
Folded layers of 50nm thick nitride, after a KOH through-wafer etch

Magnification (3"x4" image): 250X

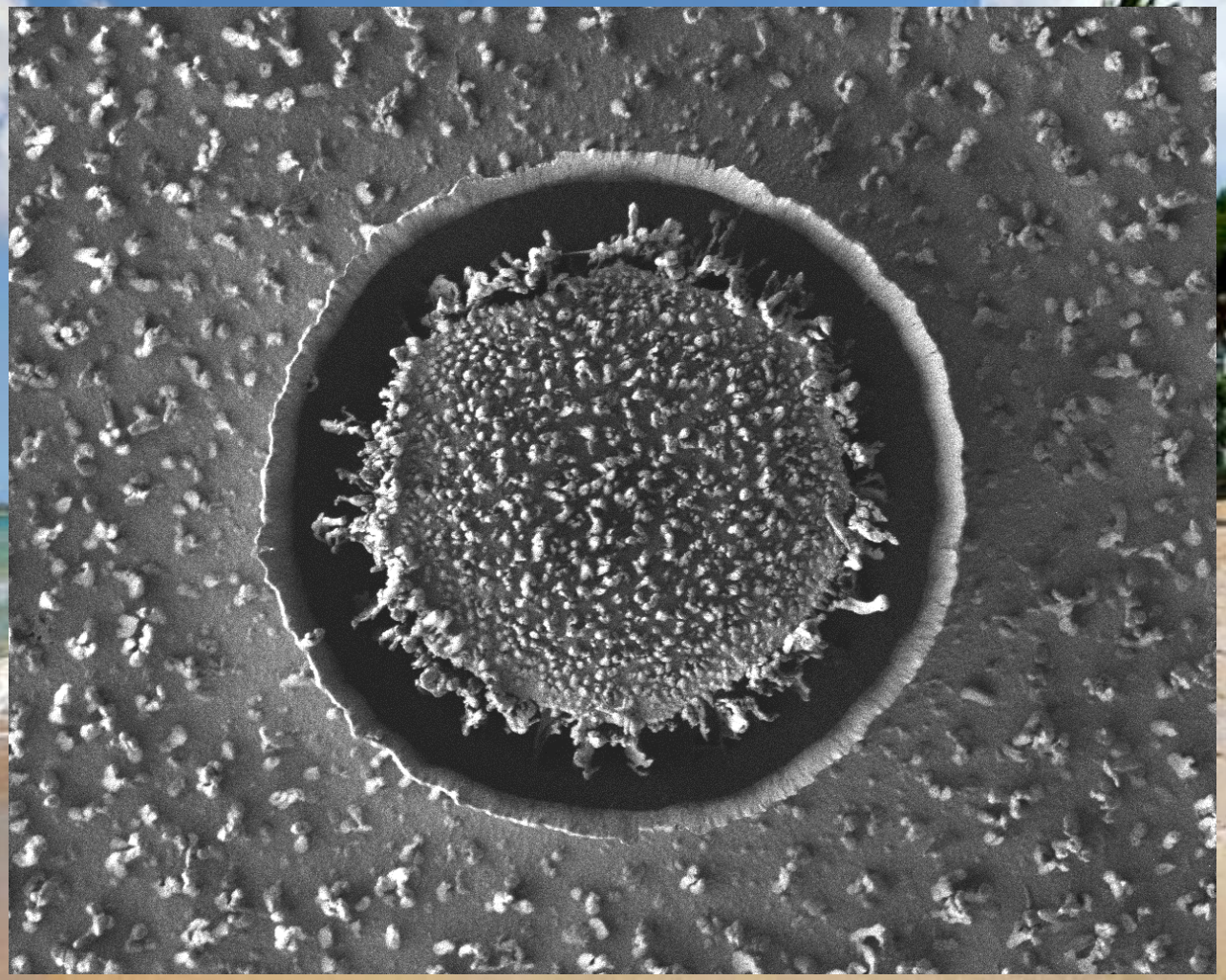
Instrument : Leica Polylite 88

Submitted by: Steve Hickman

Affiliation: Stratos Genomic

2018 EIPBN MicroGraph Contest

Micrograph Title:
Sunflower



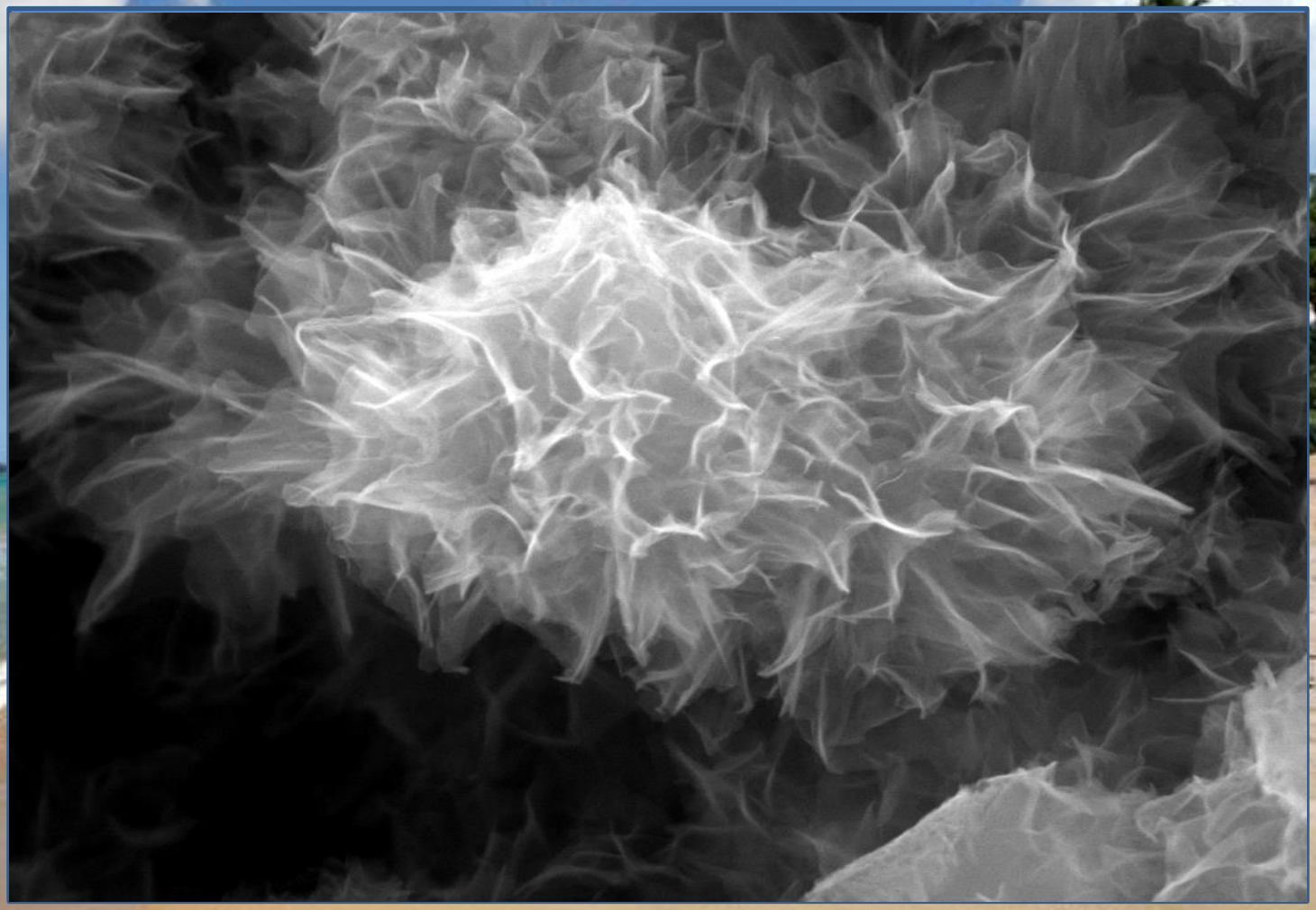
Description:
PDMS pillar surrounded by unetched metal catalyst debris

Magnification (3"x4" image): 1500X **Instrument :** JEOL JSM7400

Submitted by: Steve Hickman **Affiliation:** Stratos Genomic

2018 EIPBN MicroGraph Contest

Micrograph Title:
Coral



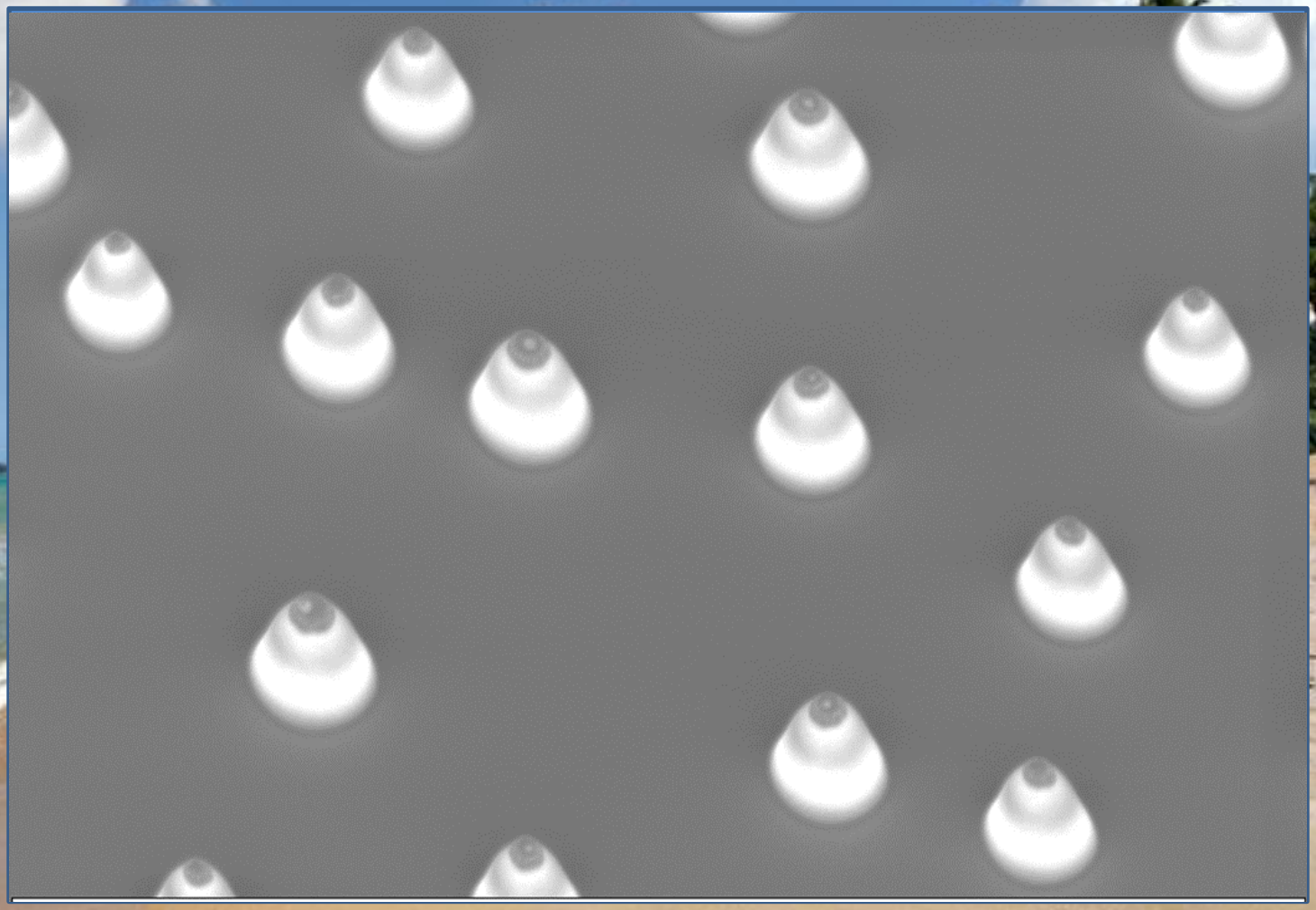
Description:
Iron Oxide, Rust

Magnification (3"x4" image): 100KX **Instrument : Zeiss Merlin SEM**

Submitted by: Dale Hensley **Affiliation: Oak Ridge National Lab**
Oak Ridge, TN North America

2018 EIPBN MicroGraph Contest

Micrograph Title:
Mini Bells



Description:
RIE Cryo etch of Si

Magnification (3"x4" image): 30.61KX **Instrument :** Zeiss Merlin SEM

Submitted by: Dale Hensley
Affiliation: Oak Ridge National Lab
Oak Ridge, TN North America

2018 EIPBN MicroGraph Contest

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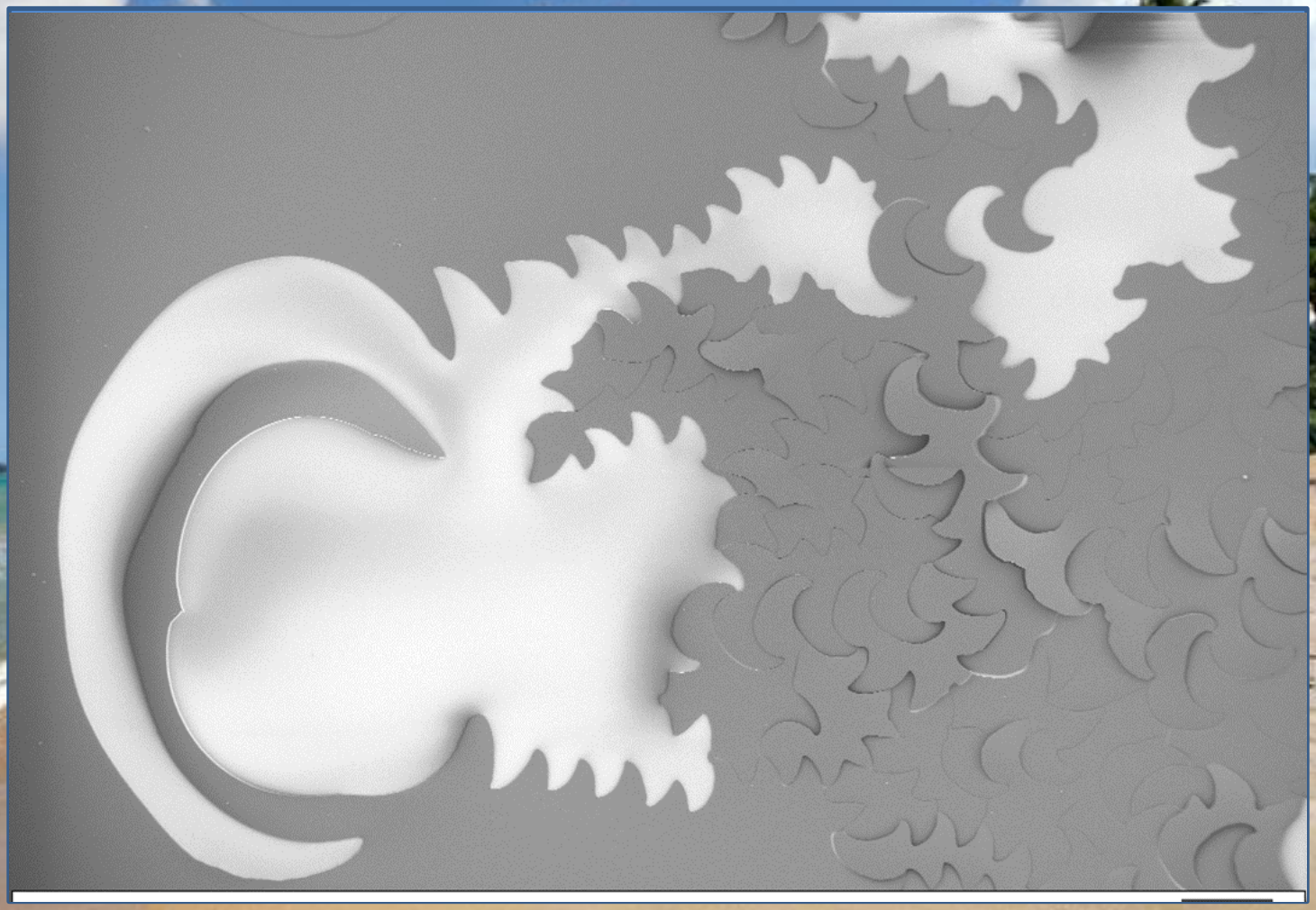
Micrograph Title:
Stress Release



Description:
Carbon NanoSpikes on Quartz

Magnification (3"x4" image): 216X

Instrument : Zeiss Merlin SEM

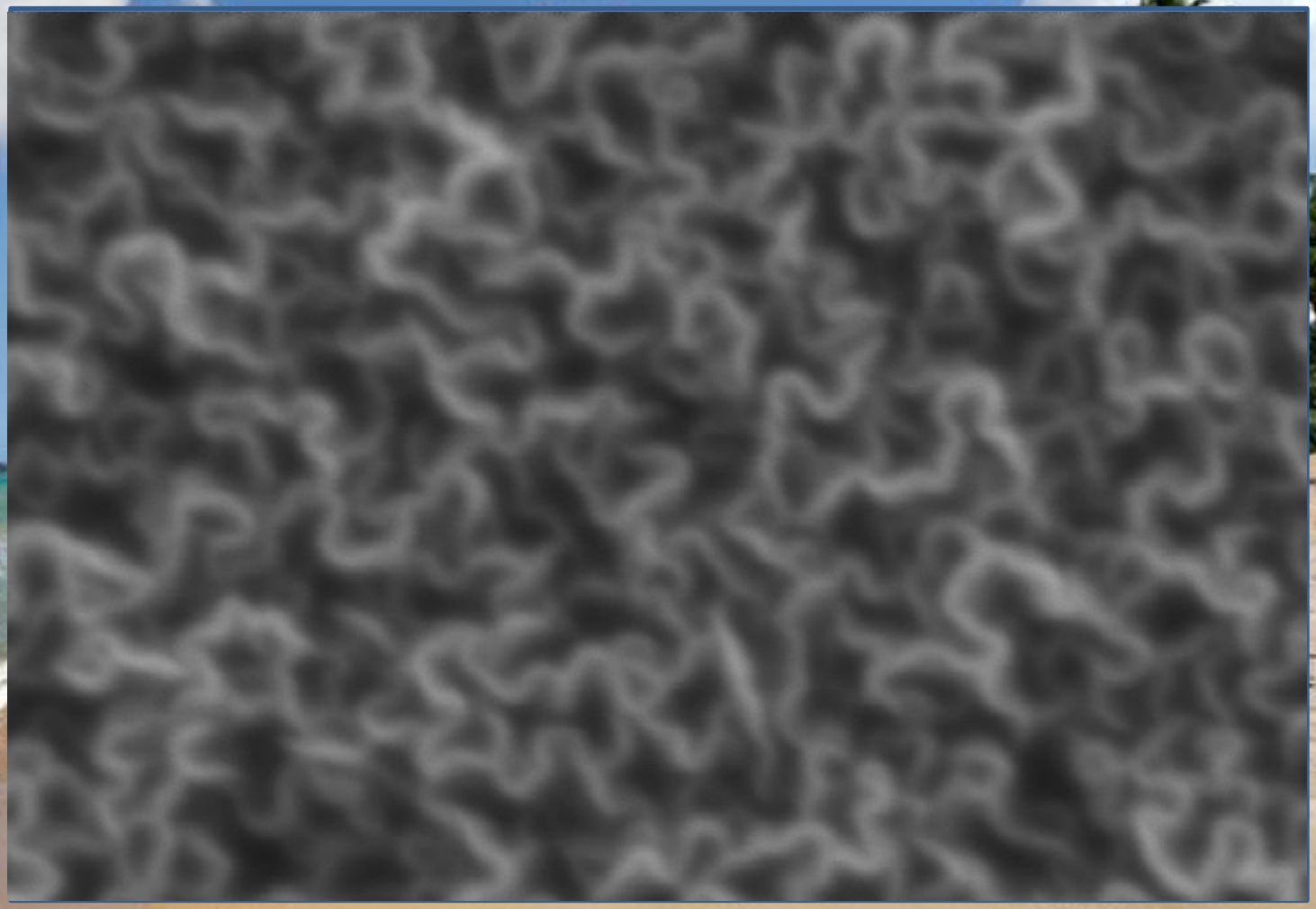
Submitted by: Dale Hensley

Affiliation: Oak Ridge National Lab

Oak Ridge, TN North America

2018 EIPBN MicroGraph Contest

Micrograph Title:
Worms



Description:
Carbon Nano Spikes On Si

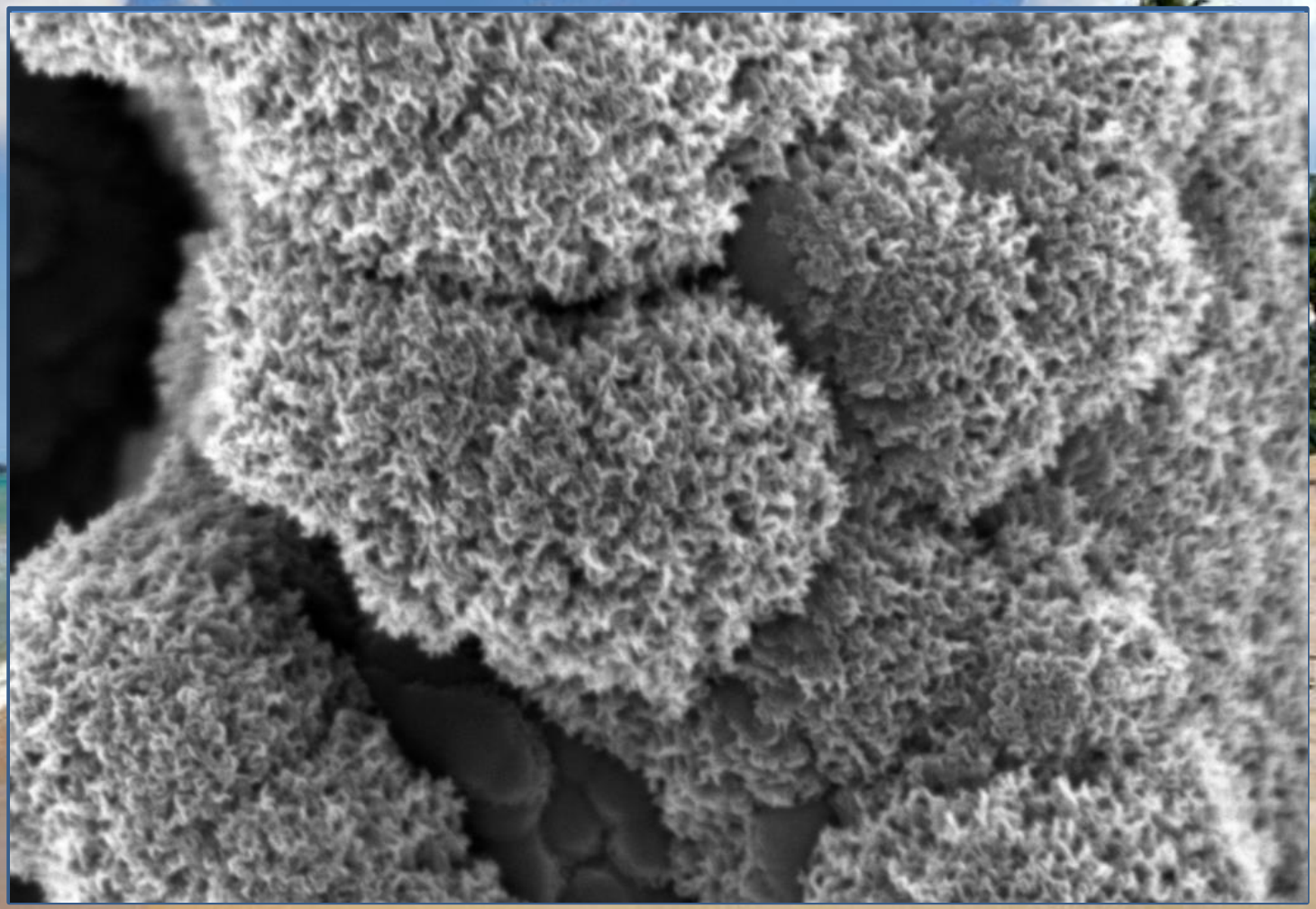
Magnification (3"x4" image): 250KX **Instrument :** Zeiss Merlin SEM

Submitted by: Dale Hensley
Affiliation: Oak Ridge National Lab
Oak Ridge, TN North America

2018 EIPBN MicroGraph Contest

Micrograph Title:
Worm Bed

Description:
Carbon Nano Spikes



Magnification (3"x4" image): 50KX

Instrument : Zeiss Merlin SEM

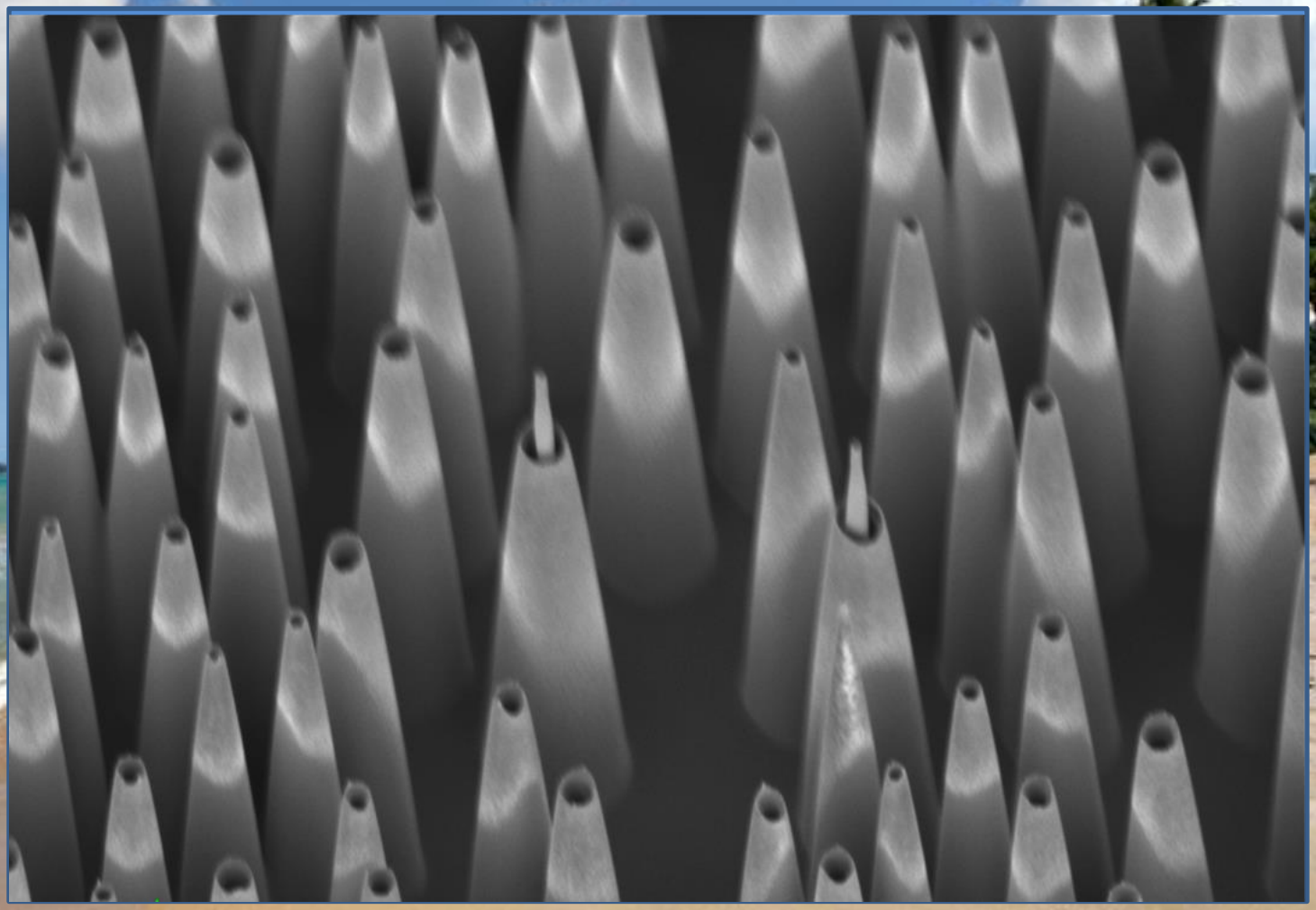
Submitted by: Dale Hensley

Affiliation: Oak Ridge National Lab

Oak Ridge, TN North America

2018 EIPBN MicroGraph Contest

Micrograph Title:
Twin Peaks



Description:
RIE Cyro etch, Black Si

Magnification (3"x4" image): 12.92KX **Instrument : Zeiss Merlin SEM**

Submitted by: Dale Hensley **Affiliation: Oak Ridge National Lab**
Oak Ridge, TN North America

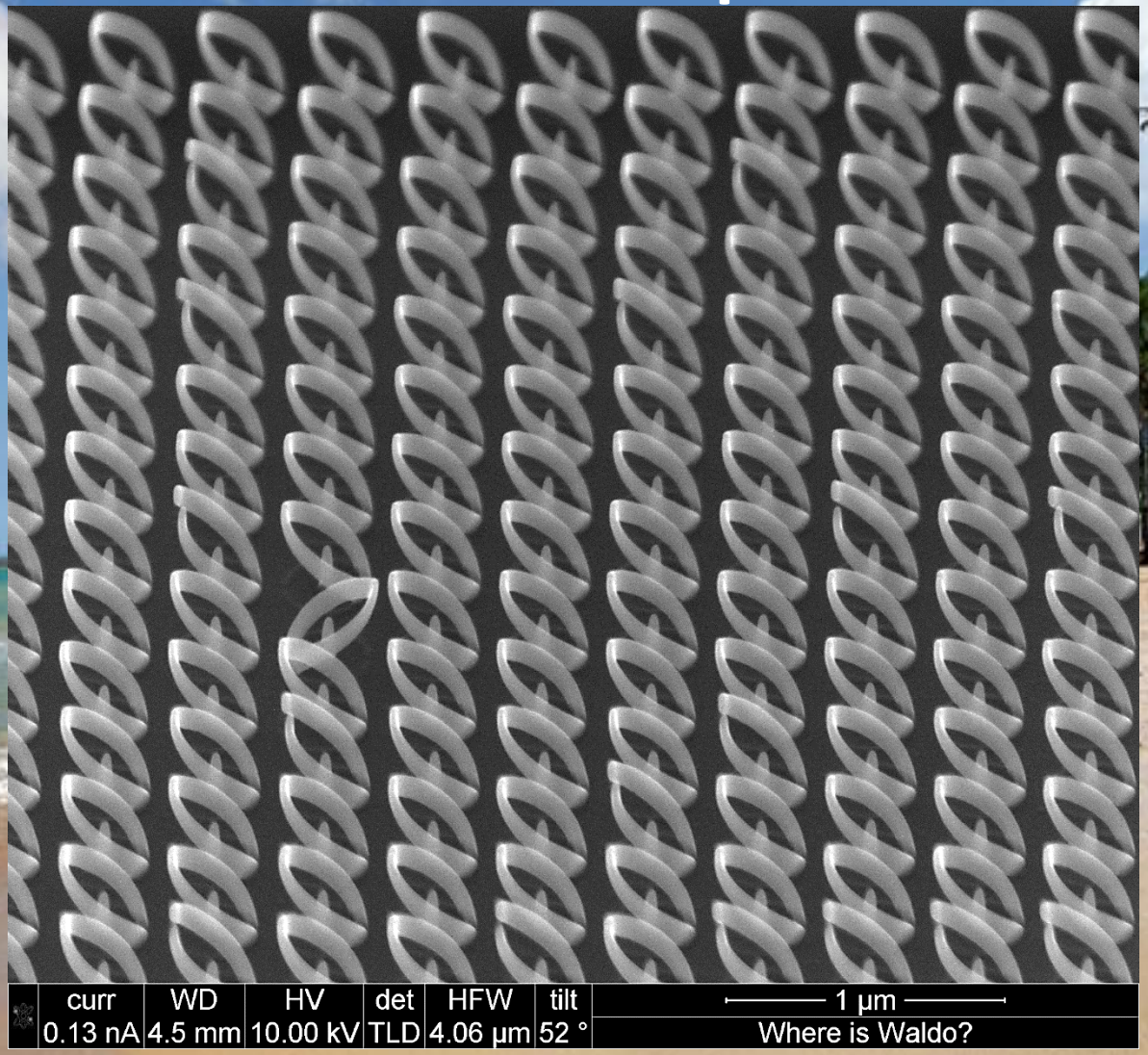
2018 EIPBN MicroGraph Contest

Micrograph Title:

Where is Waldo?

Or: A blind man is watching tennis

Description:
3D-nanoprinting of freestanding inclined rings with a central pillar. Fabricated via Focused Electron Beam Induced Deposition



Magnification (3"x4" image): 24KX

Instrument : FIB Nova 200

Submitted by: Robert Winkler

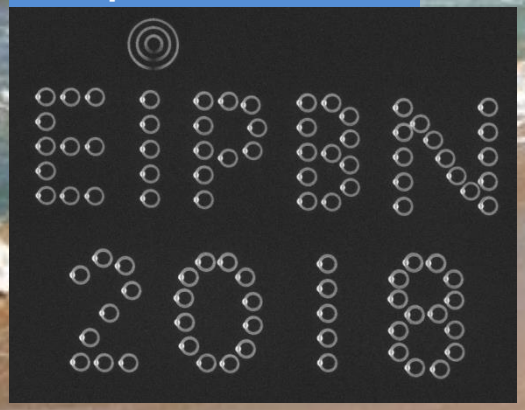
Affiliation: Christian Doppler Laboratory DEFINE

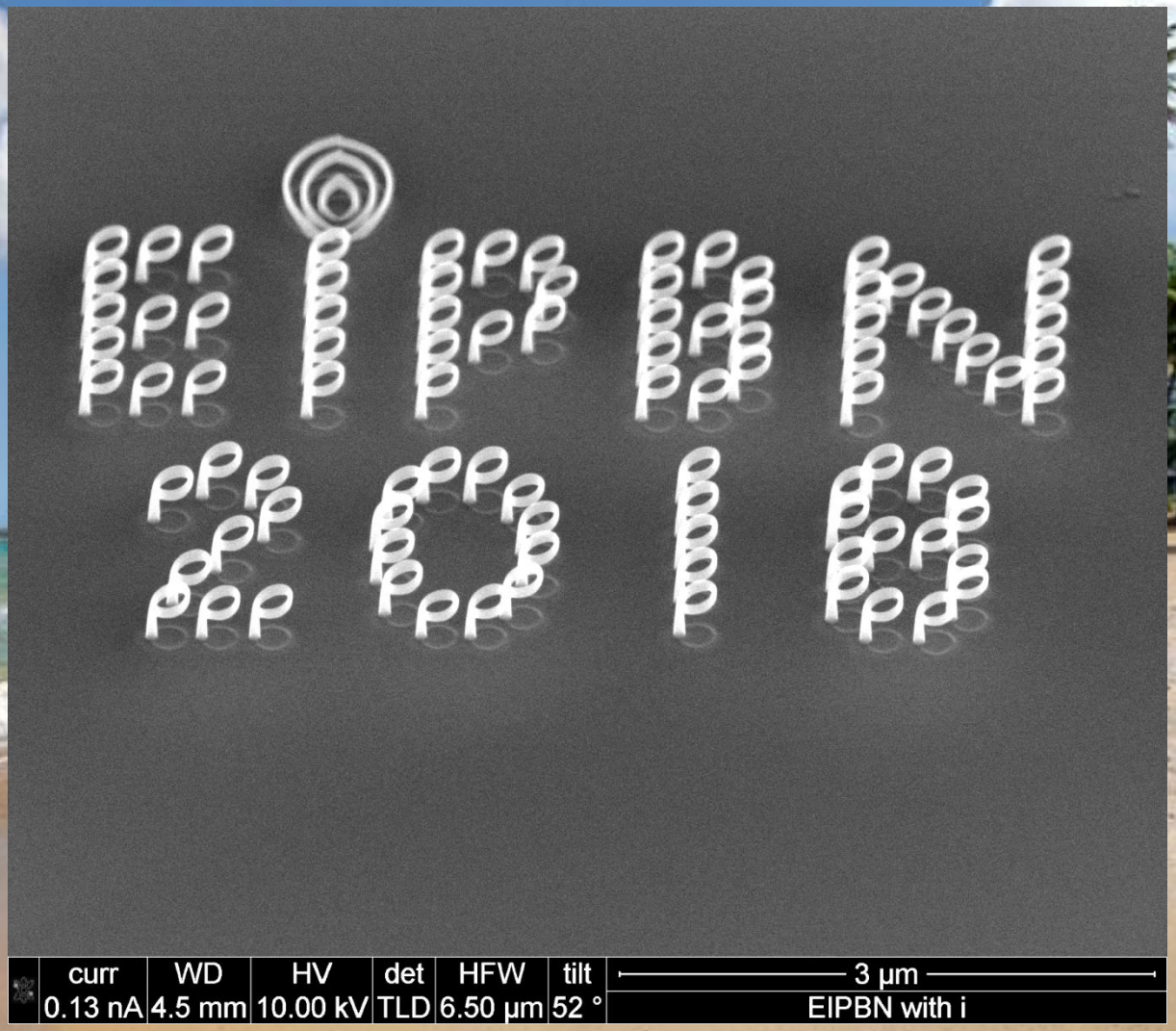
Graz University of Technology

2018 EIPBN MicroGraph Contest

Micrograph Title:
Nanofabrication of EIPBN Logo

Description:
On top of 300 nm tall pillars nanorings are levitating above the substrate. The inset at the bottom shows the same structures in top view.





Magnification (3"x4" image): 15KX

Instrument : FIB Nova 200

Submitted by: Robert Winkler

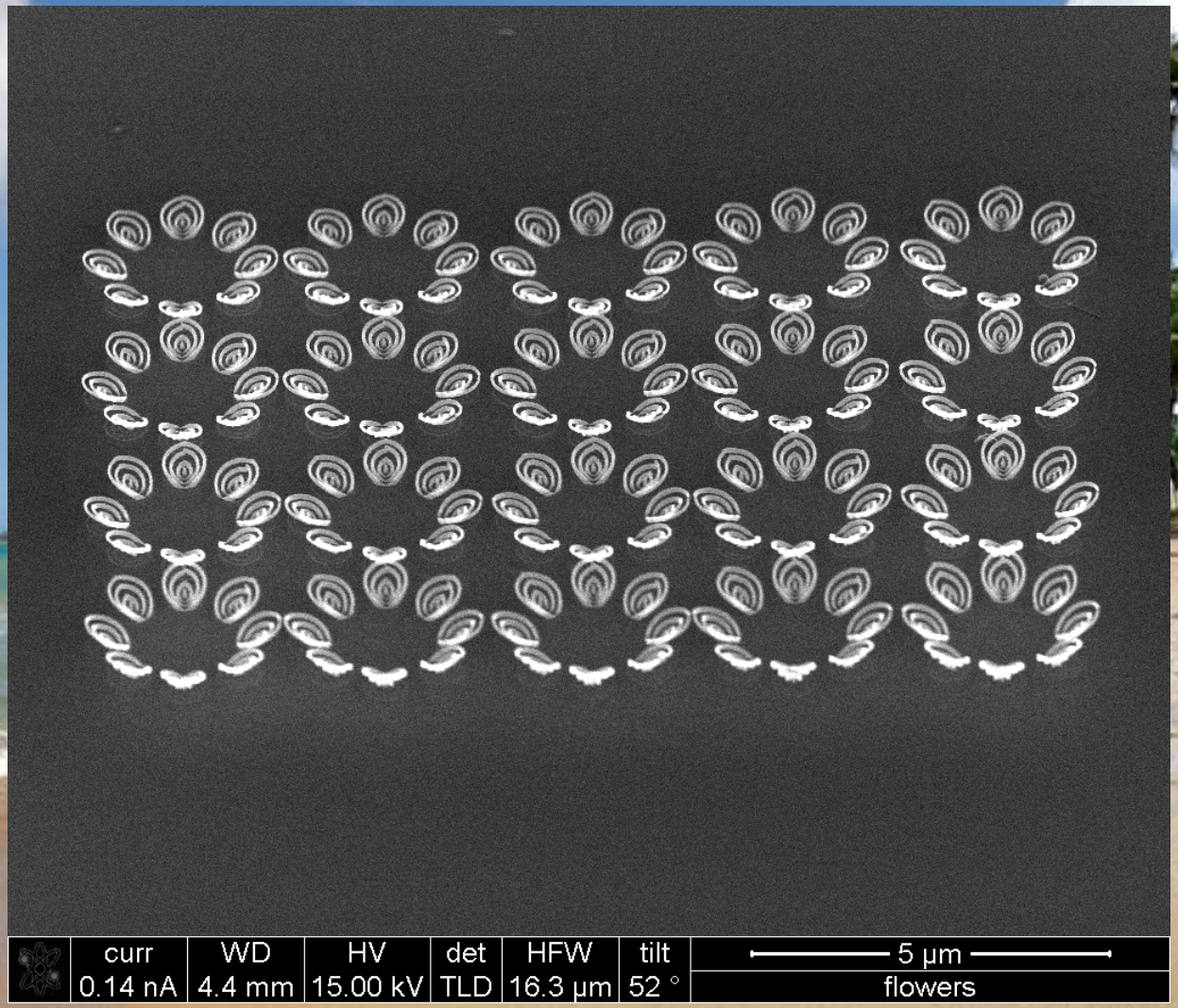
Affiliation: Christian Doppler Laboratory DEFINE
Graz University of Technology

2018 EIPBN MicroGraph Contest

Micrograph Title:

Bouquet of nano-flowers

Description:
4 freestanding rings (radius 0, 100, 200 and 300 nm) form a floral leaf. Fabricated via focused electron beam and a platinum precursor.



Magnification (3"x4" image): 6KX **Instrument : FIB Nova 200**

Submitted by: Robert Winkler

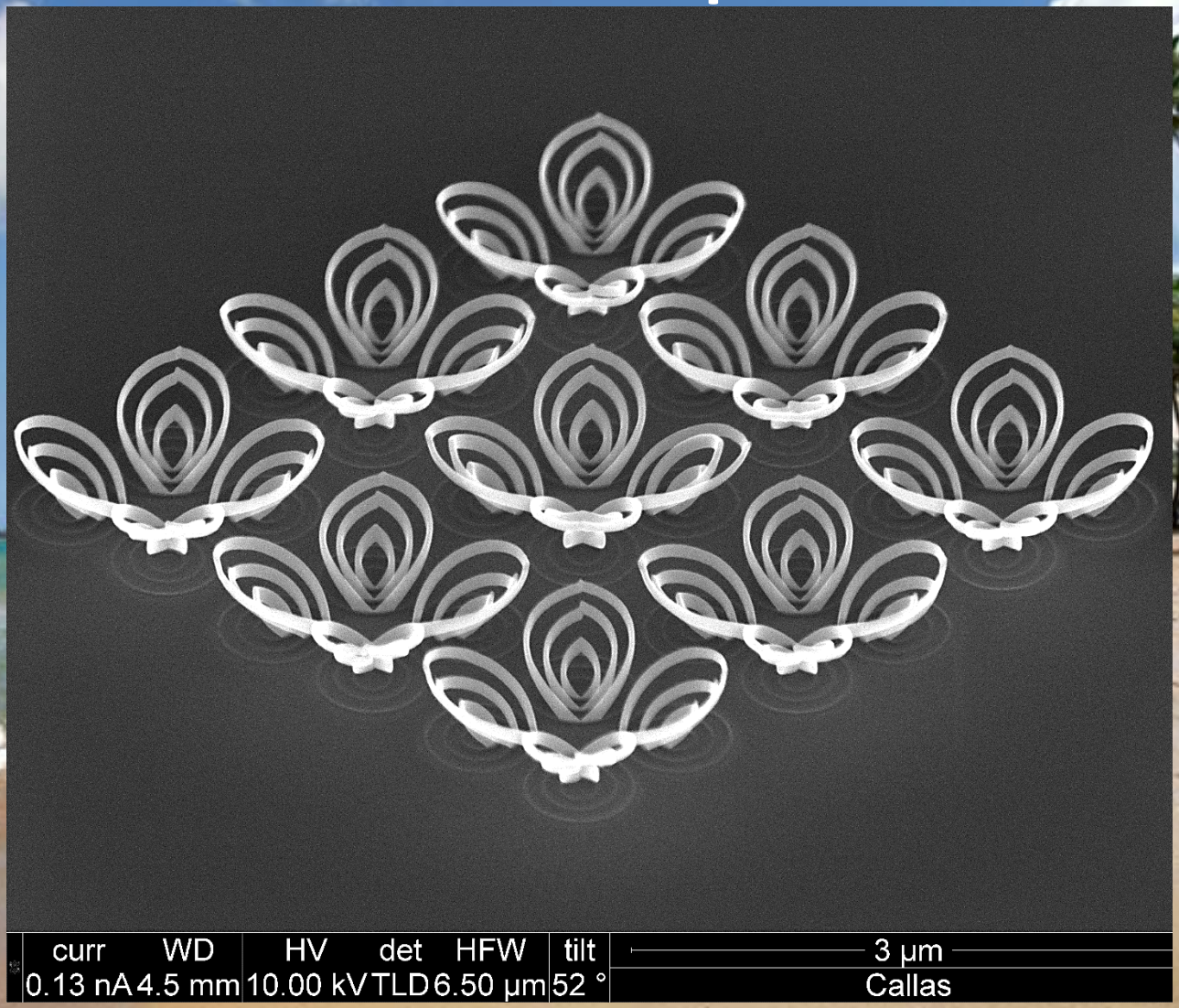
Affiliation: Christian Doppler Laboratory DEFINE
Graz University of Technology

2018 EIPBN MicroGraph Contest

Micrograph Title:

Callas

Description:
3D-nanoprinting of freestanding nano-flowers via FEBID. A single branch has a thickness of 20-70 nm and consists of platinum grains embedded in a carbon matrix.



Magnification (3"x4" image): 15KX

Instrument : FIB Nova 200

Submitted by: Robert Winkler

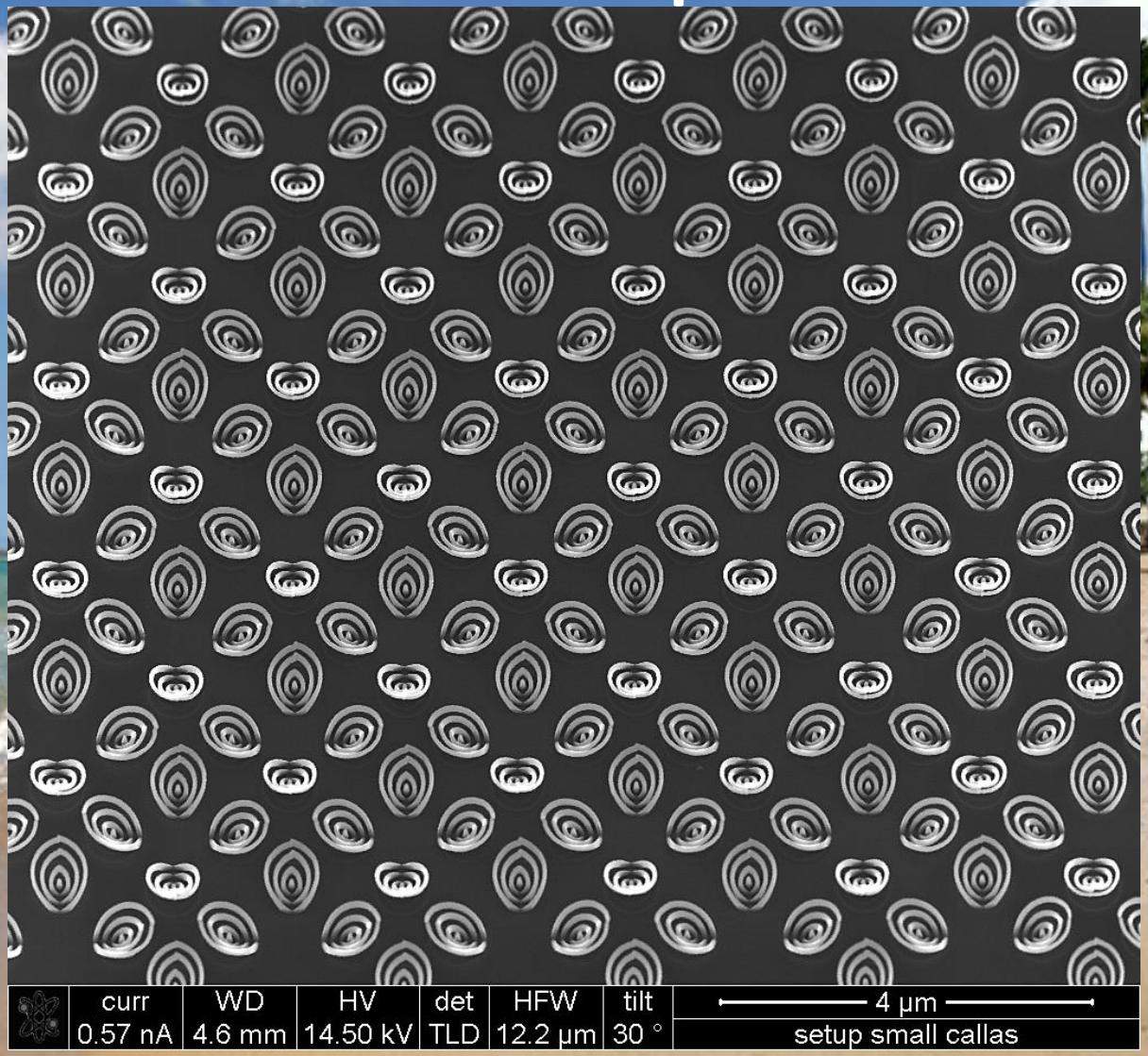
Affiliation: Christian Doppler Laboratory DEFINE
Graz University of Technology

2018 EIPBN MicroGraph Contest

Micrograph Title:

Field of Lillies

Description:
Field of freestanding Pt/C nano-flowers 3D-printed via FEBID on a silicon substrate. The angle of each ring in relation to the substrate is around 45°.



Magnification (3"x4" image): 8KX

Instrument : FIB Nova 200

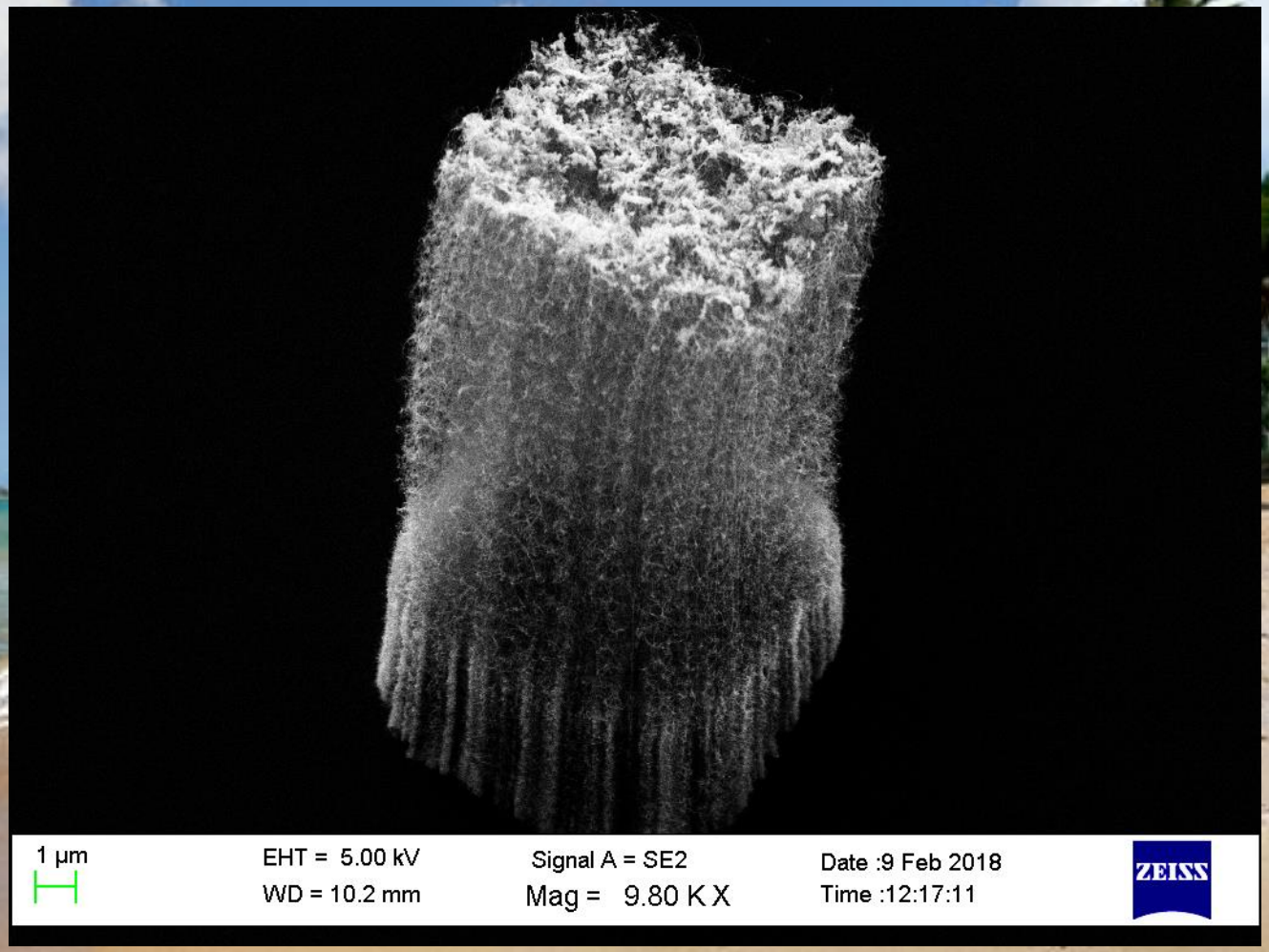
Submitted by: Robert Winkler

Affiliation: Christian Doppler Laboratory DEFINE
Graz University of Technology

2018 EIPBN MicroGraph Contest

Micrograph Title:
Leaning Tower of Nanotubes

Description:
10µm square pillar of multi-wall carbon nanotubes. Made by patterning array of iron catalyst islands on Si wafer.



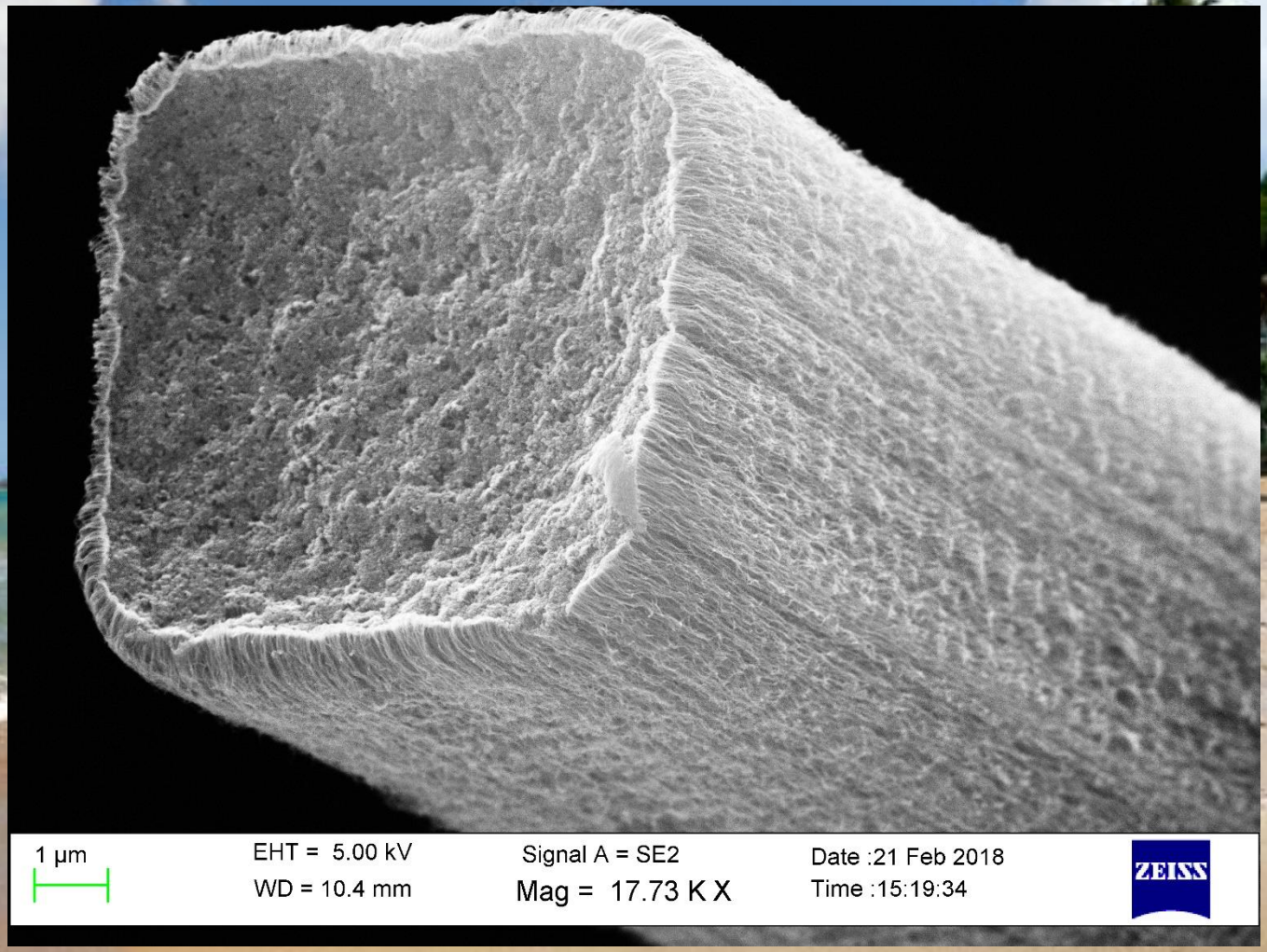
Magnification (3"x4" image): 9.8 KX **Instrument :** Zeiss Sigma SEM

Submitted by: Casimir Kuzyk **Affiliation:** University of British Columbia

2018 EIPBN MicroGraph Contest

Micrograph Title:
Nanotubes²

Description:
10μm square pillar of multi-wall carbon nanotubes. Made by patterning array of iron catalyst islands on Si wafer.



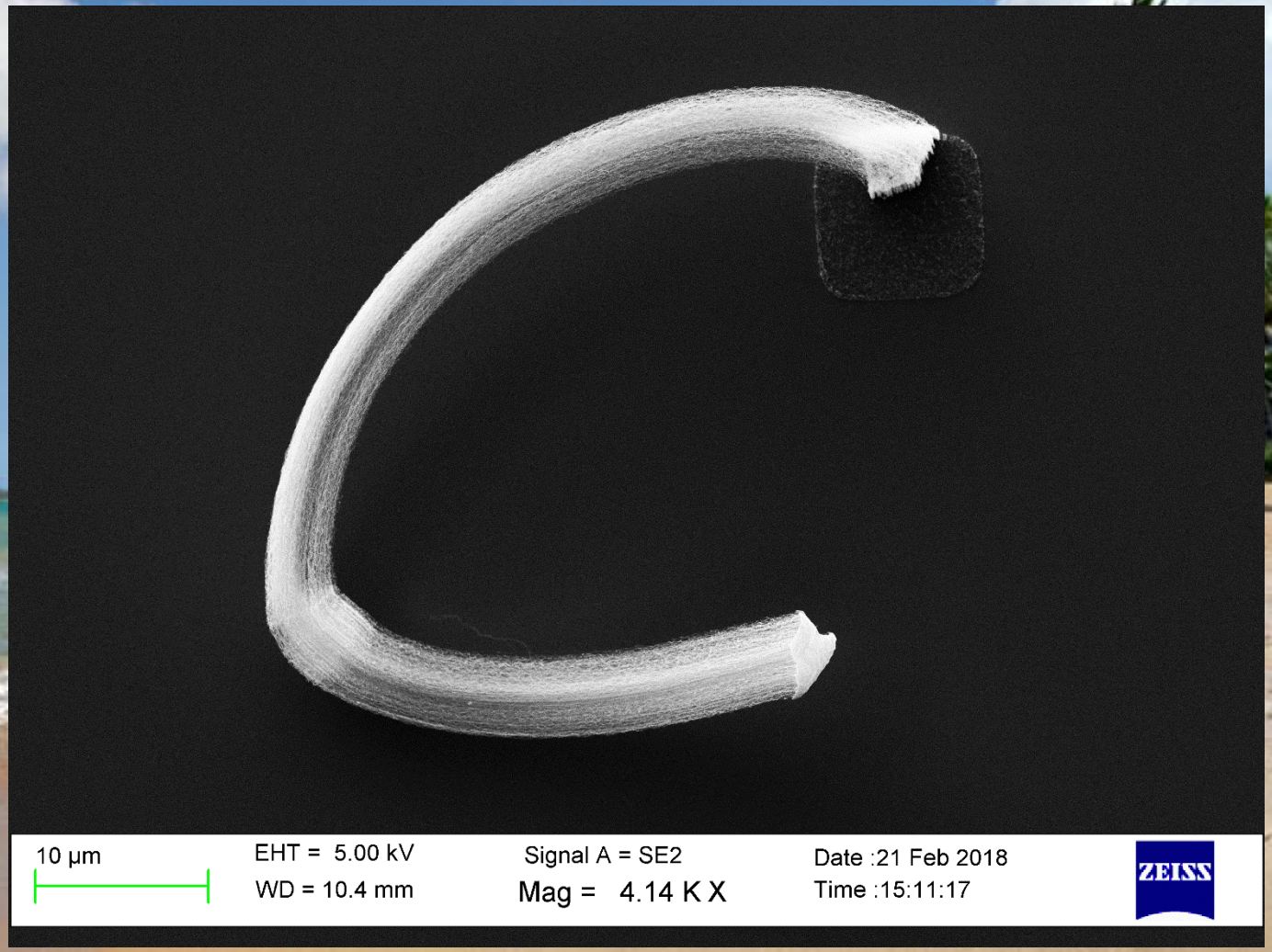
Magnification (3"x4" image): 17.73KX **Instrument :** Zeiss Sigma SEM

Submitted by: Casimir Kuzyk **Affiliation:** University of British Columbia

2018 EIPBN MicroGraph Contest

Micrograph Title:
C is for Carbon

Description:
Failed growth of square 10 micron multi wall carbon nanotube pillar.



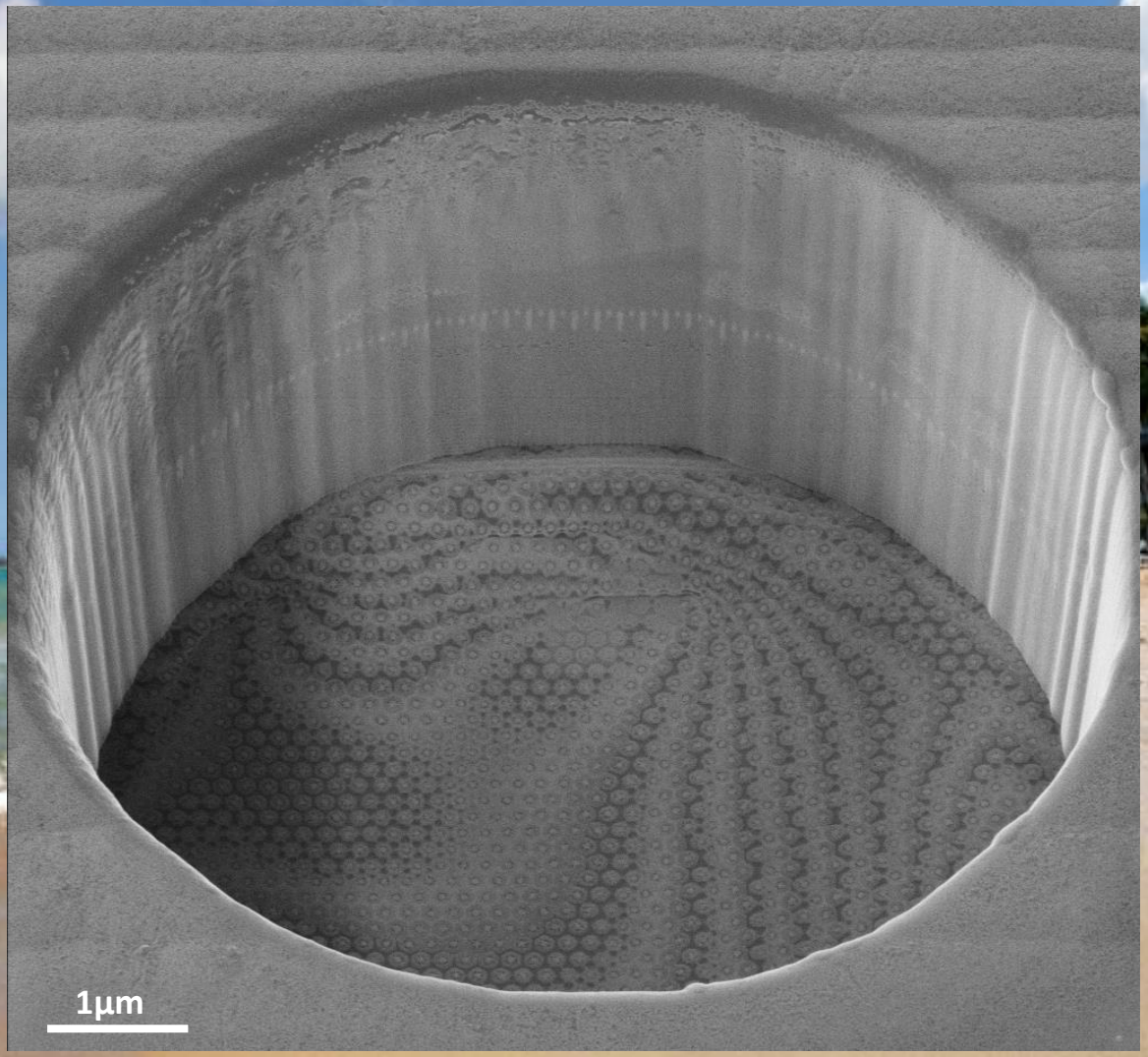
Magnification (3"x4" image): 4.14 KX **Instrument : Zeiss Sigma SEM**

Submitted by: Casimir Kuzyk **Affiliation: University of British Columbia**

2018 EIPBN MicroGraph Contest

There's plenty of pattern at the bottom.

Description:
Helium ion microscopy image of semiconductor chip after Ga-FIB milling.



Magnification (3"x4" image): 13KX

Submitted by: Deying Xia

Instrument : Zeiss Orion NanoFab

Affiliation: Carl Zeiss Microscopy, LLC

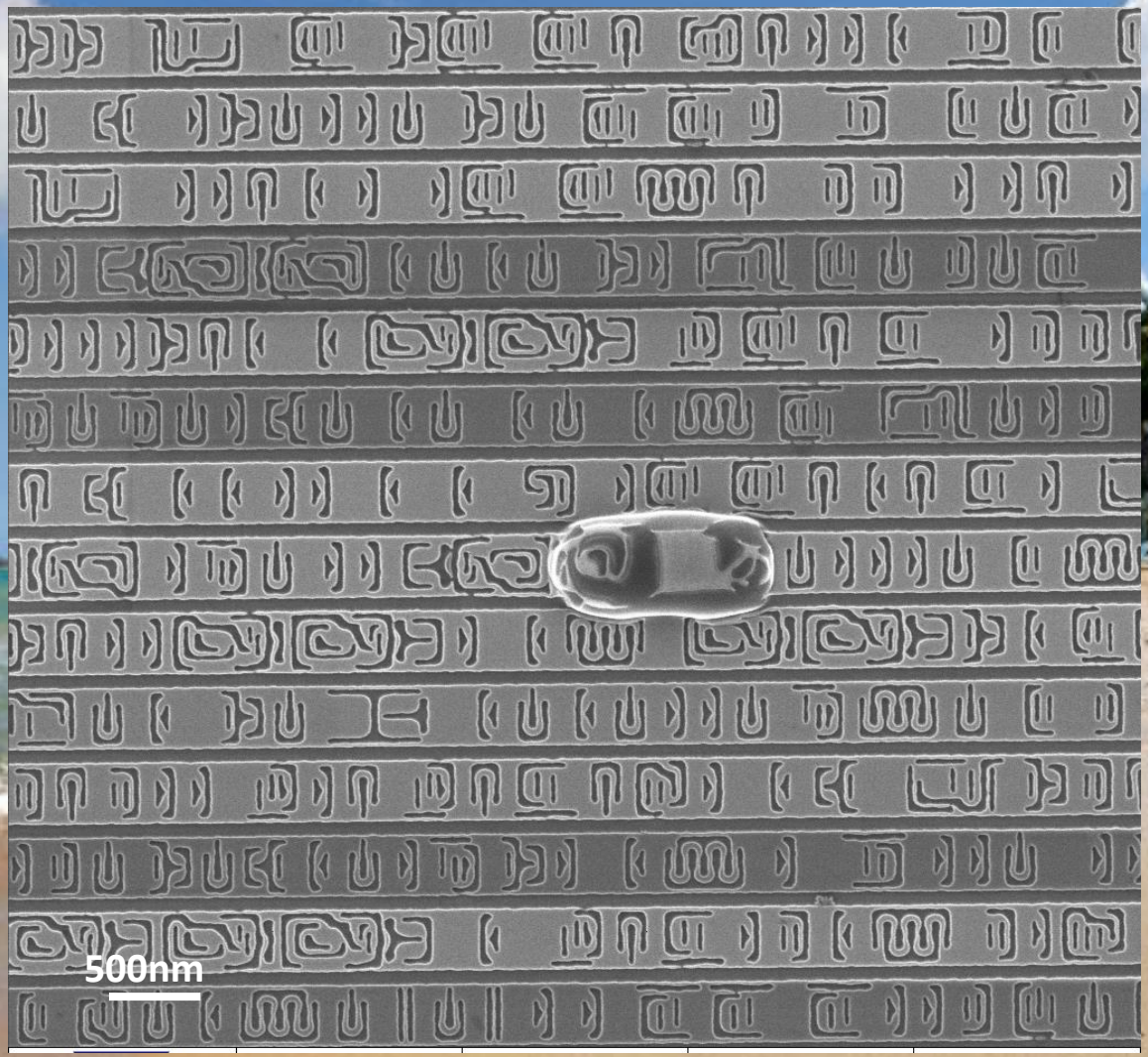
Peabody, MA, USA

2018 EIPBN MicroGraph Contest

EIPBN PUERTO RICO 2018

Drivers wanted: must be nano

Description:
Helium ion microscopy image of helium ion irradiation pattern on metal nanostructures with Si substrate.



Magnification (3"x4" image): 19KX

Submitted by: Deying Xia

Instrument : Zeiss Orion NanoFab

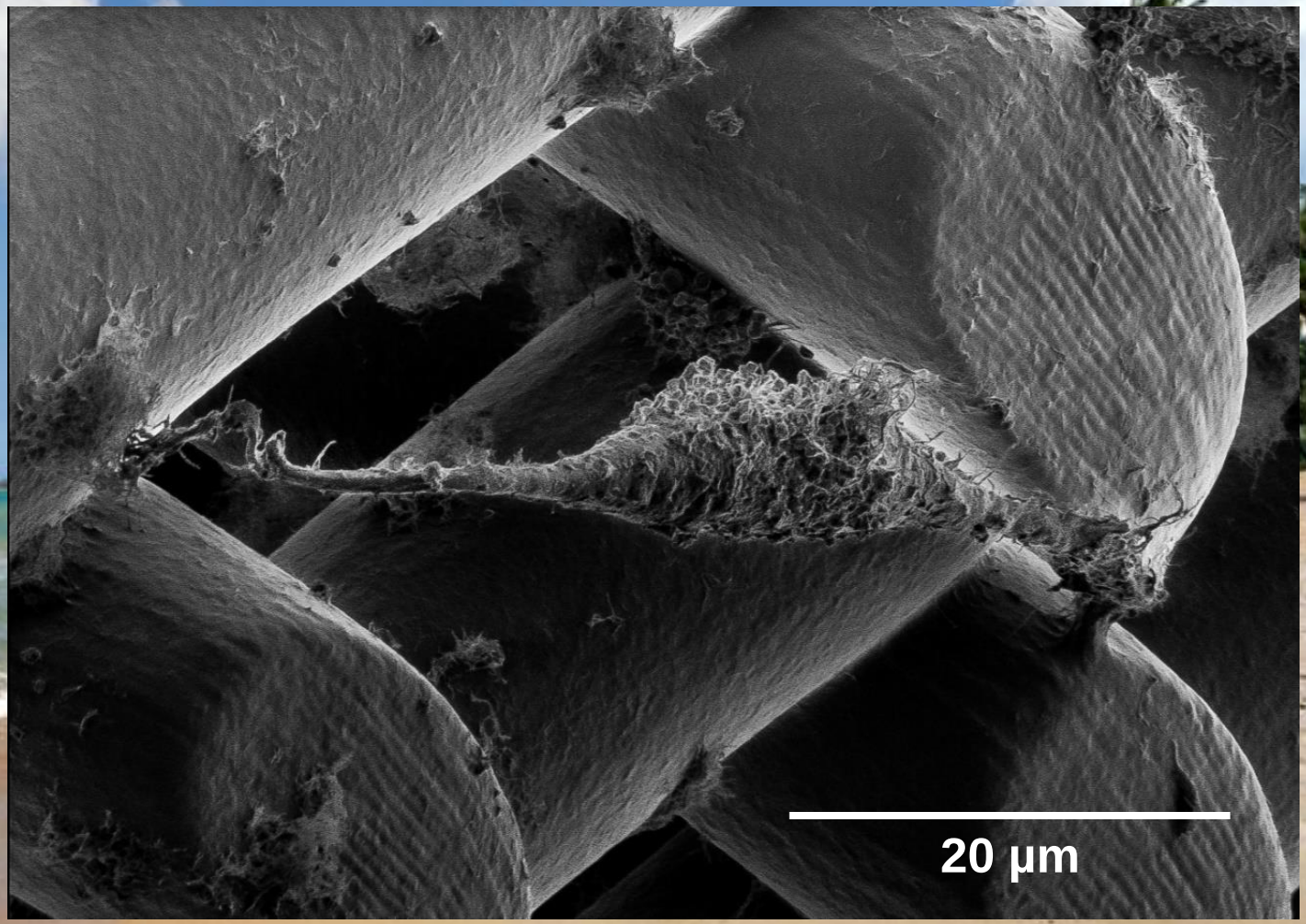
Affiliation: Carl Zeiss Microscopy, LLC
Peabody, MA, USA

2018 EIPBN MicroGraph Contest

EIPBN PUERTO RICO 2018

"STICK AROUND"

This micrograph shows a prostate cancer cell suspended between **cellulose nanocrystal** clusters doped into PEGDA hydrogel scaffolds. Our work aims to develop new 3D printing inks that incorporate renewable nanomaterials. The scaffold was printed using **2-photon DLW (Nanoscribe).** Beams are 20 µm in diameter with 30µm spacings.



Magnification: 3500x

Instrument : SEM-Helios Nanolab 600i

Submitted by: Kevin Saem

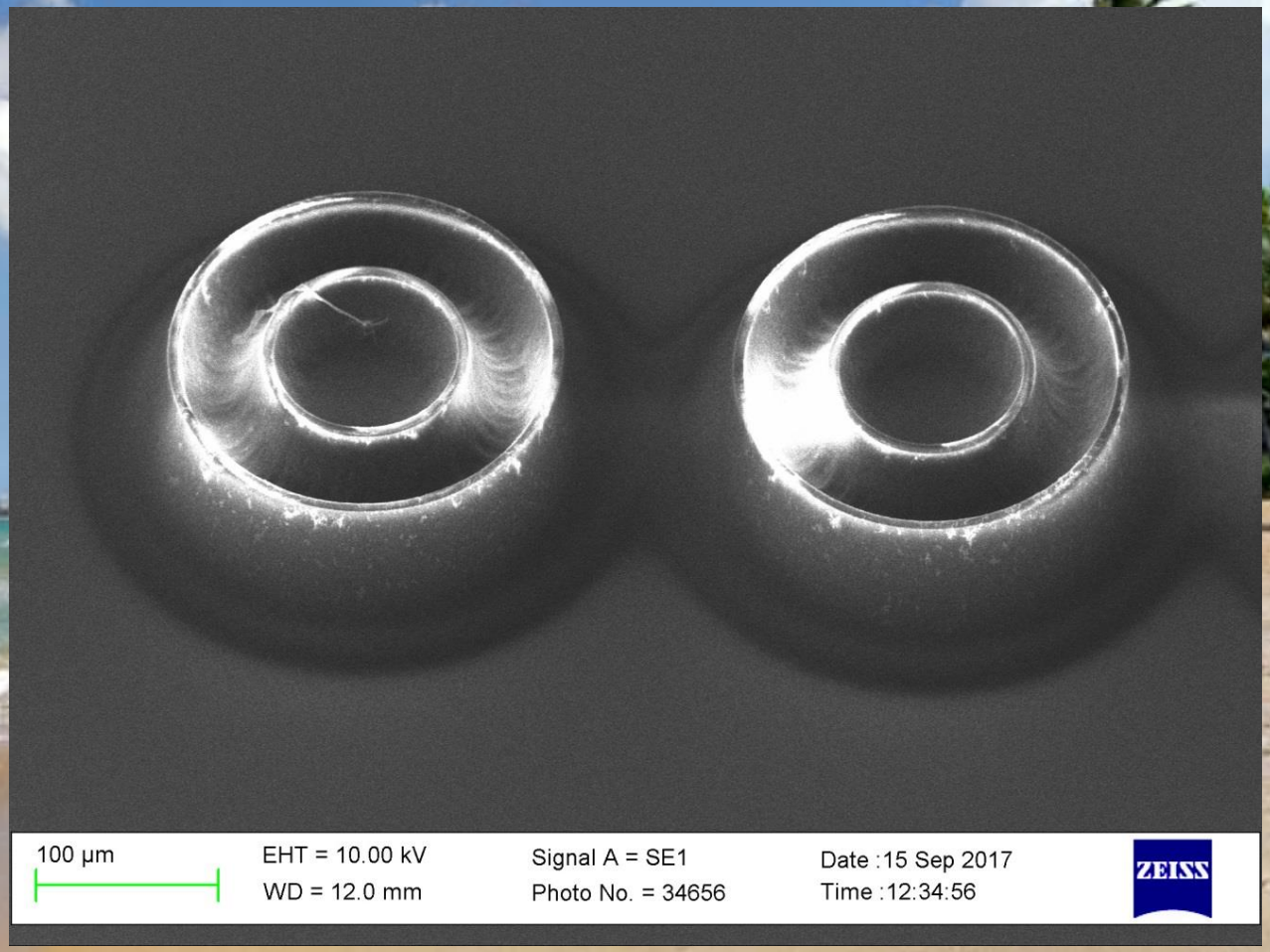
Affiliation: CNRS-LAAS / McMaster University

Toulouse-FR / Hamilton-CA

2018 EIPBN MicroGraph Contest

Micrograph Title:

“Minions Look” .



resist su8 3050, 30" @ 3000rpm (thickness: 50 um)

Aspect ratio: 1:10
EBL 100KV
dose 3uC/cm^2

Tests to verify the highest thickness we can expose on SU8 by 100kV EBL

Magnification (3"x4" image): 476 X

Instrument : Zeiss EVO 10

Submitted by: Annamaria Gerardino

Affiliation: CNR - IFN

2018 EIPBN MicroGraph Contest

Micrograph Title:

“Resist in the wind” .

resist su8 3050, 30" @ 3000rpm (thickness: 50 um)

Aspect ratio: 1:10
EBL 100KV
dose 3uC/cm^2

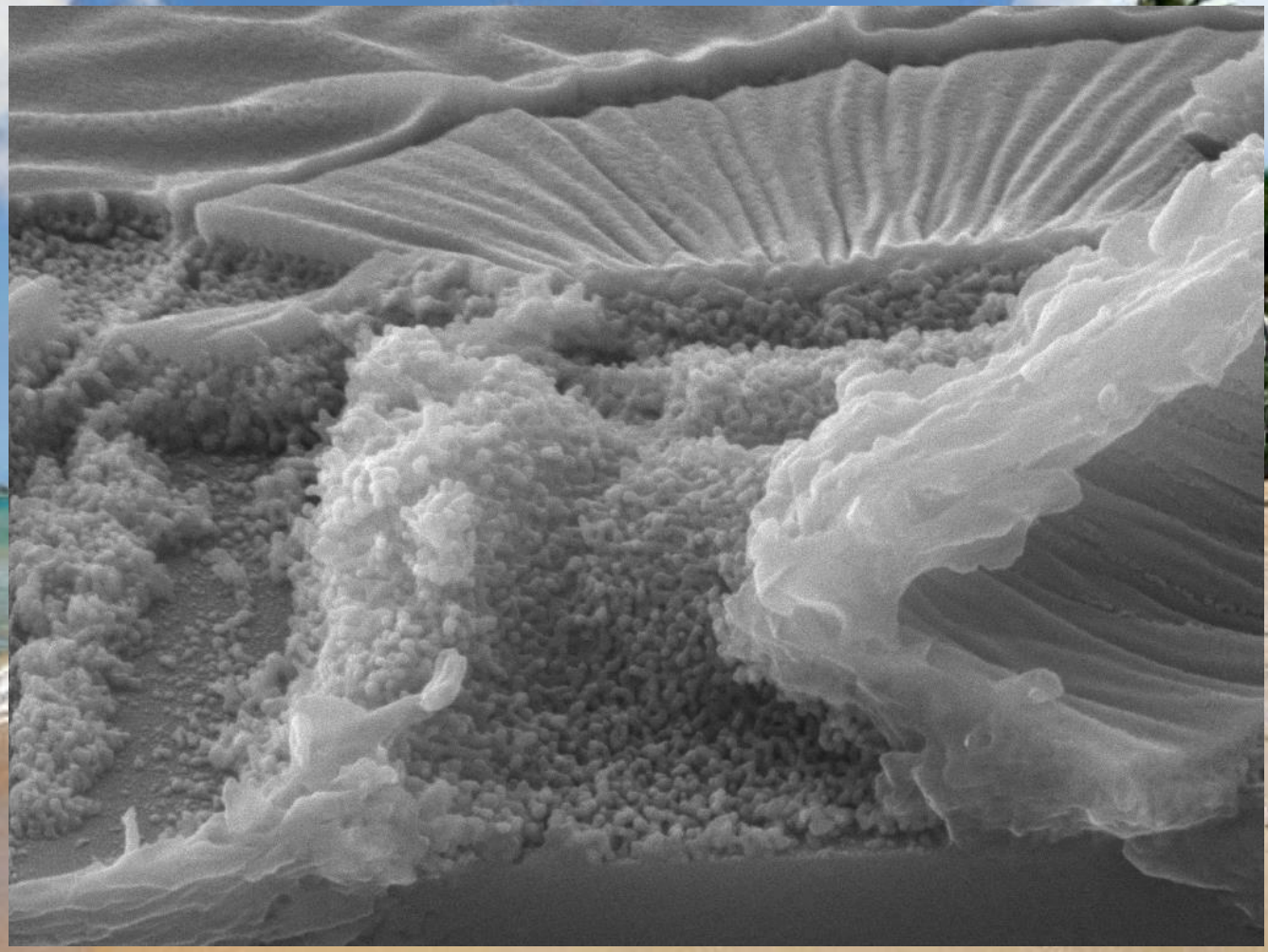
Tests to verify the highest thickness we can expose on SU8 by 100kV EBL

Magnification (3"x4" image): 332 X Instrument : Zeiss EVO 10

Submitted by: Annamaria Gerardino Affiliation: CNR - IFN

2018 EIPBN MicroGraph Contest

Micrograph Title:
The Maelstrom



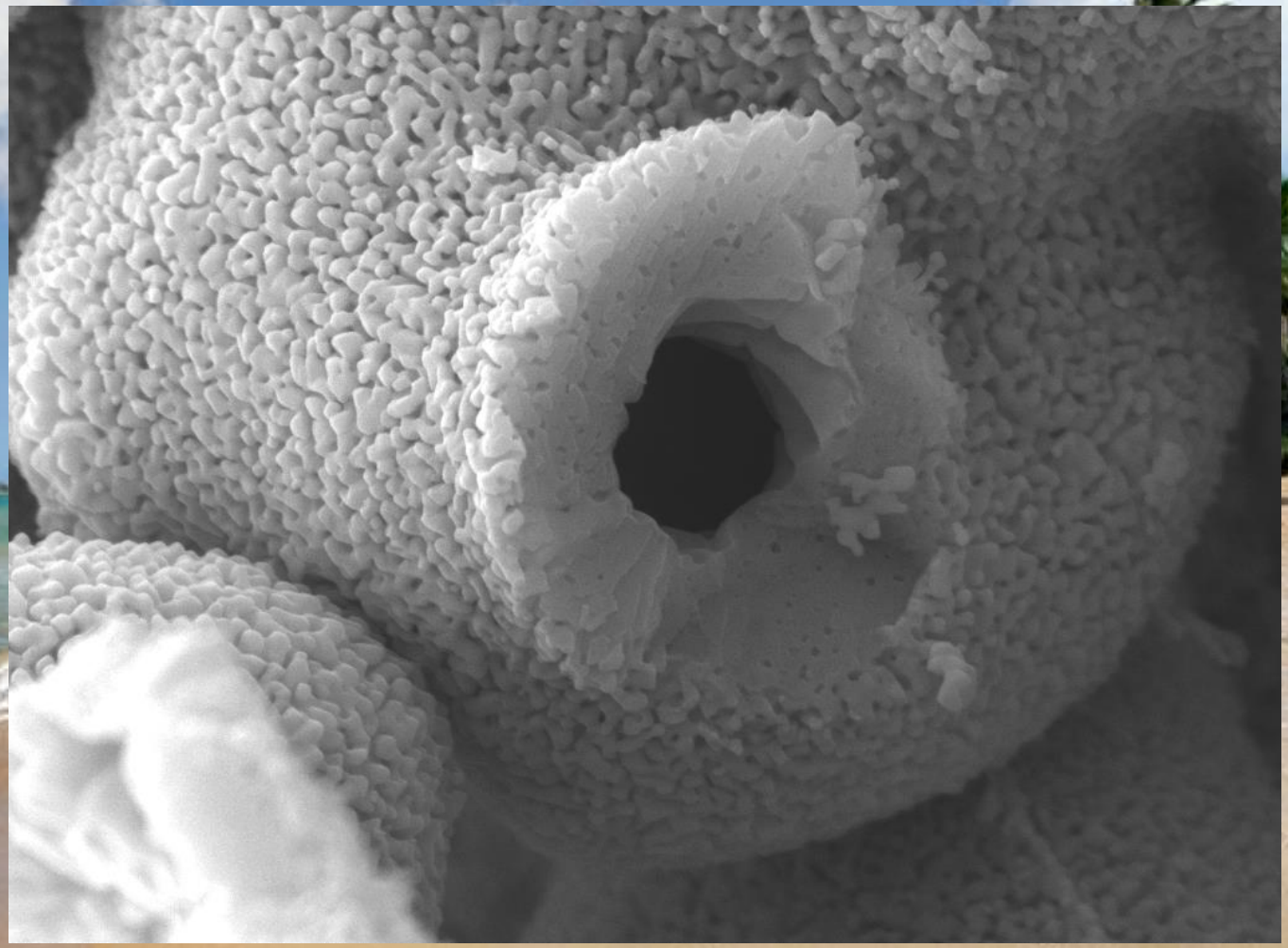
Description:
Mn_2O_3 film composed of nanoparticles after thermal processing

Magnification (3"x4" image): 55.4KX
Instrument : Tescan Mira3

Submitted by: Molly C. Brockway
Affiliation: Montana Tech

2018 EIPBN MicroGraph Contest

Micrograph Title:
Kraken Eye



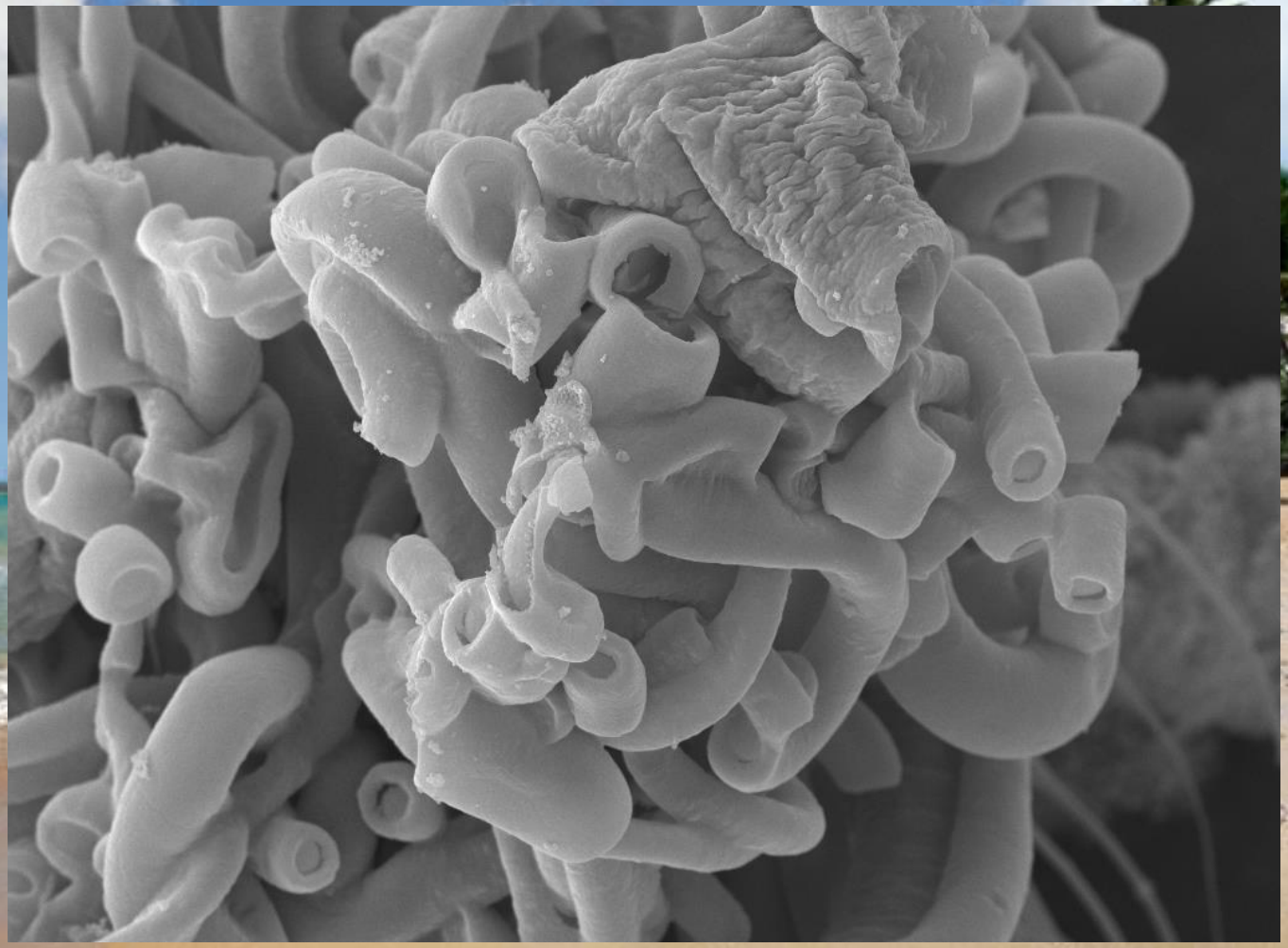
Description:
Electrospun Mn_2O_3 thermally processed while freestanding

Magnification (3"x4" image): 50.9KX
Instrument : Tescan Mira3

Submitted by: Molly C. Brockway
Affiliation: Montana Tech

2018 EIPBN MicroGraph Contest

Micrograph Title:
Macaroni, Macaroni, give me the formuloni



Description:
Electrospun Mn_2O_3 after multiphase thermal processing while freestanding

Magnification (3"x4" image): 13.8KX

Instrument : Tescan Mira3

Submitted by: Molly C. Brockway

Affiliation: Montana Tech

2018 EIPBN MicroGraph Contest

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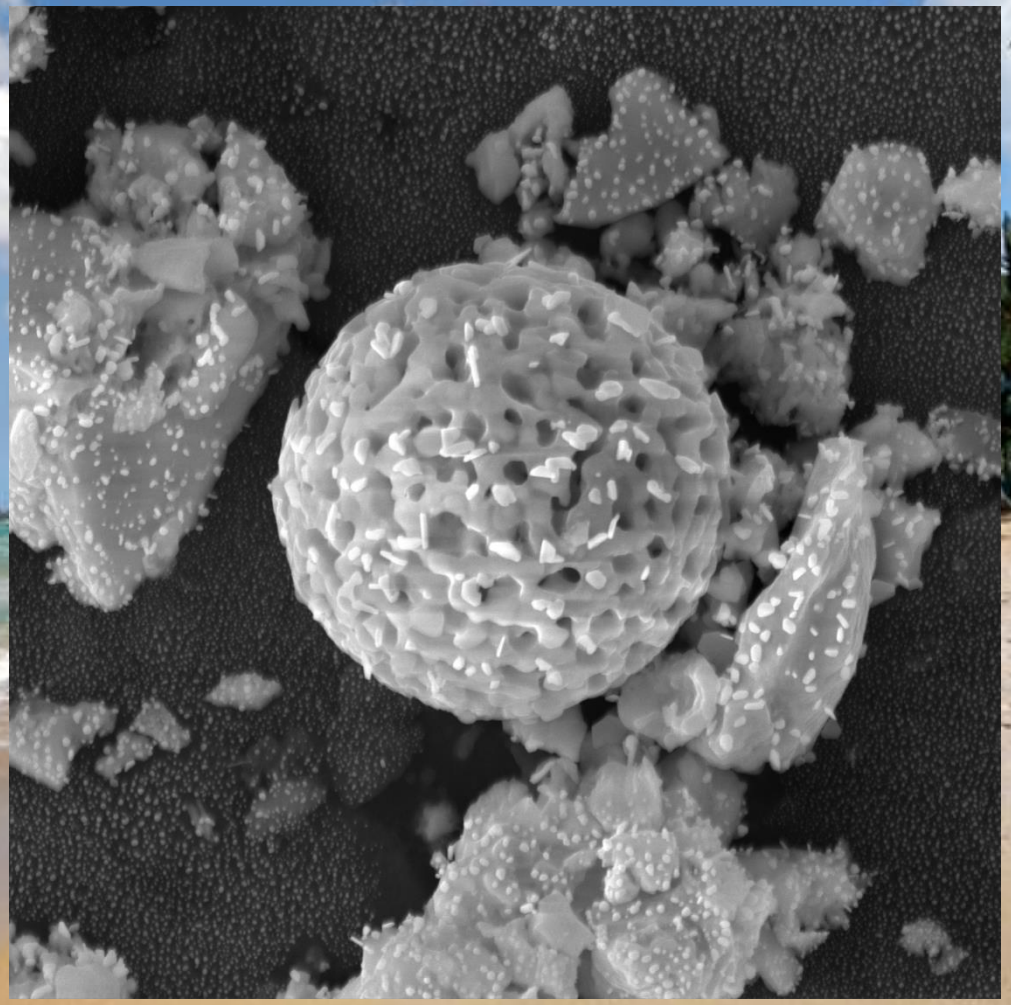
Micrograph Title:
Perovksite Doomsday Spore

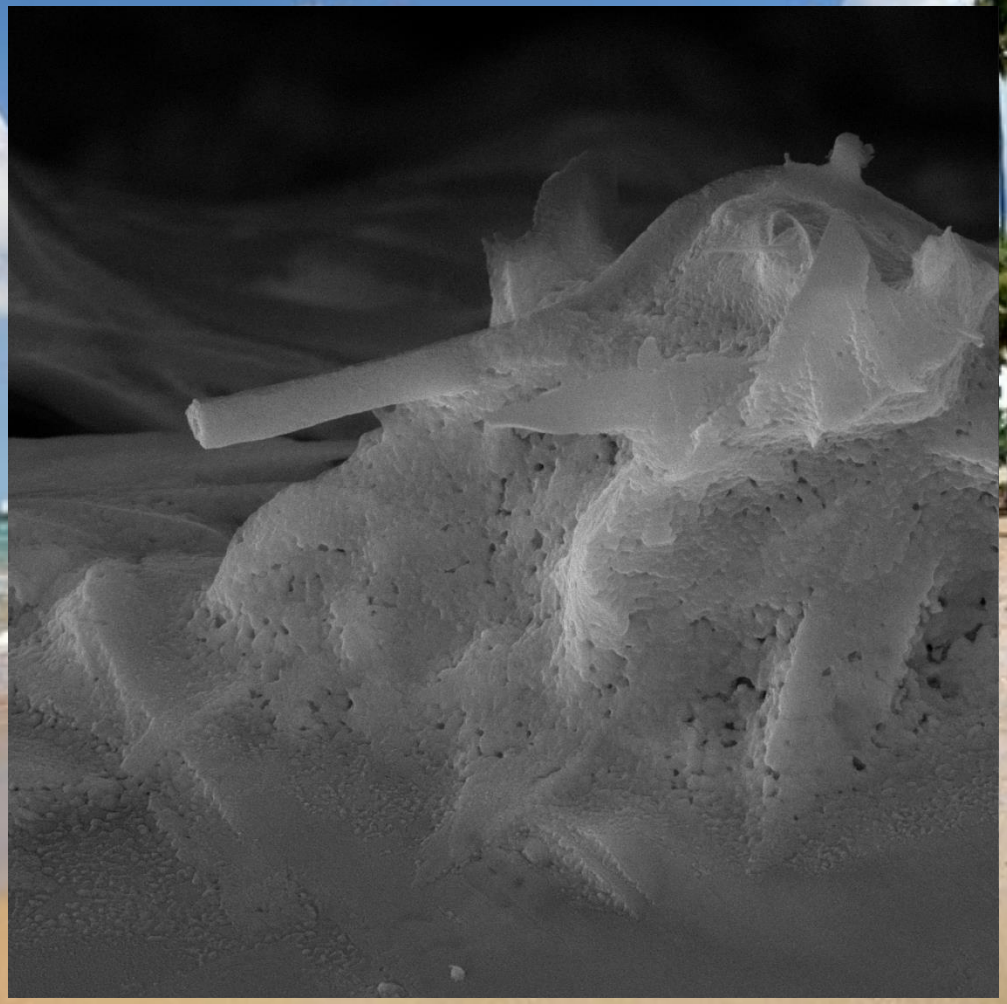
Description:
Hybrid perovskite sphere formed during melt electrospinning



Magnification (3"x4" image): 16.9KX
Instrument : Tescan Mira3
Submitted by: John P. Murphy
Affiliation: Montana Tech

2018 EIPBN MicroGraph Contest

Micrograph Title:
Aroused Elephant



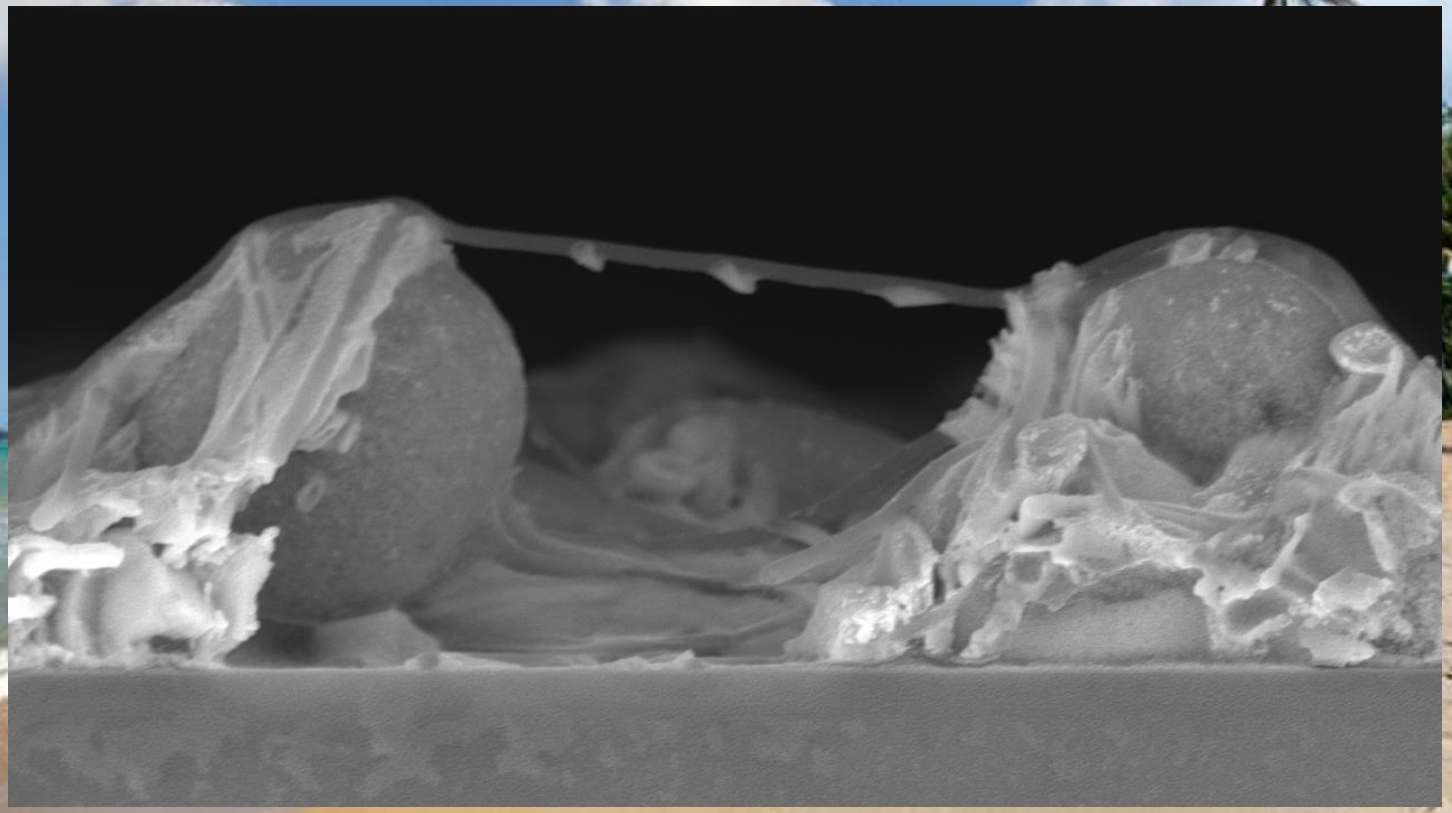
Description:
Electrospun TiO2 fibers, coated with hybrid perovskite

Magnification (3"x4" image): 20.1KX **Instrument : Tescan Mira3**

Submitted by: John P. Murphy **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Flea Circus Tightrope Walk Fiasco



Description:
PEDOT:PSS fibers coated with hybrid perovskite

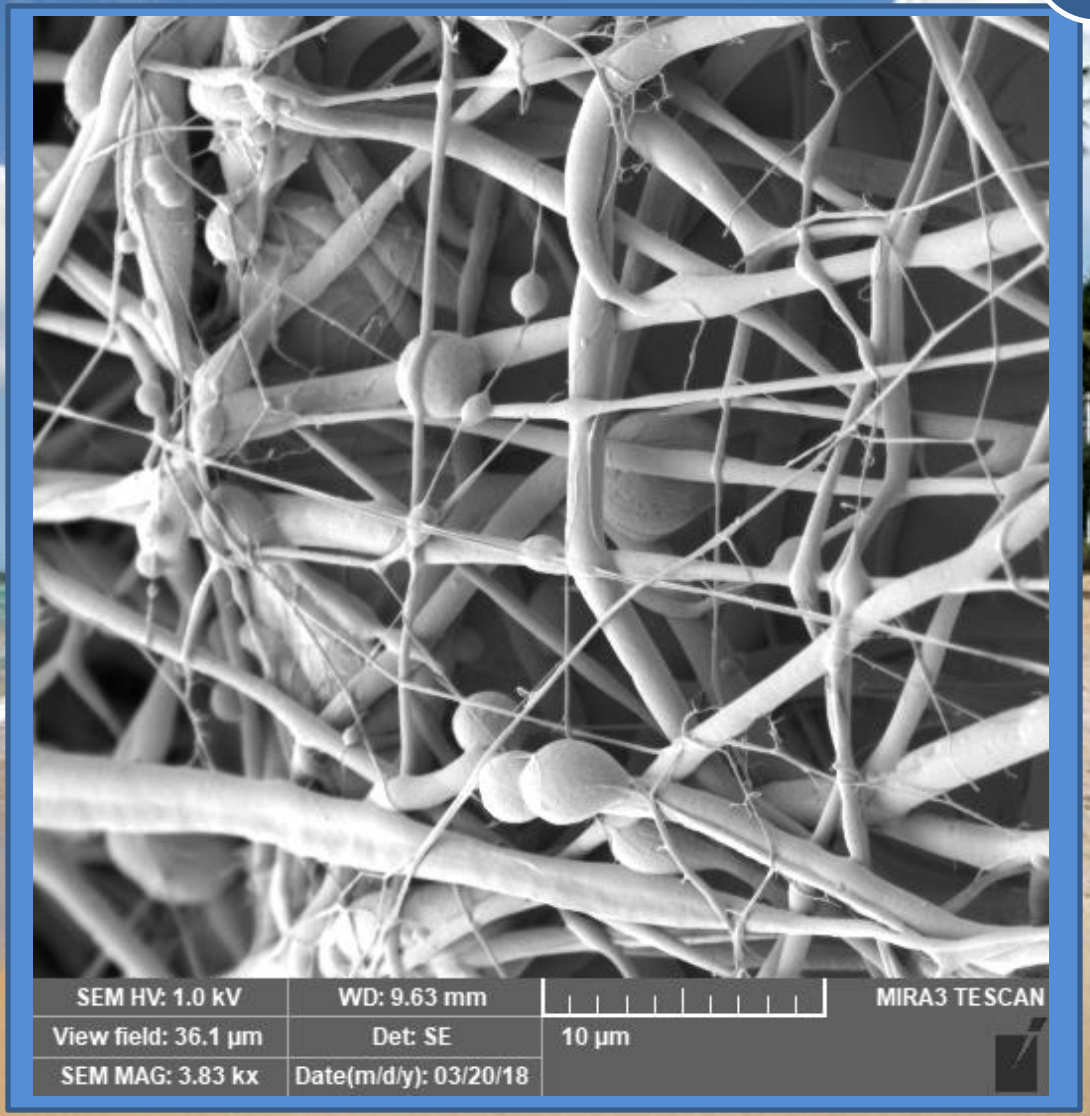
Magnification (3"x4" image): 8.99KX **Instrument : Tescan Mira3**

Submitted by: John P. Murphy **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Inadequate Beads on a String

Description:
Imperfections of a portable fiber fabricator.



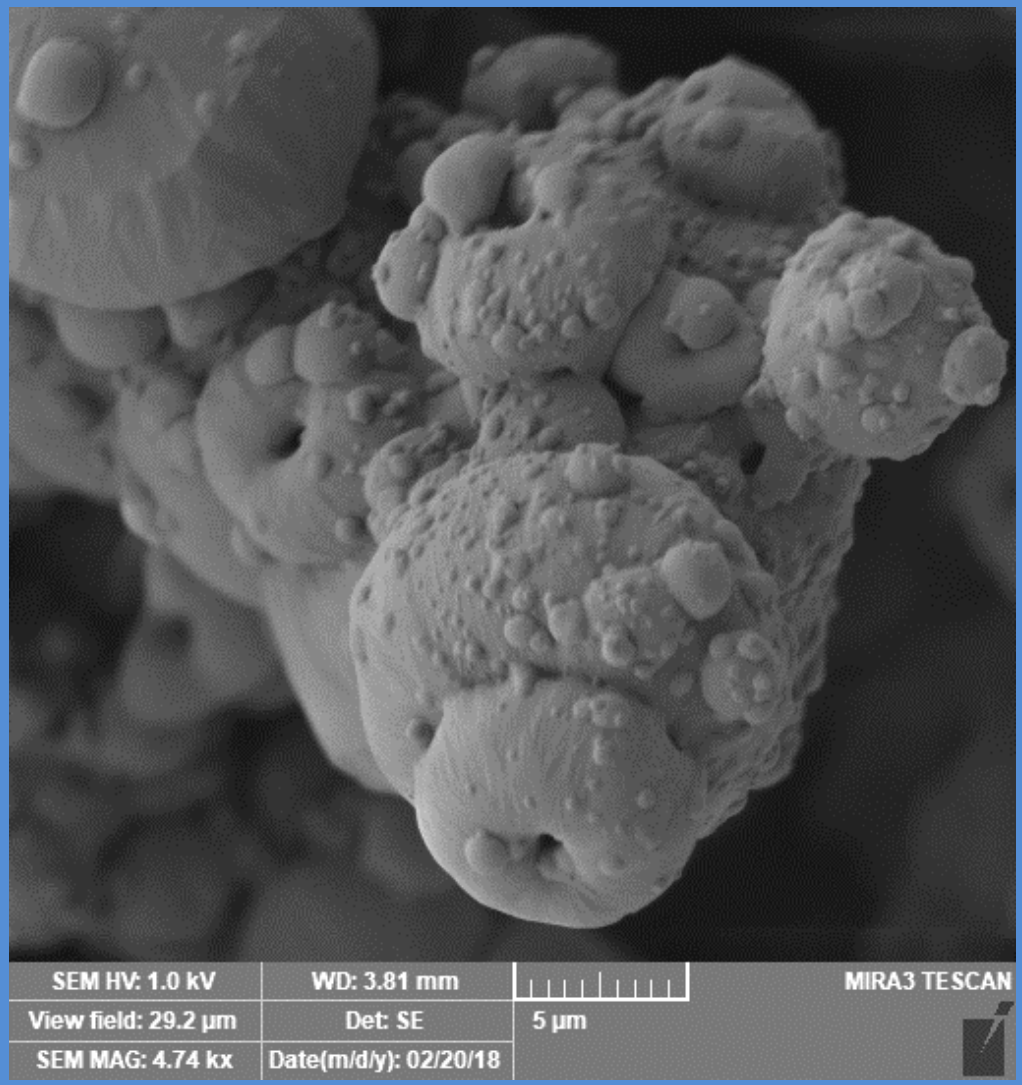
Magnification (3"x4" image): 3.83KX **Instrument : Tescan Mira 3**

Submitted by: Jessica M. Andriolo **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Flying Gummy

Description:
Accidental electrospraying of airborne gold embedded polymer.



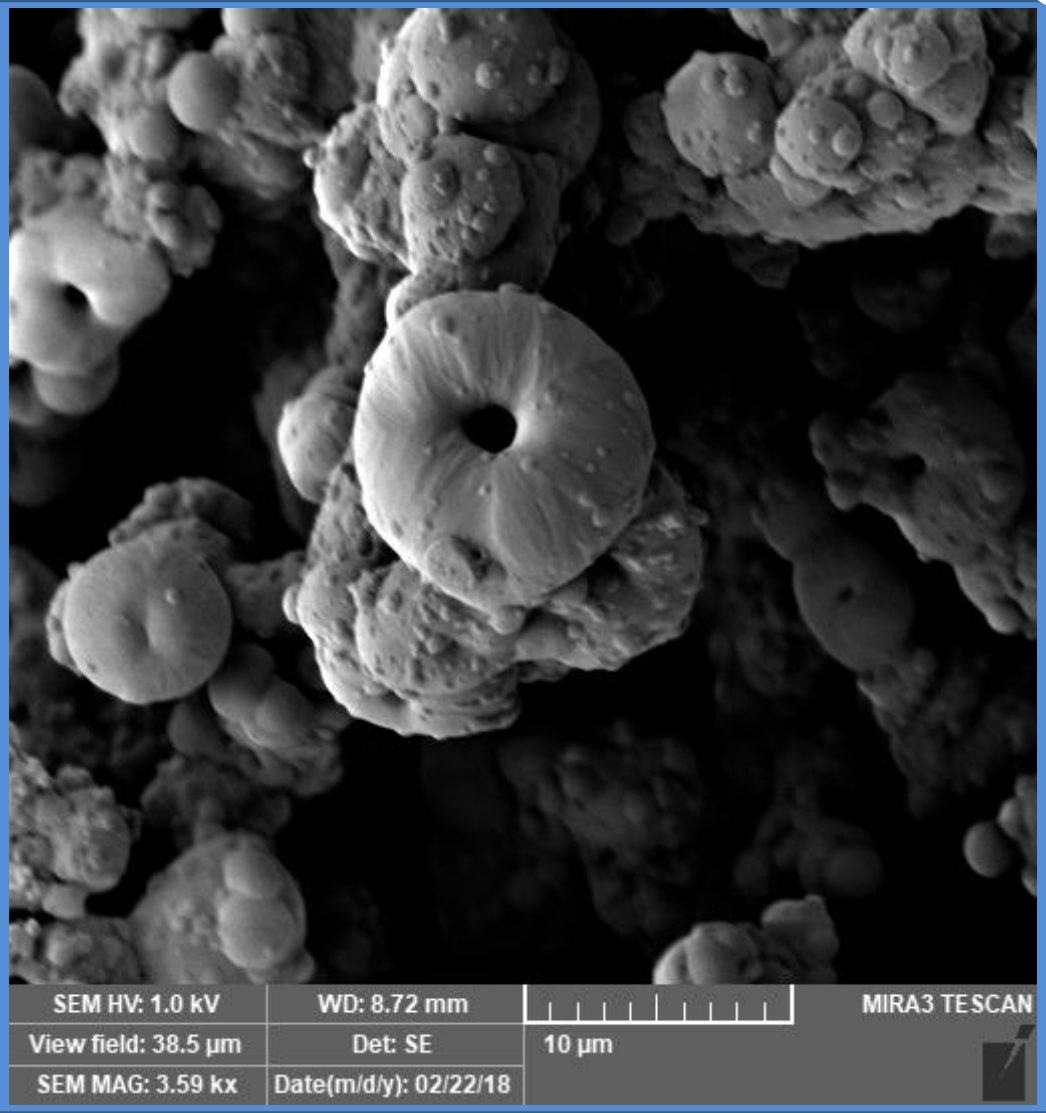
Magnification (3"x4" image): 4.74KX **Instrument : Tescan Mira 3**

Submitted by: Jessica M. Andriolo **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Freckled Sun

Description:
Accidental electrospraying of light-embracing gold embedded polymer.



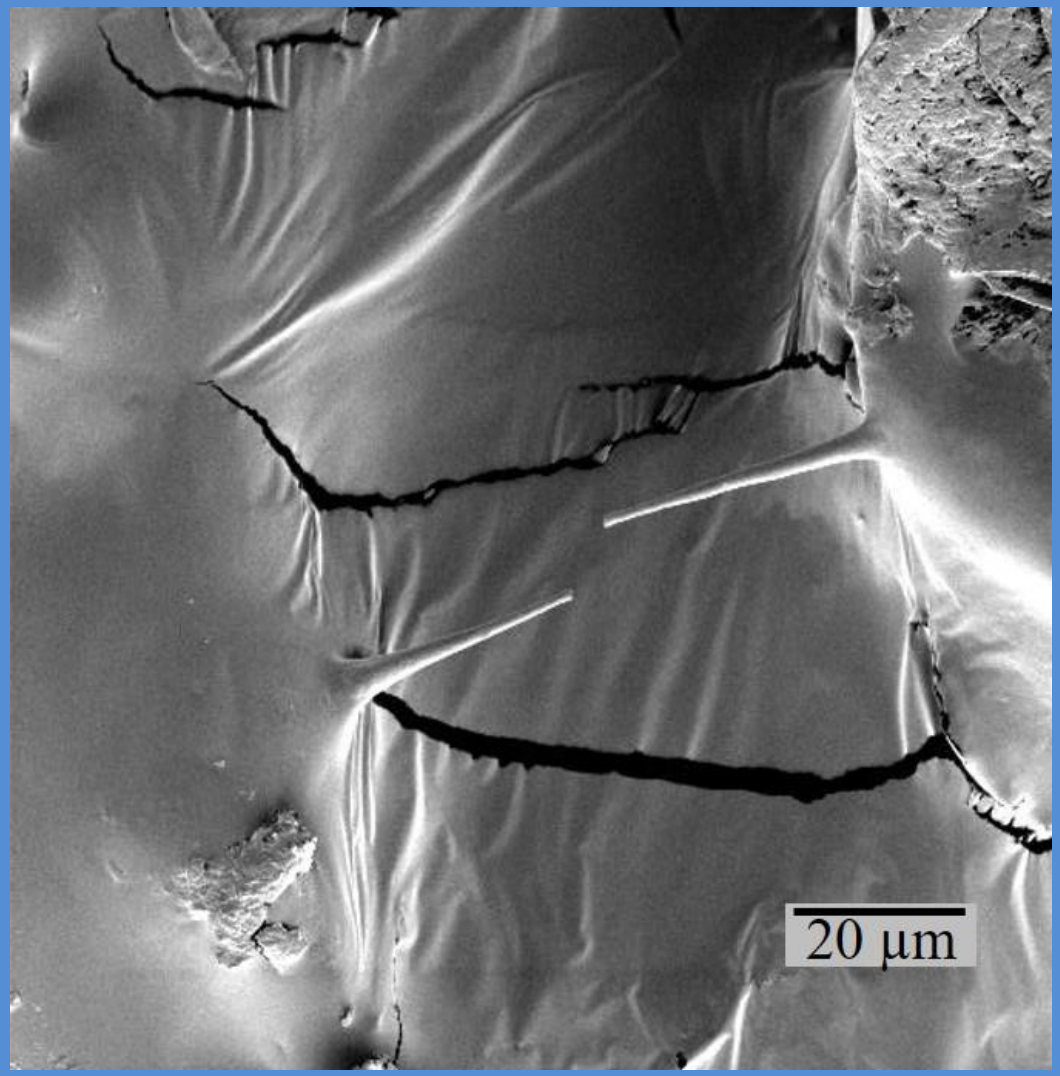
Magnification (3"x4" image): 3.59KX **Instrument : Tescan Mira 3**

Submitted by: Jessica M. Andriolo **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Hi-yah!

Description:
Unidentified opposing structures taken from an aluminum stub containing virus releasing polymer.



Magnification (3"x4" image): 1.09KX **Instrument : Tescan Mira 3**

Submitted by: Jessica M. Andriolo **Affiliation: Montana Tech**

2018 EIPBN MicroGraph Contest

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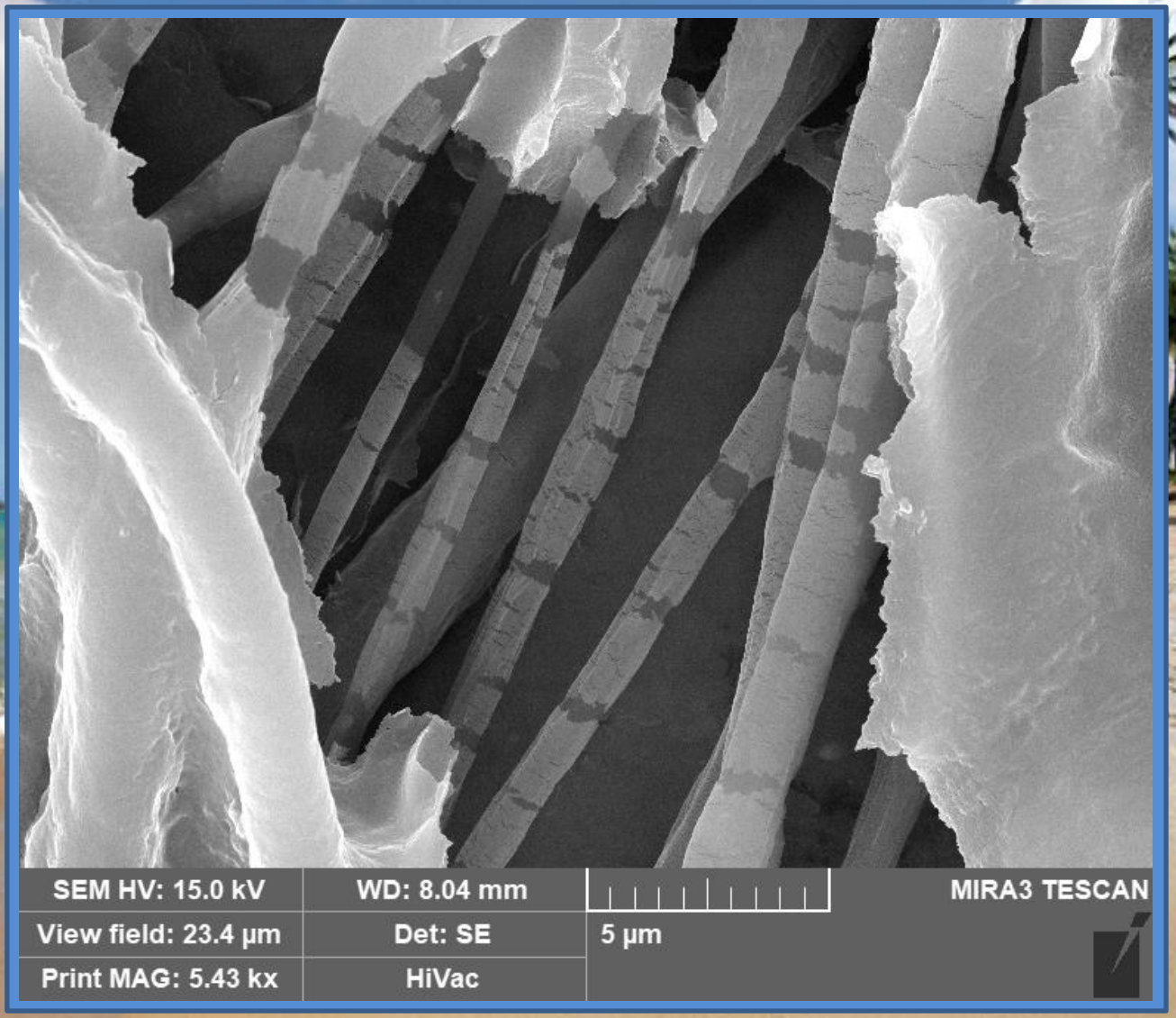
Micrograph Title:
Truffula

Description:
The Lorax was found amongst monkey cells grown on electrospun fibers.



Magnification (3"x4" image): 5.43KX **Instrument : Tescan Mira 3**

Submitted by: Jessica M. Andriolo **Affiliation: Montana Tech**

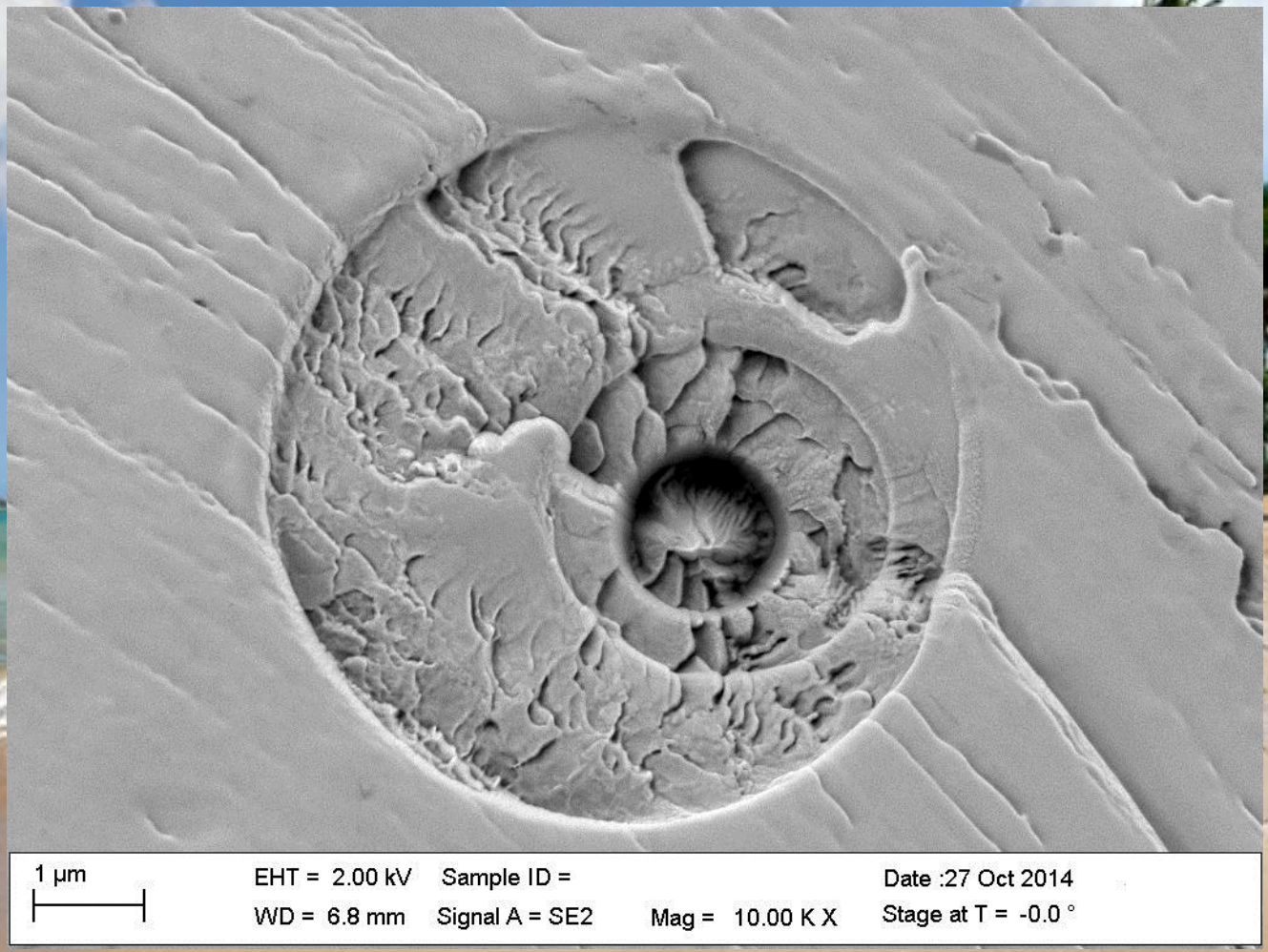
2018 EIPBN MicroGraph Contest

Micrograph Title:

Titanium Nautilus

Description:

The result of a focused ion beam milling operation.



Magnification (3"x4" image): 10KX

Instrument : Zeiss Cross-Beam

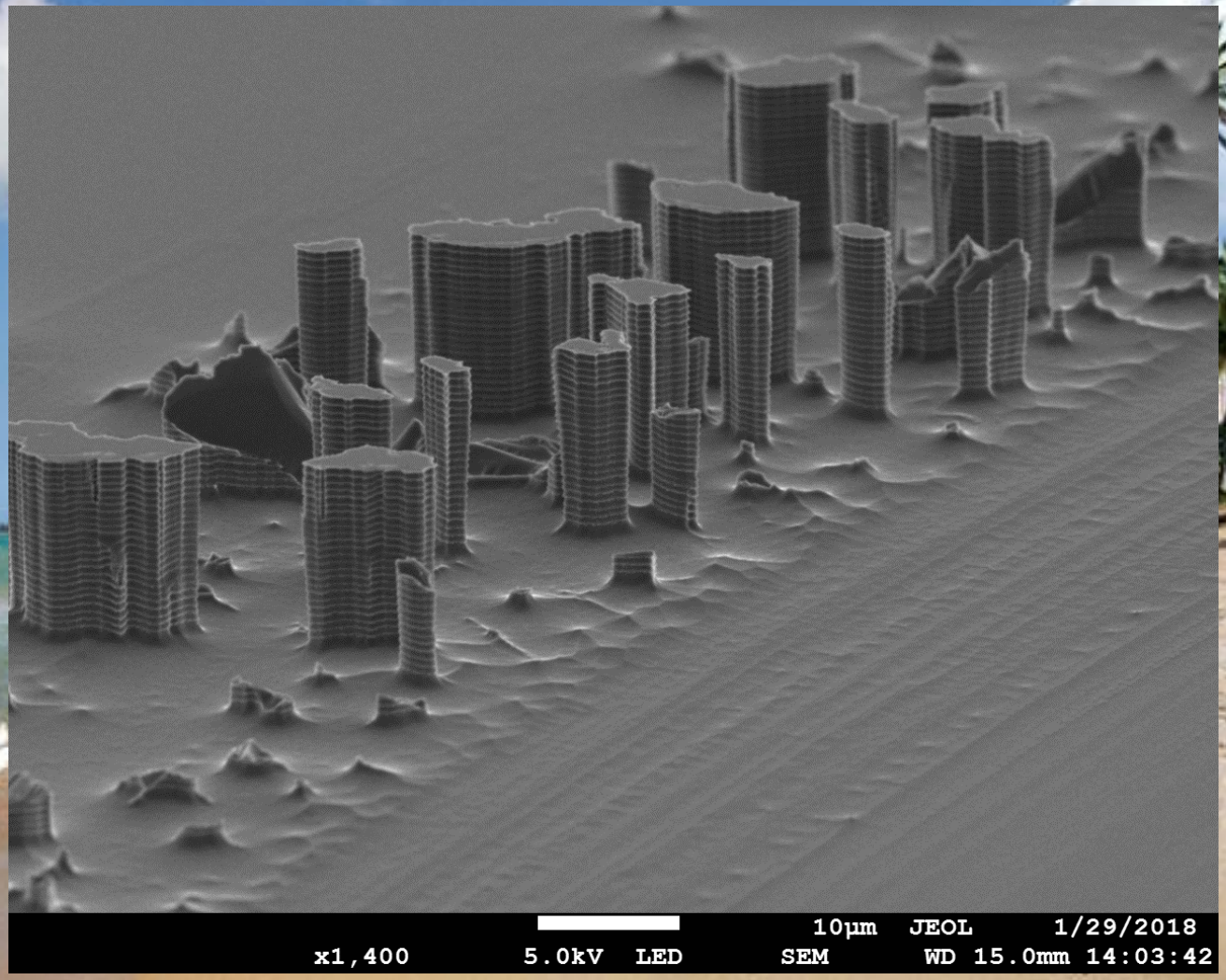
Submitted by: John Gerling

Affiliation: KLA-Tencor

2018 EIPBN MicroGraph Contest

Micrograph Title:
Beachfront Skyline

Description:
DRIE silicon pillars from sample contamination

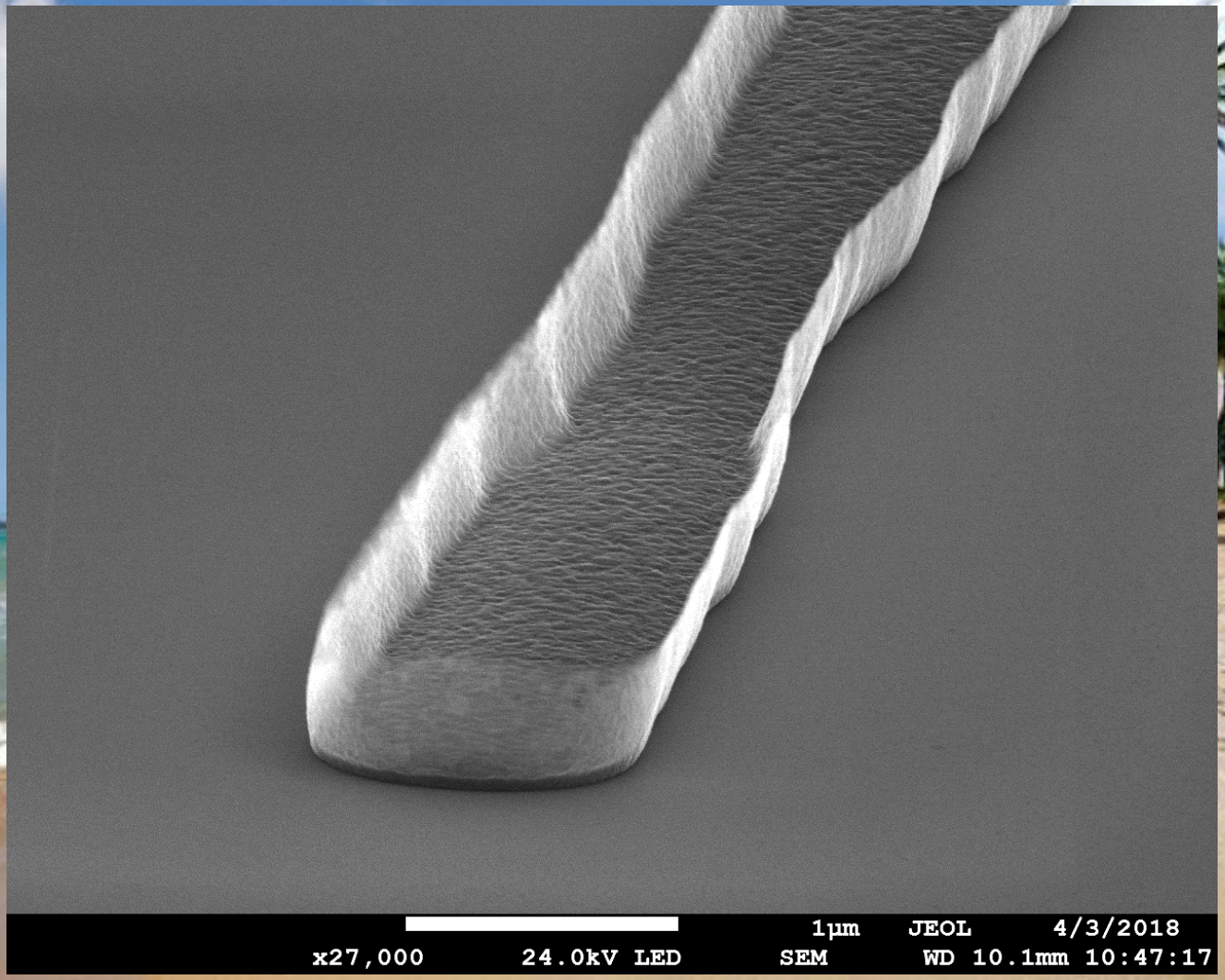


Magnification (3"x4" image): 1.4KX
Instrument : JEOL JSM 7200F
Submitted by: Greg Holloway
Affiliation: Quantum NanoFab
University of Waterloo

2018 EIPBN MicroGraph Contest

Micrograph Title:
Boundless Waterfall

Description:
Sputtered aluminum pattern with prominent liftoff ‘ears’

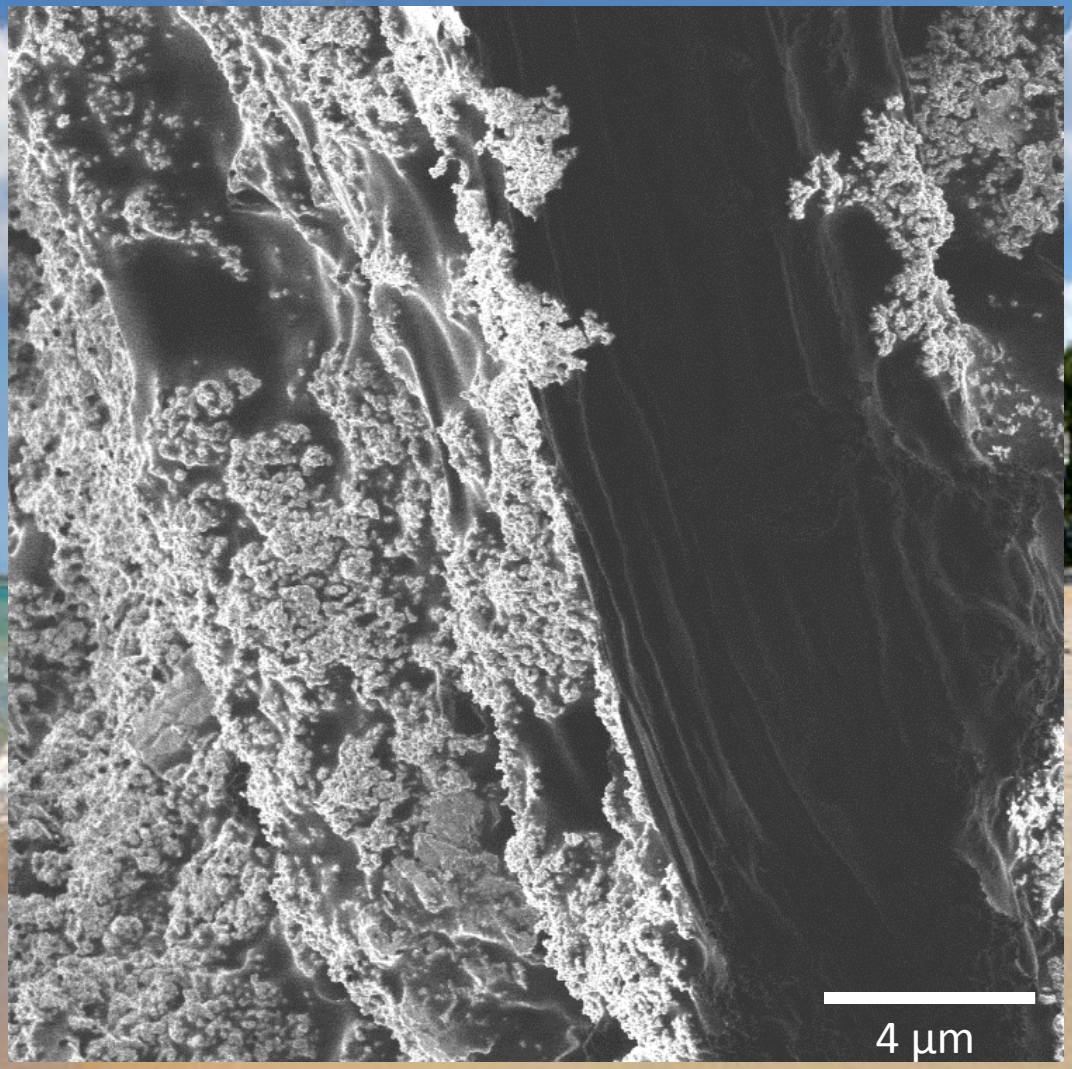


Magnification (3"x4" image): 27 KX
Instrument : JEOL JSM 7200F

Submitted by: Greg Holloway
Affiliation: Quantum NanoFab
University of Waterloo

2018 EIPBN MicroGraph Contest

Micrograph Title:
Battle of San Juan Hill



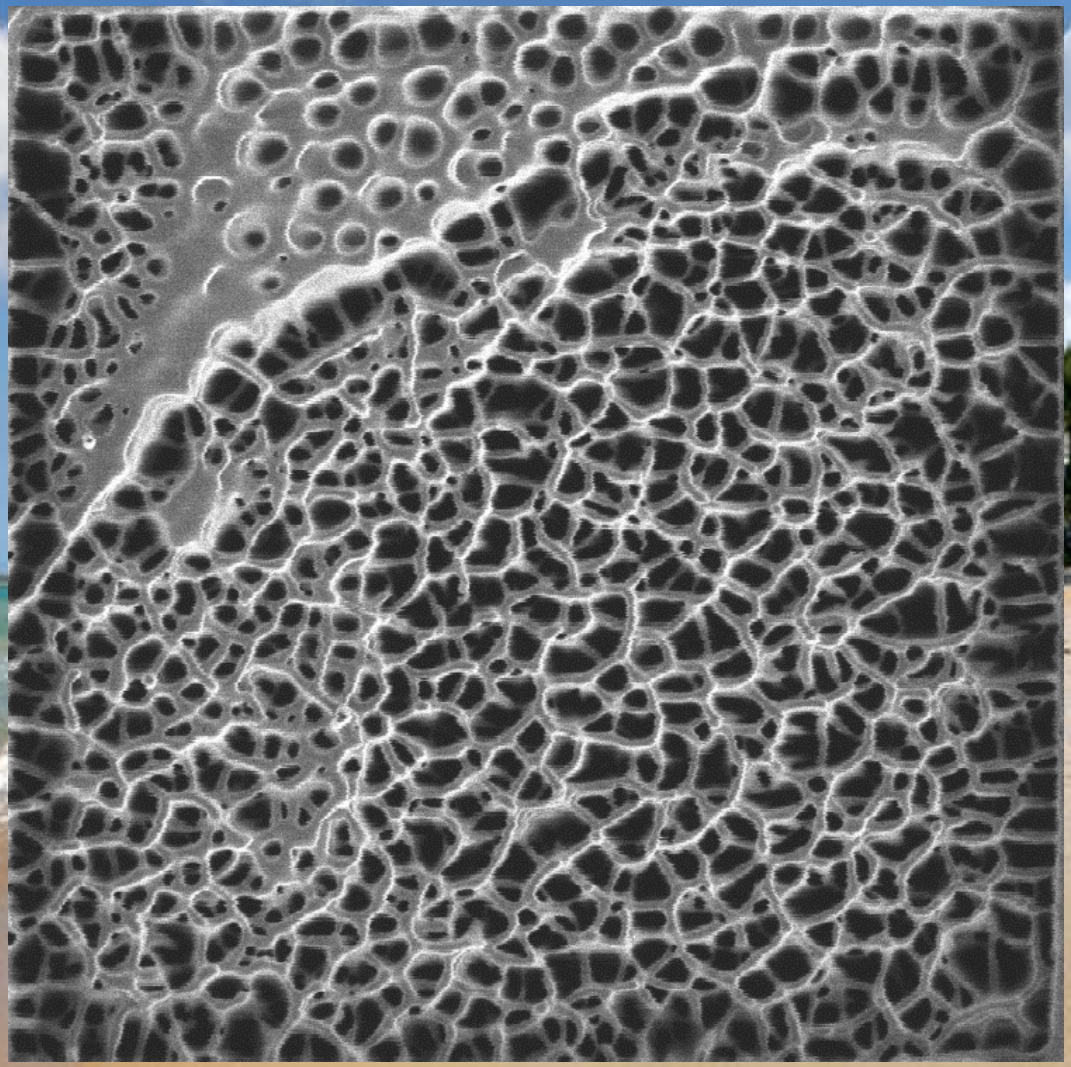
Description:
Anther covered in creeping carbon particles and Fluoroelastomer

Magnification (3"x4" image): 5KX
Instrument : Cs^+ LoTIS-FIB
Submitted by: Adam V. Steele
Affiliation: zeroK NanoTech MD, USA

2018 EIPBN MicroGraph Contest

EIPBN PUERTO RICO 2018

Micrograph Title:
Cellular Spaghetti



Description:
FIB etch of fixed red blood cell revealing cellular structure

Magnification (3"x4" image): 20KX

Instrument : Cs^+ LoTIS-FIB

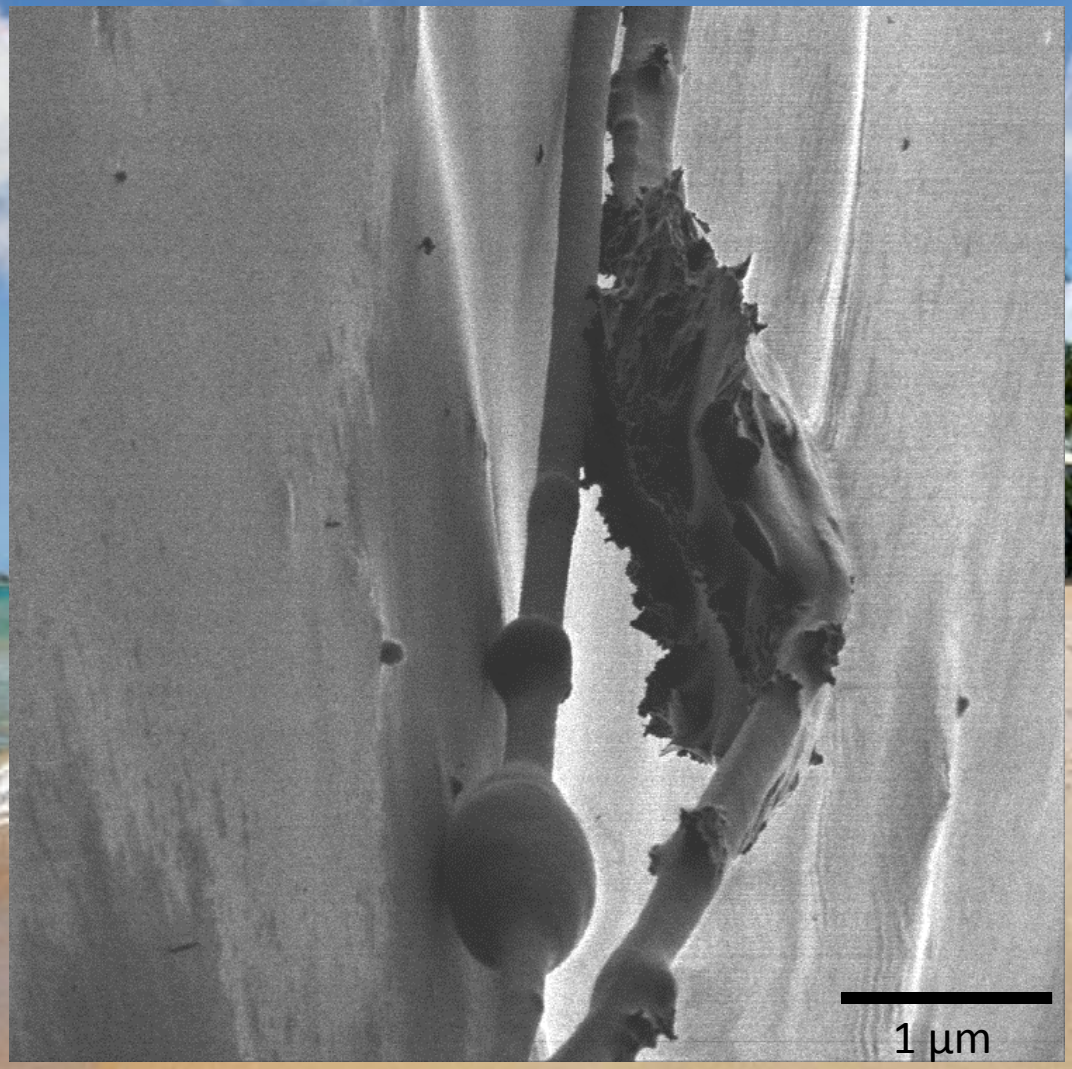
Submitted by: Adam V. Steele

Affiliation: zeroK NanoTech
MD, USA

2018 EIPBN MicroGraph Contest

Micrograph Title:
Every Rose Has Its Thorn

Description:
Plant fiber extracted from anther of a springtime bloom

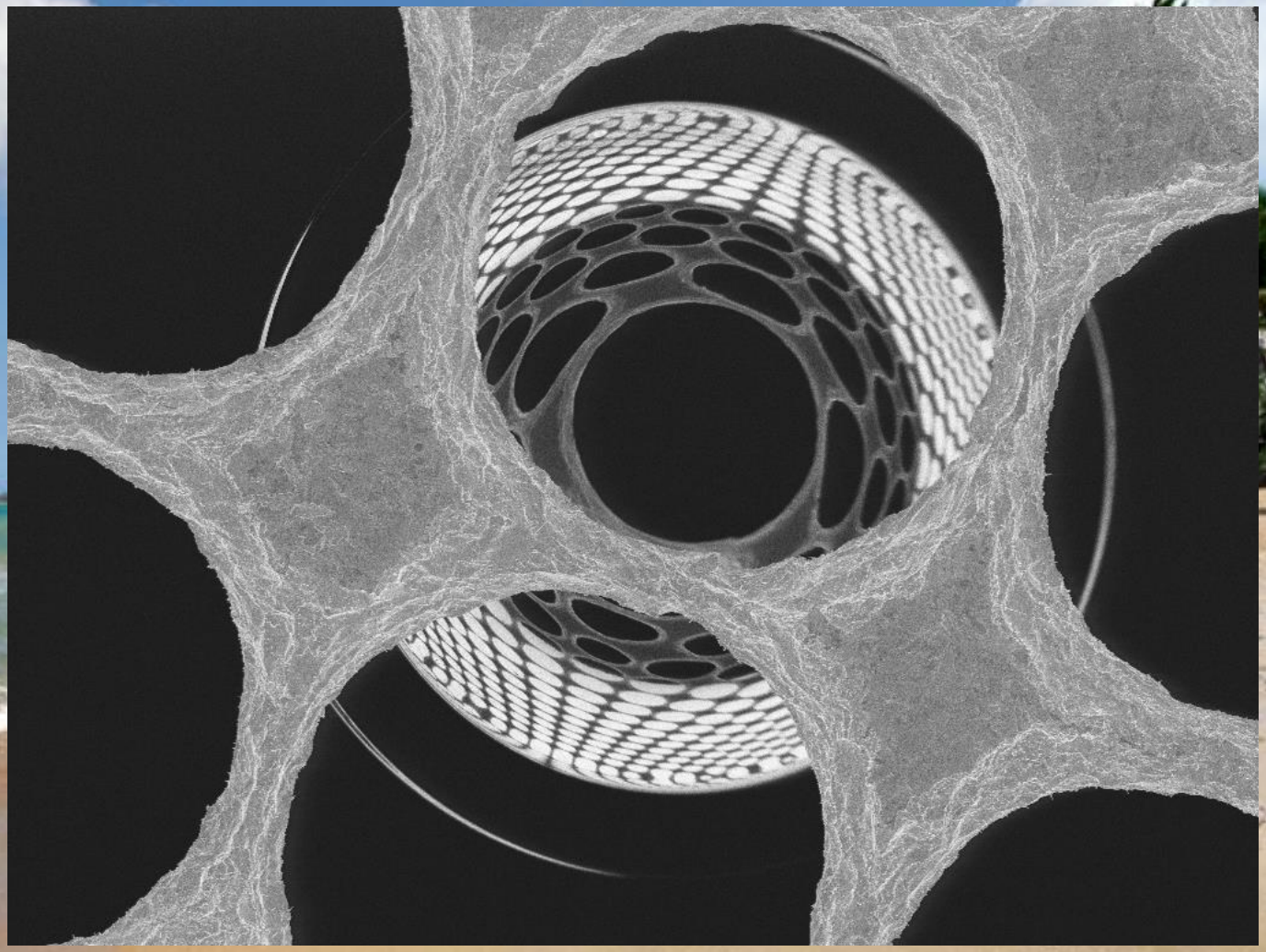


Magnification (3"x4" image): 20KX
Submitted by: Adam V. Steele

Instrument : Cs^+ LoTIS-FIB
Affiliation: zeroK NanoTech
MD, USA

2018 EIPBN MicroGraph Contest

Micrograph Title:
Black hole in an SEM



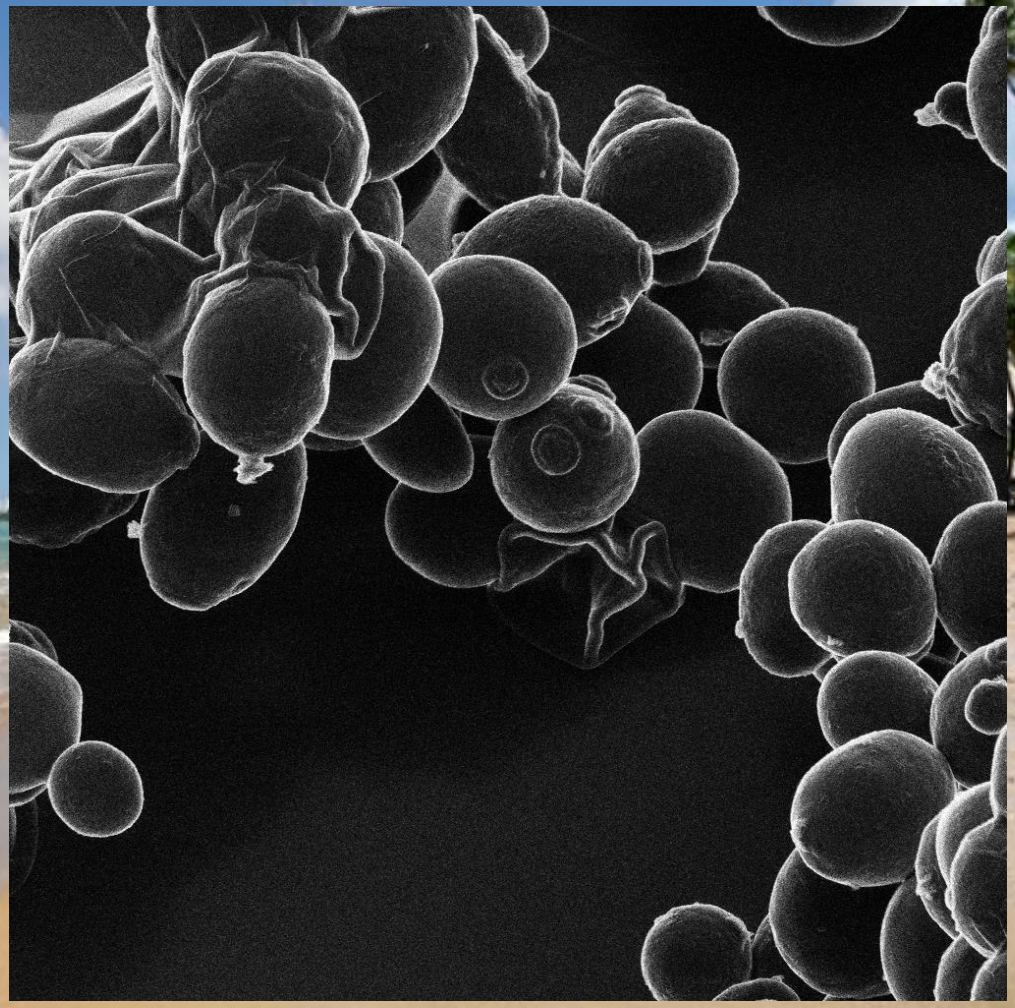
Description:
Copper grid (front) with its demagnified and distorted reflection in a concave electron mirror

Magnification (3"x4" image): 1KX
Instrument : Zeiss SEM (LEO 1525)

Submitted by: Navid Abedzadeh
Affiliation: MIT, Cambridge MA

2018 EIPBN MicroGraph Contest

Micrograph Title:
Run, Forrest! Run!



Description:
One yeast cell decided to grow arms and legs and to go for a little run.

Magnification (3"x4" image): 4KX

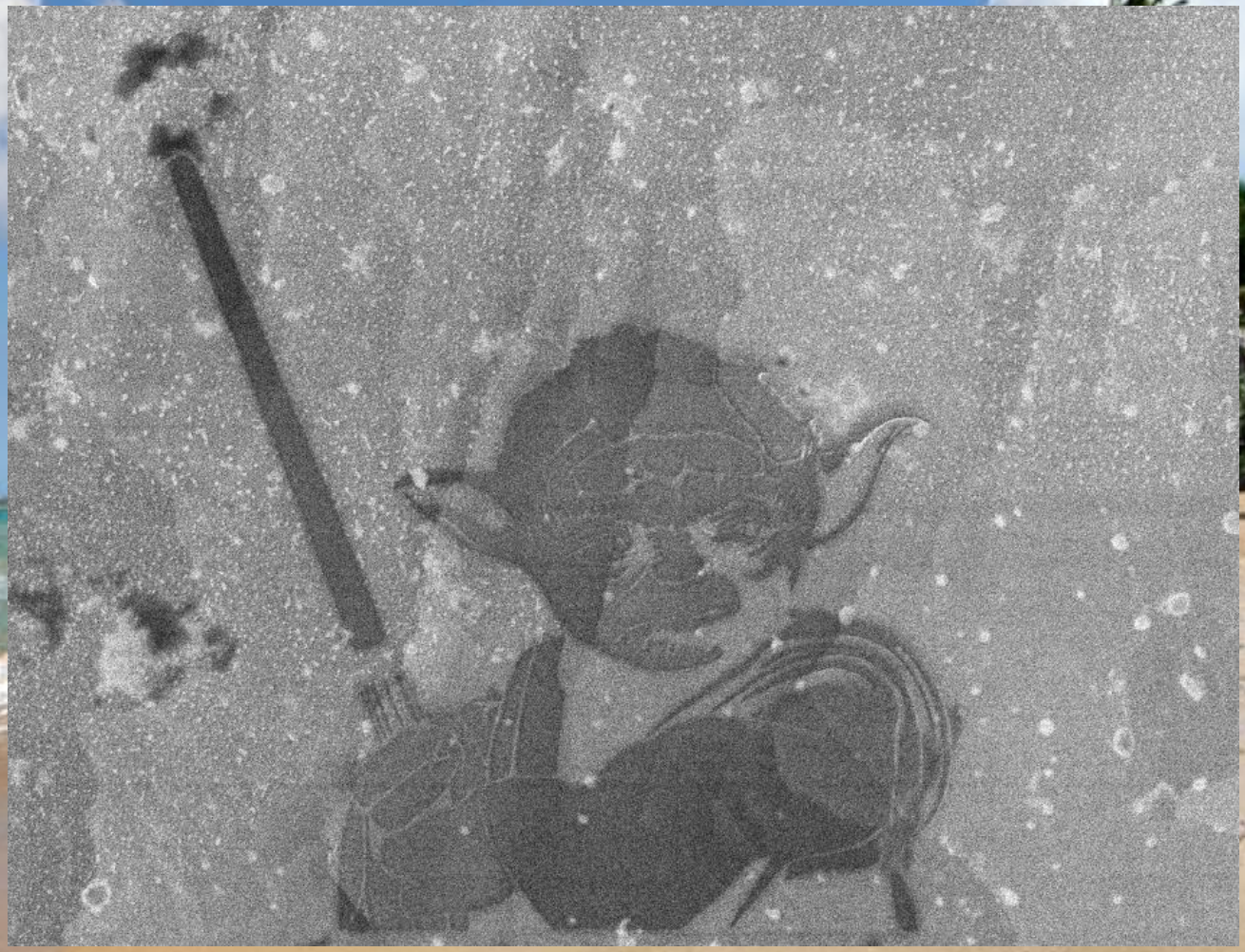
Instrument : Zeiss Orion Nanofab

Submitted by: Annalena Wolff

Affiliation: QUT
Brisbane, Australia

2018 EIPBN MicroGraph Contest

Micrograph Title:
May the source be with you



Description:
The source is what gives the HIM operator his/her power. 'May the source be with you' is a phrase that is extended to other HIM operators to wish one another good luck.

Magnification (3"x4" image): 12KX
Instrument : Zeiss Orion Nanofab

Submitted by: Annalena Wolff
Affiliation: QUT
Brisbane, Australia

2018 EIPBN MicroGraph Contest

Micrograph Title:
The dark side of the source

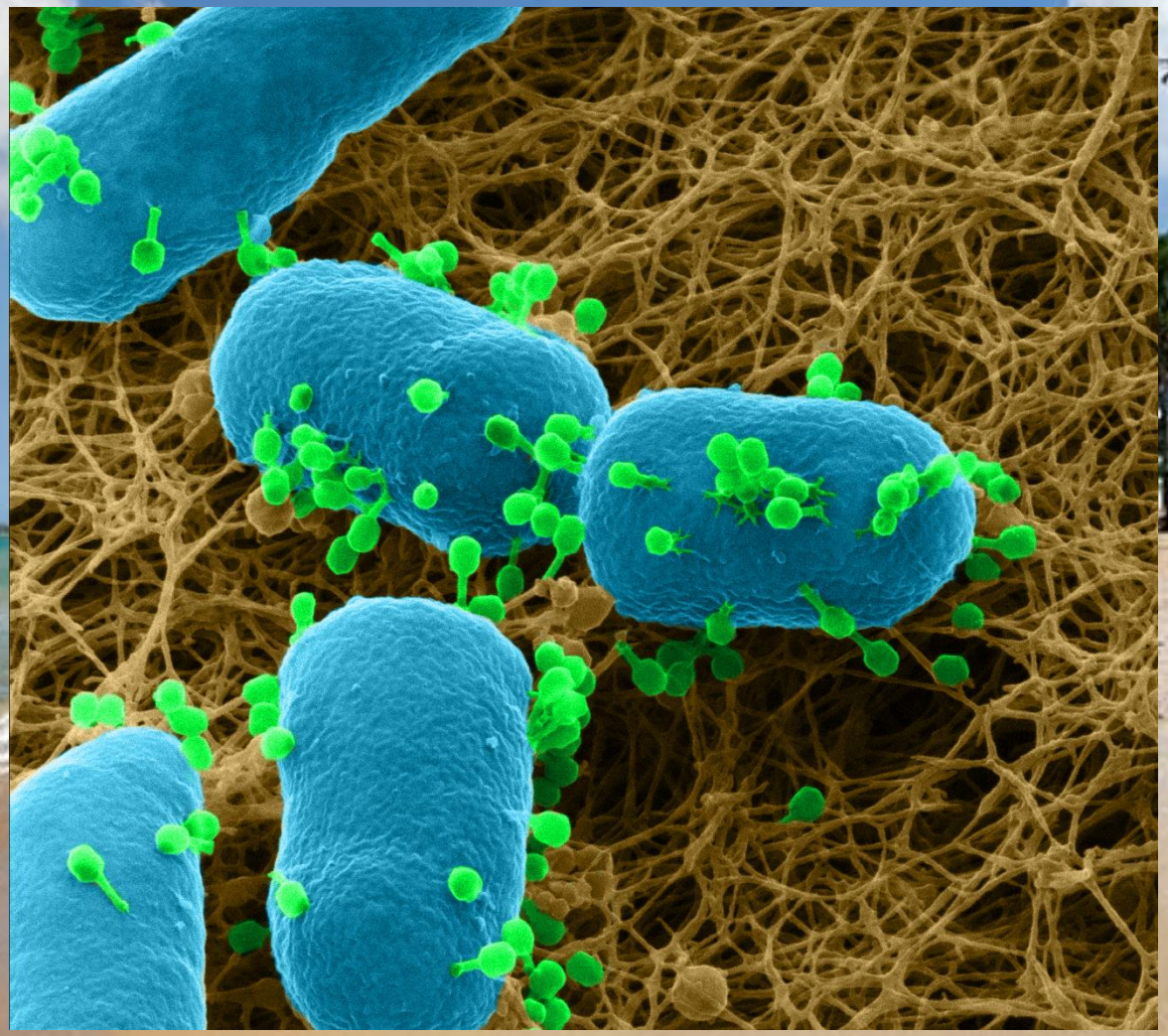
Description:
'Once you start down the dark path, forever it will dominate your destiny'…until you get a new source for the Helium Ion Microscope

Magnification (3"x4" image): 126X
Instrument : Zeiss Orion Nanofab

Submitted by: Annalena Wolff
Affiliation: QUT
Brisbane, Australia

2018 EIPBN MicroGraph Contest

Micrograph Title:
Phage Attack!



Description:
Helium ion image of T4 phage (green) attacking E Coli (blue) on agar substrate.

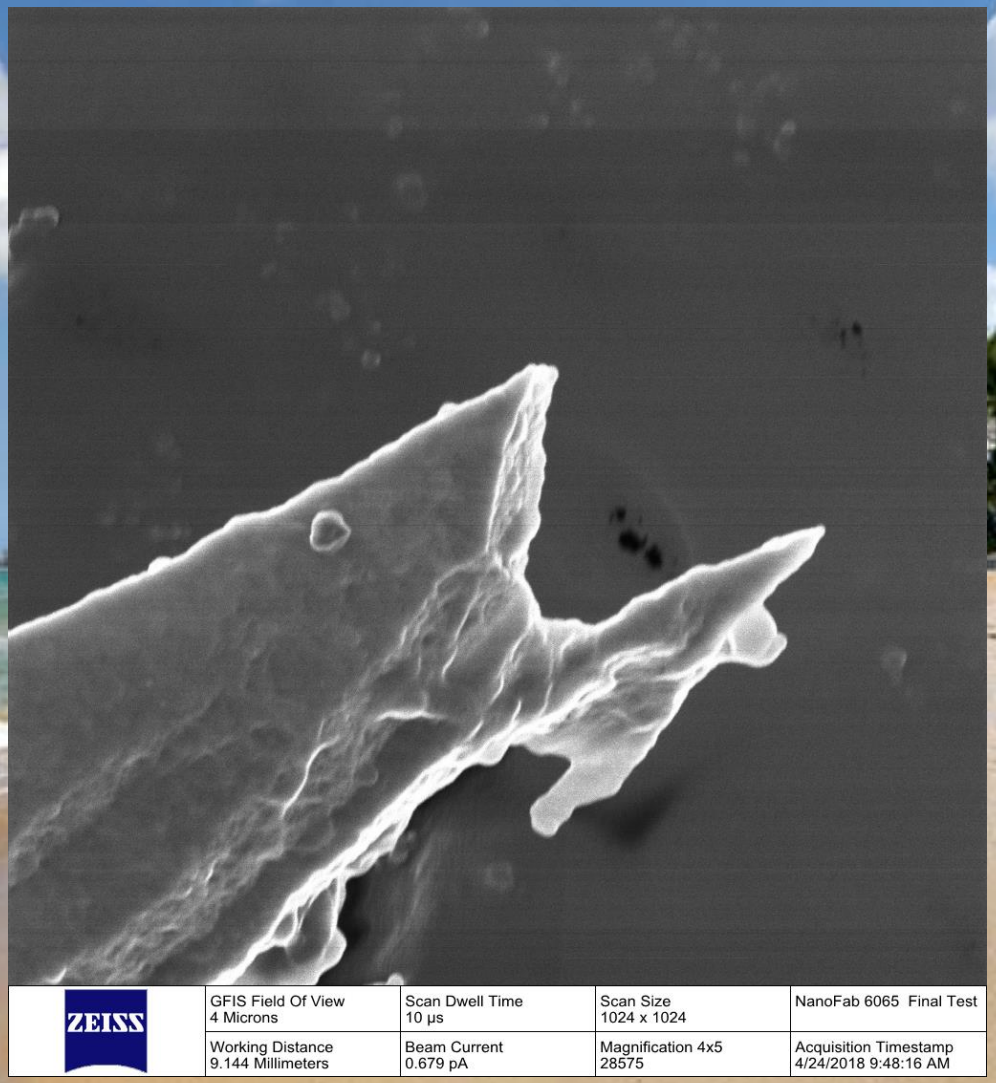
Magnification (3"x4" image): 56 kX **Instrument:** ORION NanoFab

Submitted by: Miika Leppänen (Department of Physics, University of Jyväskylä), and John Notte (Carl Zeiss Microscopy)

2018 EIPBN MicroGraph Contest

Micrograph Title:
Trout

Description:
Metal particle on silicon substrate



ZEISS	GFIS Field Of View 4 Microns	Scan Dwell Time 10 µs	Scan Size 1024 x 1024	NanoFab 6065 Final Test
	Working Distance 9.144 Millimeters	Beam Current 0.679 pA	Magnification 4x5 28575	Acquisition Timestamp 4/24/2018 9:48:16 AM

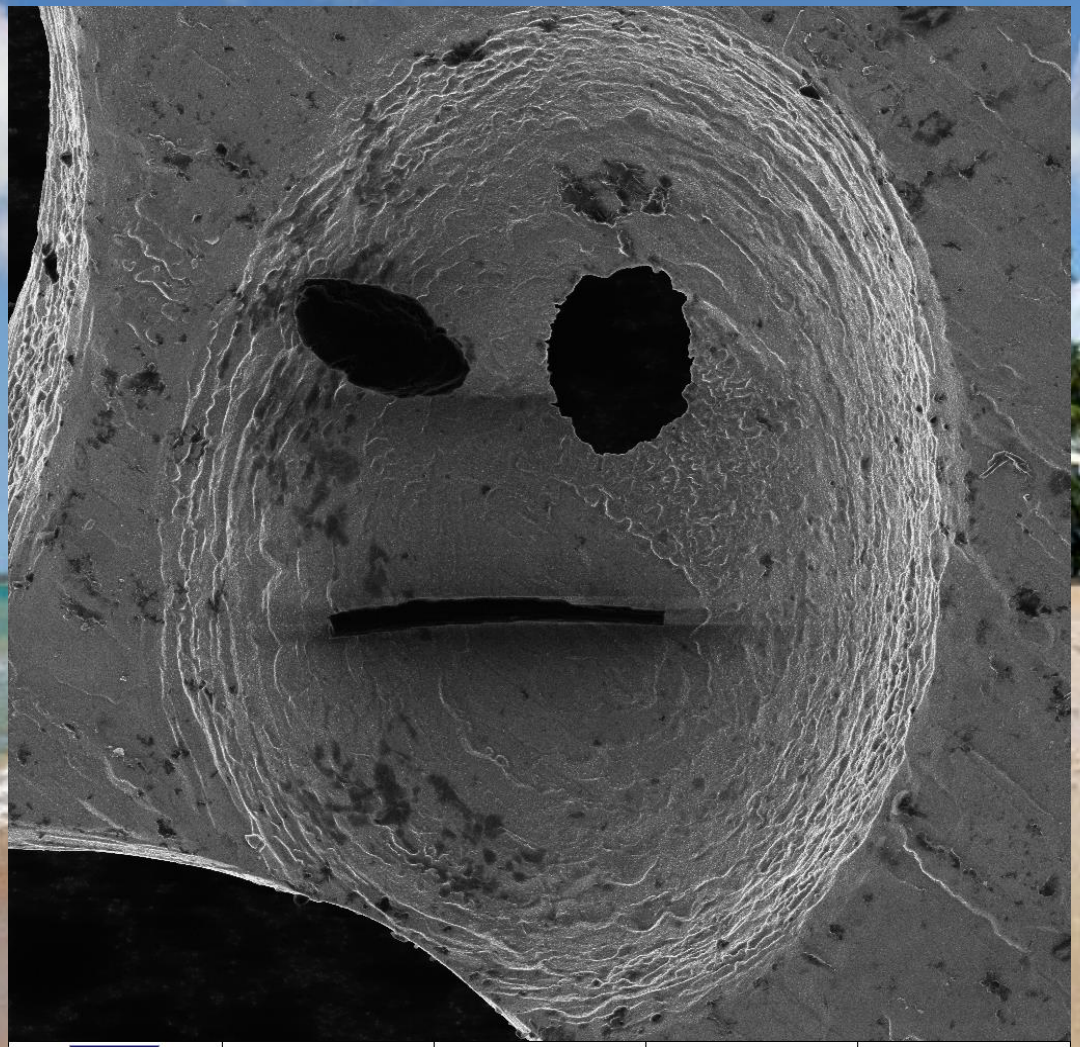
Magnification (3"x4" image): 25 kX
Instrument: ORION NanoFab
Submitted by: Bill Somers
Affiliation: Zeiss

2018 EIPBN MicroGraph Contest

50

Micrograph Title:
Namogi

Description:
Metal foil with disturbing face.



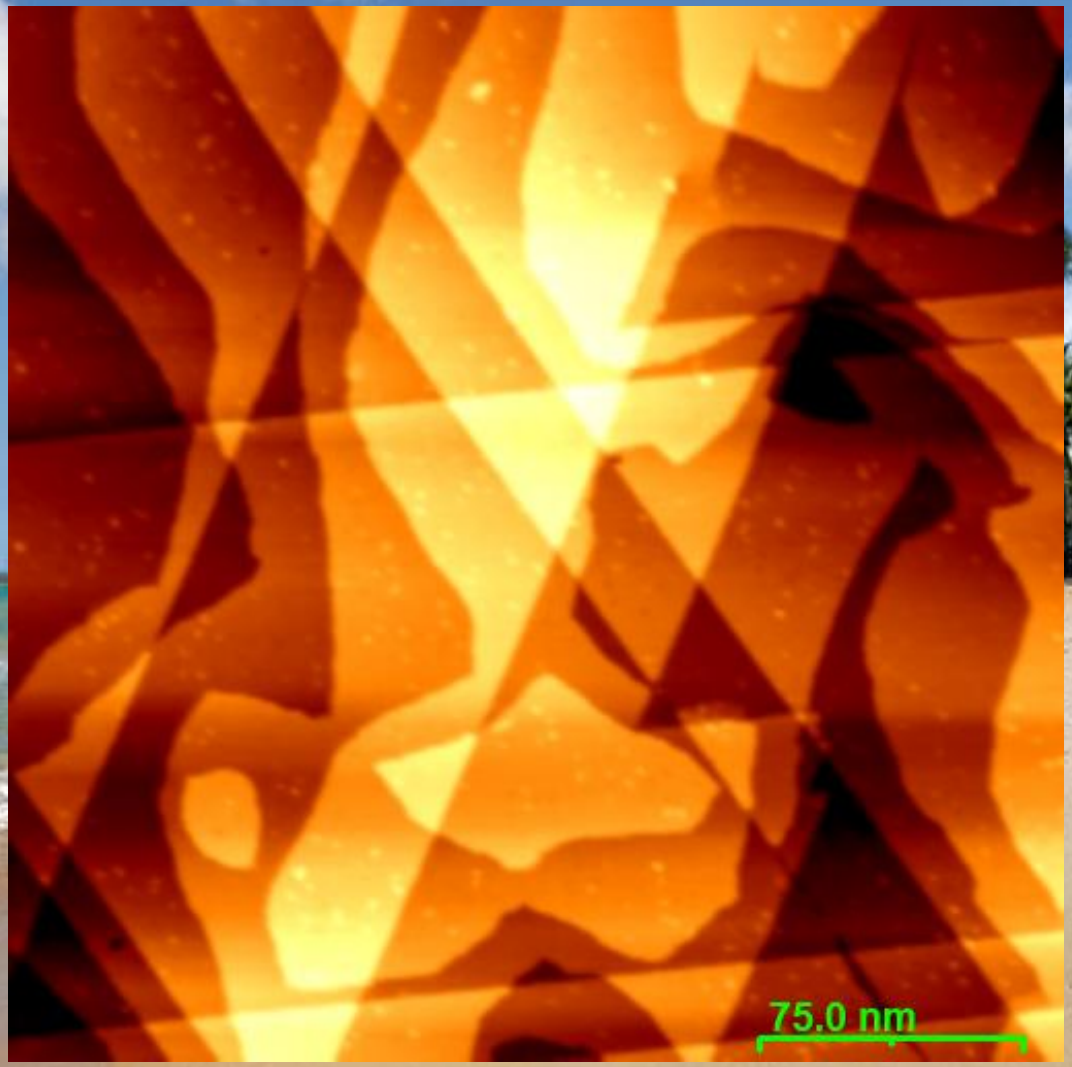
ZEISS	GFIS Field Of View 50 Microns	Scan Dwell Time 10 µs	Scan Size 1024 x 1024	User Text
	Working Distance 9.145 Millimeters	Beam Current 0.069 pA	Magnification 4x5 2286	Acquisition Timestamp 4/16/2018 10:09:54 AM

Magnification (3"x4" image): 2.0 kX **Instrument: ORION NanoFab**

Submitted by: Bill Somers **Affiliation: Zeiss**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Nano-Picasso.



Description:
The surface of Pd(111) taken using Zyvex Labs' Scanz software driving Matrix hardware on an Omicron VT STM, with live Creep and Hysteresis Correction active.

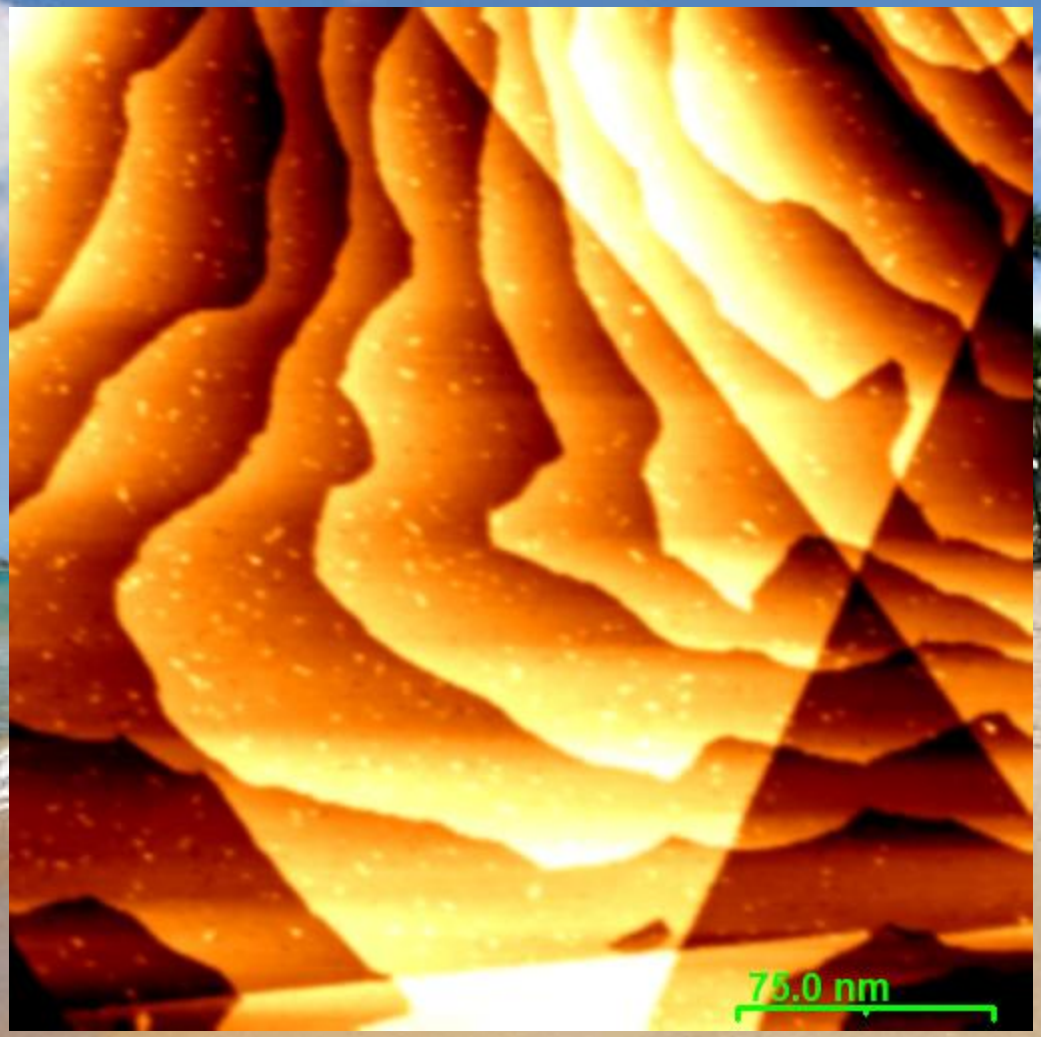
Magnification (3"x4" image): 300kx
Submitted by: James Owen

Instrument : Omicron VT STM, Scanz.
Affiliation: Zyvex Labs
Richardson, TX.

2018 EIPBN MicroGraph Contest

Micrograph Title:
A Searchlight illuminating the landscape

Description:
The surface of Pd(111) taken using Zyvex Labs' Scanz software driving Matrix hardware on an Omicron VT STM, with live Creep and Hysteresis Correction active.



Magnification (3"x4" image): 300kx
Submitted by: James Owen

Instrument : Omicron VT STM, Scanz.
Affiliation: Zyvex Labs
Richardson, TX.

2018 EIPBN MicroGraph Contest

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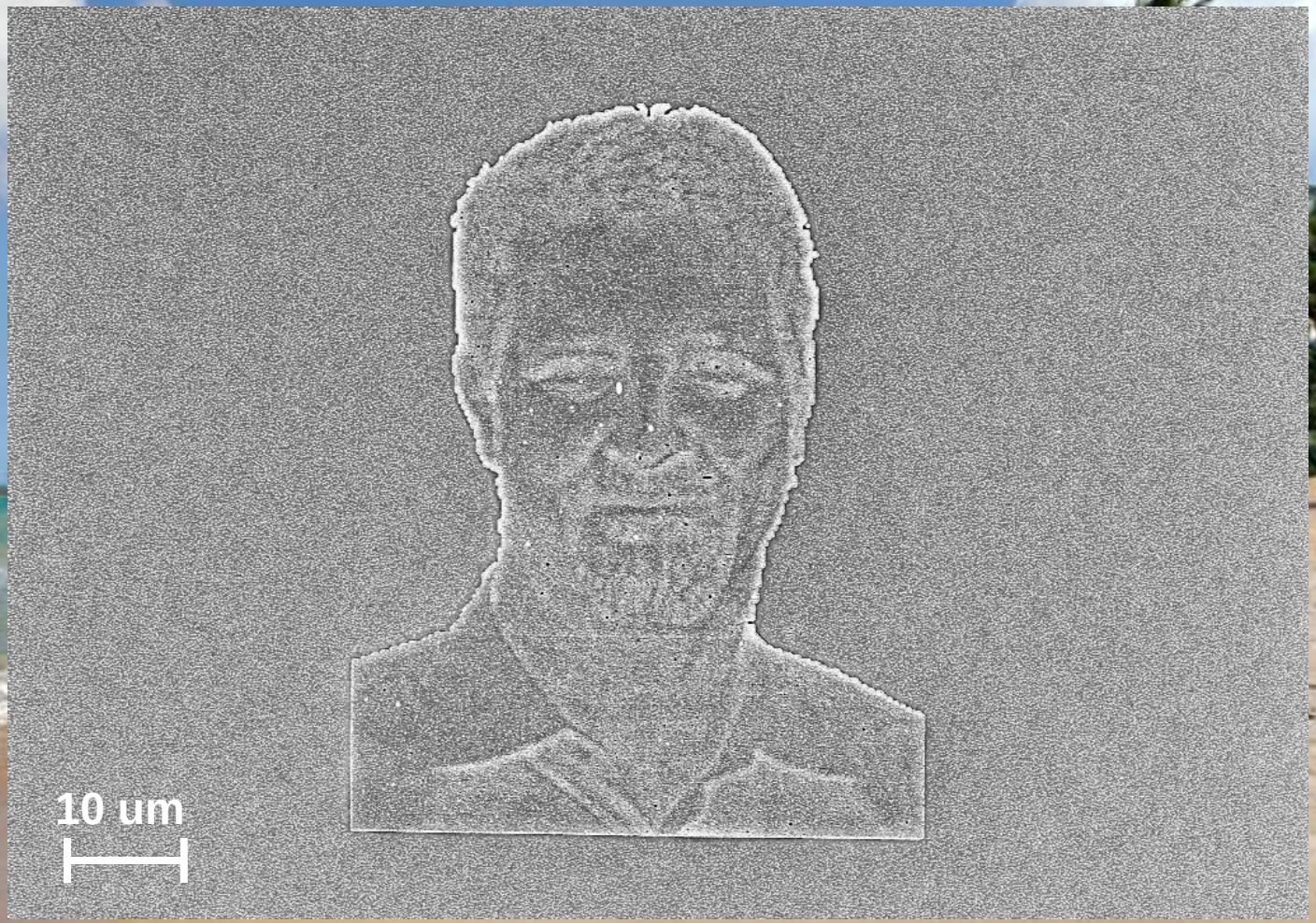
Micrograph Title:
Nanofabricated nanofabricator

Description:
3D image patterned by plasma etching of a greyscale mask written by Gallium FIB



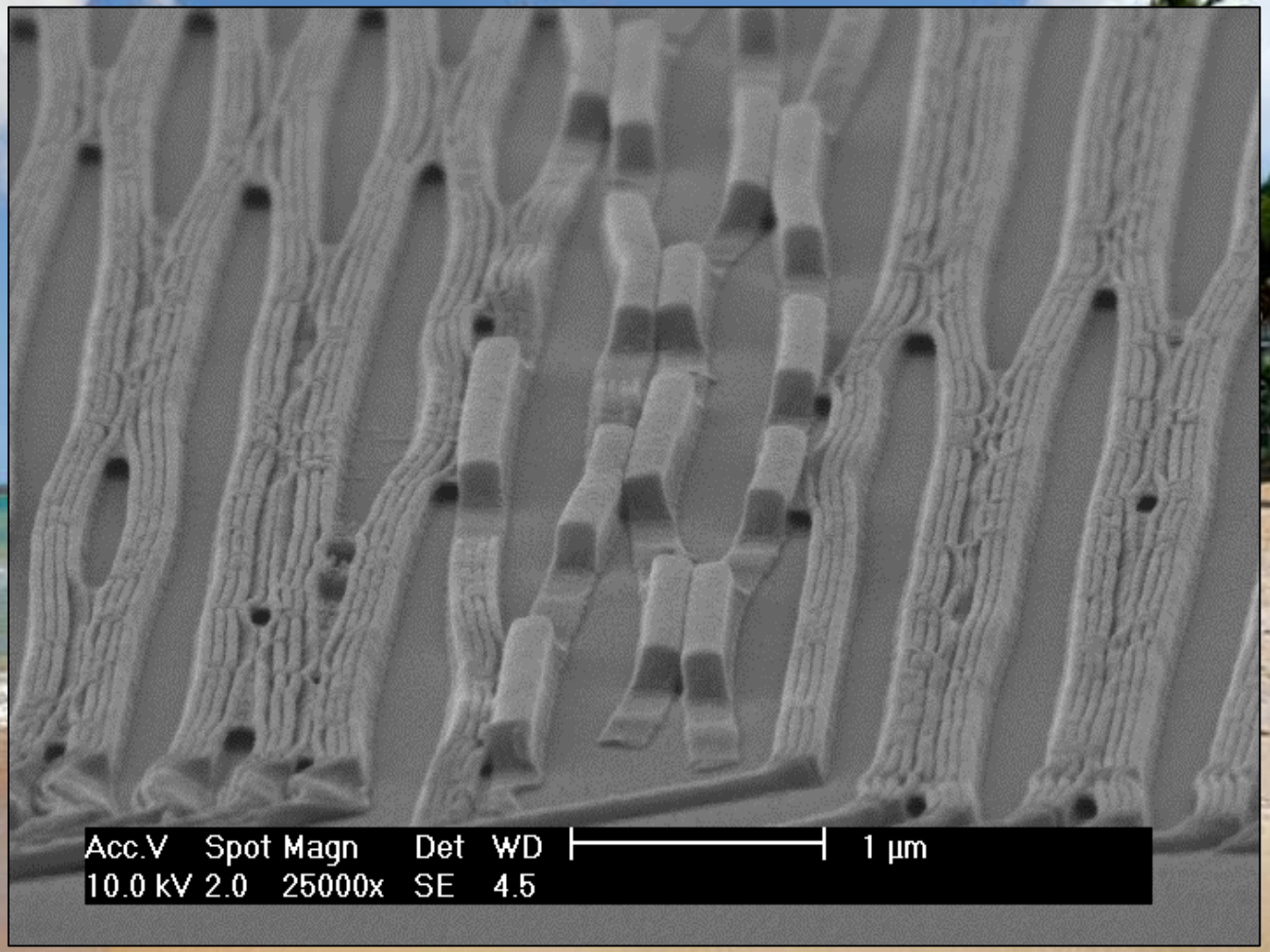
Magnification (3"x4" image): 1 KX
Instrument : Zeiss Ultra 60-SEM

Submitted by: Stefano Dallorto
Alexander Koshelev
Affiliation: Molecular Foundry - LBNL
TU Ilmenau

2018 EIPBN MicroGraph Contest

Micrograph Title:
Rails

Description:
On a hot summer day railroad companies may be in trouble ….



Magnification (3"x4" image): 25KX
Submitted by: Andre Mayer

Instrument : Fei XL30 - SFEG
Affiliation: University of Wuppertal Germany

2018 EIPBN MicroGraph Contest

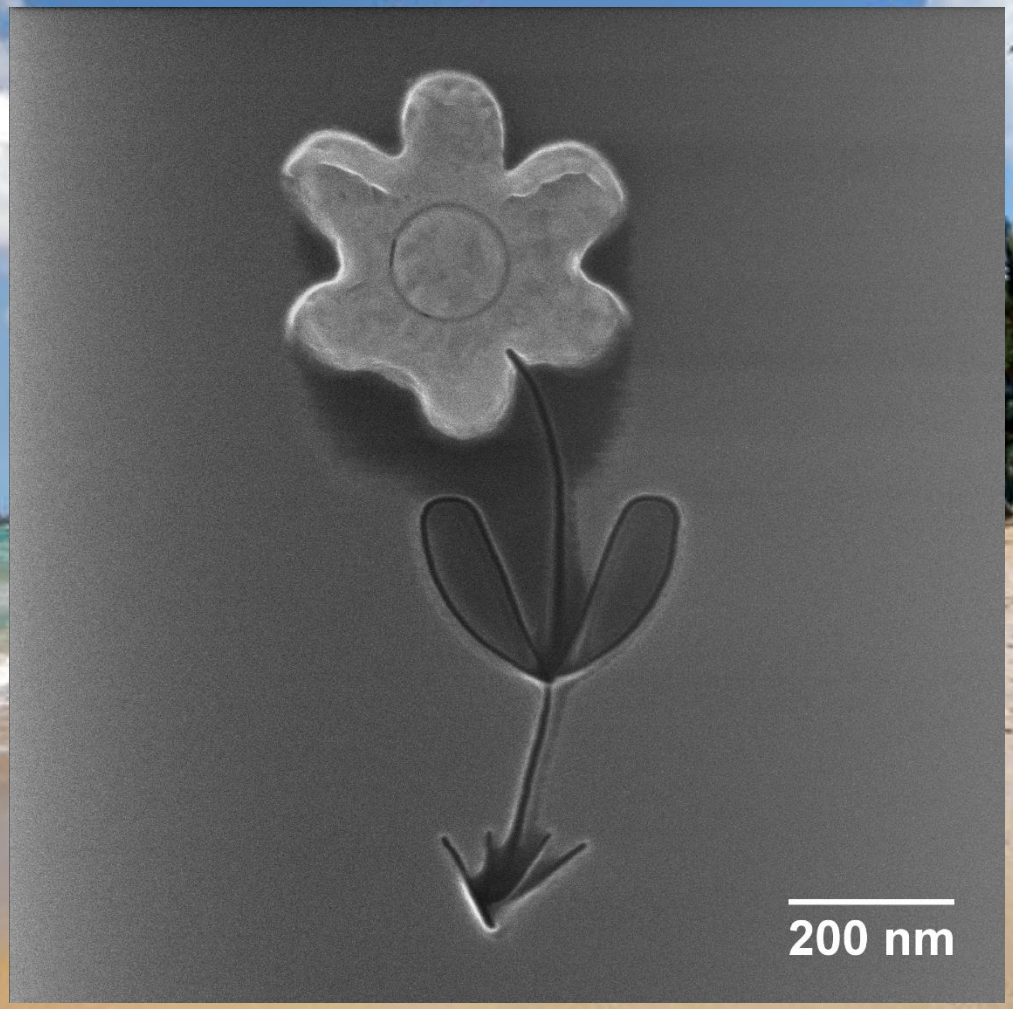
Micrograph Title:
Eiffel Tower

Description:
Eiffel Tower made of acrylate, 2 mm tall. Imaged with long depth of focus helium beam. No metal coating.

Magnification (3"x4" image): 75 X Instrument: ORION NanoFab
Submitted by: Doug Wei (Zeiss) and Sofia Rodriguez (Nanoscribe).

2018 EIPBN MicroGraph Contest

Micrograph Title:
Nano-Flower



Description:
Au nano-flower on quarz glass, milled and imaged both by He^+ with charge compensation

Magnification (3"x4" image): 95KX
Submitted by: Daniel Emmrich

Instrument : Zeiss Orion Plus
Affiliation: Bielefeld University, Germany

2018 EIPBN MicroGraph Contest

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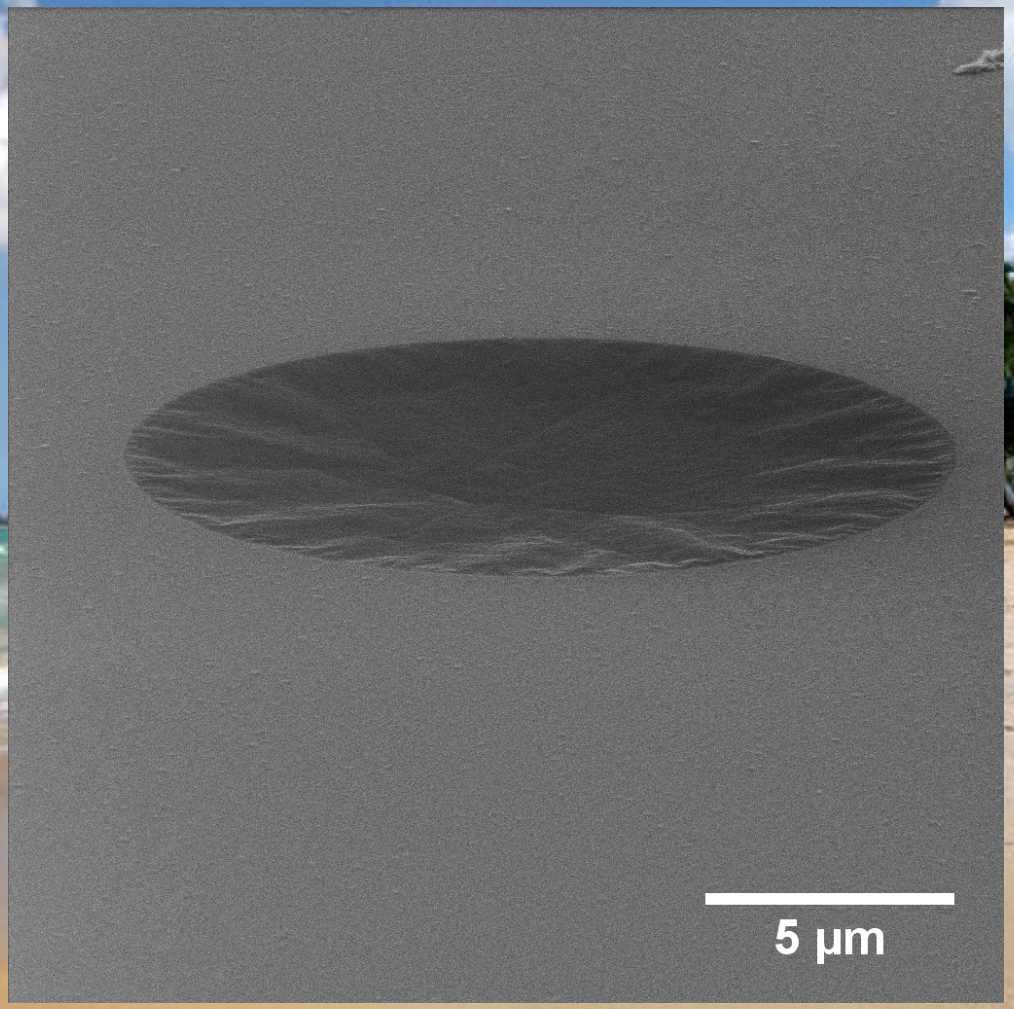
Micrograph Title:
1nm thick Trampoline



Description:
1nm thick, insulating Carbon Nanomembrane spanning over a hole in a Silicon Nitride Membrane, imaged with charge compensation, tilt angle: 75°

Magnification (3"x4" image): 5.7KX
Submitted by: Daniel Emmrich

Instrument : Zeiss Orion Plus
Affiliation: Bielefeld University, Germany

2018 EIPBN MicroGraph Contest

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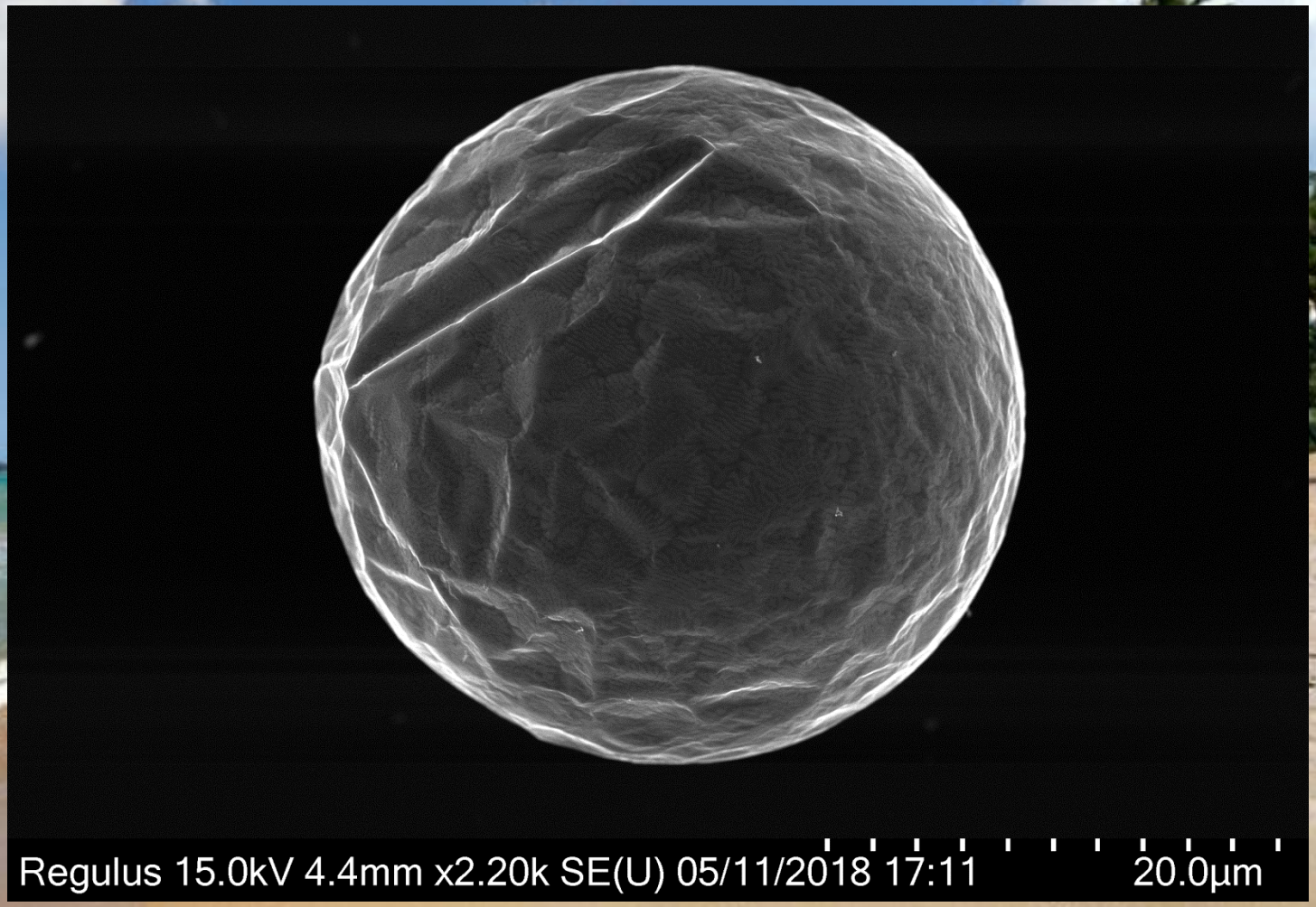
Micrograph Title:
***μ*Pluto: The newly discovered microplanet**

Description:
The "microplanet" microparticle is still of unknown origin and needs to be further explored...



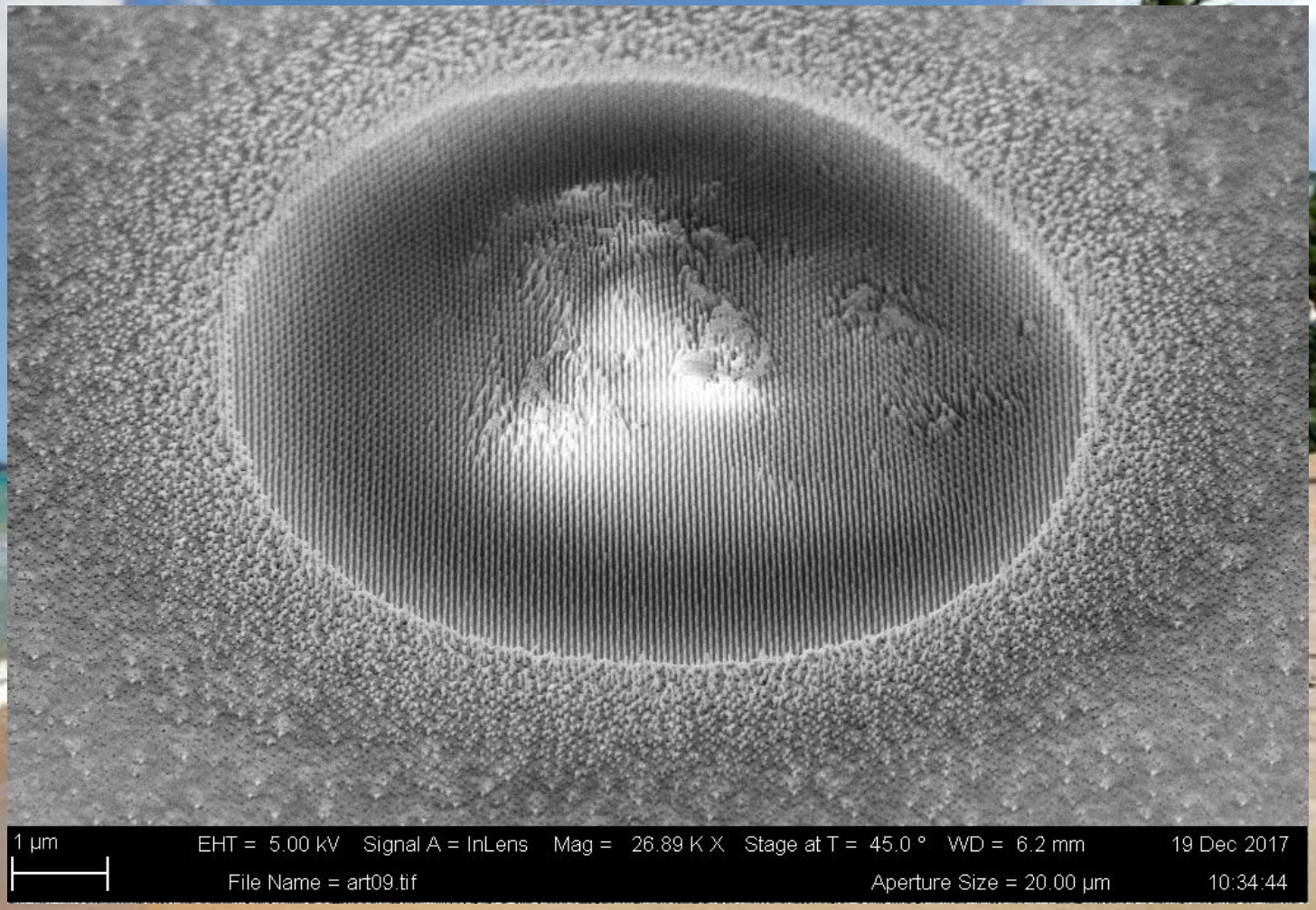
Magnification (3"x4" image): 2.20KX
Submitted by: Dimitrios Kazazis

Instrument : Hitachi Regulus 8230
Affiliation: Paul Scherrer Institut
Villigen, Switzerland

2018 EIPBN MicroGraph Contest

Micrograph Title:
Atlantis: a land lost in the distance.

Description:
HSQ pillars sticking out of electroplated Ni around a defect site.



Magnification (3"x4" image): 26.89KX
Instrument : Zeiss Supra 55 VP

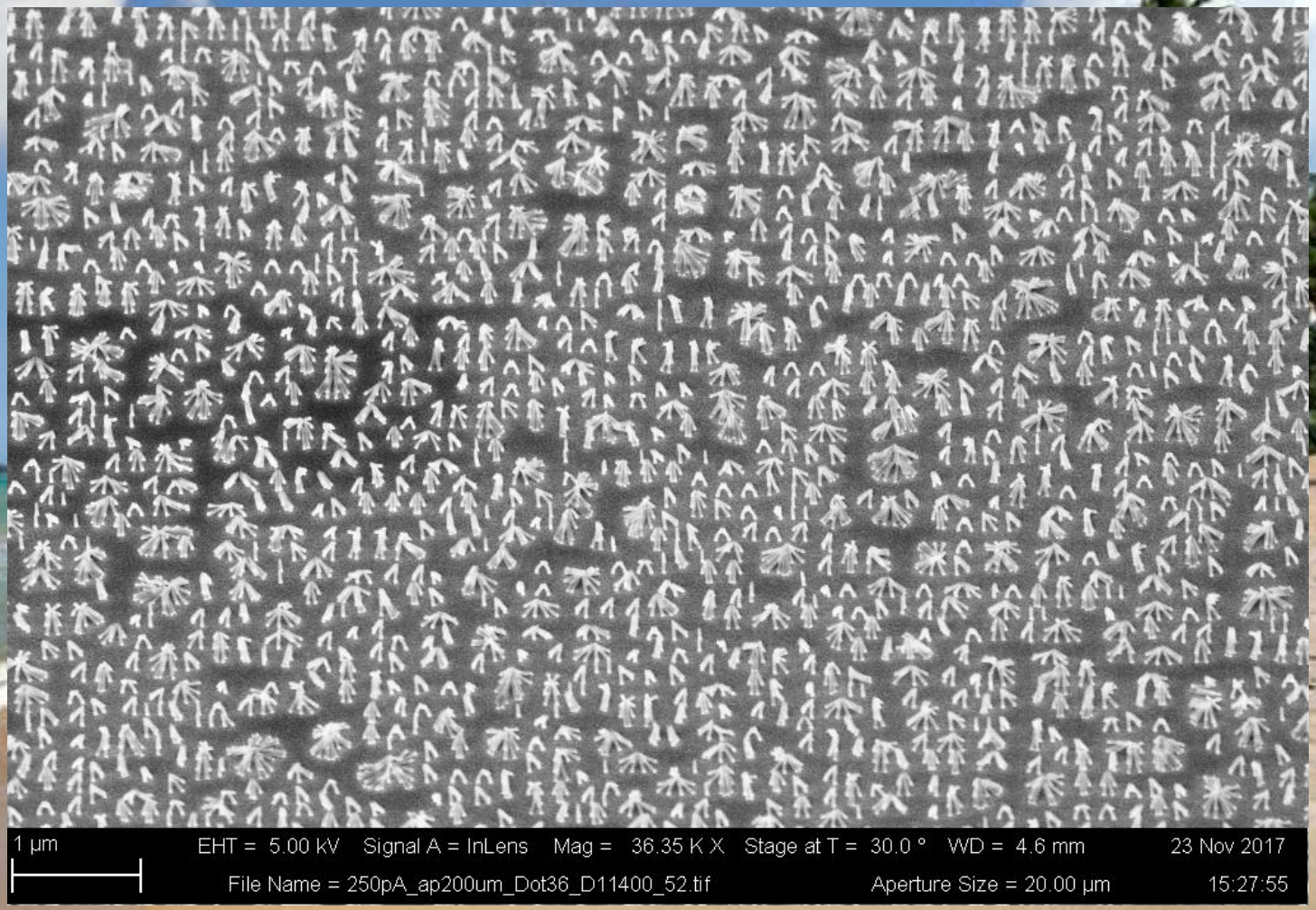
Submitted by: Dimitrios Kazazis
Affiliation: Paul Scherrer Institut
Villigen, Switzerland

2018 EIPBN MicroGraph Contest

EIPBN PUERTO RICO 2018

Micrograph Title:
The nano-Rosetta Stone

Description:
These are 36 nm diameter HSQ pillars patterned on a square lattice by e-beam lithography, which collapsed and merged after development and drying due to capillary forces



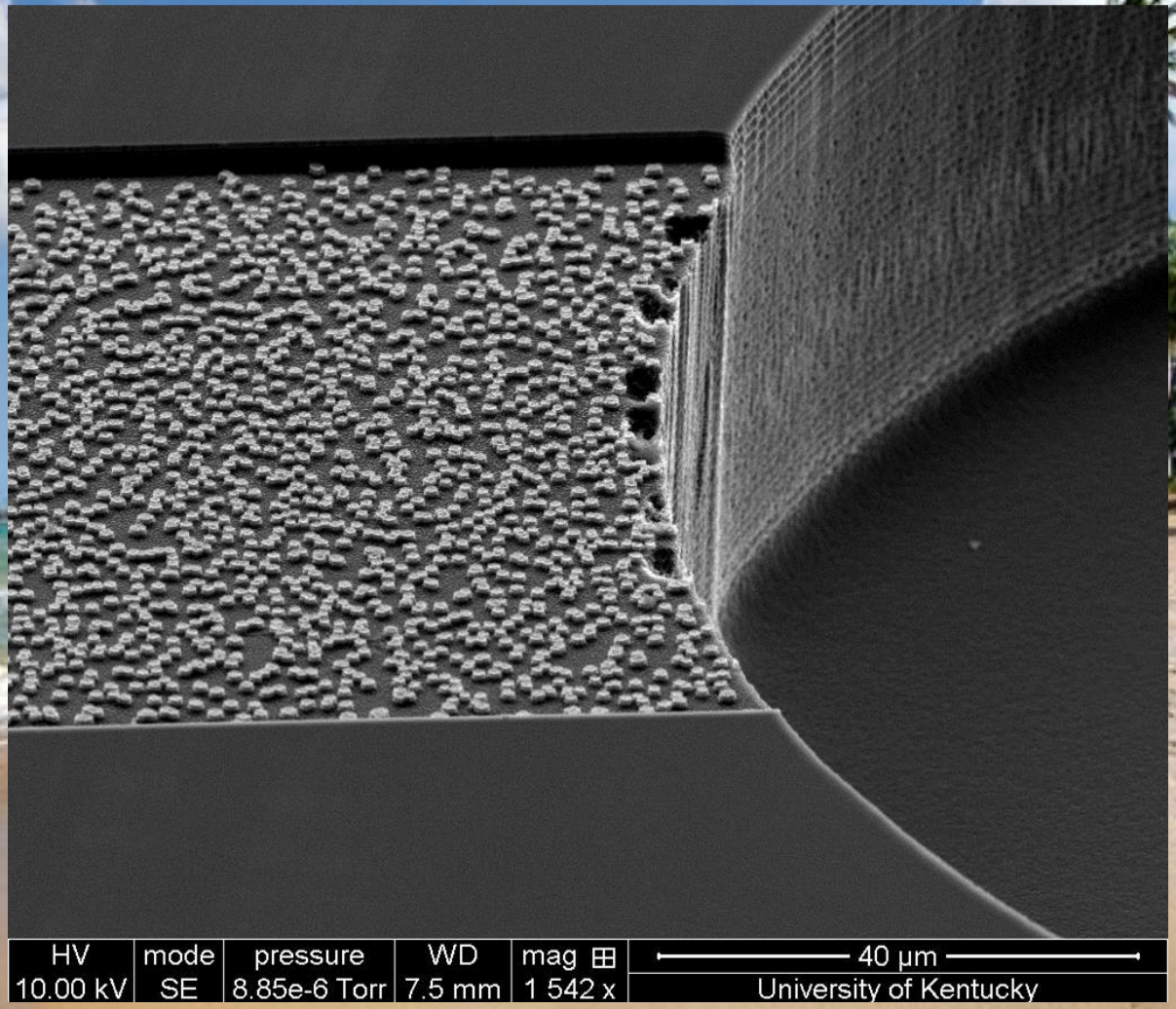
Magnification (3"x4" image): 36.35KX
Instrument : Zeiss Supra 55 VP

Submitted by: Dimitrios Kazazis
Affiliation: Paul Scherrer Institut
Villigen, Switzerland

2018 EIPBN MicroGraph Contest

Micrograph Title:
Stocked Behind The Valley

Description:
Silicon residue in the channel after deep reactive ion etching process



Magnification (3"x4" image): 1542 x

Instrument : Quanta ESEM - FEI

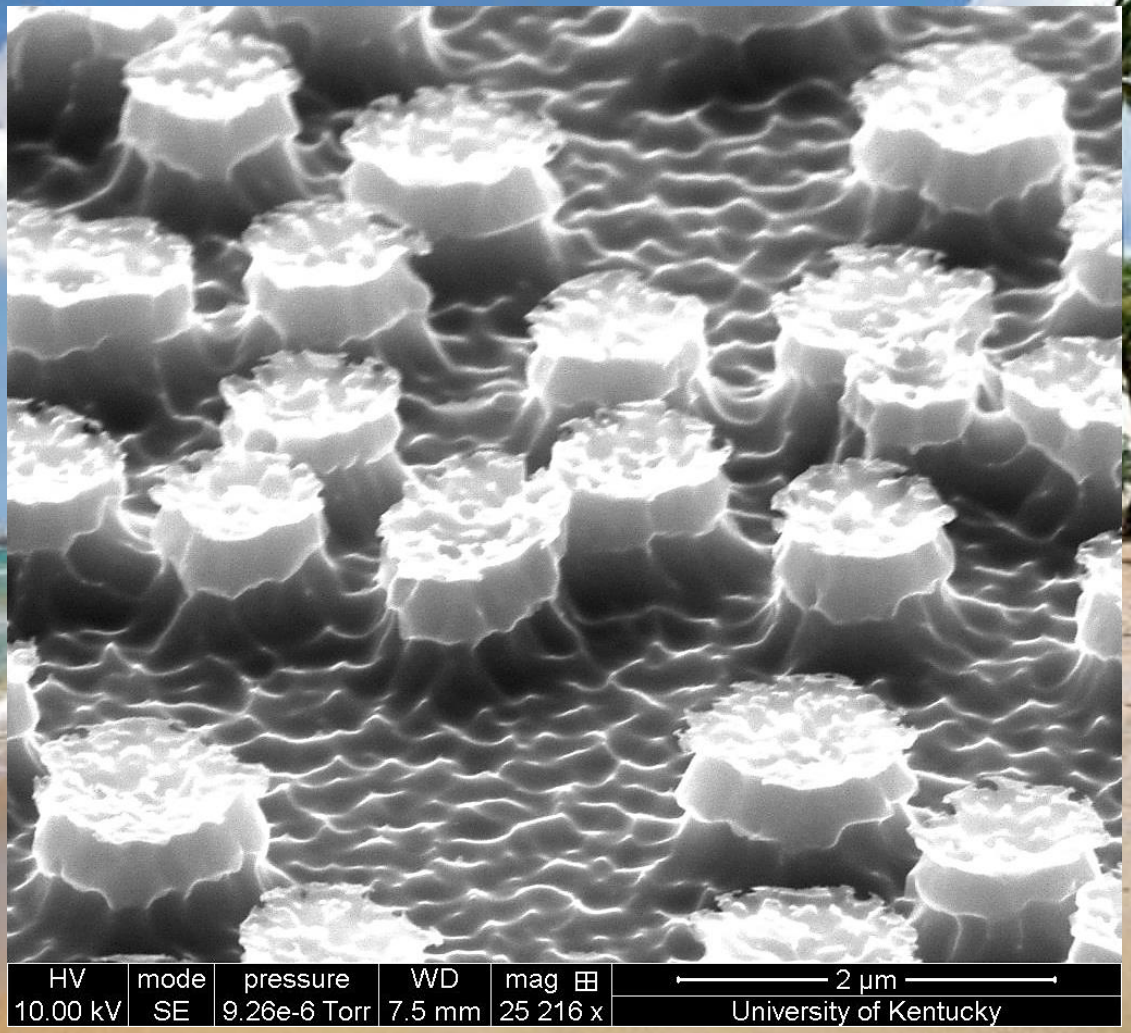
Submitted by: Samaneh Esfandiarpour

Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
Stubborn

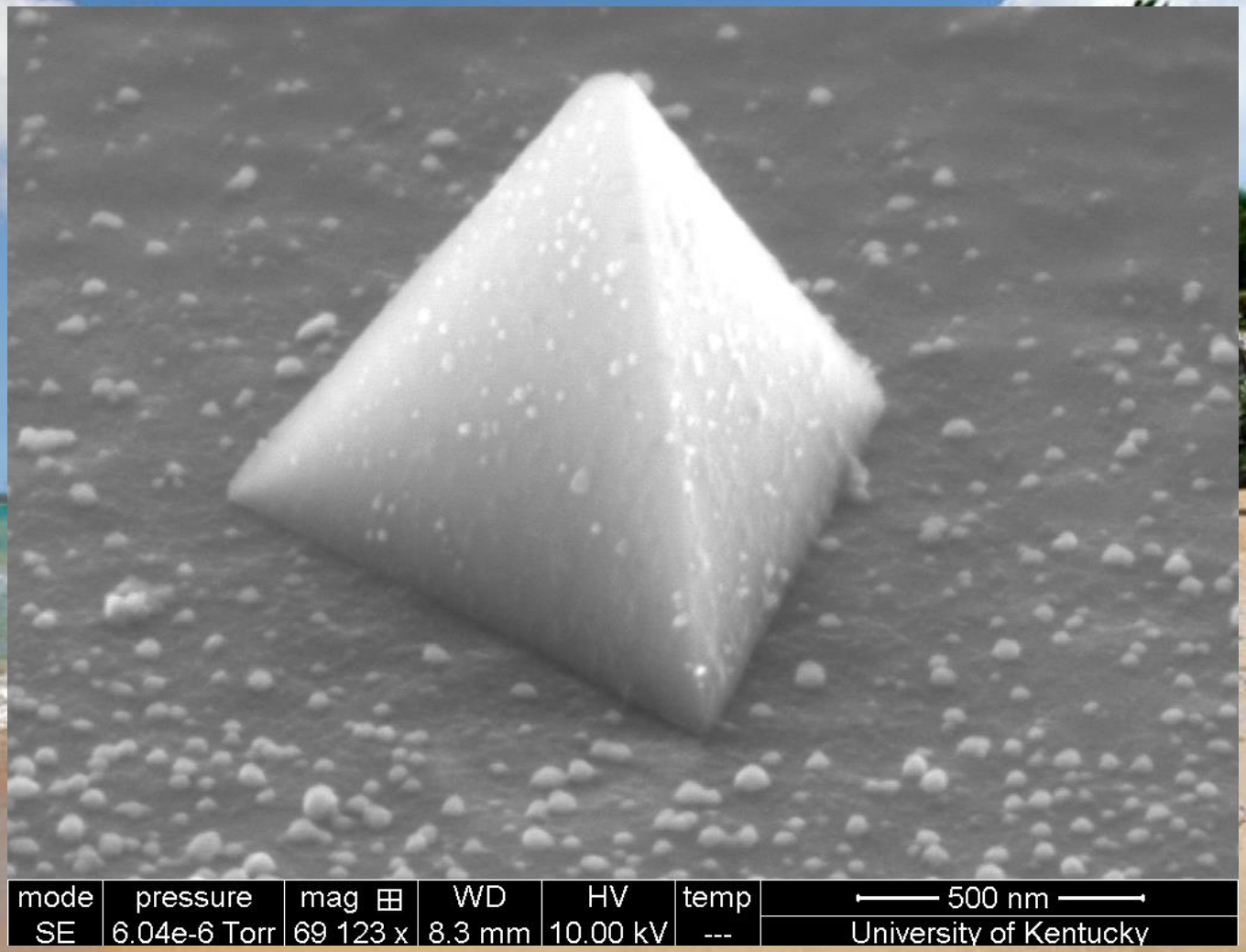
Description:
Silicon residue on the wafer after reactive ion etching process



Magnification (3"x4" image): 25 kx
Instrument : Quanta ESEM - FEI
Submitted by: Samaneh Esfandiarpour
Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
Perfect Pyramid



Description:
Copper crystal formed during the LP-EBID process from aqueous $CuSO_4 : H_2SO_4$

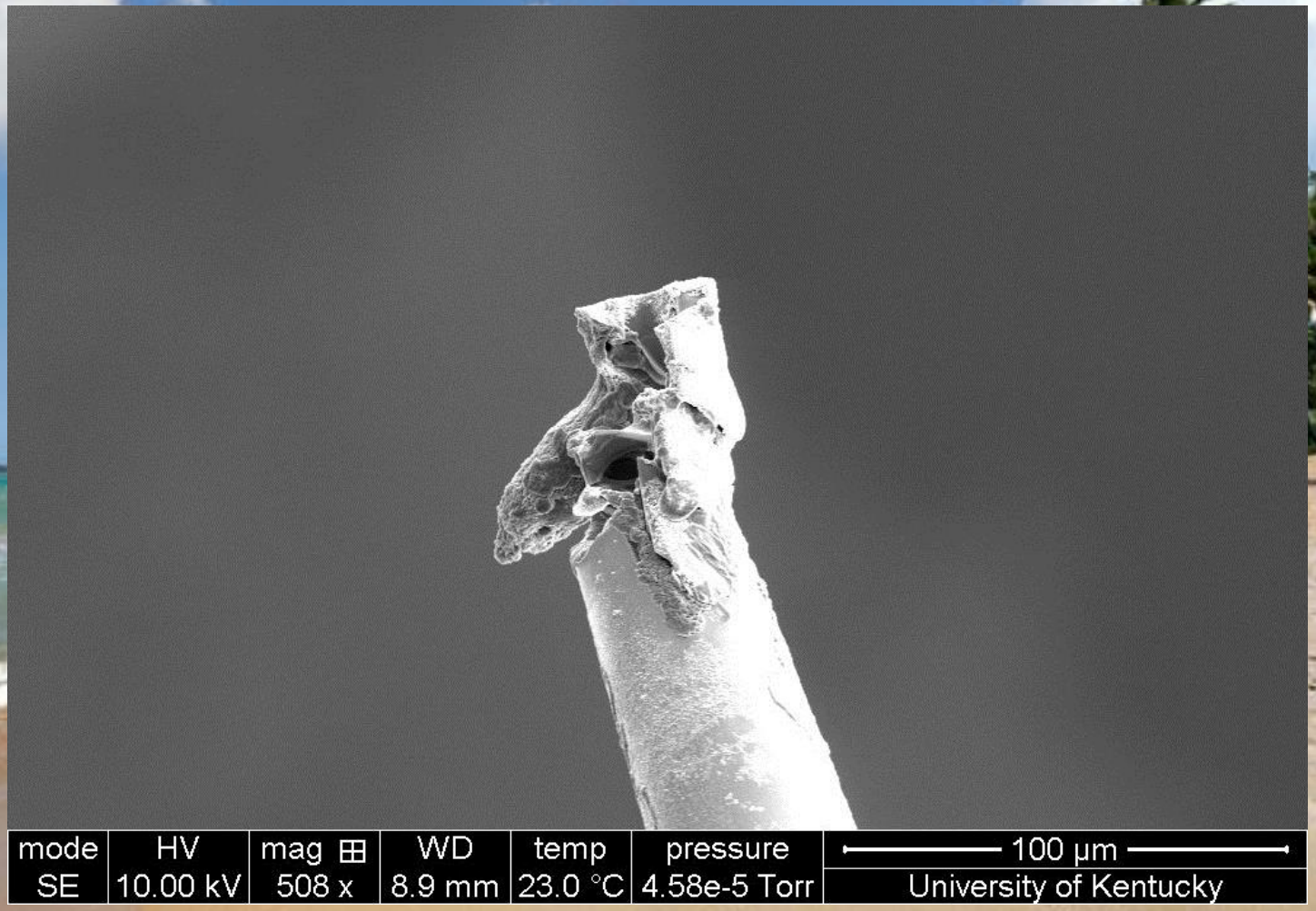
Magnification (3"x4" image): 69KX **Instrument : Quanta ESEM- FEI**

Submitted by: Samaneh Esfandiarpour **Affiliation: University of Kentucky**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Mission Accomplished

Description:
Brocken micro-pipette tip after being used in-situ in a liquid injection system.



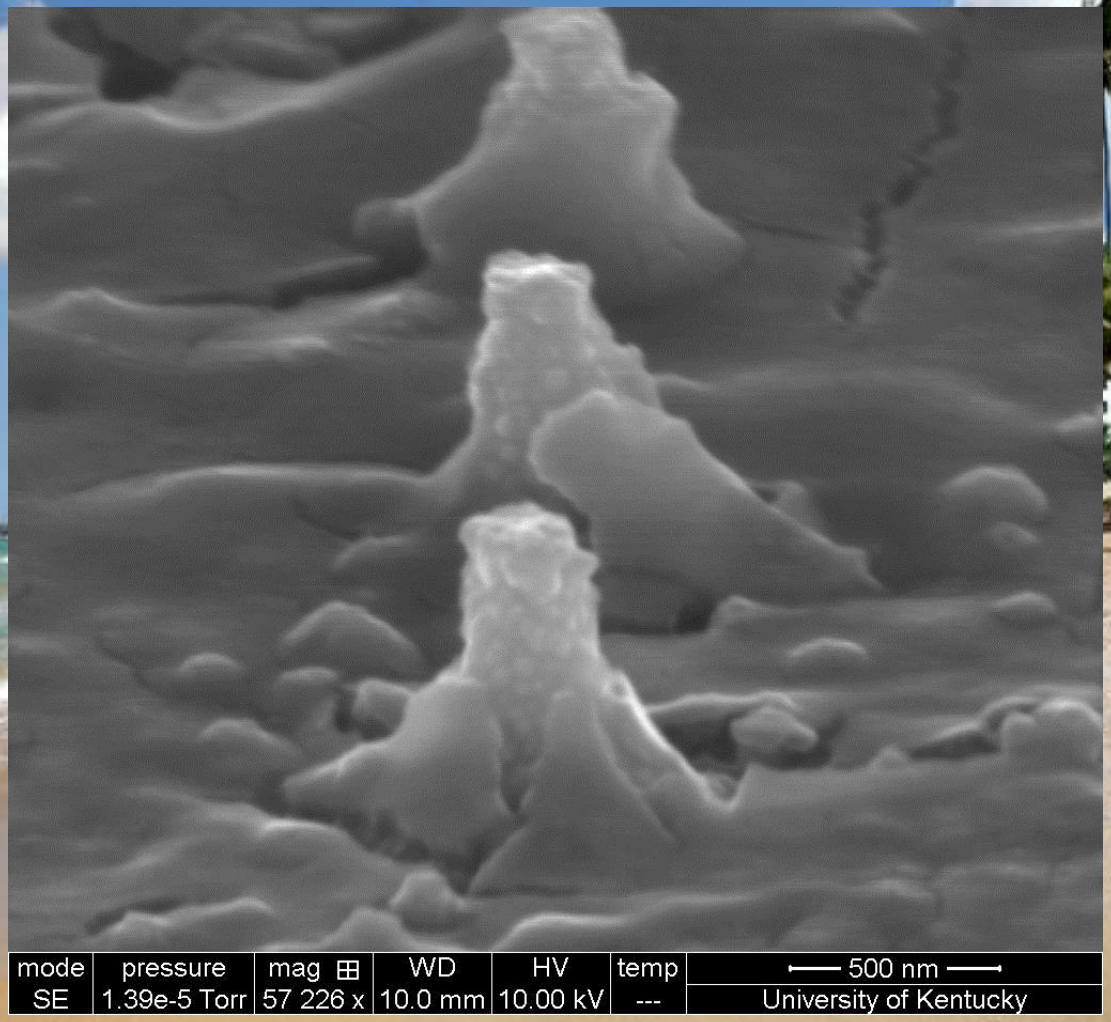
Magnification (3"x4" image): 508X **Instrument : Quanta ESEM- FEI**

Submitted by: Samaneh Esfandiarpour **Affiliation: University of Kentucky**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Found Our Way Out

Description:
70° tilted view of copper cylinders deposited from liquid precursor using focused electron beam



Magnification (3"x4" image): 57 kX

Instrument : Quanta ESEM- FEI

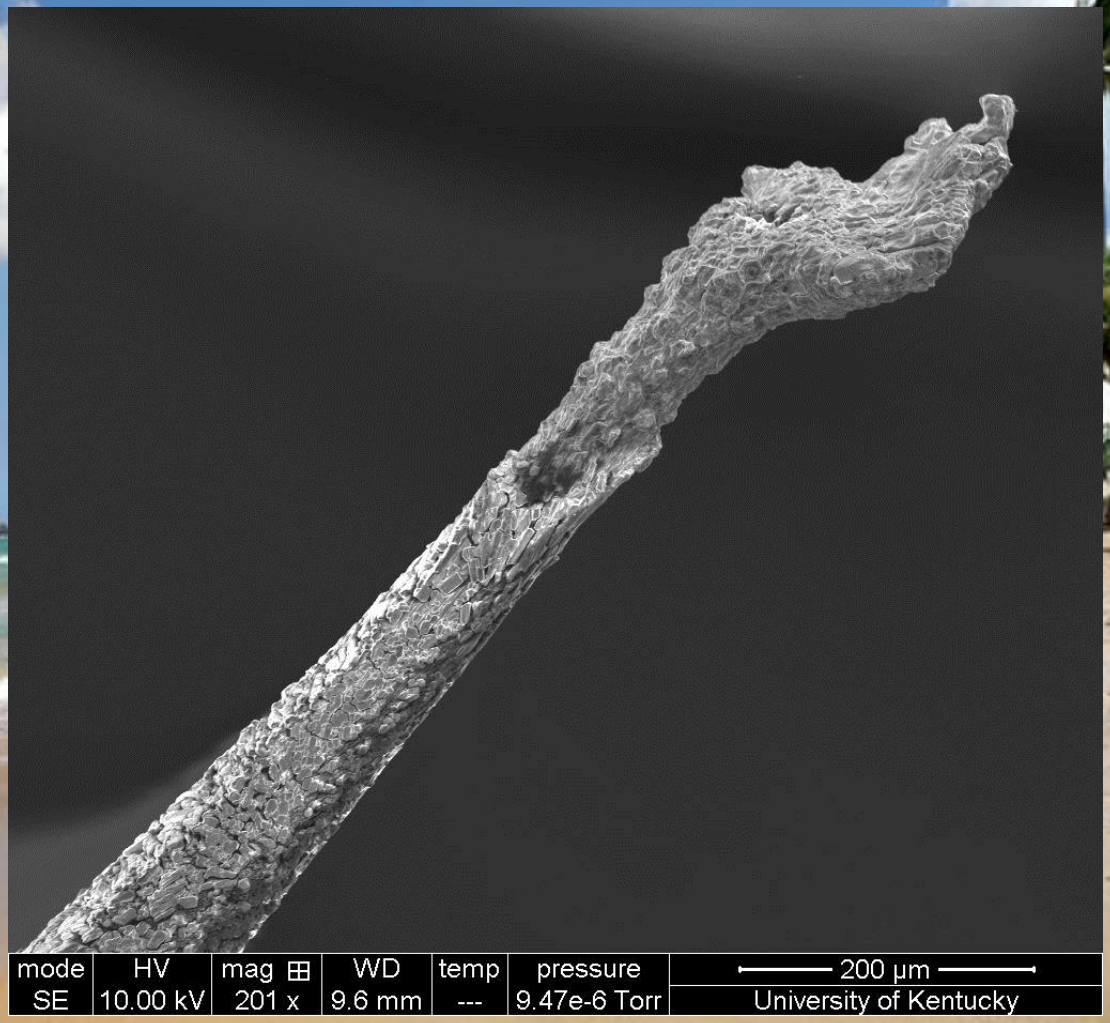
Submitted by: Samaneh Esfandiarpour

Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
Prayer

Description:
Copper crystal growth on micro-pipette tip after being used as working electrode for electro-deposition of copper during LP-EBID.



Magnification (3"x4" image): 201X

Instrument : Quanta ESEM - FEI

Submitted by: Samaneh Esfandiarpour

Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

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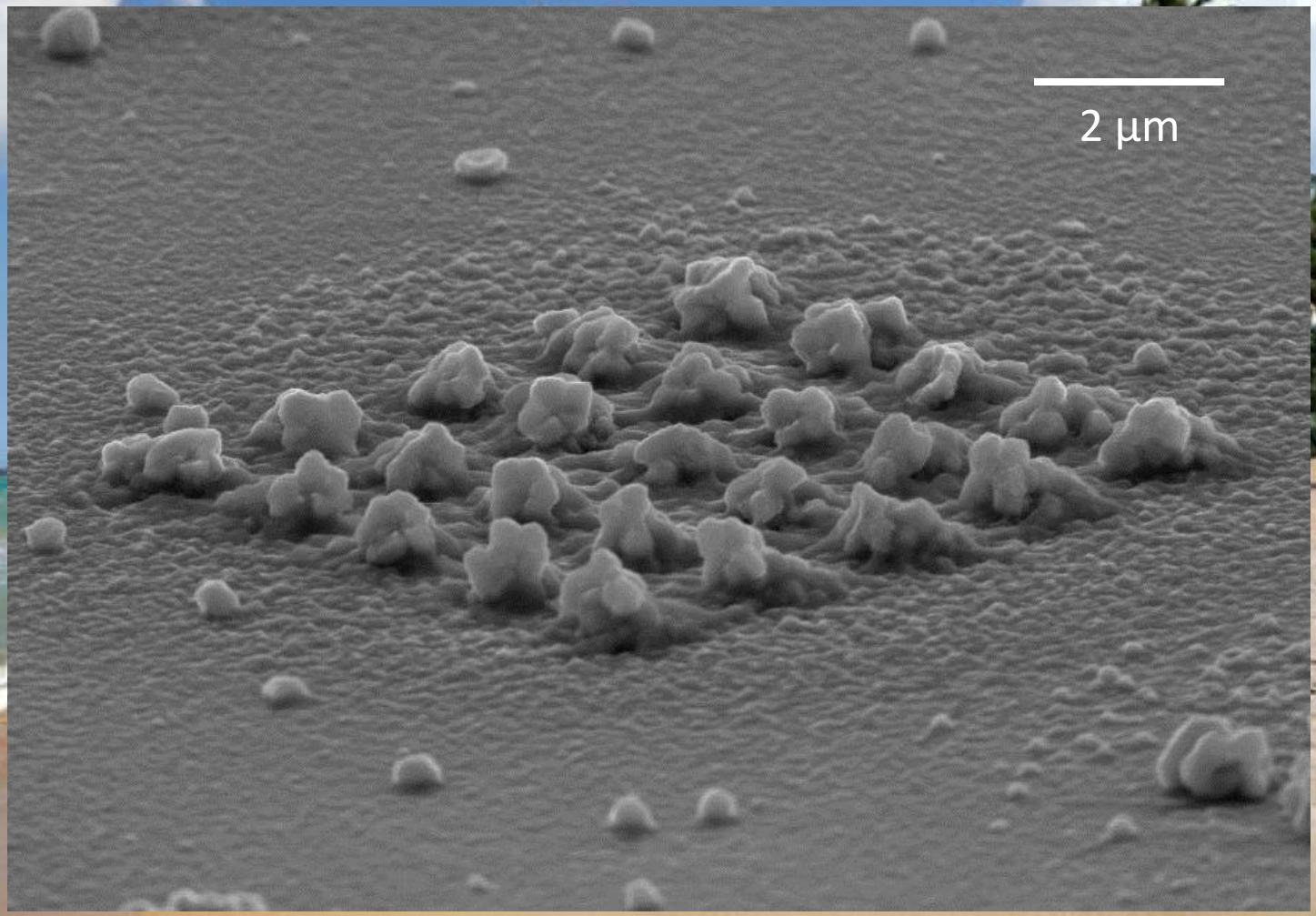
Micrograph Title:
Sleepy tired crew after running for 6 hours

Description:
70° tilted view of 5x5 array of copper dots deposited from liquid precursor using focused electron beam



Magnification (3"x4" image): 10 kX

Instrument : Quanta ESEM - FEI

Submitted by: Samaneh Esfandiarpour

Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

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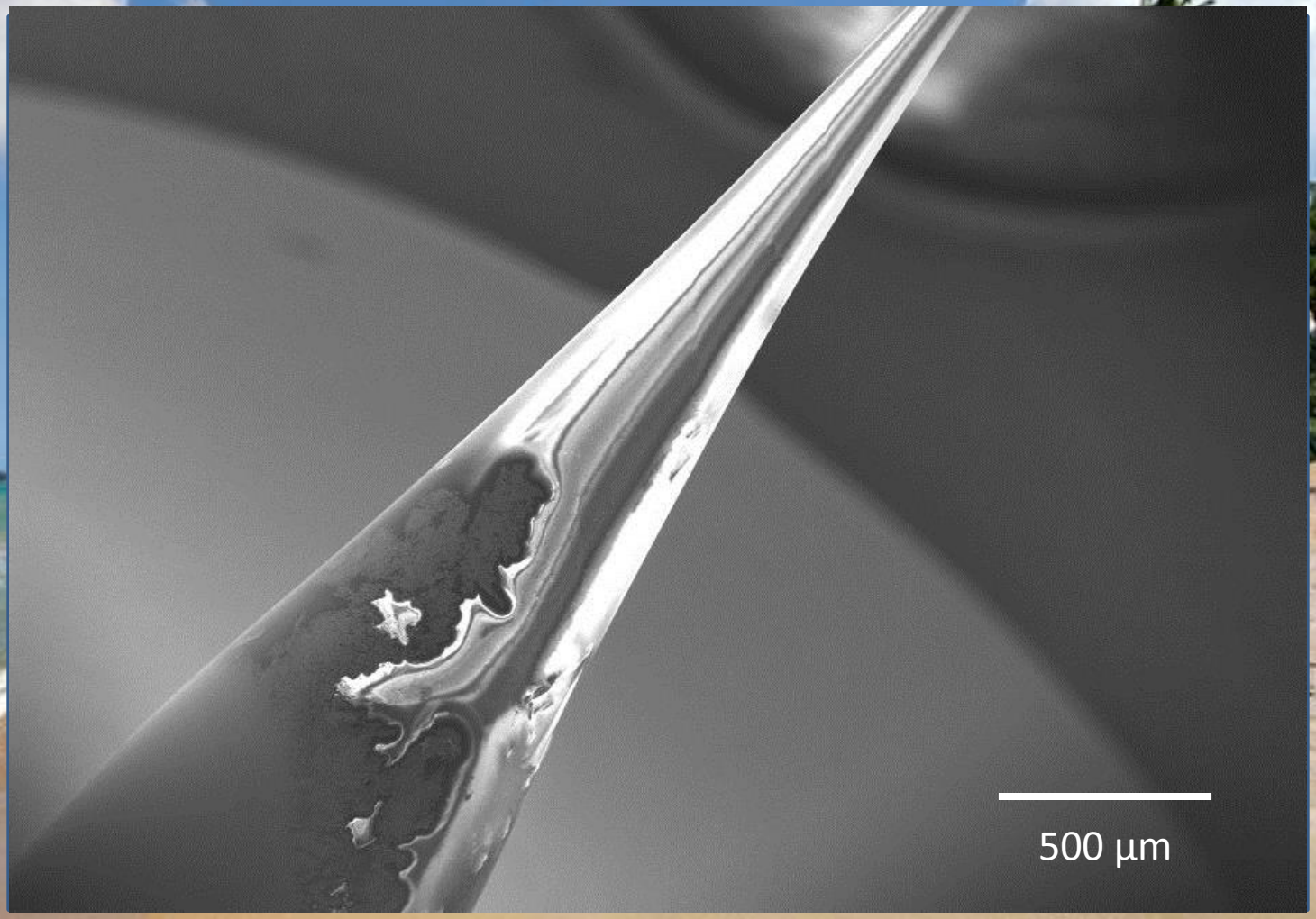
Micrograph Title:
In-situ Wet Pipette

Description:
Sulfuric Acid residue on a glass micro-pipette in high vacuumed SEM



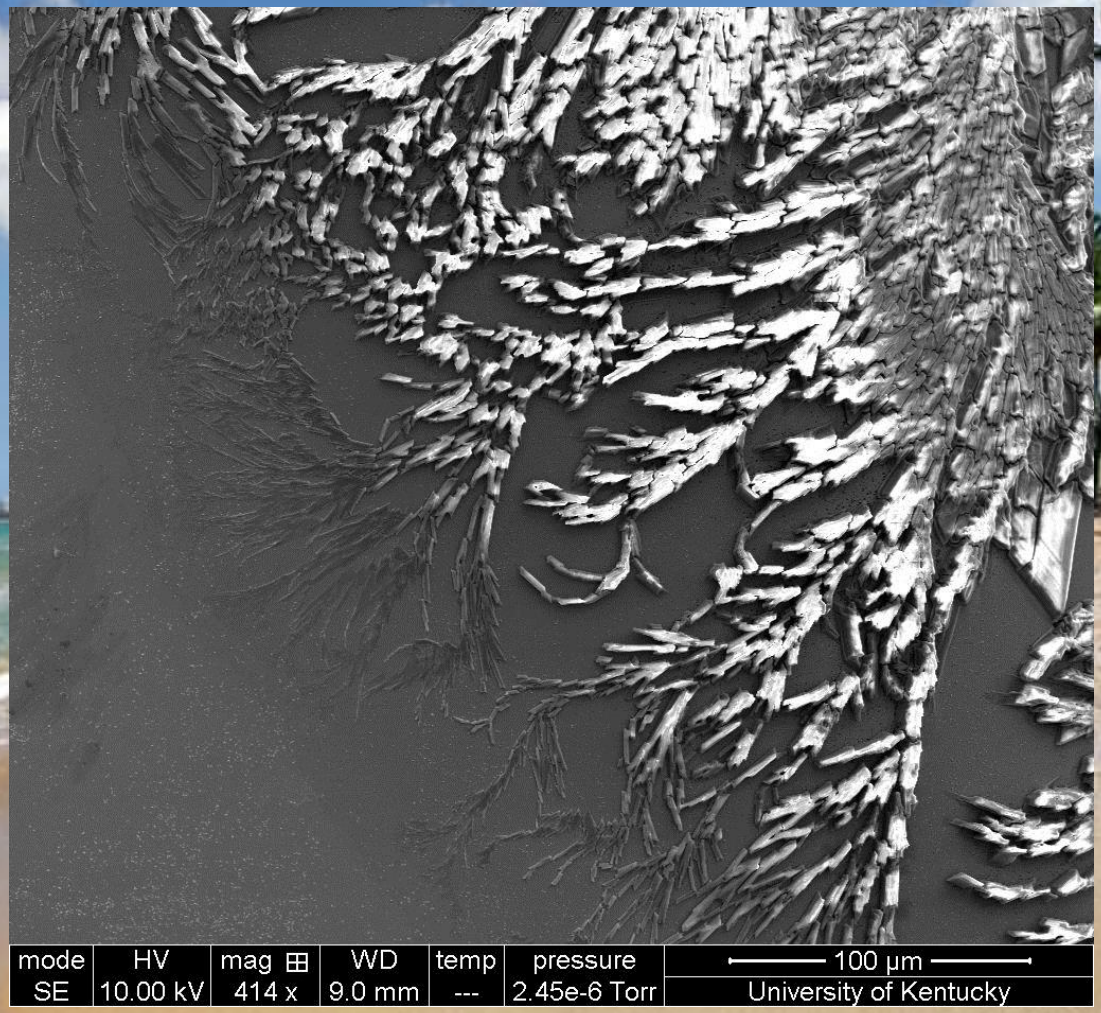
Magnification (3"x4" image): 45 X
Instrument : Quanta ESEM - FEI

Submitted by: Samaneh Esfandiarpour
Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
After Flood

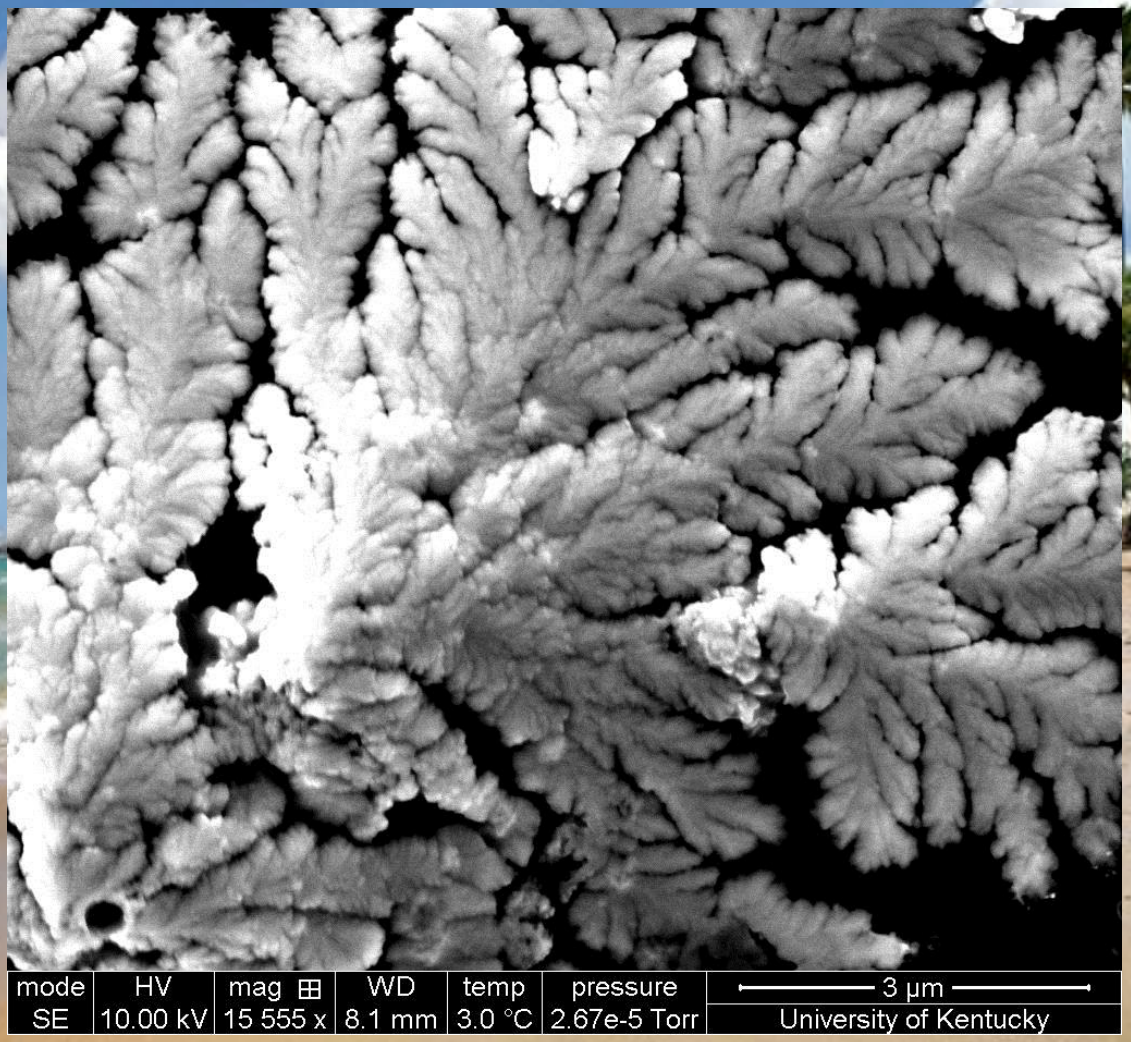
Description:
Dried $CuSO_4$ on the glass pipette after being used to deliver liquid in-situ for LP-EBID process



Magnification (3"x4" image): 414x
Instrument : Quanta ESEM - FEI
Submitted by: Samaneh Esfandiarpour
Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
Frozen Leaves



Description:
Dendritic copper growth on silicon from acidified liquid precursor using focused electron beam in an environmental scanning electron microscope.

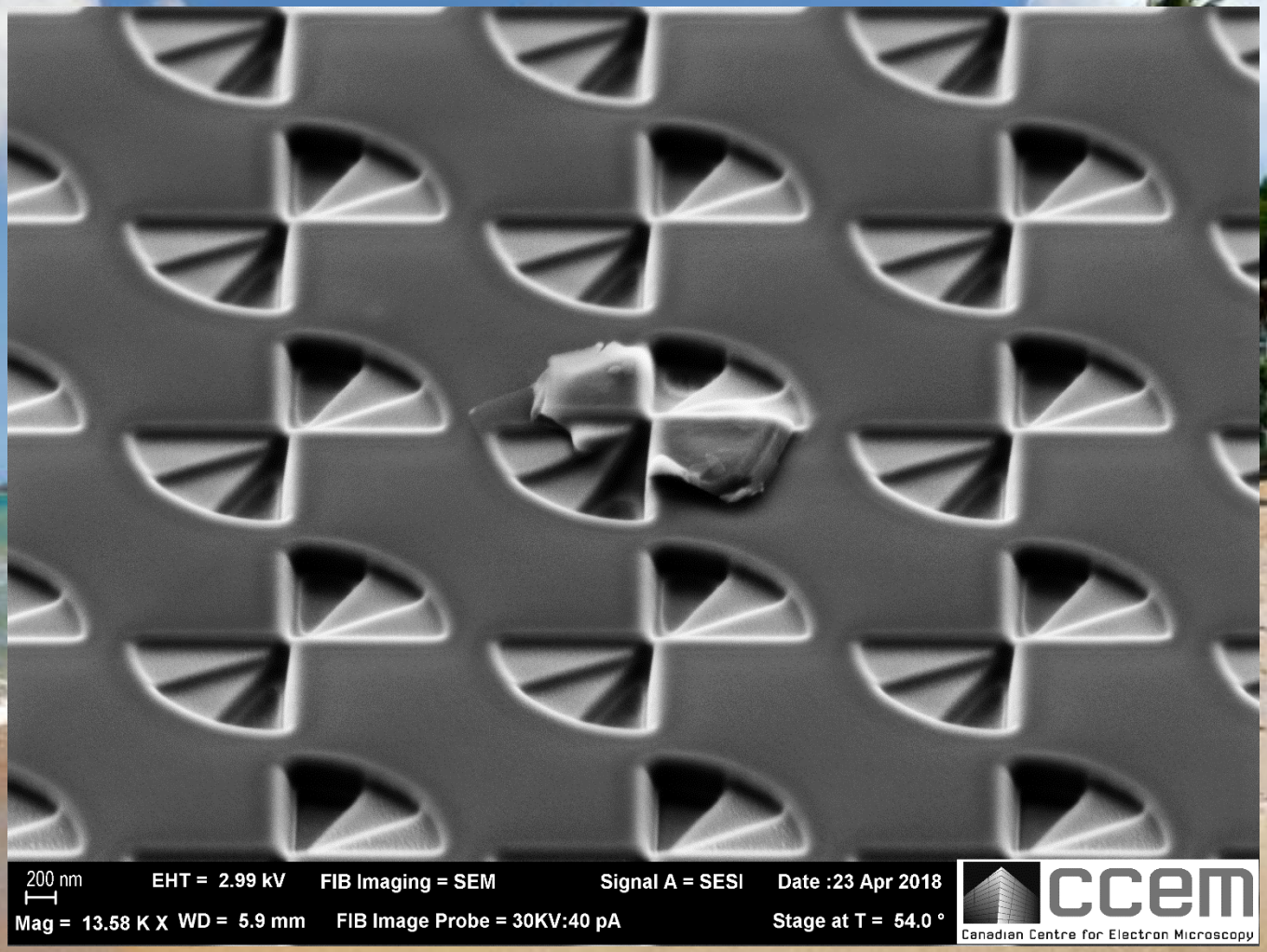
Magnification (3"x4" image): 15.5 kx
Instrument : Quanta ESEM - FEI

Submitted by: Samaneh Esfandiarpour
Affiliation: University of Kentucky

2018 EIPBN MicroGraph Contest

Micrograph Title:
Farfala

Description:
Chiral metamaterial array FIB-milled into 200 nm thick hBN flakes



Magnification (3"x4" image): ~13KX
Instrument : Zeiss NVision 40

Submitted by: Sam Norris
Affiliation: McMaster University, Hamilton, Ontario

2018 EIPBN MicroGraph Contest

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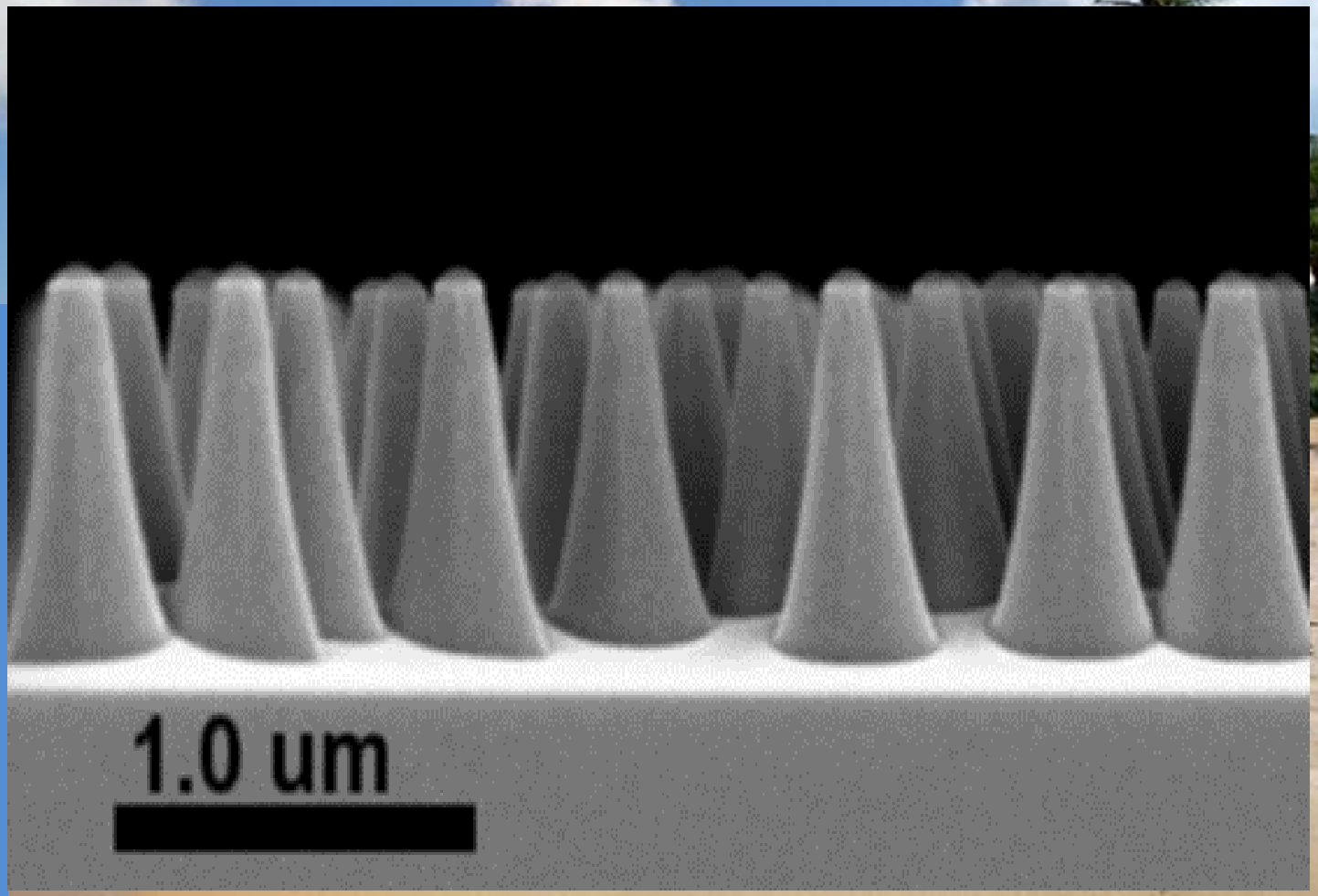
Micrograph Title:
Greatest nanocones, the world has ever seen.

Description:
Cross-sectional SEM image of Gallium Arsenide nanocones, fabricated using novel colloidal lithography. These periodic nanocones act as broad-band anti-reflection coatings, resulting in order of magnitude enhancement in solar absorption



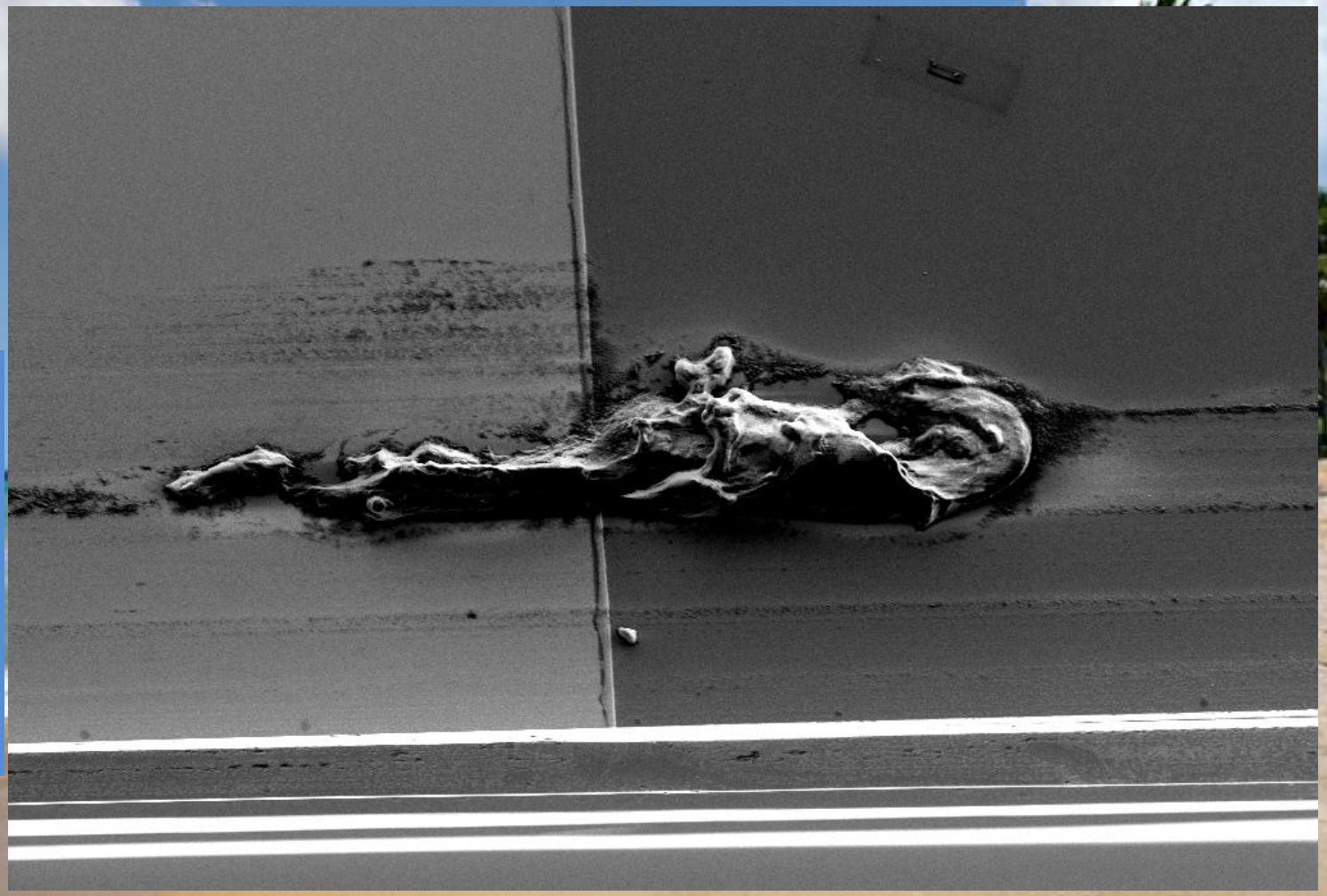
Magnification (3"x4" image): 40 KX **Instrument :** Zeiss Leo

Submitted by: Kashif Awan **Affiliation:** University of Ottawa (SEM @ KTH)

2018 EIPBN MicroGraph Contest

Micrograph Title:
Why did the chicken cross the wafer?

Description:
Image of a deceased chicken that had an unfortunate time crossing the wafer roadway. (Made lovingly from photoresist on niobium nitride)



Magnification (3"x4" image): 1.7KX Instrument : Zeiss SEM

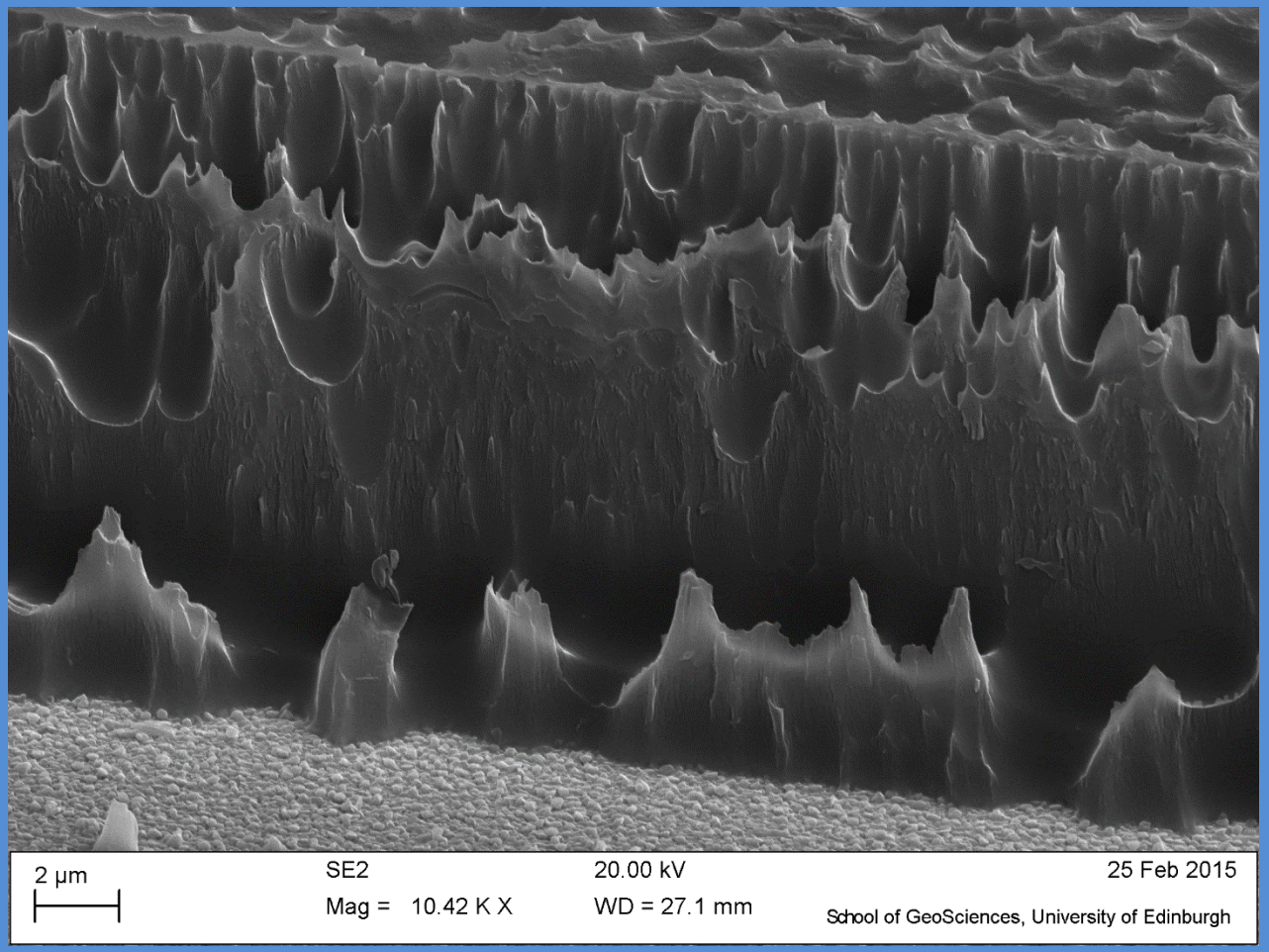
Submitted by: Emily Toomey, Marco Colangelo, and Navid Abedzadeh

Affiliation: MIT, Cambridge MA

2018 EIPBN MicroGraph Contest

Micrograph Title:
Pick something that the judges will change.

Description:
Nano Waves



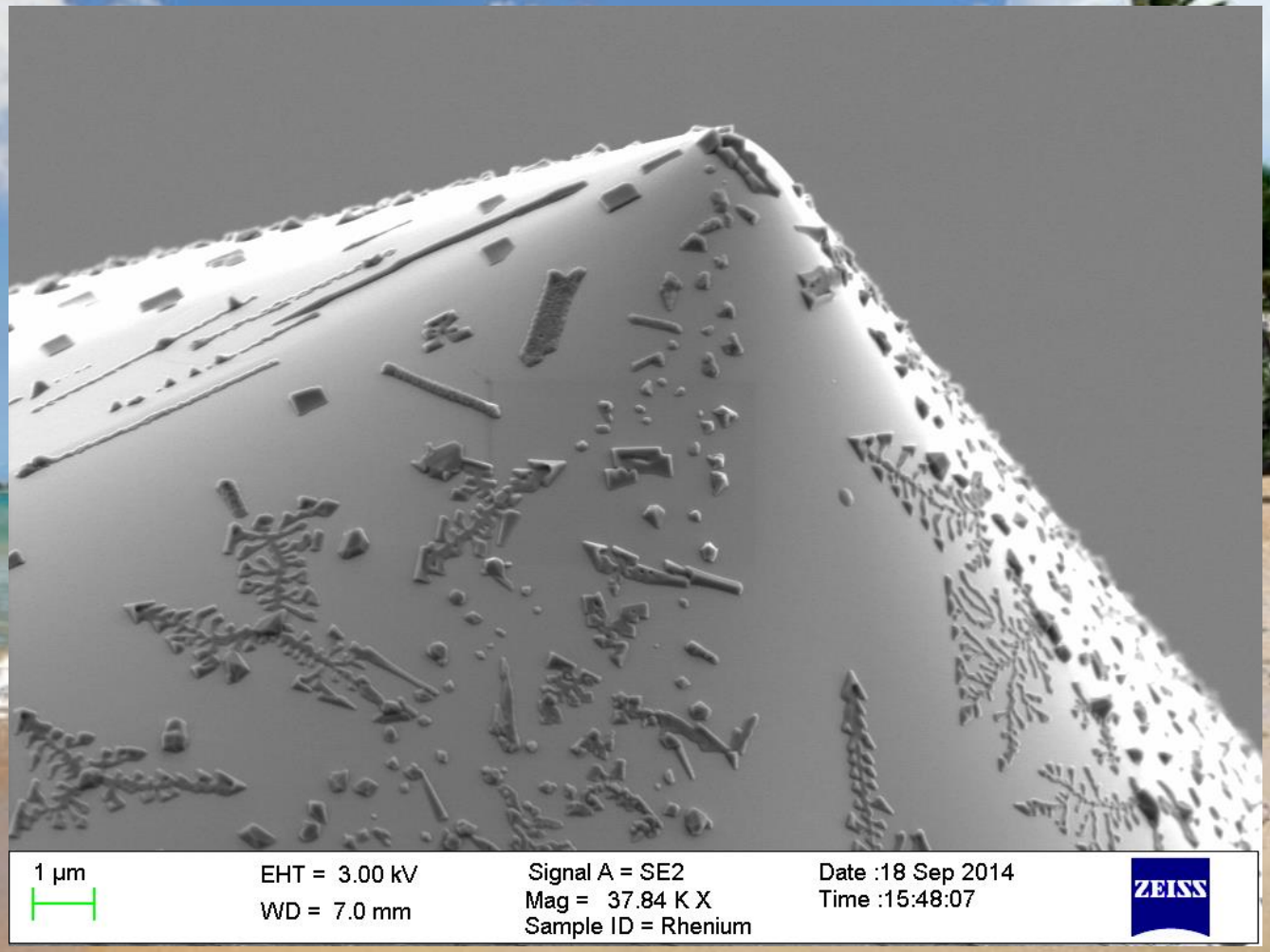
Magnification (3"x4" image): 20KX Instrument : Hitachi

Submitted by: Atif Syed Affiliation: University of Edinburgh

2018 EIPBN MicroGraph Contest

Mount Rhenium

A frozen rhenium Taylor cone is shown. This sample has underdone atmospheric interaction, which created rhenium oxide surface crystals.

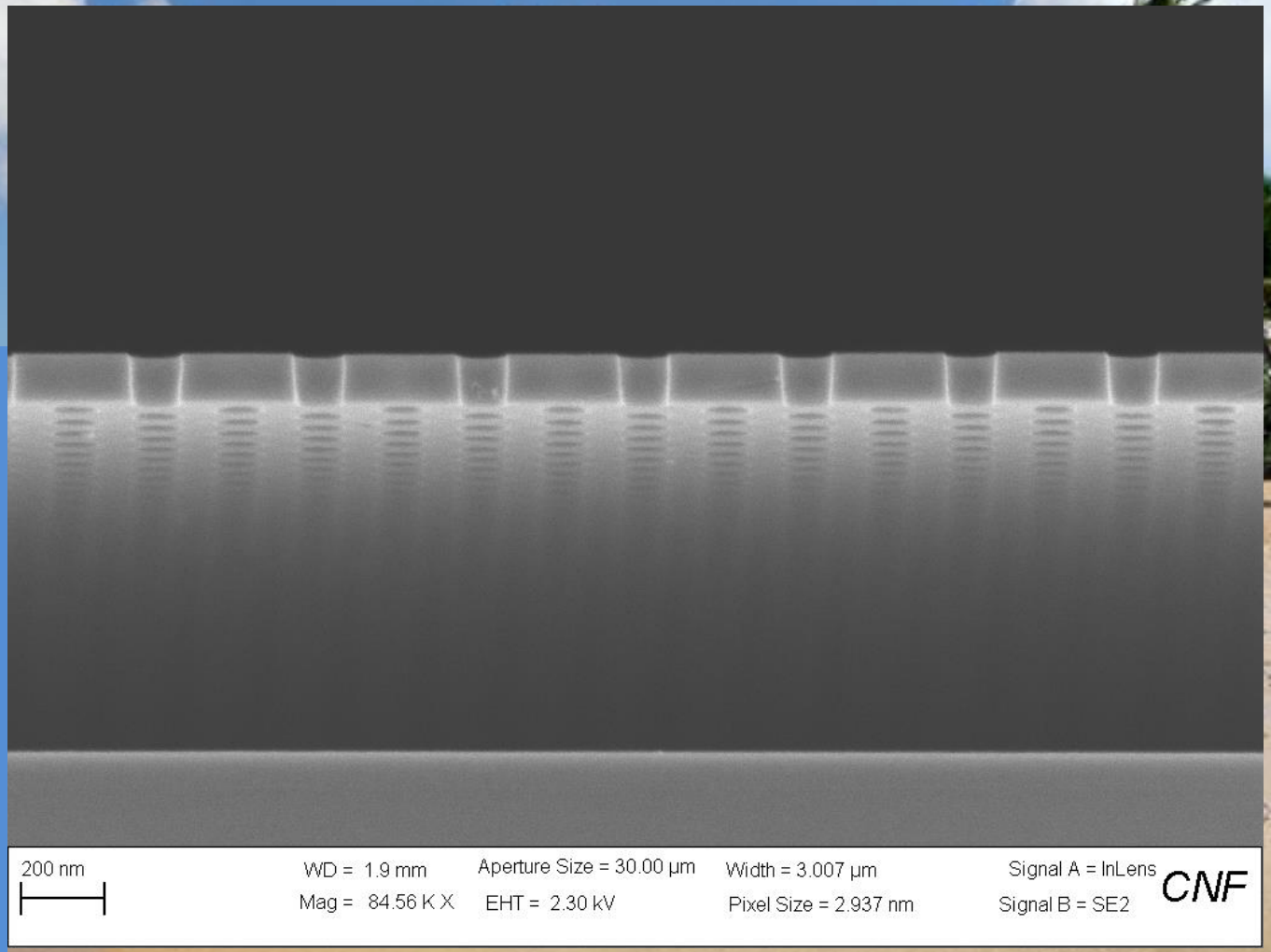


Instrument : Zeiss Ultra-55 FE-SEM
Submitted by: Gregory Hirsch
Affiliation: Hirsch Scientific
Pacifica, California USA

2018 EIPBN MicroGraph Contest

Micrograph Title:
Lets make photonic crystals great again.

Description:
Cross-sectional SEM image of an air-bridge Gallium Arsenide photonic crystal nanocavity. Slab thickness is ~165 nm, with ~3000 nm thick undercut. Special care and effort was made to cleave a nice and smooth facet. No conductive layer (gold or E-spacer etc) was used.



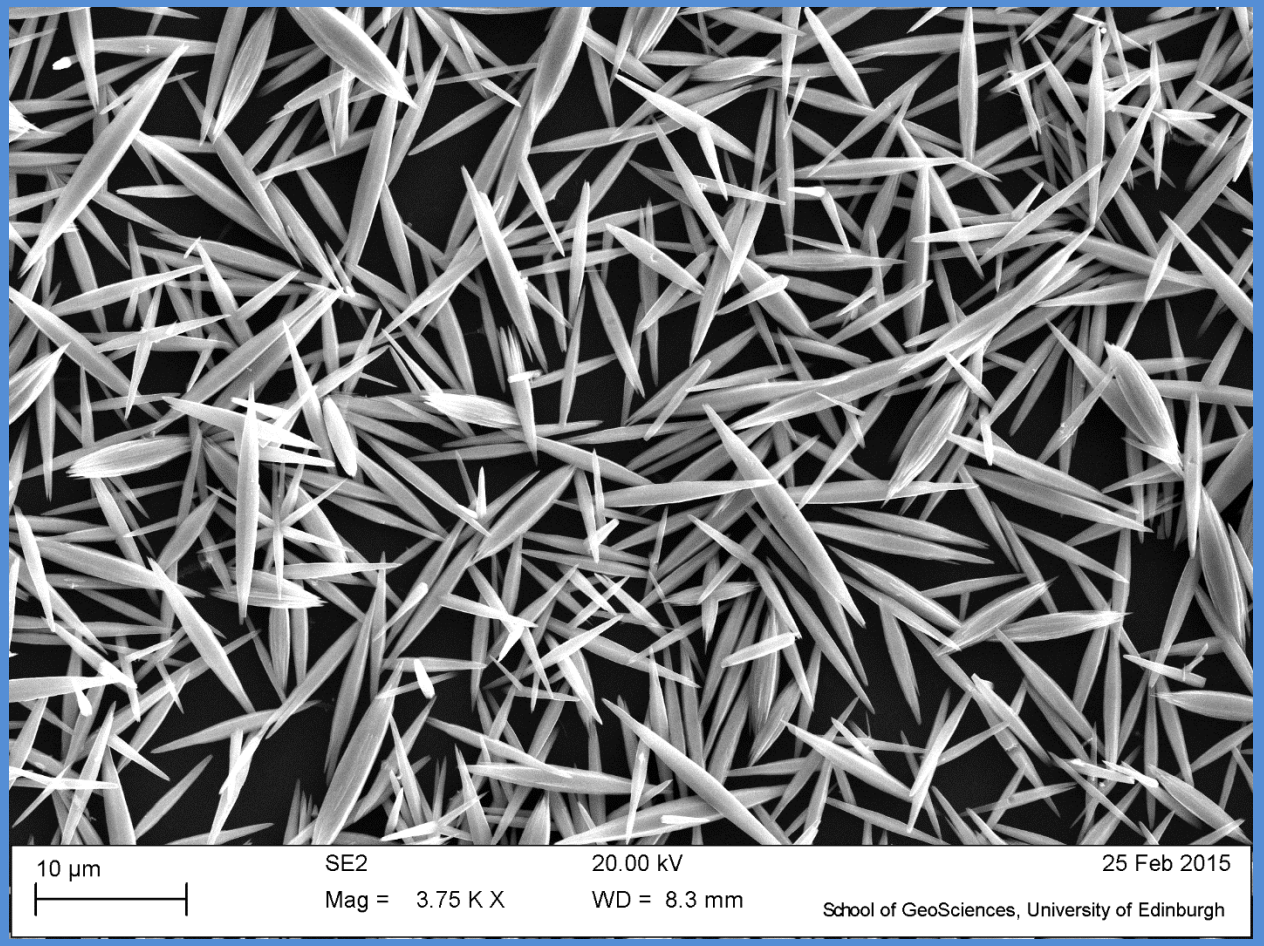
Magnification (3"x4" image): 84.56 KX **Instrument : Zeiss Ultra**

Submitted by: Kashif Awan **Affiliation: University of Ottawa (SEM @ CNF)**

2018 EIPBN MicroGraph Contest

Micrograph Title:
Needle in a haystack

Description:
ZnO nanowires are individually stacked on Gold surface



Magnification (3"x4" image): 18.10KX **Instrument :** Hitachi

Submitted by: Atif Syed **Affiliation:** University of Edinburgh