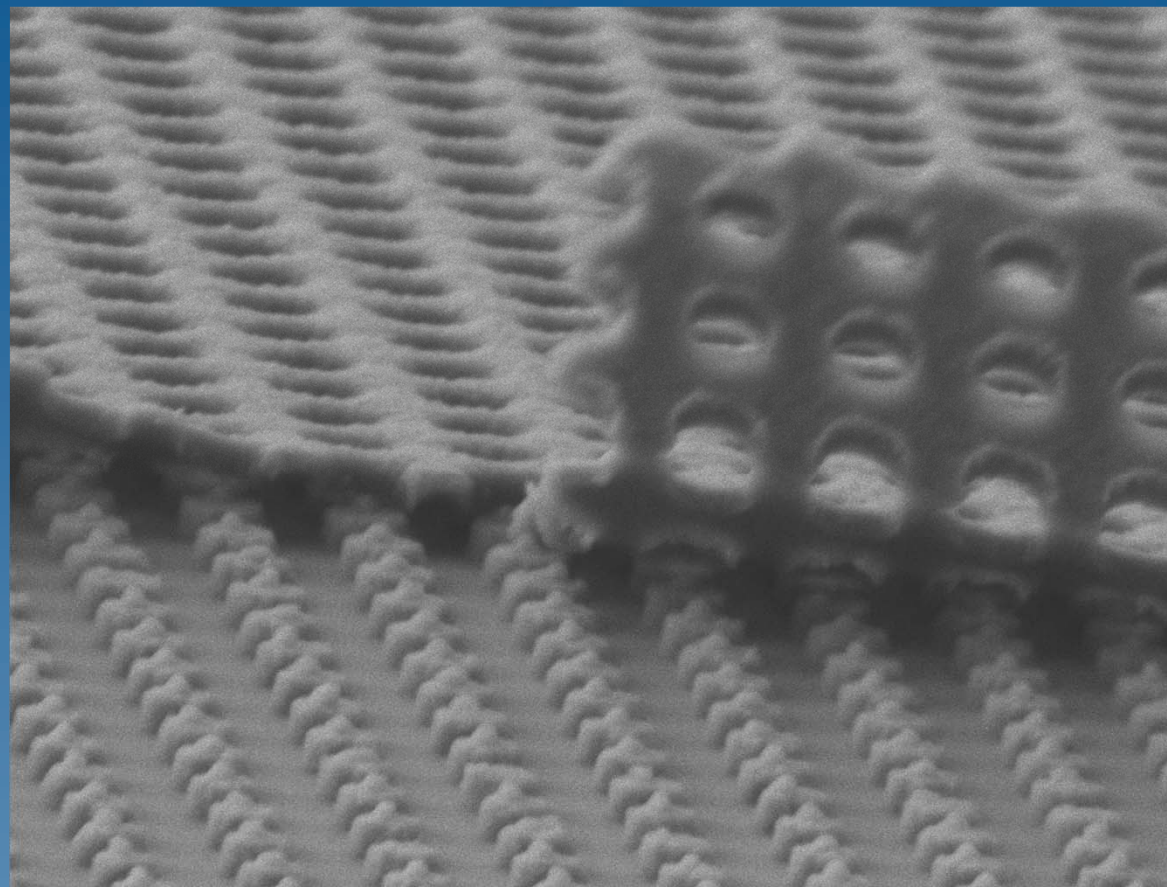




Description:

Al lift-off stopped midway and observed in the SEM. Resist is PMMA with holes made by single e-beam shots overexposing the resist to create negative post in the middle of each hole.



IMEL Sb:99 SEM LEI 3.0kV X30,000 WD 5.1mm 100nm

Magnification: 30KX

Submitted by: Antonis Olziersky

Instrument: JEOL JSM 7401-F

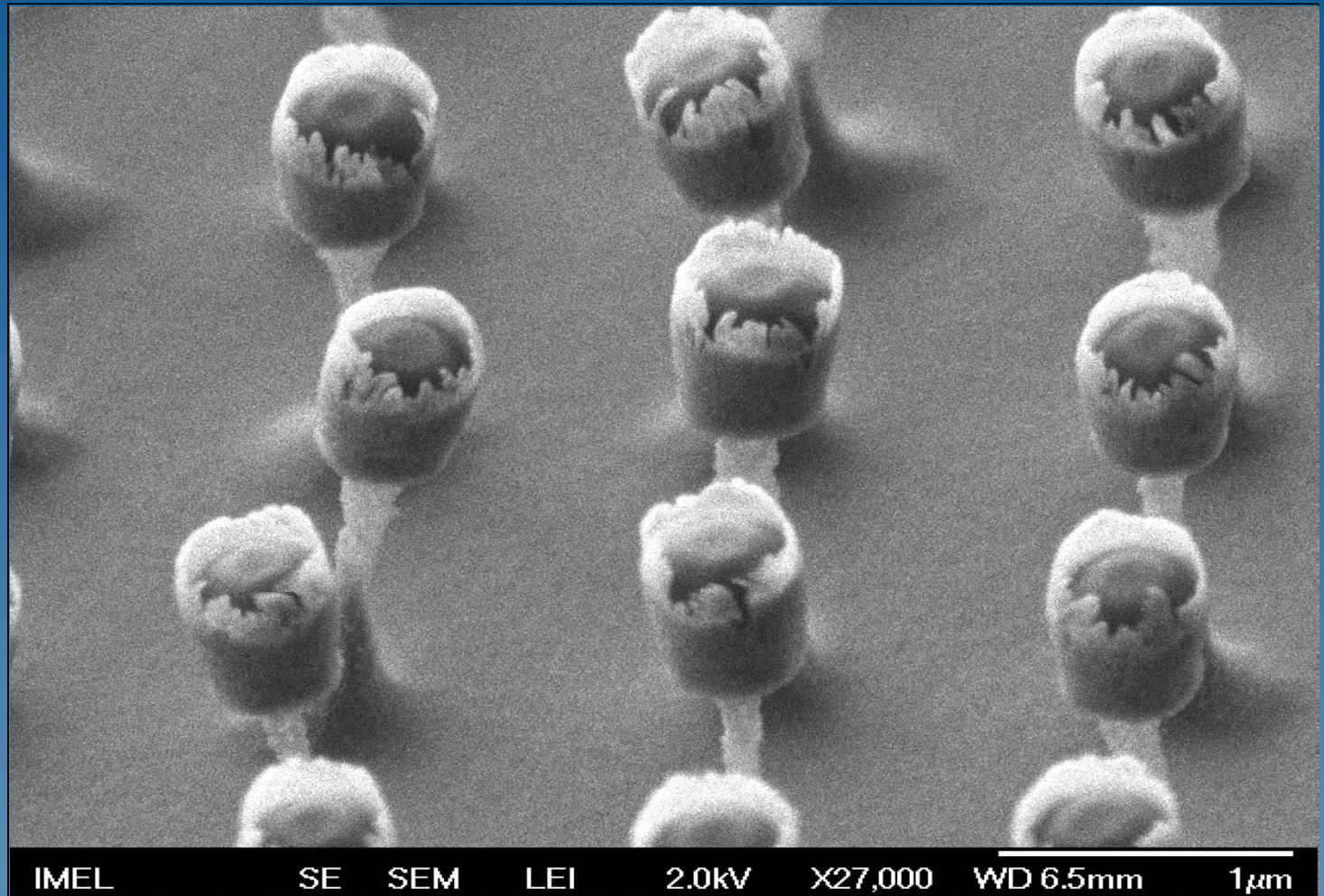
Affiliation: NCSR “Demokritos” Athens, Greece

micro & nano - graph Title:
“Silicon μ -tulips make a great bouquet”



Description:

A set of tulips in the backyard of a silicon wafer.



Magnification: 27000X

Instrument: Jeol – JSM7401F

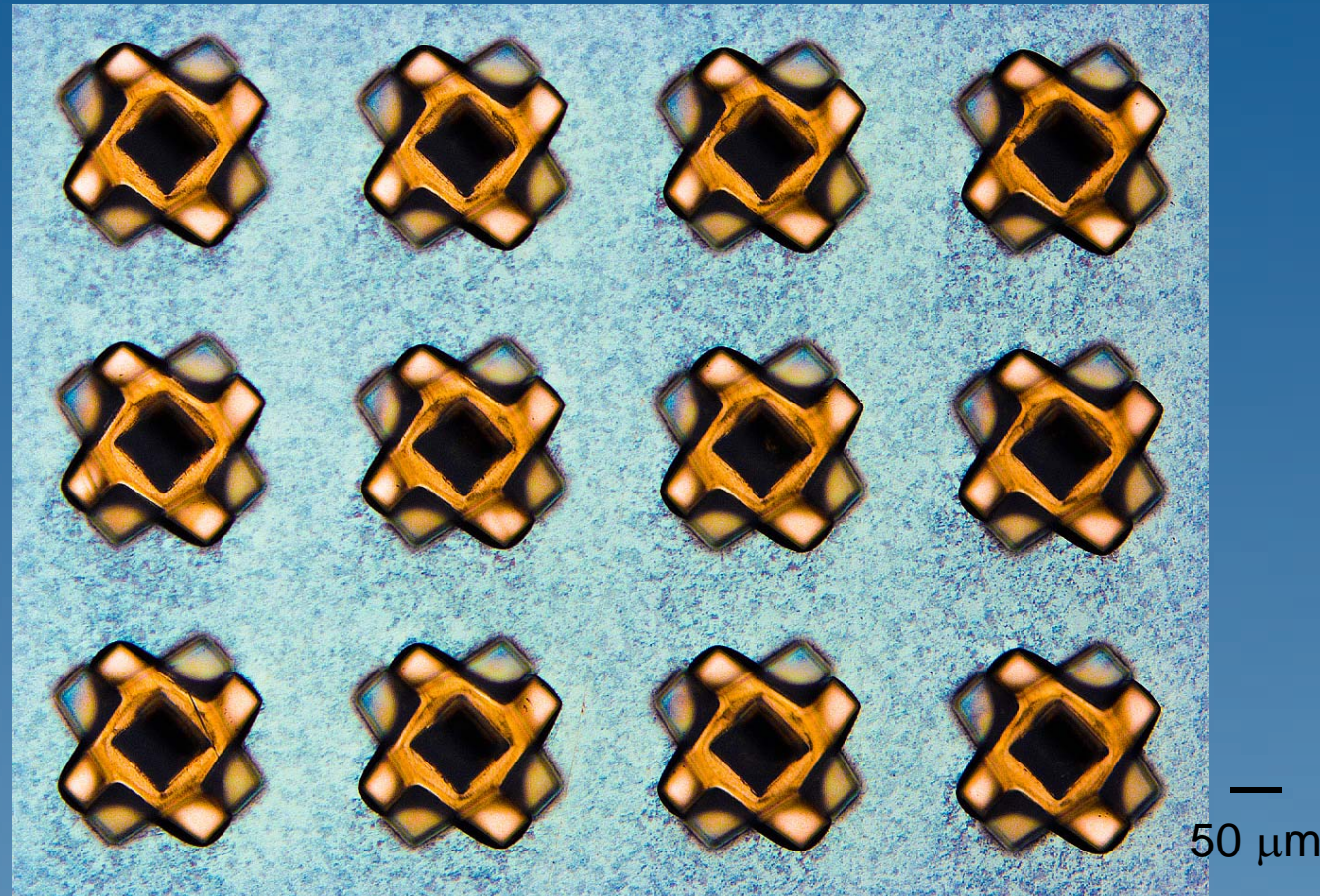
Submitted by: Evangelos Gogolides

Affiliation: IMEL N.C.S.R. Demokritos.,
Athens, GREECE



Description:

Bi-layered, 100 μm -thick SU-8 microtiles with bottom layer embedded into 50 μm -thick sacrificial copper layer. The top SU-8 tile layer seen in transparence is an inverted copy of the embedded one. This stacked, chiral embrace gives rise to 3D microtiles – fundamental vehicles to study the dynamics of fluidic self-assembly. The snowy, mesmerizing background is due to oxygen plasma activation of the mixed copper/SU-8 surface prior to spinning of the top SU-8 layer. The harmonious beauty of this picture is stunning. How esthetically rewarding microfabrication can be!



Magnification: 100x

Submitted by: Massimo Mastrangeli

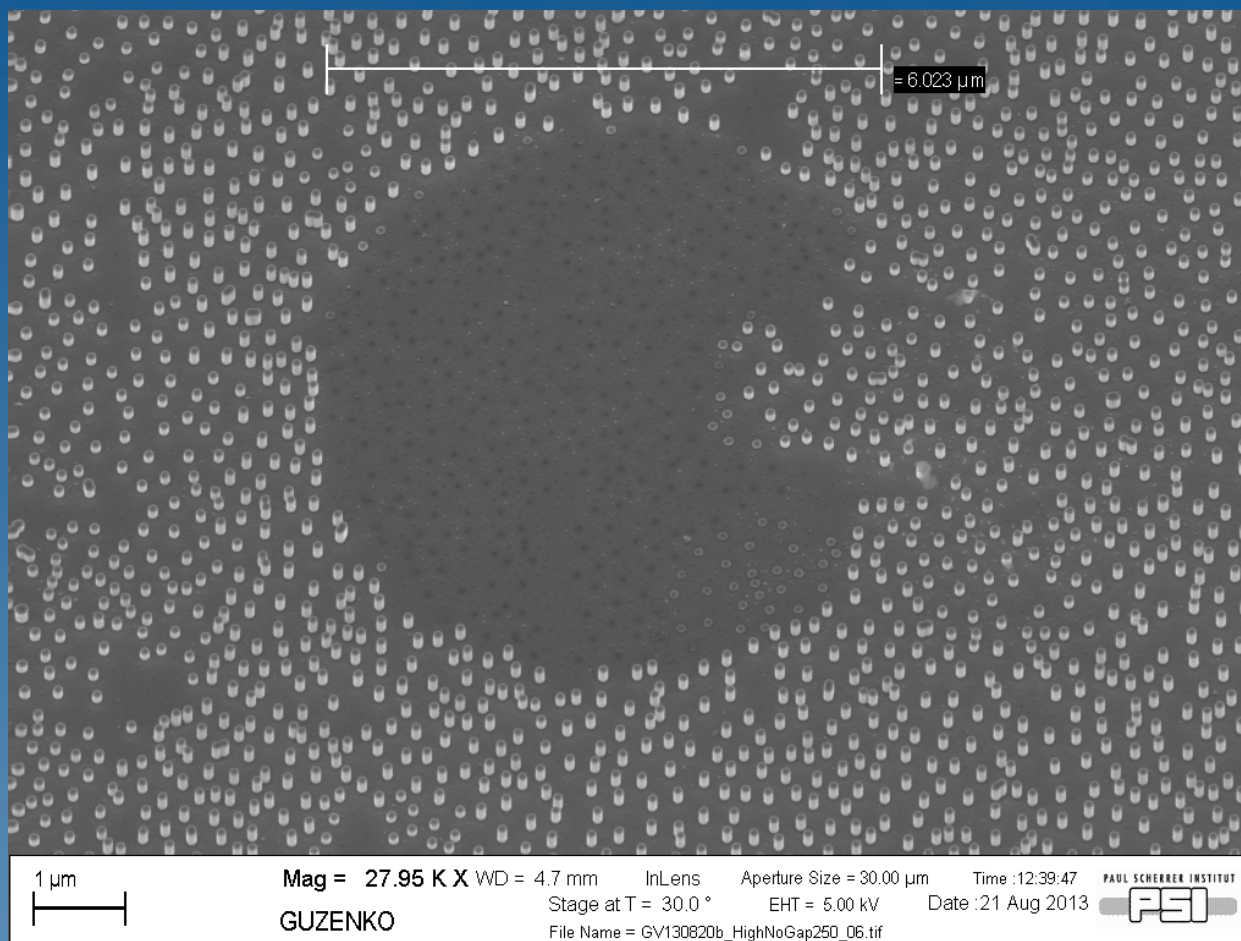
Instrument: Nikon Eclipse L200 with Digital Sight DS 5 M camera

Affiliation: Microsystems laboratory (LMSI1), Ecole Polytechnique Fédérale de Lausanne (EPFL), Lausanne (CH)



Description:

A void in ensemble
of gold nanorods
on a Si_3N_4
membrane
(electroplating into
PMMA mold,
exposed by e-
beam at 100 keV)



Magnification: 27.95 kX

Submitted by: Vitaliy Guzenko

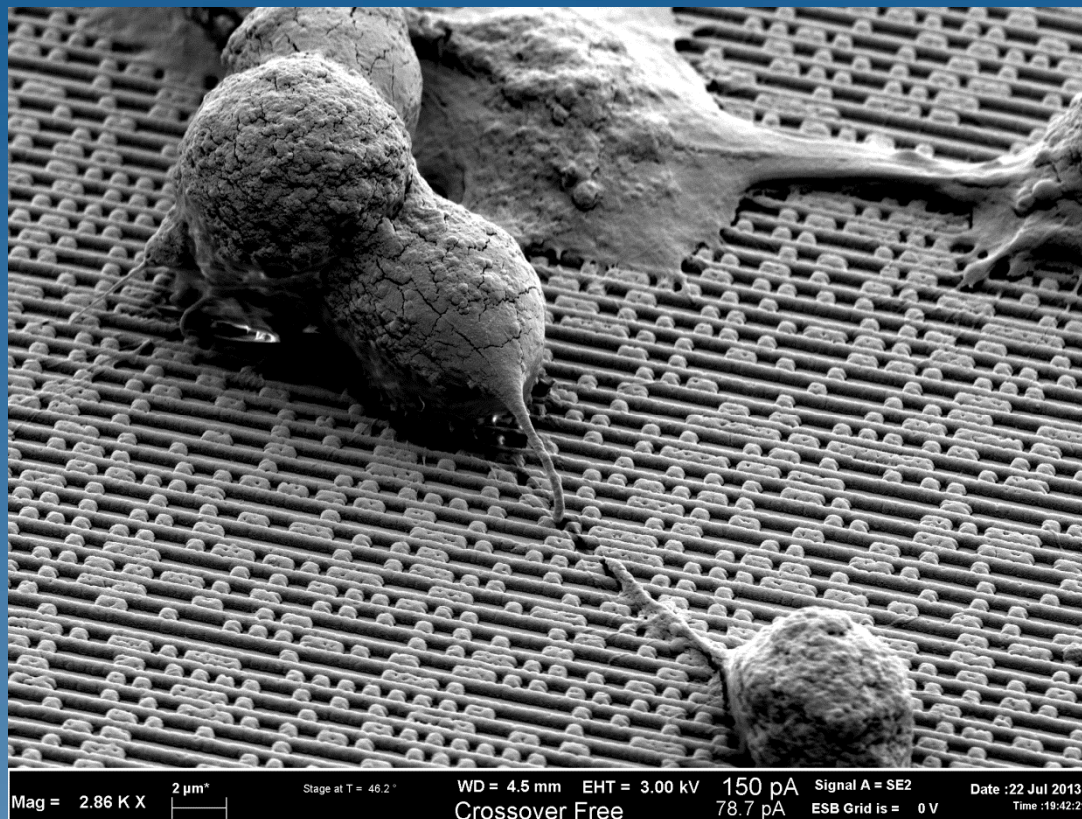
Instrument: SEM Zeiss Supra 55VP

Affiliation: Paul Scherrer Institute,
5232 Villigen PSI, Switzerland



Description:

On a highly directional structure (*i.e.* a nanograting) are randomly added 500nm x 500nm nanomodifications, acting as bridges between the ridges of the nanostructure. PC12 cells are differentiated, promoting the emission of neurites. Two cells are growing protrusions looking for each other, using the nanomodifications as rafts to break the constraints imposed by the nanograting..



Magnification: 2.86KX

Submitted by: Sandro Meucci

Instrument: Merlin (Zeiss) – Gemini II column

Affiliation: NEST, Scuola Normale Superiore and
Istituto Nanoscienze-CNR, Pisa (ITALY)

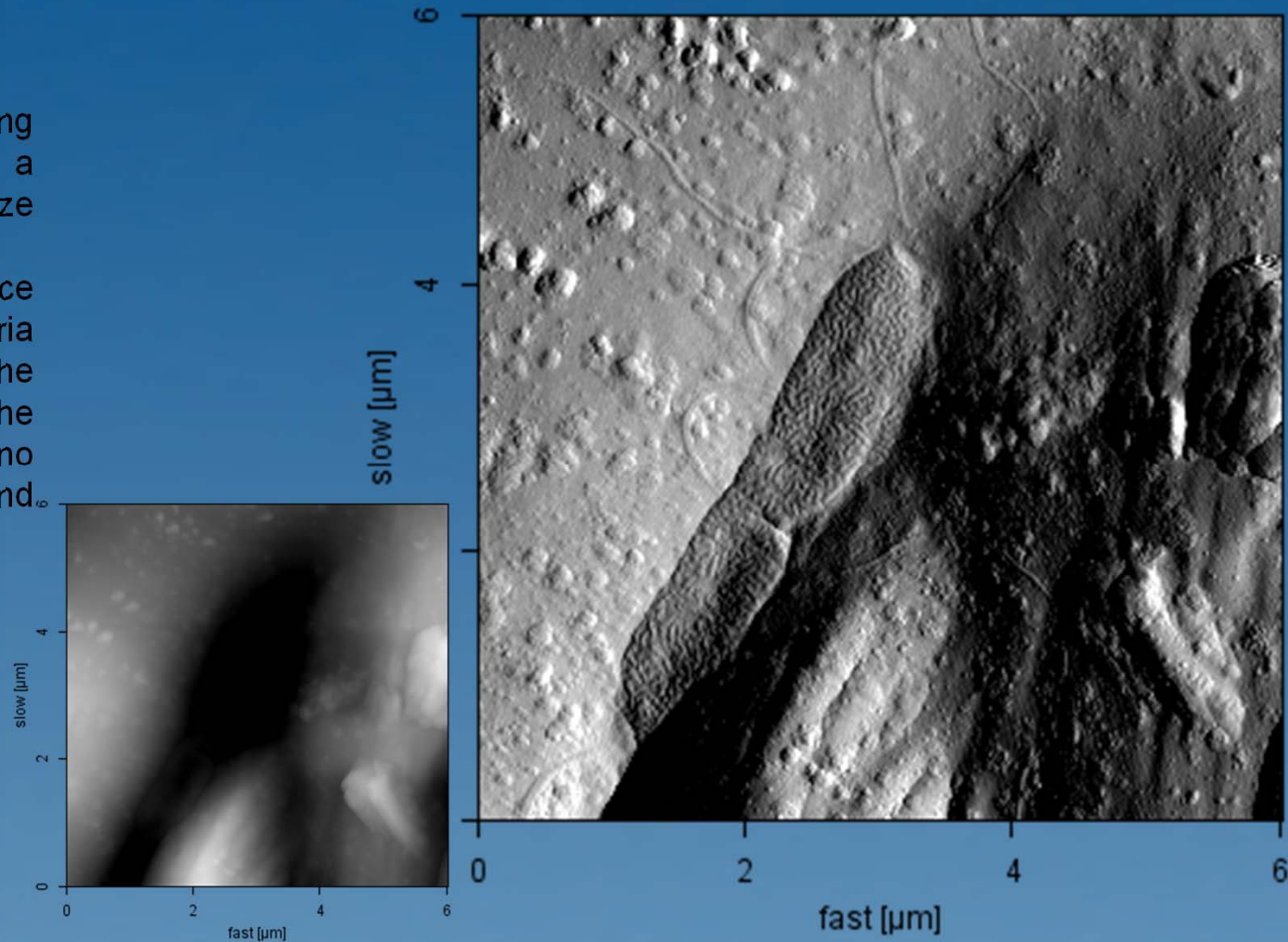
micro & nano - graph Title: “Bacteria lying in ambush”



Description:

AFM image of a dividing bacterium hiding in a dark corner of a maize leaf.

Flagellae and surface structure of bacteria are clearly visible in the error image, while in the topography image, no sign of bacteria far and wide.



Magnification: 20KX

Submitted by: Ursula SAUER

Instrument: NanoWizard JPK Instruments

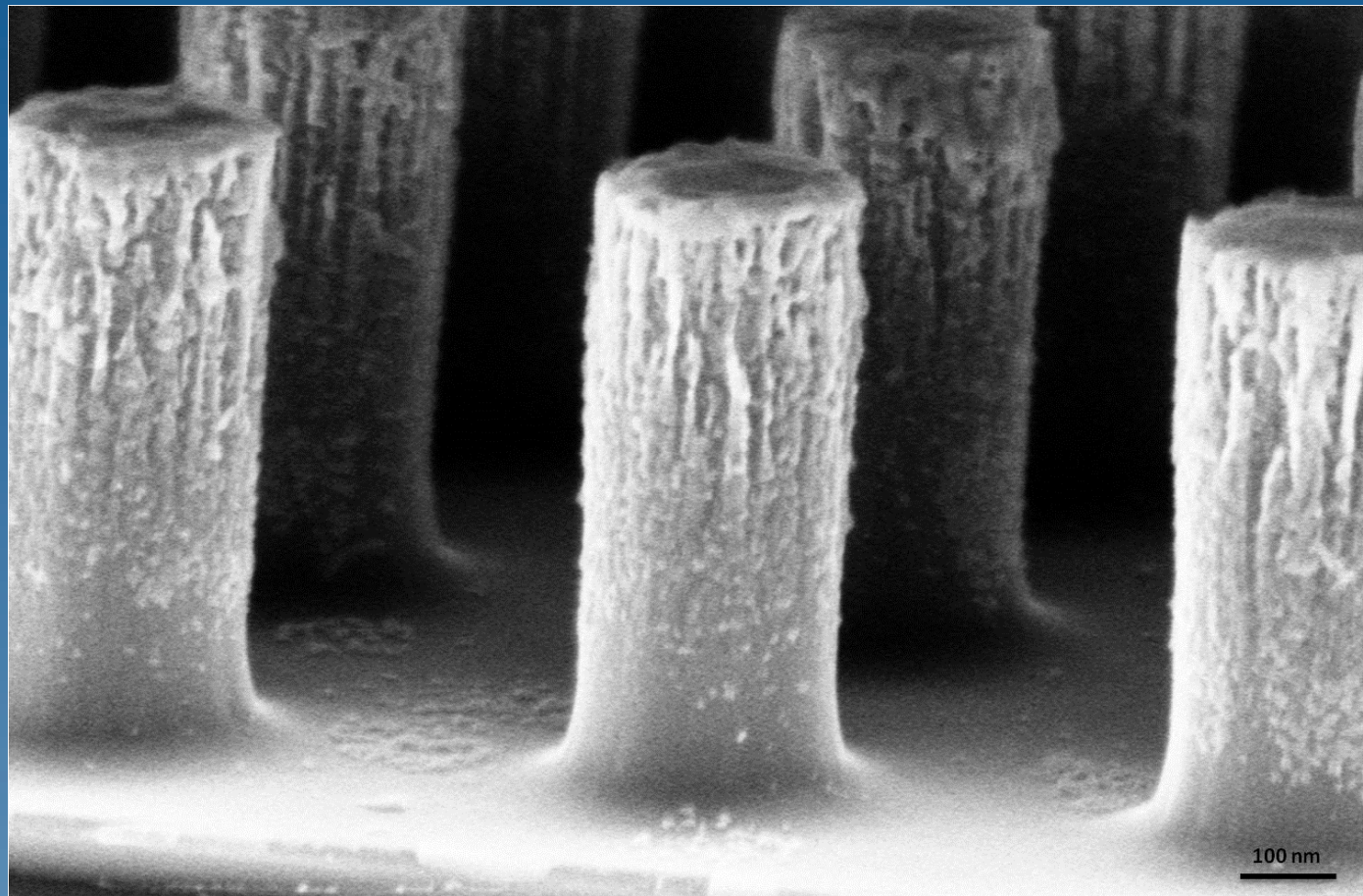
Affiliation: AIT Austrian Institute of Technology GmbH, AUSTRIA

micro & nano - graph Title:
“Candles off”



Description:

The image reminds candles with their wick finished and melted wax around their sidewalls. Actually, we are seeing silicon posts and the roughness comes from chromium hardmask used for the etching



Magnification: 200KX

Submitted by: Iñaki Cornago

Instrument: Zeiss Ultraplus FE-SEM

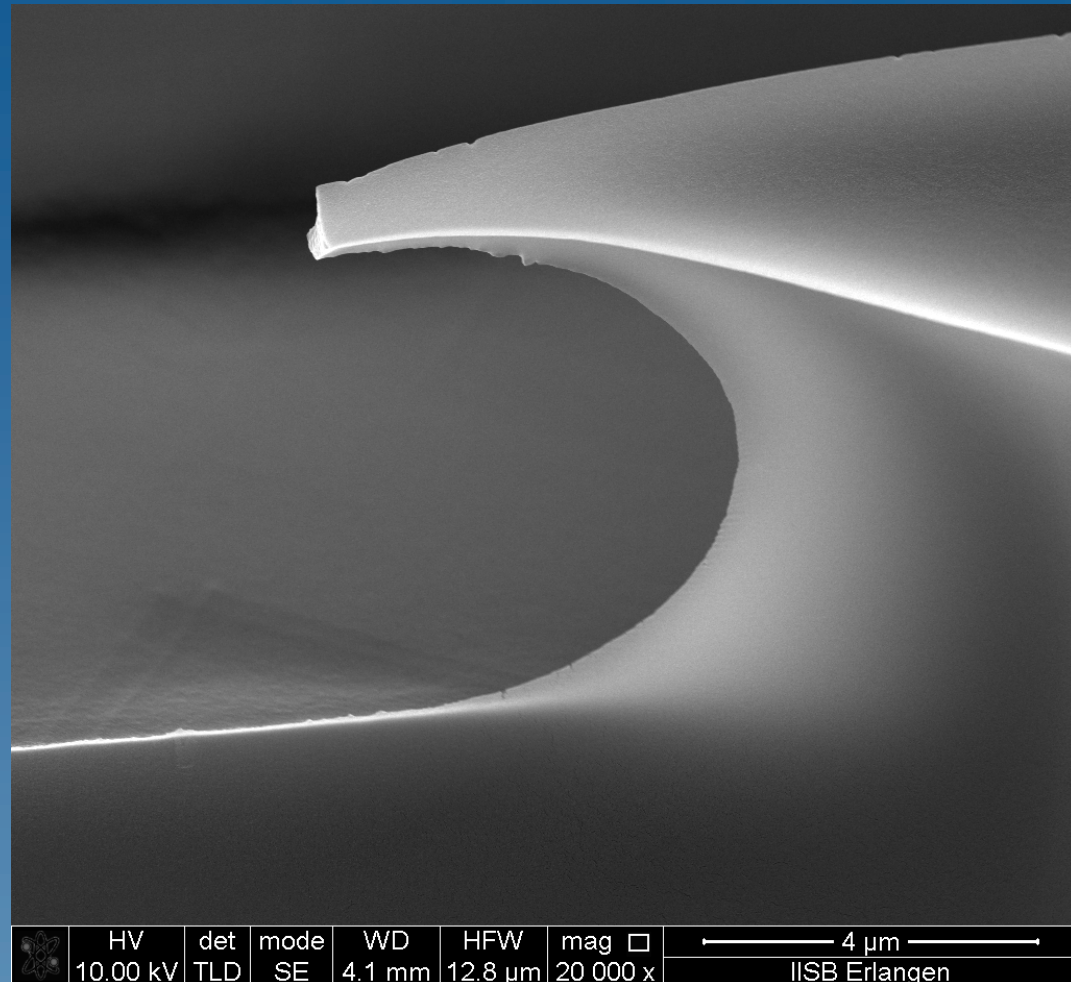
Affiliation: FideNa, Pamplona (Spain)



Description:

Wave-like feature formed due to the incomplete filling of the mold structure during an imprint.

Has anyone seen the Silver Surfer?



Magnification: 20 KX

Submitted by: Maximilian Rumler

Instrument: FEI Helios Nanolab 600

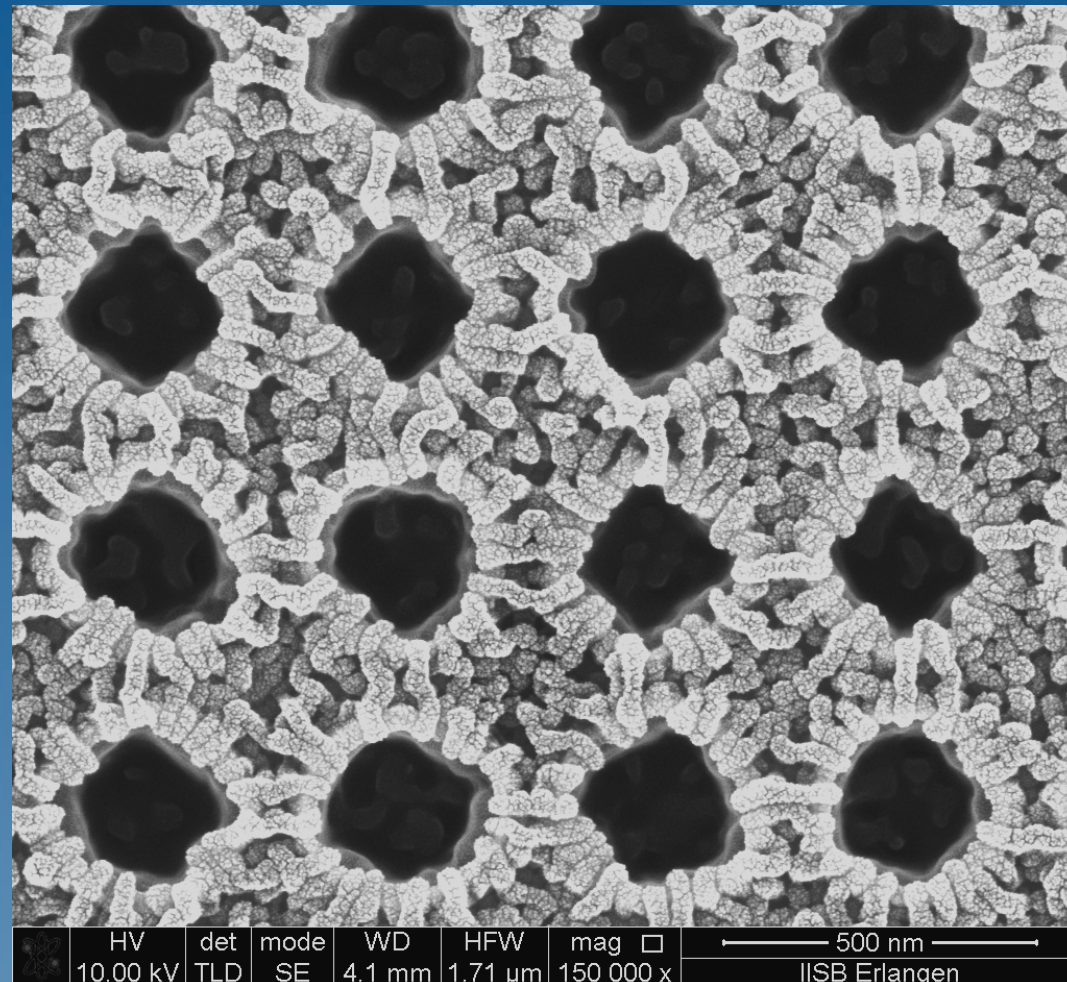
Affiliation: Fraunhofer IISB Erlangen



Description:

Imprinted resist structure after RIE etching. The resist has been severely attacked by the etching process forming the “nano worms”.

Be aware: nano worms can consume an 8” wafer in less than 24 hours...



Magnification: 150 KX

Submitted by: Maximilian Rumler

Instrument: FEI Helios Nanolab 600

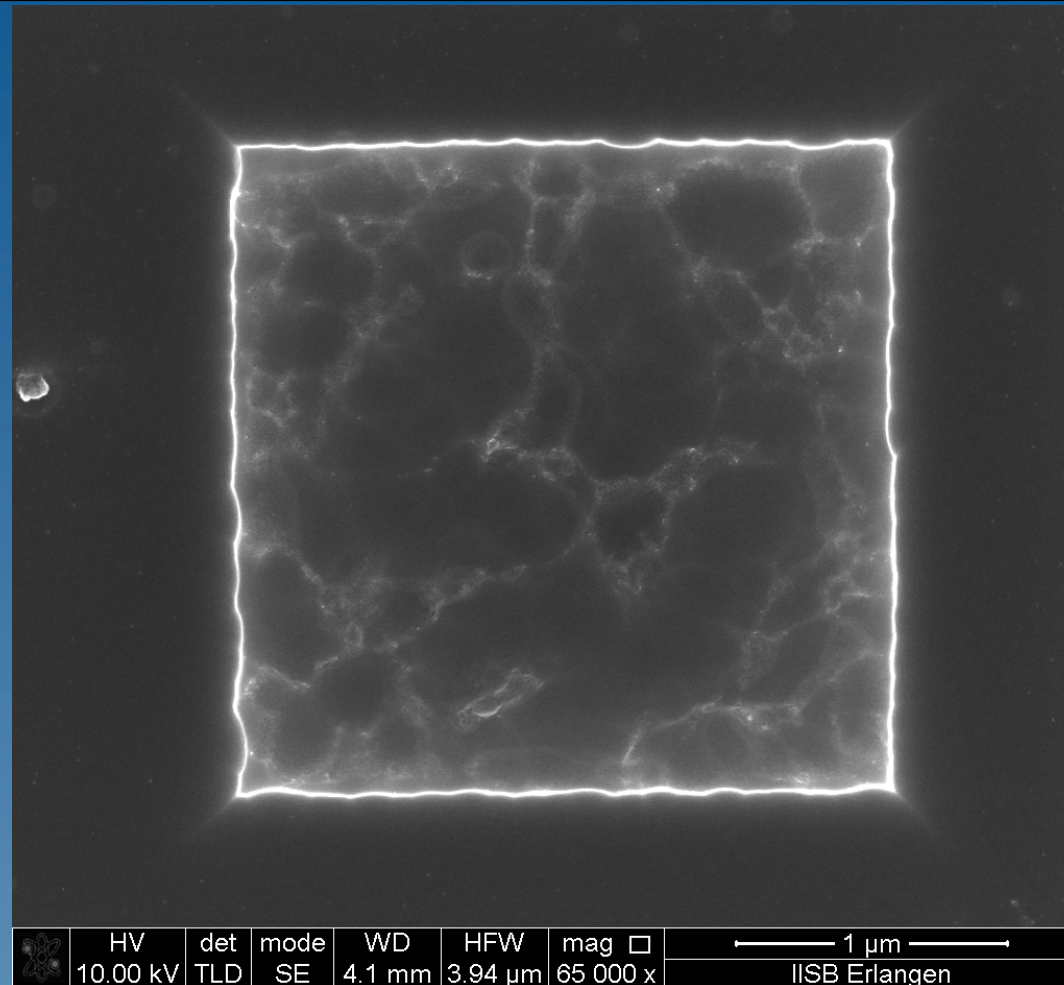
Affiliation: Fraunhofer IISB Erlangen



Description:

Square structure formed by RIE and resistless Ga-beam lithography. The etching process has damaged the implanted mask.

Looking at our sample we found this little window to another galaxy...



Magnification: 65KX

Submitted by: Maximilian Rumler

Instrument: FEI Helios Nanolab 600

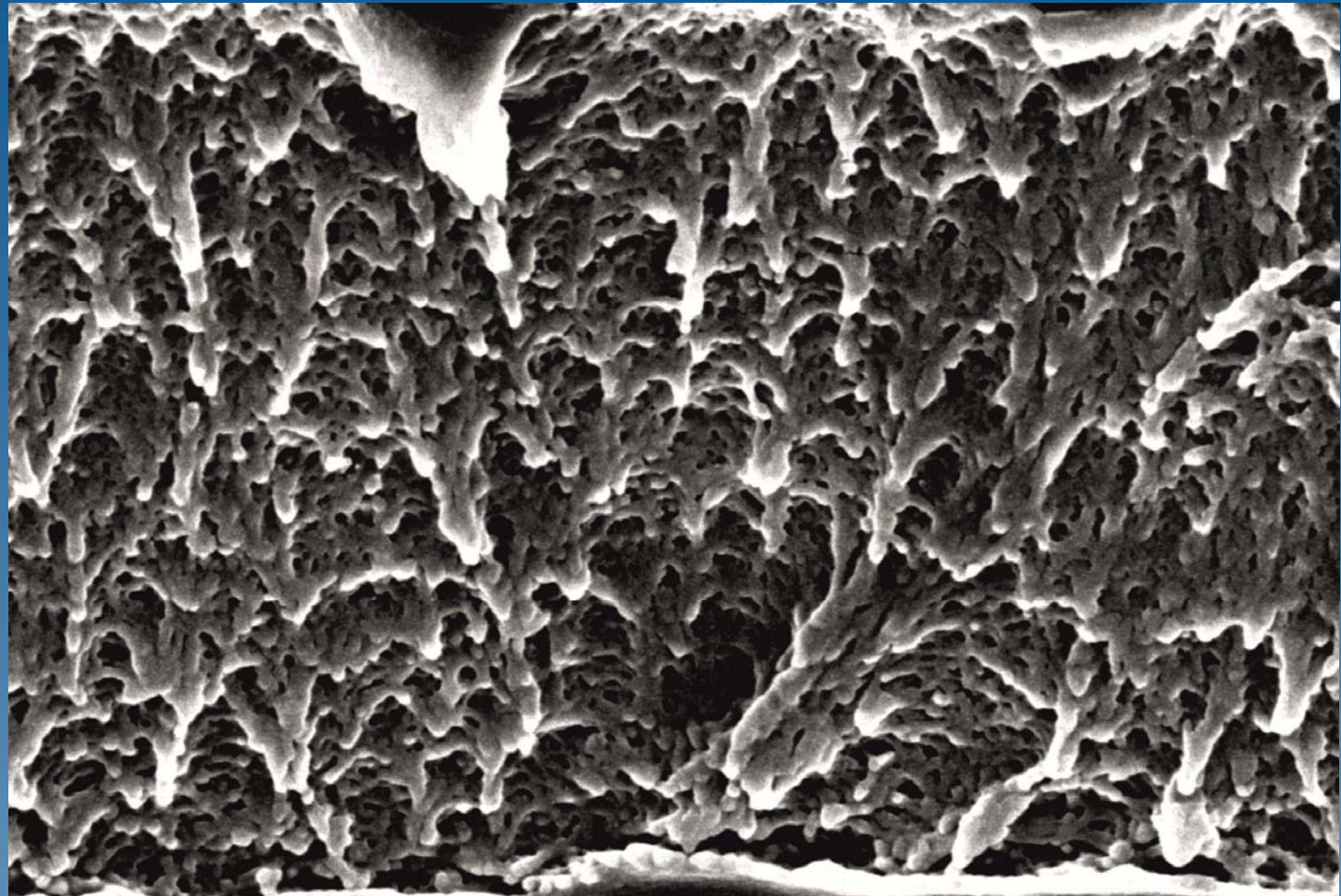
Affiliation: Fraunhofer IISB Erlangen



Description:

Imagine Prof. Lidenbrock hiking deeper and deeper towards the center of the earth: where will this cave lead to?

Spongy facet of an PMMA waveguide after cleaving due to brittle material behavior.



Magnification: 155KX

Submitted by: Robert Kirchner

Instrument: ZEISS Supra 55 VP

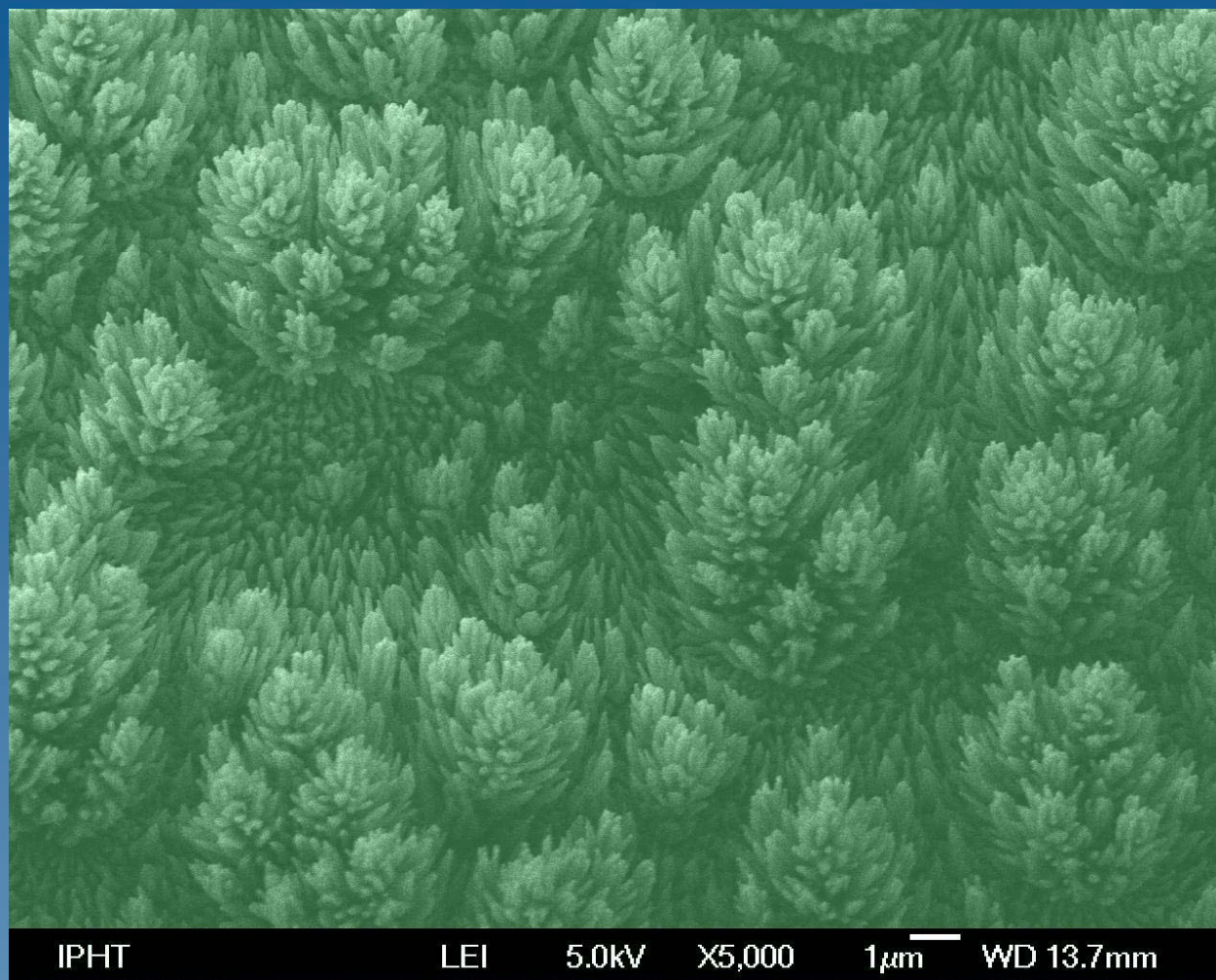
Affiliation: Paul Scherrer Institut
Switzerland



Description:

Spontaneous growth of “3D flower like”-nanostructures after atomic layer deposition (ALD) of SiO₂ on EGNPs (Enzymatically Generated Silver-NanoParticles).

For use as SERS-substrate (Surface Enhanced Raman Spectroscopy).



Magnification: 5 kX

Submitted by: Uwe Huebner

Instrument: JEOL JSM6700F

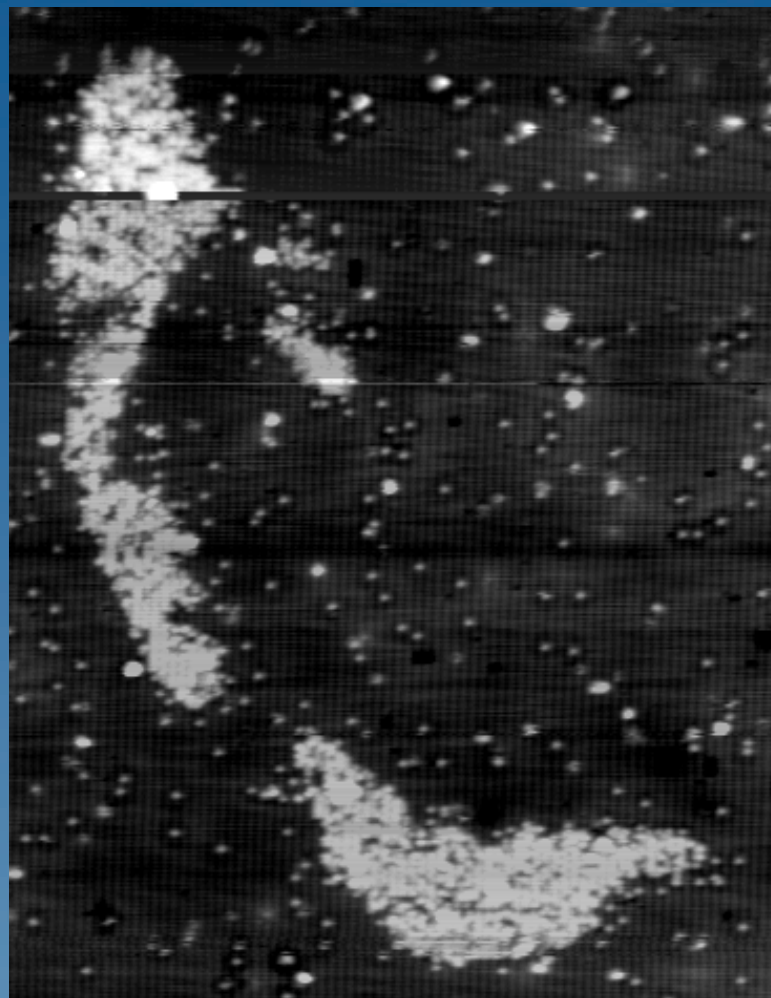
Affiliation: IPHT Jena,
Jena, Germany



Description:

Hydrogen
Depassivation
Lithography portrait of
one of the company
wives.

The vertical stripes are
each two atoms wide,
and the background
dots are single missing
surface atoms.



Magnification: 2.2 MX

Submitted by: James Owen

Instrument: Zyvex Labs HDL Manufacturing Tool

Affiliation: Zyvex Labs
Richardson, TX

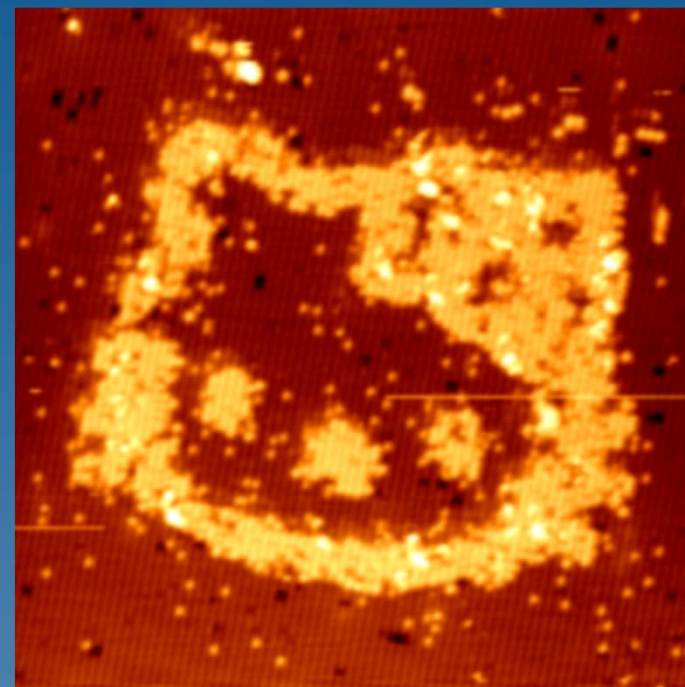
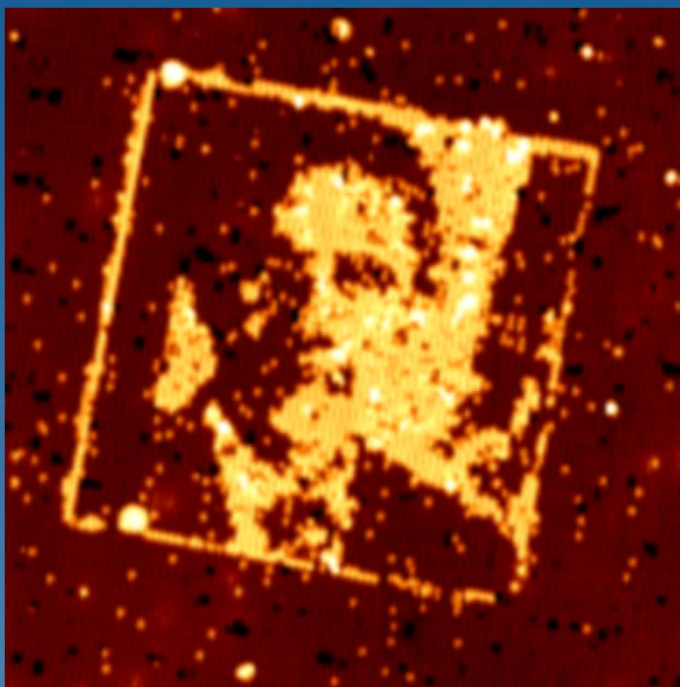
micro & nano - graph Title:
“Which one’s the cartoon character?”



Description:

Portraits made by removing H atoms from a Si(001) surface with an STM tip

The roughly vertical lines in the images are Si:H dimer rows, 0.768 nm wide. The black holes are missing dimers, and the white dots are single missing H atoms.



Magnification: 2.2 MX

Submitted by: James Owen

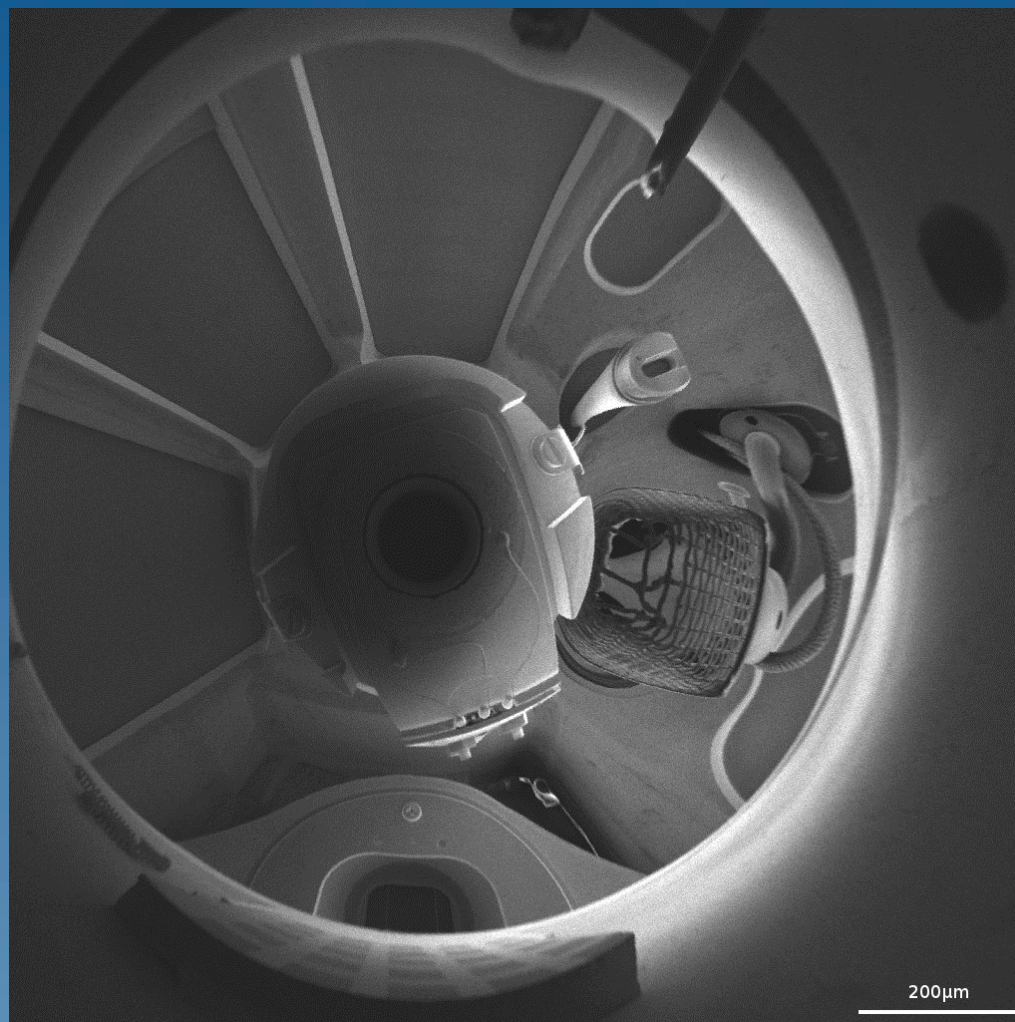
Instrument: Zyvex Labs HDL Manufacturing Tool

Affiliation: Zyvex Labs
Richardson, TX



Description:

Panorama of the SEM chamber. An upright standing fiber was charged at 40kV and then observed at a low voltage (1kV). During scanning the electron beam is deflected at the negative potential of the fiber. The farther away from the charged fiber the beam is the weaker is the field and therefore the smaller is the deflection of the beam.



Magnification: 78X

Submitted by: Irina Harder

Instrument: Jeol JSM-840A

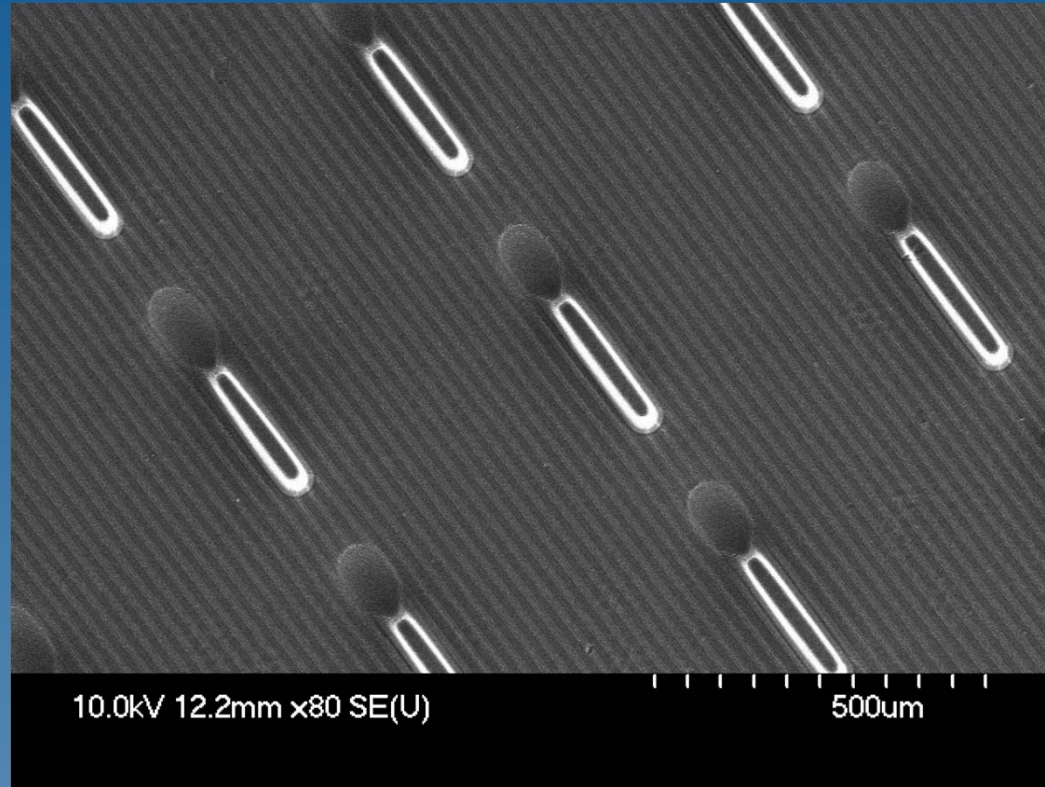
**Affiliation: Max Planck Institute for the Science of Light
Erlangen, Germany**

micro & nano - graph Title: “Tiny eating utensils”



Description:

Hydrogel spacers and micro grating for fibroblast alignment made by UV-NIL with a PDMS stamp. When this process is done with gravity acting towards the substrate, bubbles are trapped in the features due to the hydrophobicity of the stamp, causing these troughs during crosslinking. Showing the importance of surface chemistry in NIL



Magnification: x80

Submitted by: Alex Vasiev

Instrument: Hitachi S4700

Affiliation: University of Glasgow, Glasgow, United Kingdom

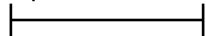


Description:

Maskless etching process performed (by mistake) on a 20 nm gold coated silicon surface. The deep etching has stripped part of the gold and created an interesting nanograss-based Swiss-like landscape



2 μ m



EHT = 10.00 kV

WD = 4.0 mm

Signal A = InLens

Mag = 22.39 K X

Date :31 Mar 2011

Time :11:14:36

Width = 13.41 μ m

Magnification: 22.39 KX

Submitted by: Filippo Bosco

Instrument: SEM Zeiss

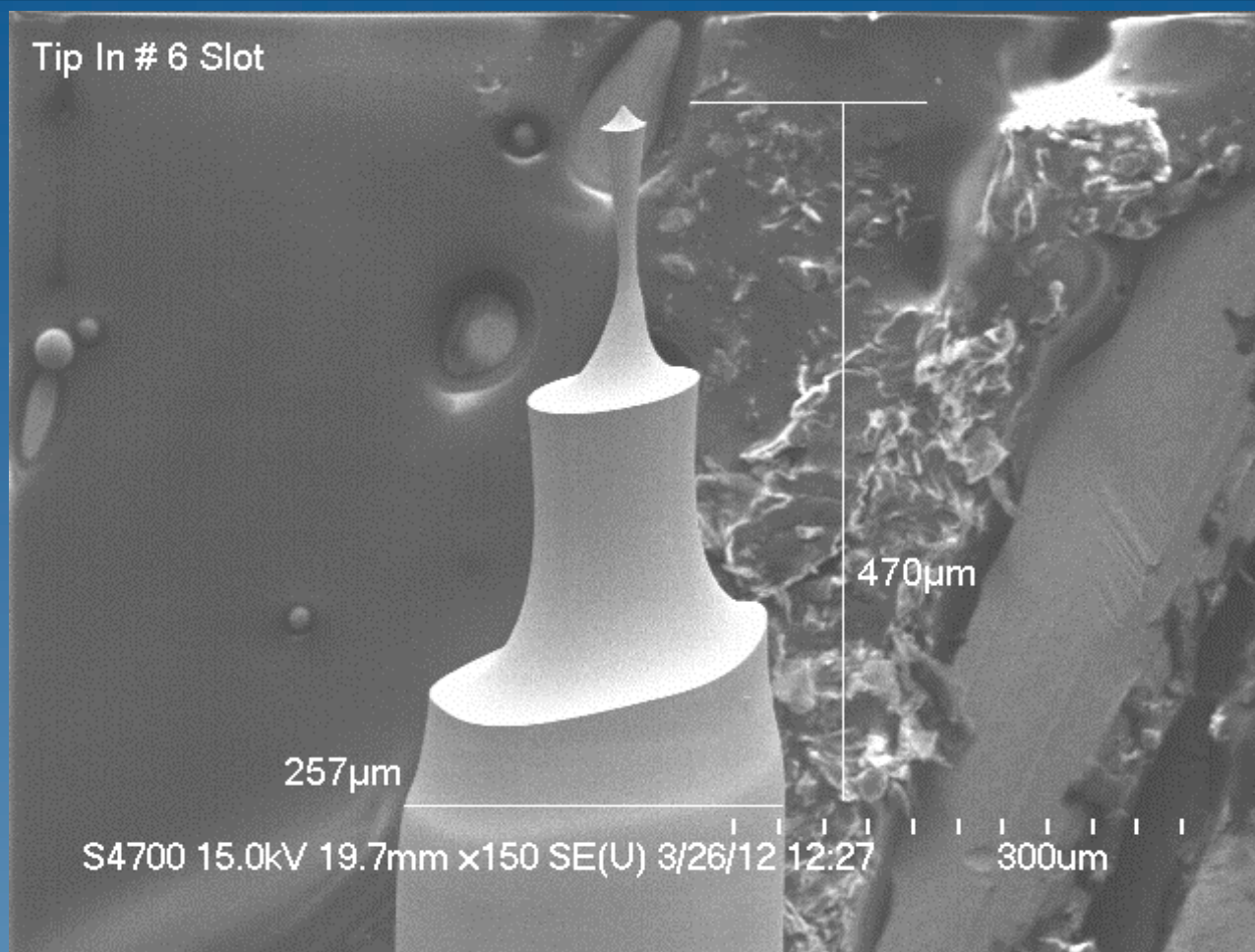
Affiliation: DTU Nanotech

Somehoven, Netherlands



Description:

SEM image of a tungsten STM tip that was etched wrong.



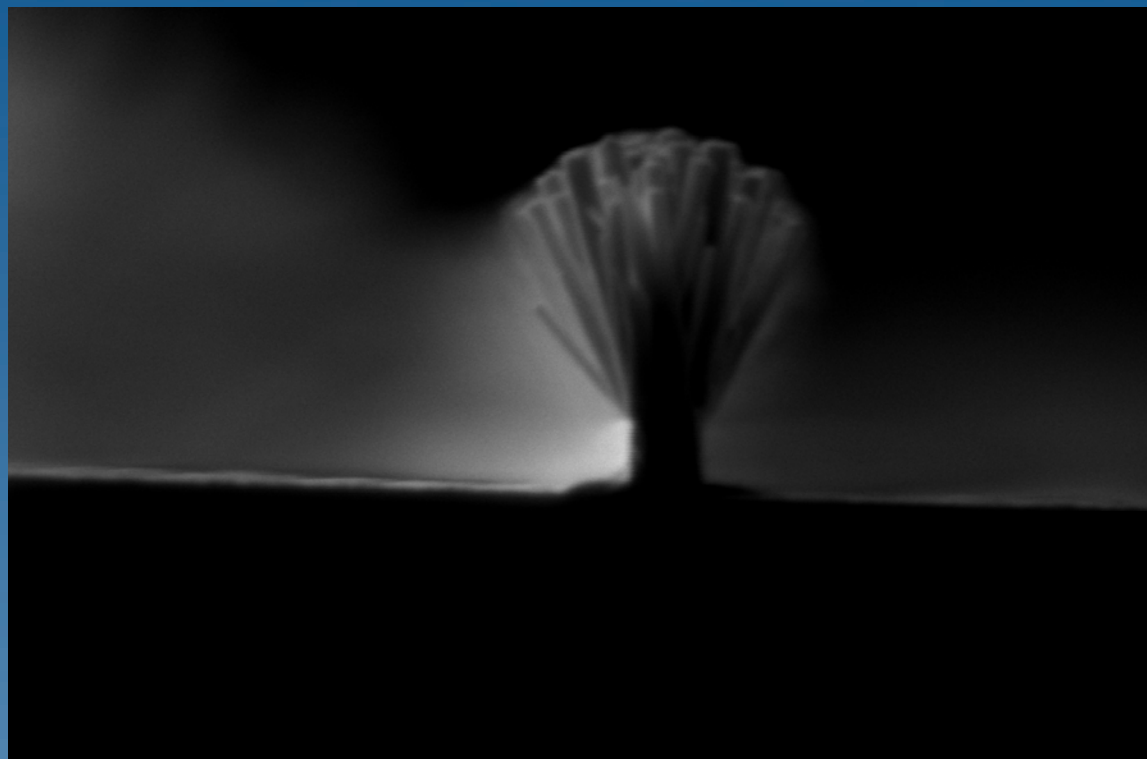
Magnification (3"x4" image): 150 X
Submitted by: Bill Owen & J. Owen

Instrument : Hitachi S-4700 SEM
Affiliation: Zyvex Labs



Description:

NWs bunch growth by hydrothermal technique. The growth is driven by a patterned resist layer on a ZnO(30nm)/Si substrate. The image is acquired with 90° tilt on a cleaved the sample.



Magnification: 53KX

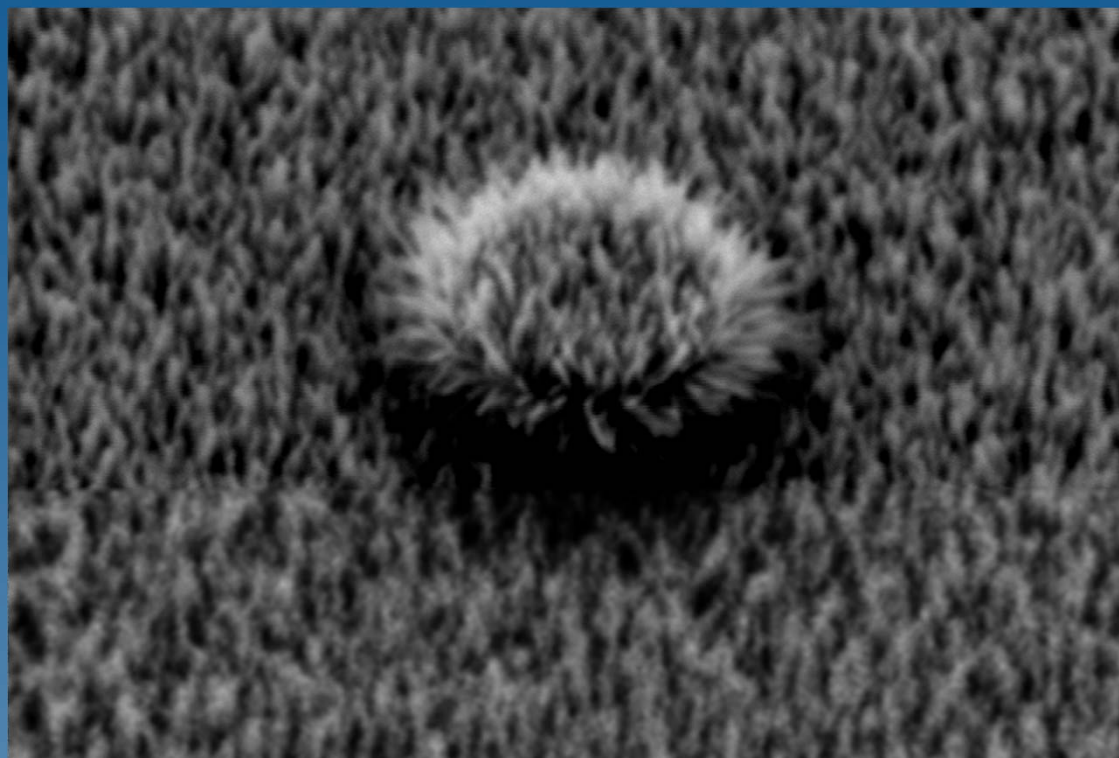
Submitted by: Marialilia Pea

Instrument: Zeiss EVO MA10

Affiliation: Institute of Photonic and Nanotechnology
Rome, Italy

**Description:**

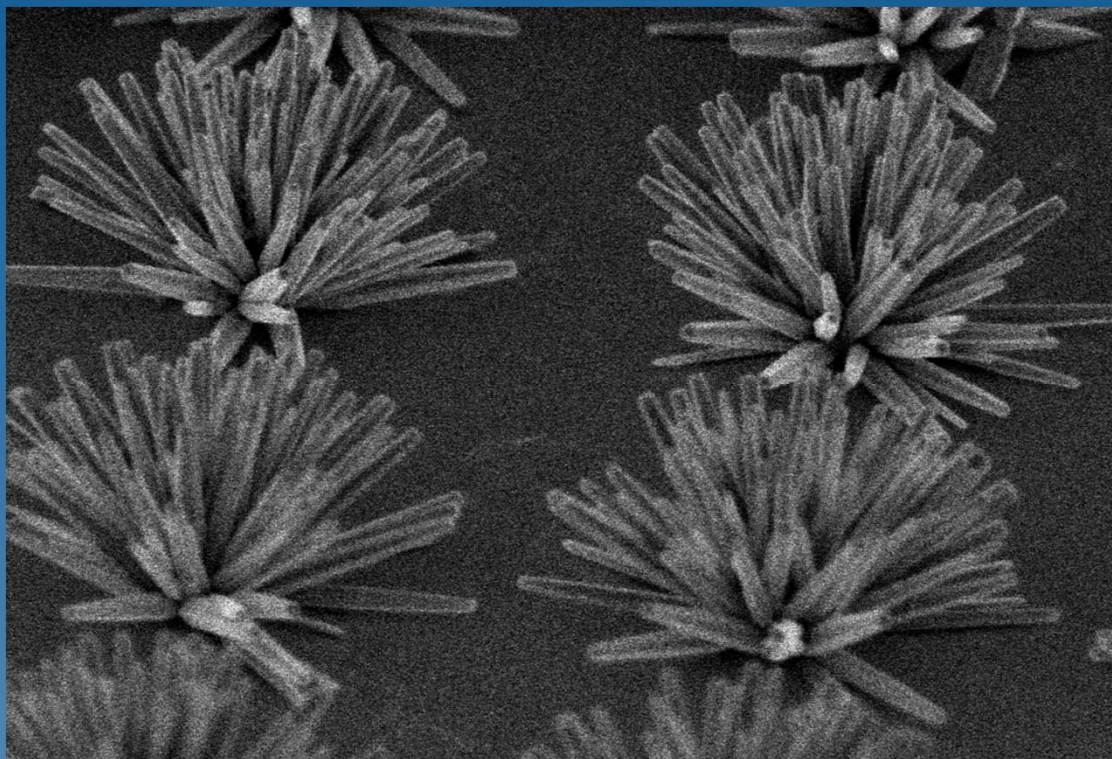
NWs grown by hydrothermal technique on a patterned Si substrate. (A thin ZnO layer is deposited on Si by sputtering before growth). The image is acquired with 45° tilt.

**Magnification:** 50KX**Submitted by:** Marialilia Pea**Instrument:** Zeiss EVO MA10**Affiliation:** Institute of Photonic and Nanotechnology
Rome, Italy

**Description:**

NWs grown by hydrothermal technique on a patterned ZnO seed layer deposited on Si substrate.

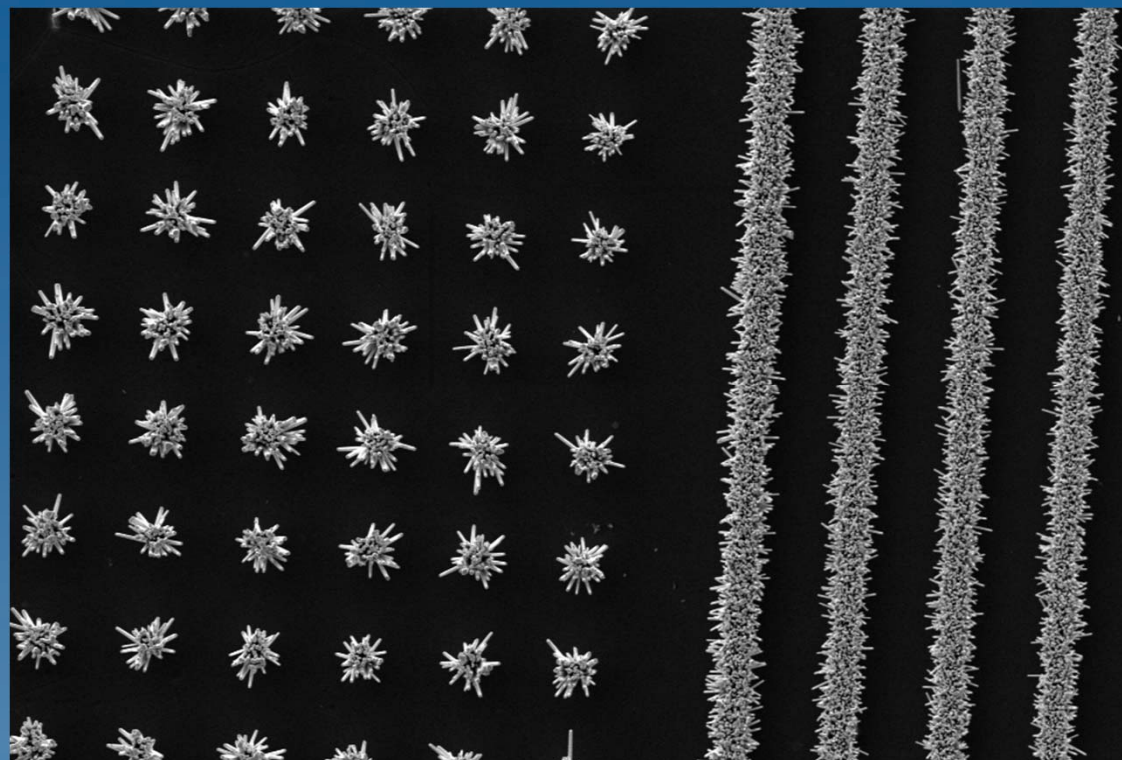
The image is acquired with 45° tilt.

**Magnification:** 15KX**Submitted by:** Marialilia Pea**Instrument:** Zeiss EVO MA10**Affiliation:** Institute of Photonic and Nanotechnology
Rome, Italy



Description:

NWs bunch and stripes growth by hydrothermal technique. The growth is driven by a patterned resist layer on a ZnO(30nm)/Si substrate. The image is acquired with 45° tilt.



Magnification: 2.7KX

Submitted by: Marialilia Pea

Instrument: Zeiss EVO MA10

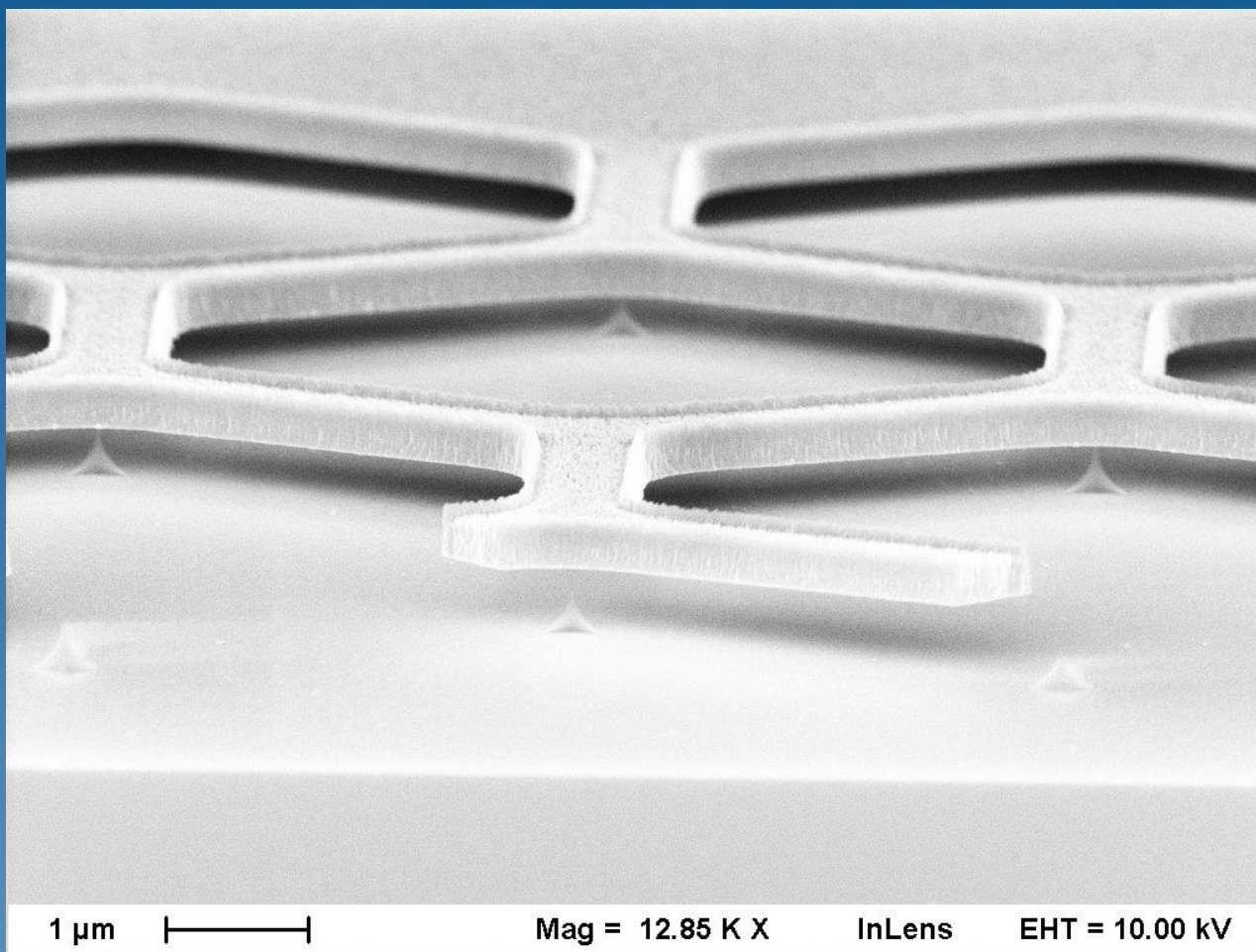
Affiliation: Institute of Photonic and Nanotechnology
Rome, Italy



Description:

Levitating
acceleration grid
from an electronic
photo ionization
detector.

It consists of
titanium nitride and
is fabricated by the
help of a sacrificial
layer technique



Magnification: 12.85 KX

Submitted by: Cordula Zimmer
& Klaus Kallis

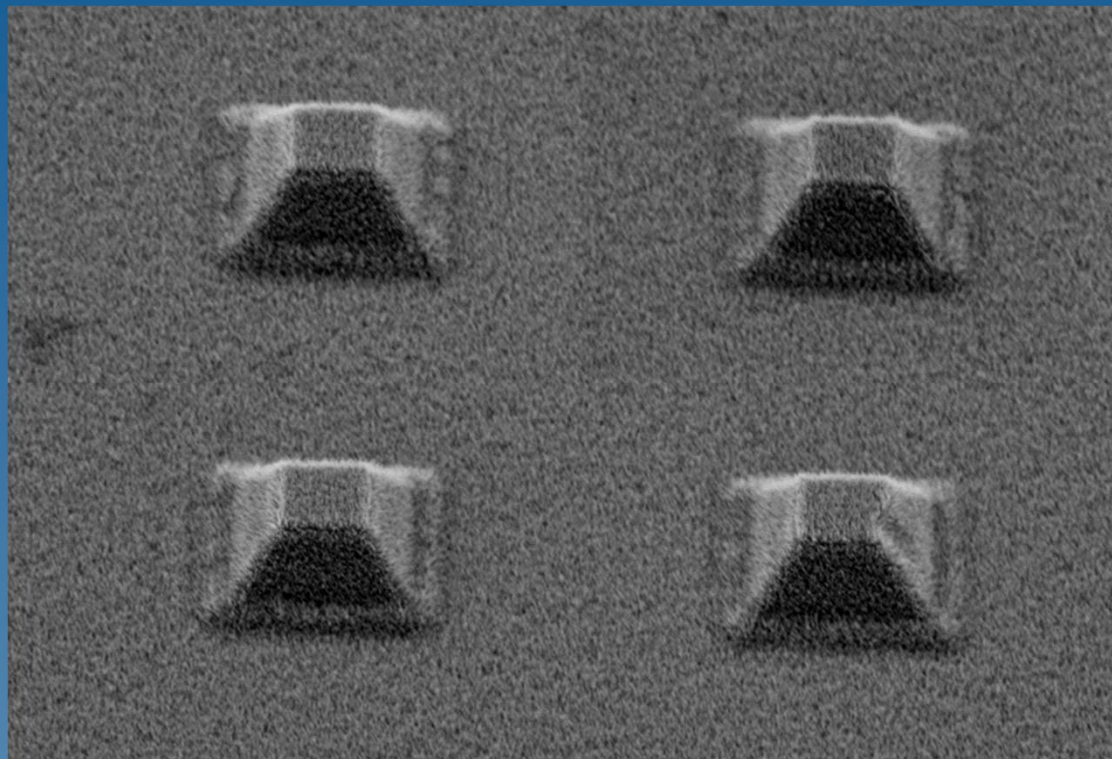
Instrument: Raith Pioneer

Affiliation: TU Dortmund University,
Dortmund, Germany



Description:

NWs grown by hydrothermal technique on a patterned Si substrate. (A thin ZnO layer is deposited on Si by sputtering before growth).
The image is acquired with 45° tilt.



Magnification: 6.4KX

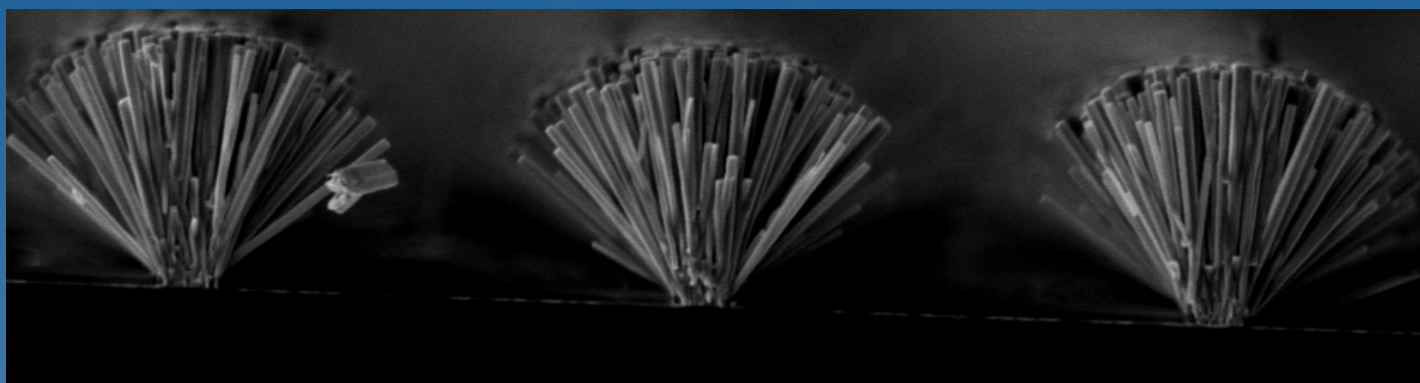
Submitted by: Marialilia Pea

Instrument: Zeiss EVO MA10

Affiliation: Institute of Photonic and Nanotechnology
Rome, Italy

**Description:**

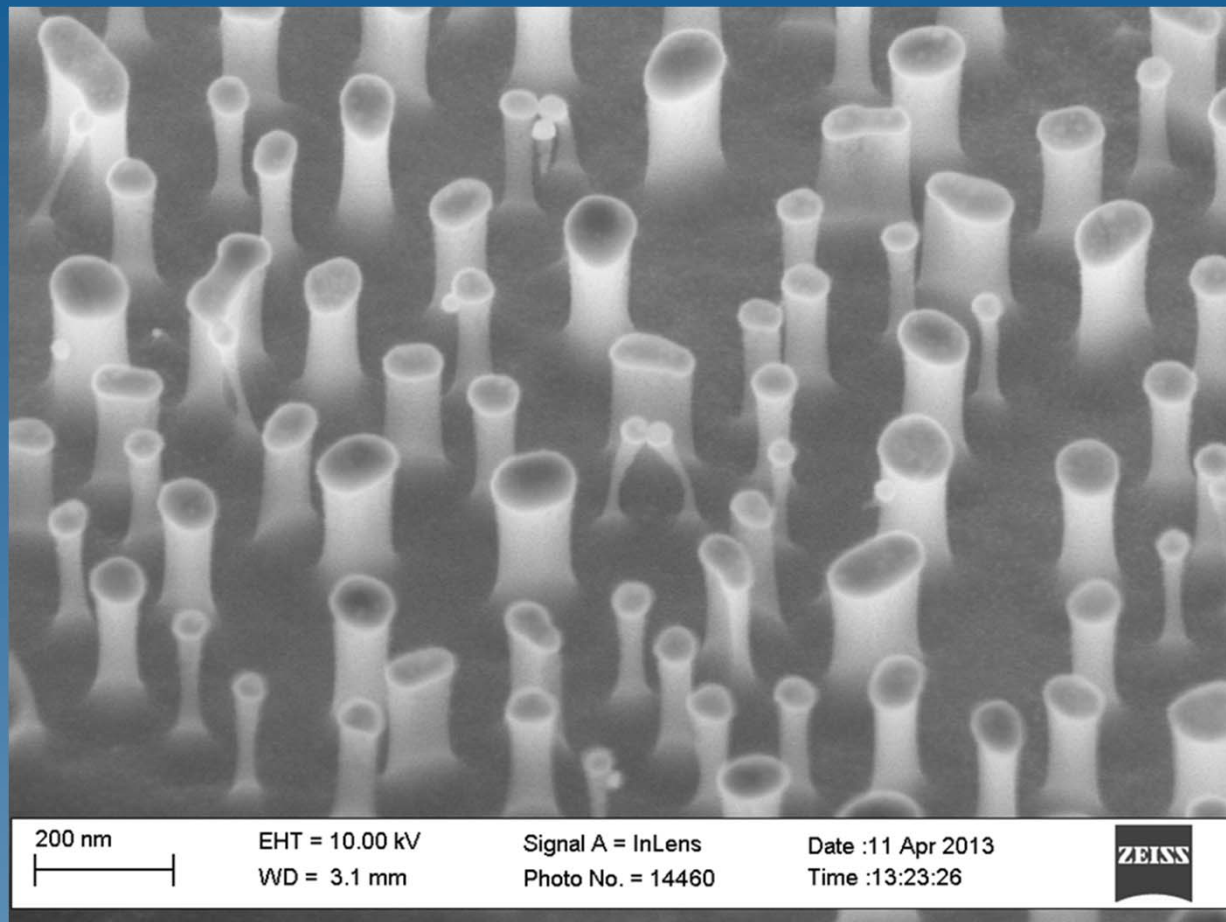
NWs bunch growth by hydrothermal technique. The growth is driven by a patterned resist layer on a ZnO(30nm)/Si substrate. The image is acquired with 90° tilt on a cleaved the sample.

**Magnification:** 10KX**Submitted by:** Marialilia Pea**Instrument:** Zeiss EVO MA10**Affiliation:** Institute of Photonic and Nanotechnology
Rome, Italy



Description:

SiO₂ pillars with gold at the top end (acting like humans). The pillars are formed by RIE. The mask used for RIE is self- assembled gold nanoparticles.



Magnification: ???KX

Submitted by: Aikaterini Argyraki

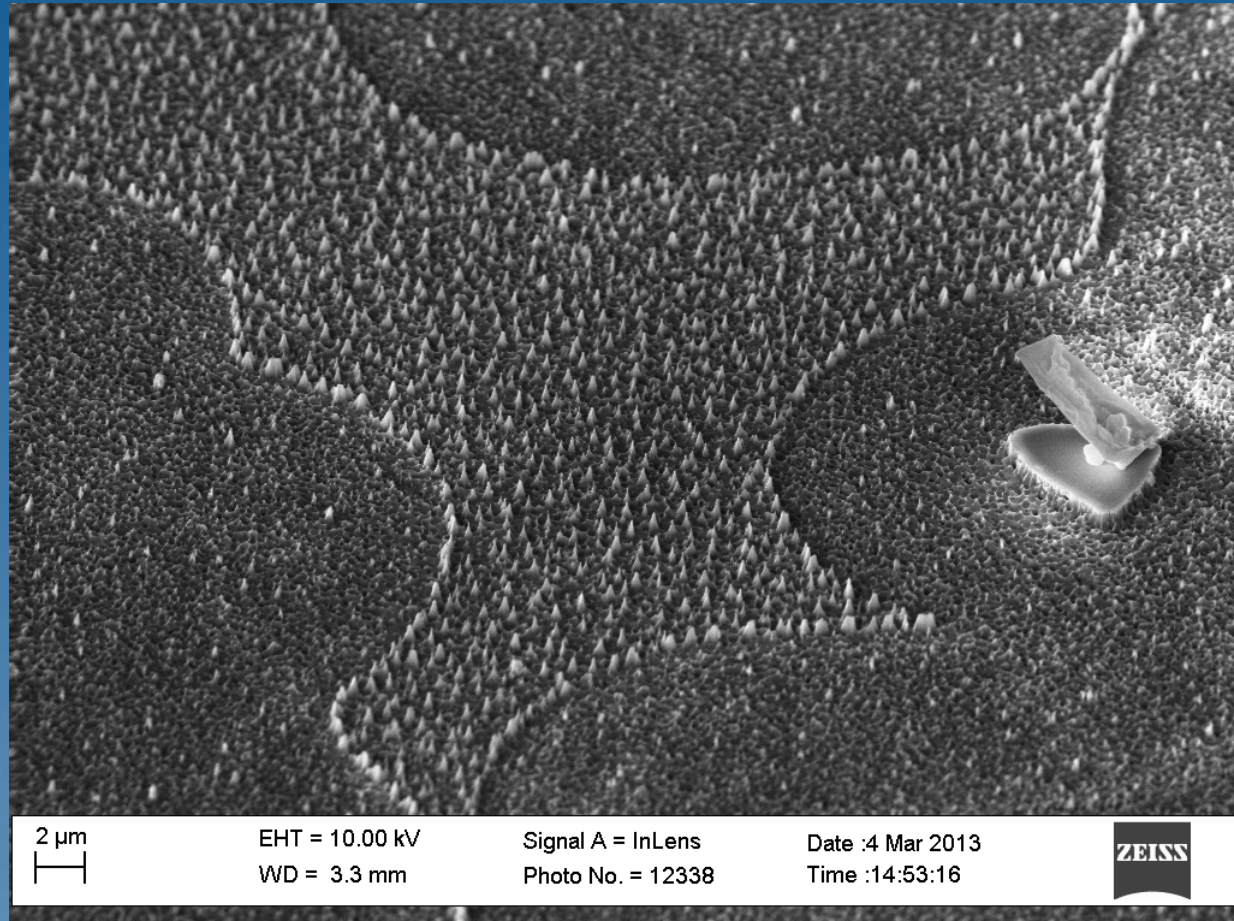
Instrument: Zeiss Supra VP 40 SEM

Affiliation: Technical University of Denmark, DTU



Description:

SiC processed by RIE in order to fabricate “Black SiC”. The pearl was created by contamination. The abstract pattern consisting of higher structures close to the pearl was created by unknown reasons.



Magnification: ???KX

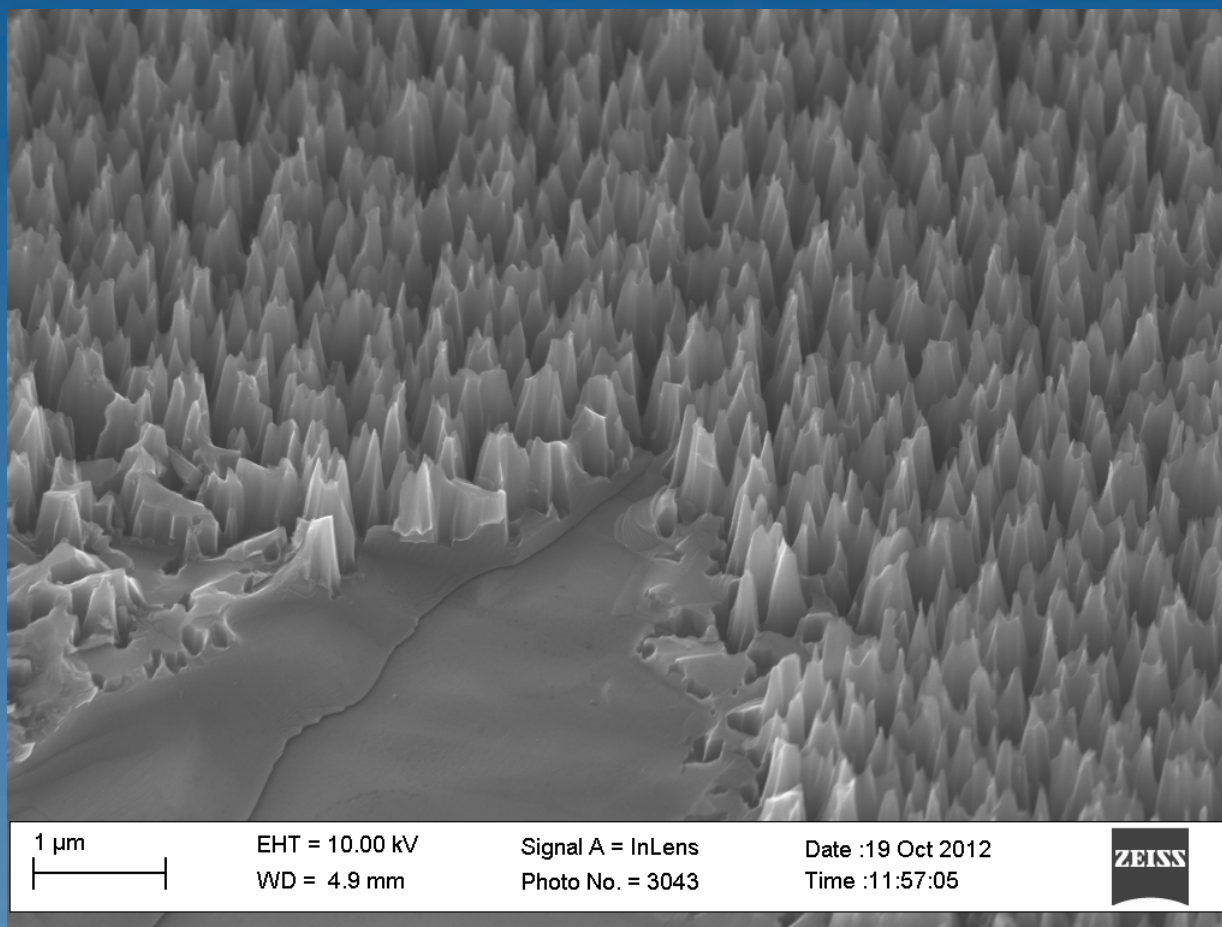
Submitted by: Aikaterini Argyraki

Instrument: Zeiss Supra VP 40 SEM

Affiliation: Technical University of Denmark, DTU



Description:
Nanoforest on
SiC substrate.
The river is
created after
dicing the
sample.



Magnification: ???KX

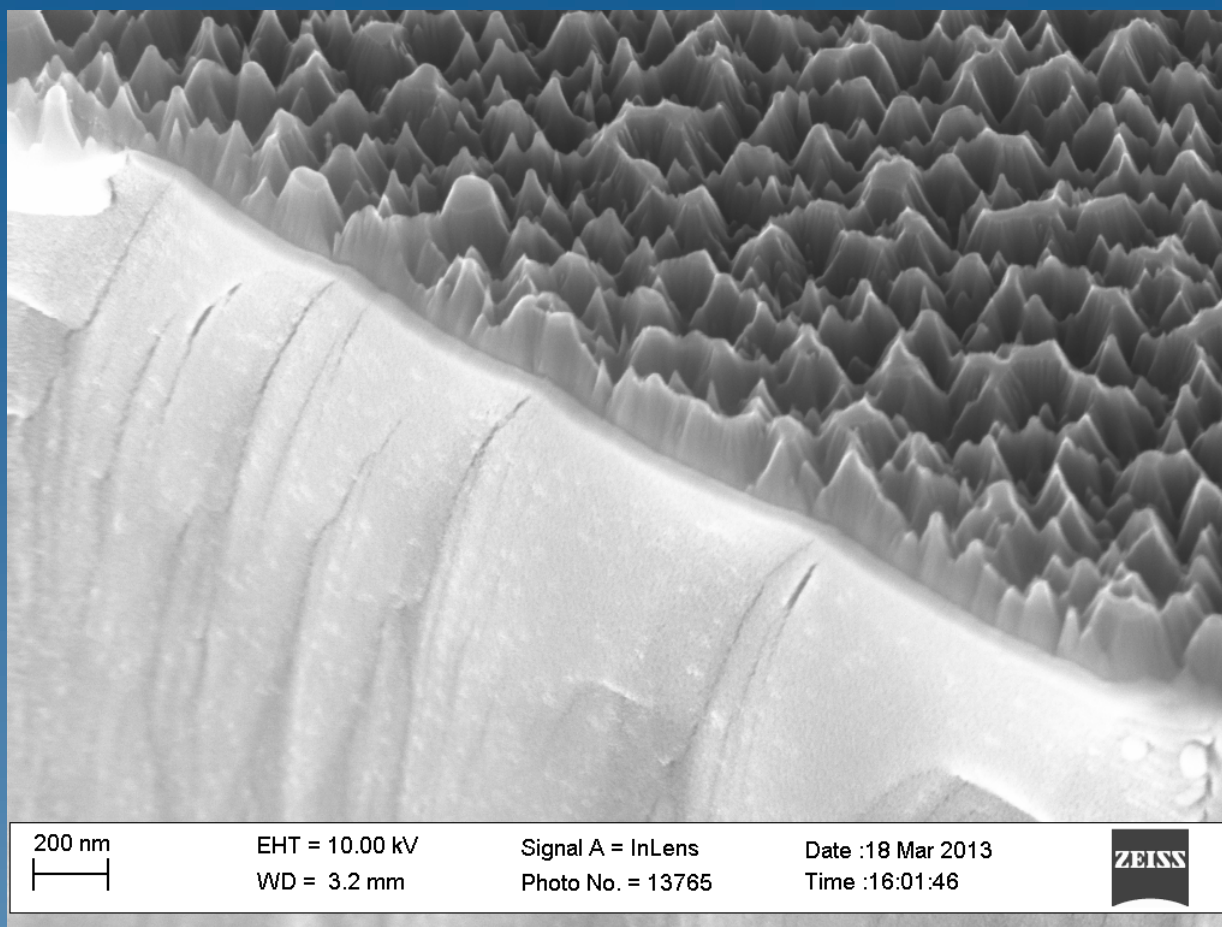
Instrument: Zeiss Supra VP 40 SEM

Submitted by: Aikaterini Argyraki

Affiliation: Technical University of Denmark, DTU



Description:
Nanoforest on
SiC substrate.
The waterfall is
due to
damaged edge
of the sample.



Magnification: ???KX

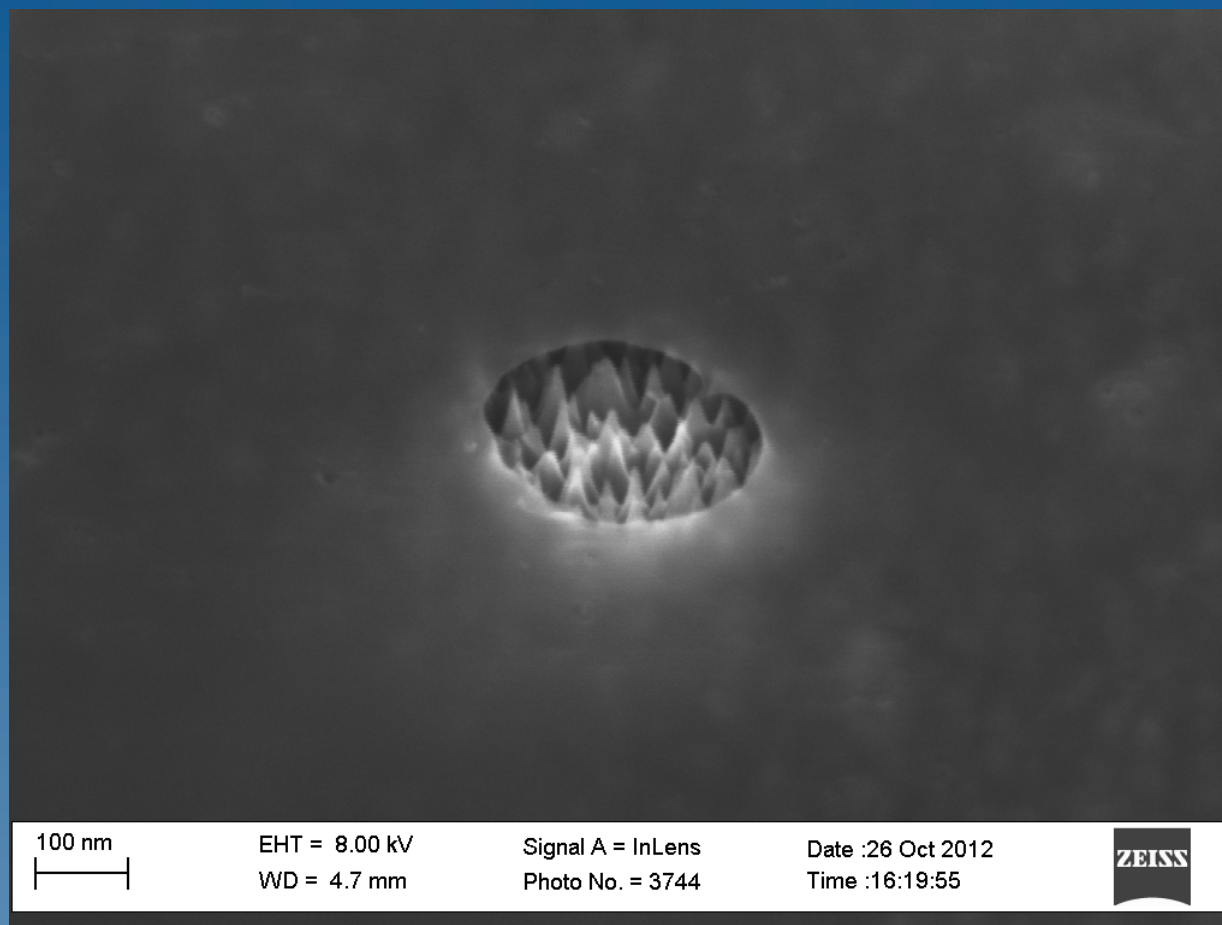
Submitted by: Aikaterini Argyraki

Instrument: Zeiss Supra VP 40 SEM

Affiliation: Technical University of Denmark, DTU



Description:
Nanoforest on
SiC substrate
covered by a
thin layer of
triton soap.
The nanocones
have a height
less than
100nm.



Magnification: ???KX

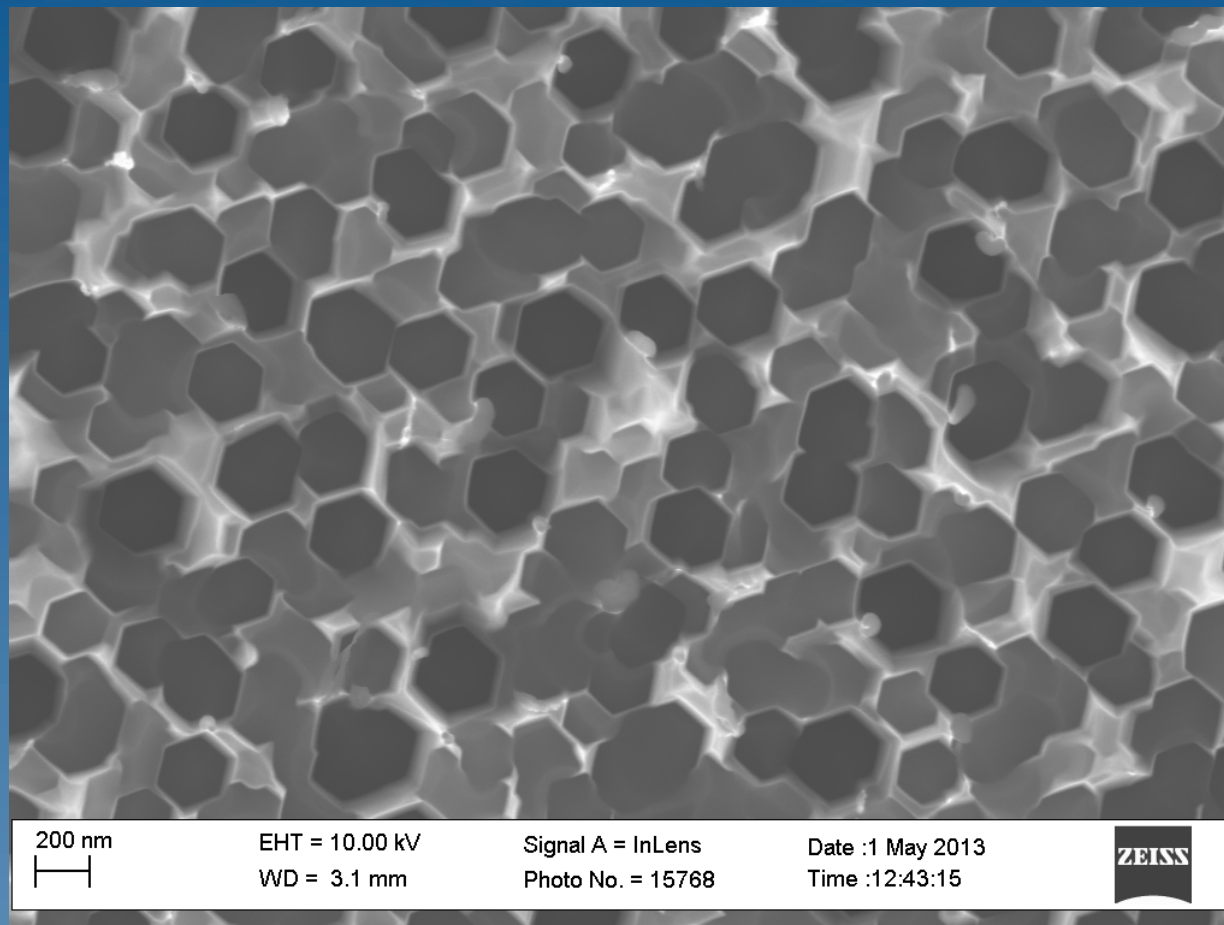
Submitted by: Aikaterini Argyraki

Instrument: Zeiss Supra VP 40 SEM

Affiliation: Technical University of Denmark, DTU



Description:
Overetched 6H-SiC substrate.
The hexagons could be related to different etching rates of crystal orientations or threading dislocations of the 6H-SiC.



Magnification: ???KX

Submitted by: Aikaterini Argyraki

Instrument: Zeiss Supra VP 40 SEM

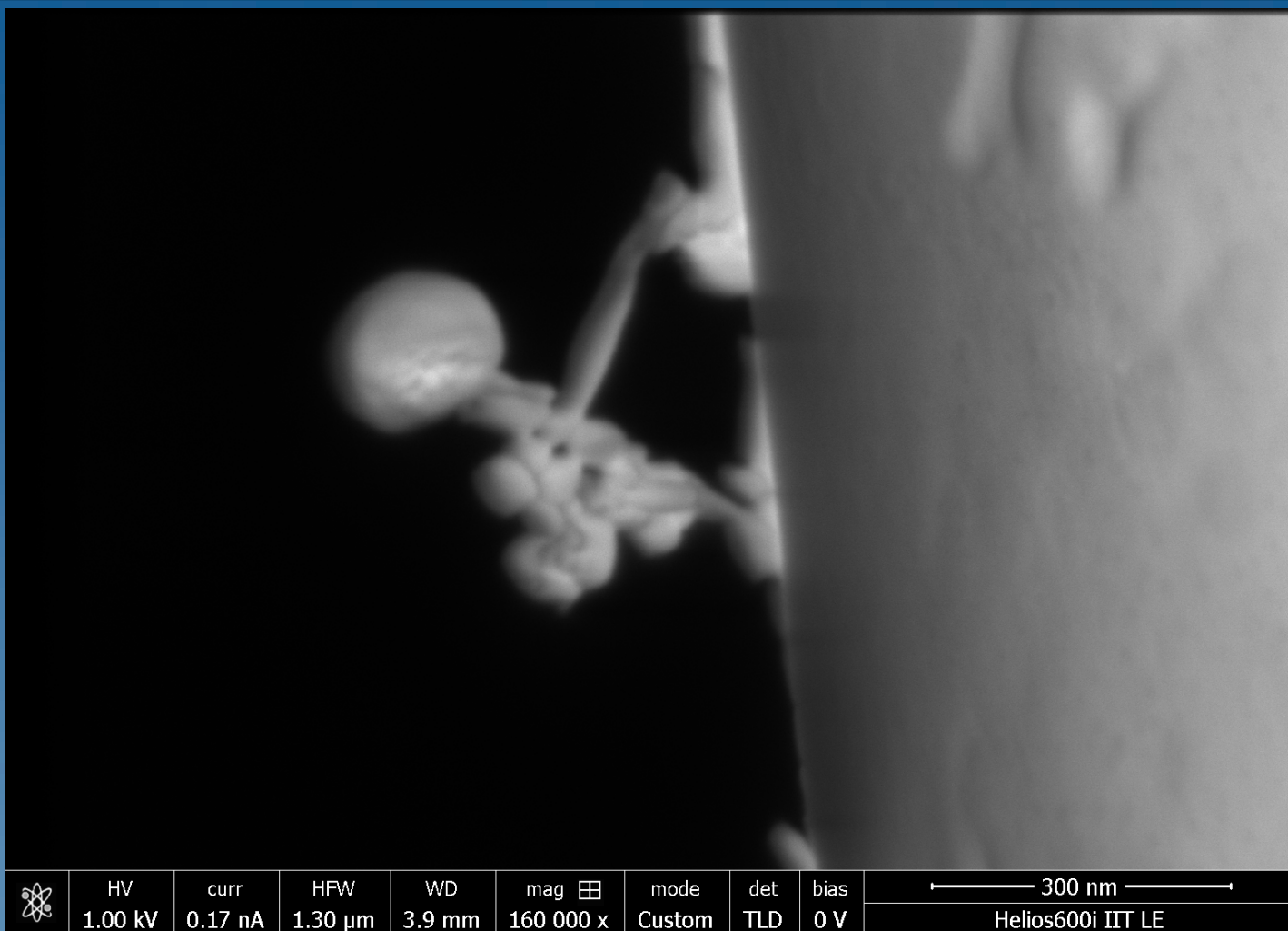
Affiliation: Technical University of Denmark, DTU



Description:

Beyond the nanoworld there is a lady climbing a tapered optical fiber in order to save her baby (attached to her backpacking) from the fire emitted from the fiber tip.

This stunning defect arose after having melted the gold coating of a tapered optical fiber with a too high power of the guided light.



Magnification: 160 KX

Instrument: Elios600i

Submitted by: Ferruccio Pisanello,
Leonardo Sileo.

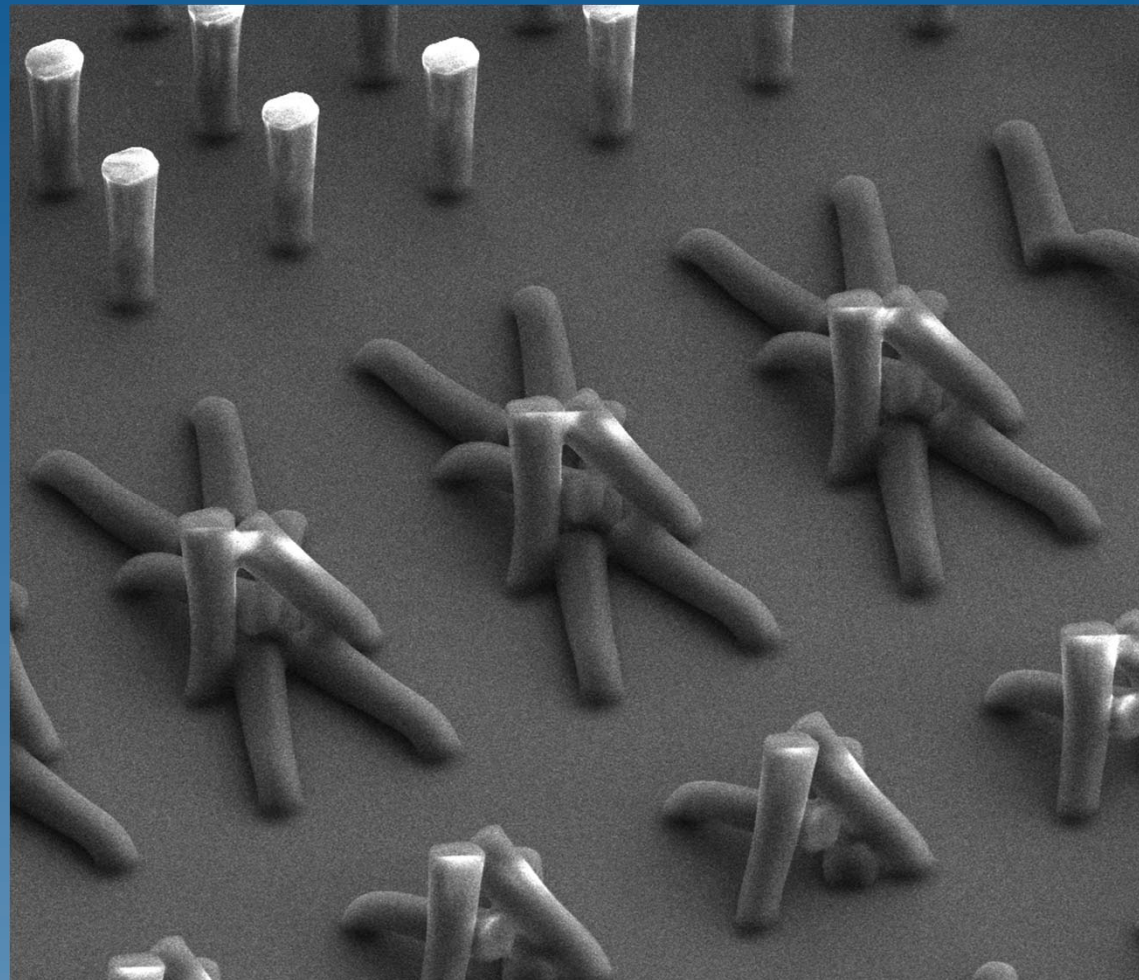
Affiliation: Italian Institute of Technilgy, Center for
Biomolecular Nanotechnology, Lecce, Italy

“Evolutionary Chromosomes”



Description:

The Si micro pillars pattern was fabricated by a double-step approach including a first optical lithography process to define the position of the microstructures and a further Bosch plasma reactive ion etch for the physical shaping. The surface was intended to be superhydrophobic by mimicking Nature (lotus leaves features) but here we went much more beyond!!!



Magnification: 2KX

Submitted by: Angelo Accardo

Instrument: FEI – Helios Nanolab 600

Affiliation: Italian Institute of Technology
Genova, Italy

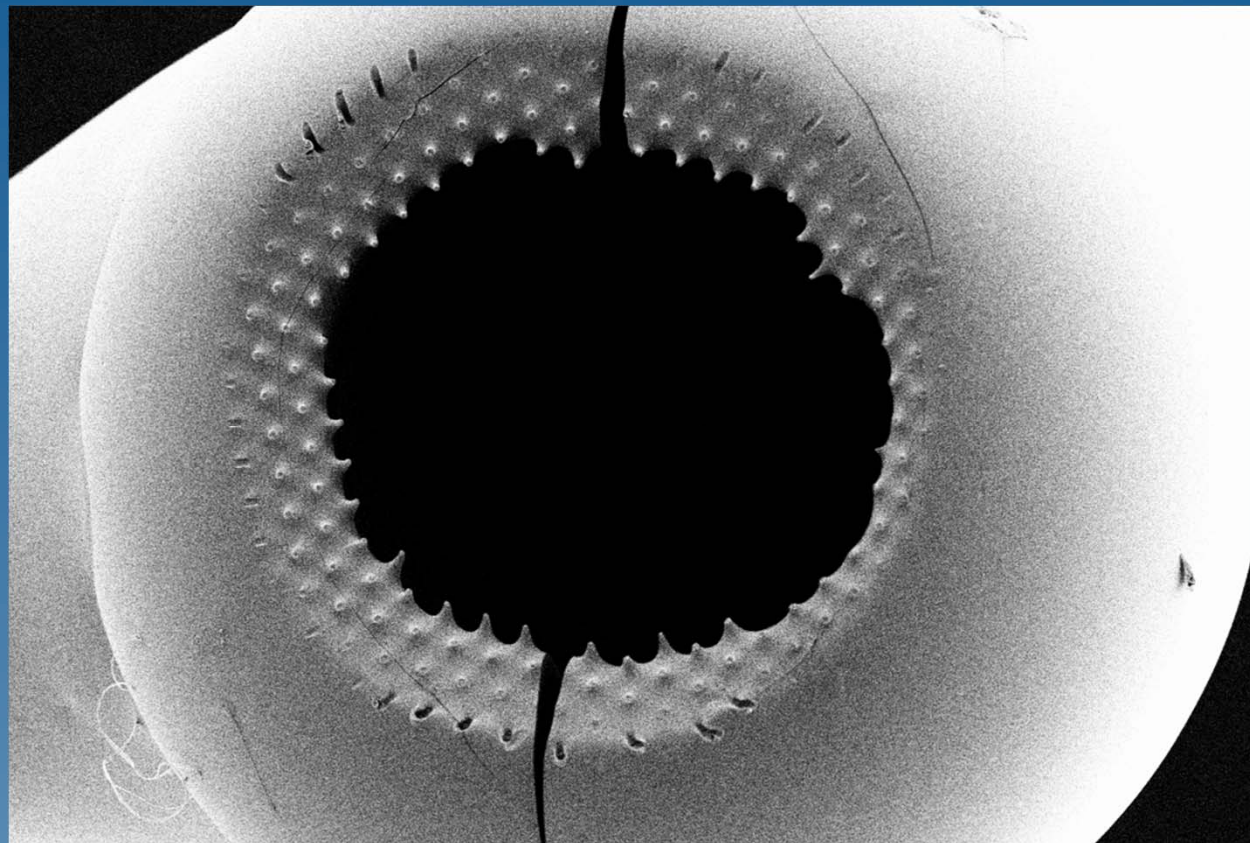
“I’m gonna eat you”



Description:

Lysozyme residual coming from droplet drying on a micropillar superhydrophobic substrate. The protrusions are due to the pinning effect of the droplet on the microasperities of the surface.

Spatial monster or black hole, it is better to run!!!



Magnification: 497X

Submitted by: Angelo Accardo

Instrument: FEI – Helios Nanolab 600

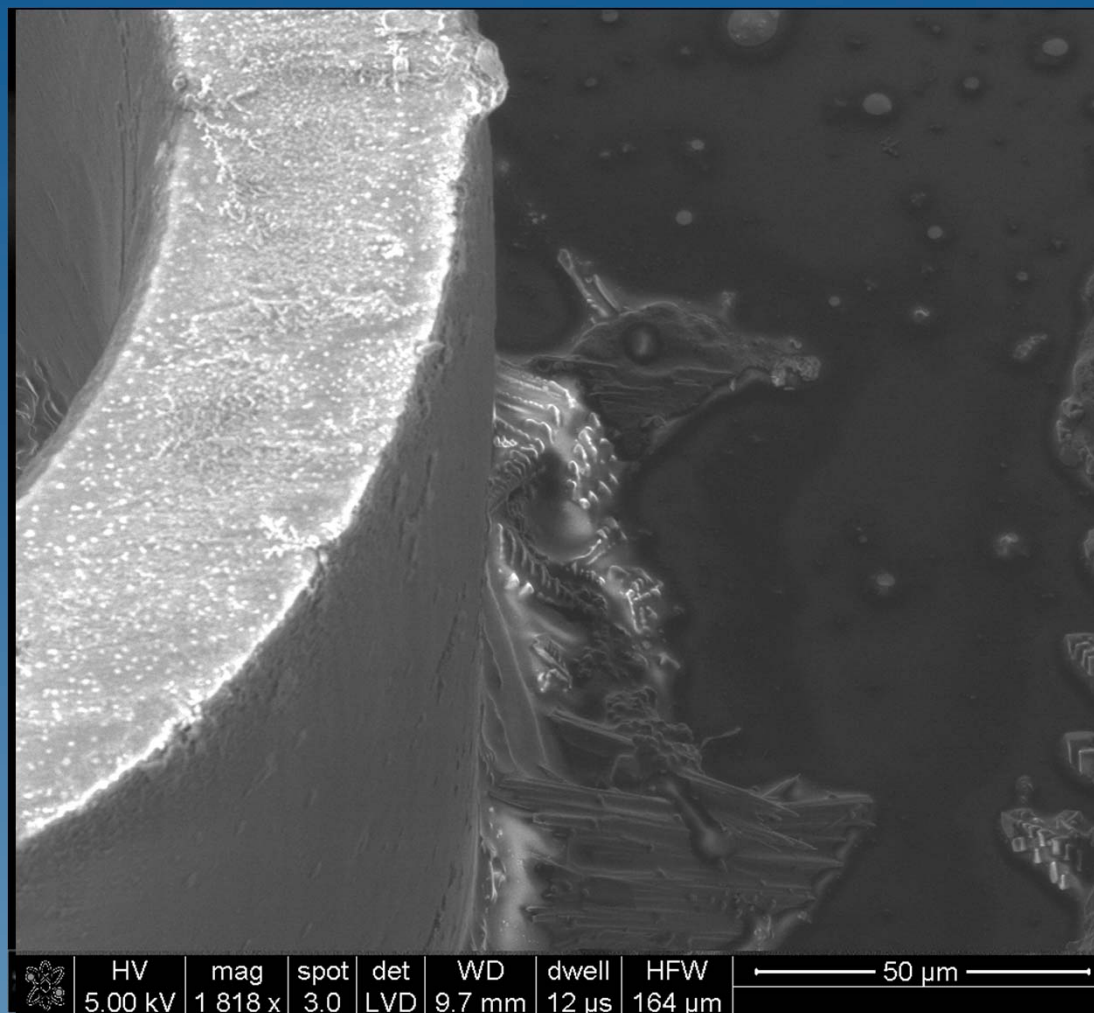
Affiliation: Italian Institute of Technology
Genova, Italy



Description:

Fossile on a chip:
Crystals of
Furosemide drug
on a silicon wafer
with SU-8
microstructures.

Maybe I should
clean up in my old
samples once in a
while...



Magnification: 5KX

Submitted by: Stephan S. Keller

Instrument: FEI Nova SEM 600

Affiliation: Technical University of Denmark
Kongens Lyngby, Denmark

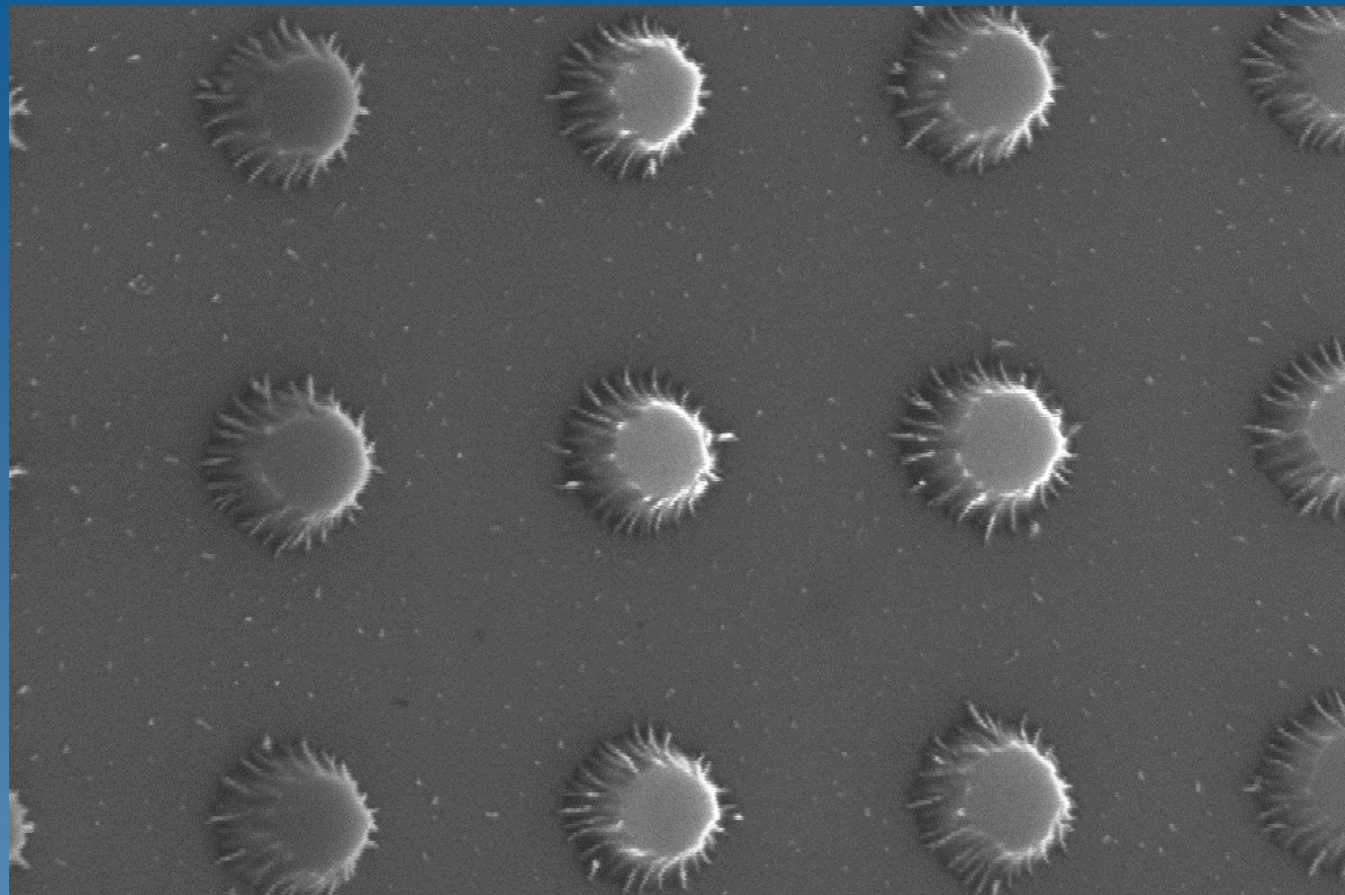
“Deep Sea nanocreatures”



Description:

AZ Barli II anti-reflection nanopillars during reactive ion etching pattern transfer to silicon.

They look like some deep sea creatures.



Raith 150
Mag = 46.02 K X

200nm
|————|

EHT = 10.00 kV
WD = 4 mm

Signal A = InLens
User Name = SS167

Date :25 Mar 2012
Time :17:52:06

Magnification: 46KX

Submitted by: Maan Alkaisi,
Senthuran Sivasubramaniam

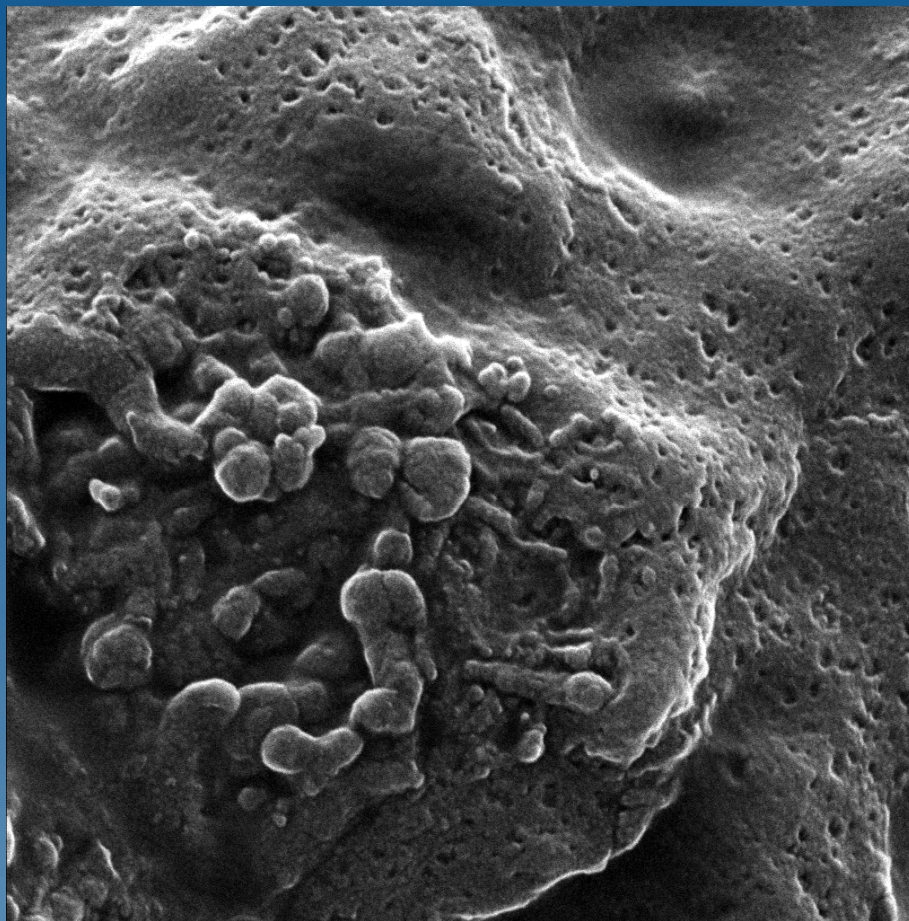
Instrument: RAITH 150



Affiliation: University of Canterbury, NEW ZEALAND



Description:

Coated surface of lymphocyte cell.



	Field Of View 1.50 um	Blanker Current 0.5 pA	Dwell Time 0.5 us	Date: 6/5/2013 Time: 4:35 PM
	Working Dist 8.8 mm	Mag (Display) 133,948.41 X	Acceleration V 33.3 kV	 200.00 nm

Magnification: 134KX

Submitted by: Kian Shen Kiang

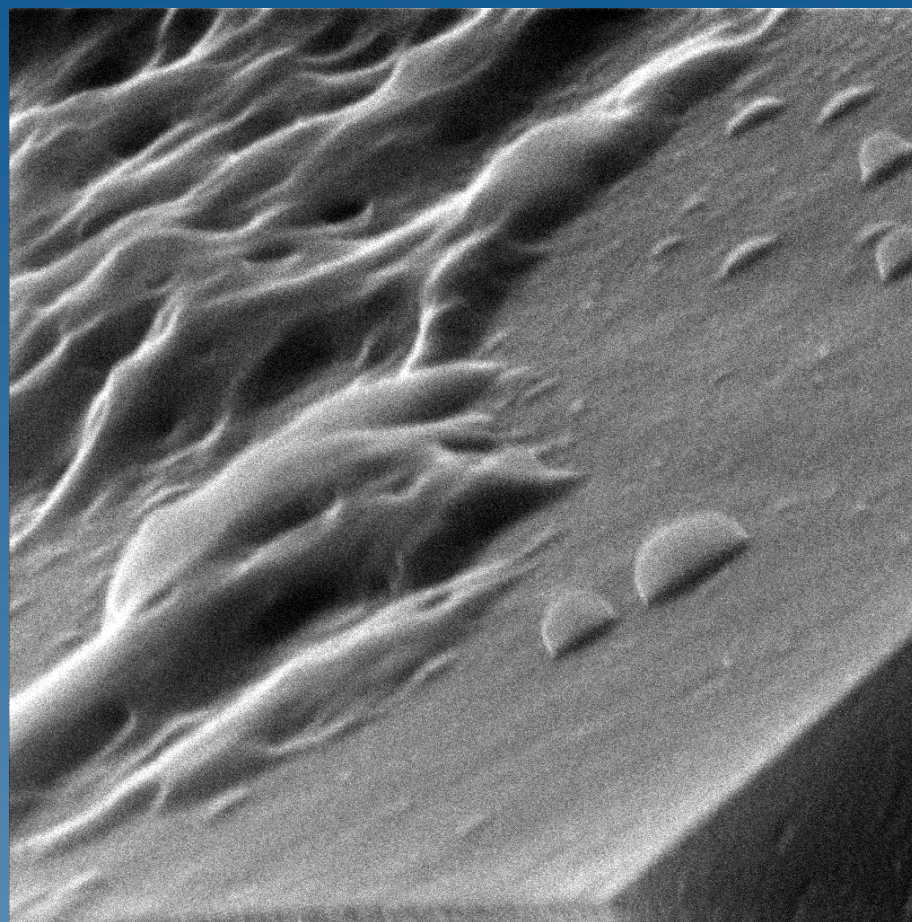
Instrument: ZEISS ORION Helium Ion Microscopy


Affiliation: Southampton Nanofabrication Centre
University of Southampton, UK



Description:

Protein Coated
AFM tip.



	Field Of View 900.00 nm	Blanker Current 0.3 pA	Dwell Time 1.0 us	Date: 6/19/2013 Time: 11:35 AM
	Working Dist 6.8 mm	Mag (Display) 223,247.35 X	Acceleration V 32.8 kV	100.00 nm

Magnification: 223KX

Submitted by: Kian Shen Kiang

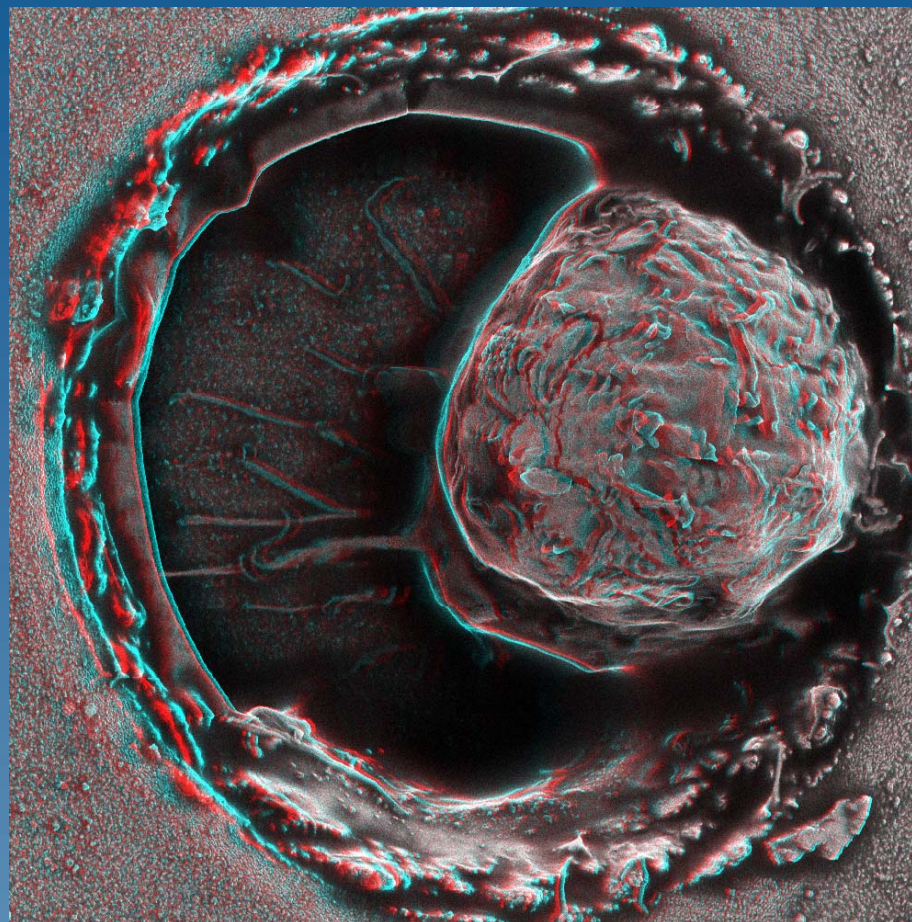
Instrument: ZEISS ORION Helium Ion Microscopy

Affiliation: Southampton Nanofabrication Centre
University of Southampton, UK



Description:

3D image of a
coated
lymphocyte cell
trapped in a well.



Magnification: 10KX

Submitted by: Kian Shen Kiang

Instrument: ZEISS ORION Helium Ion Microscopy

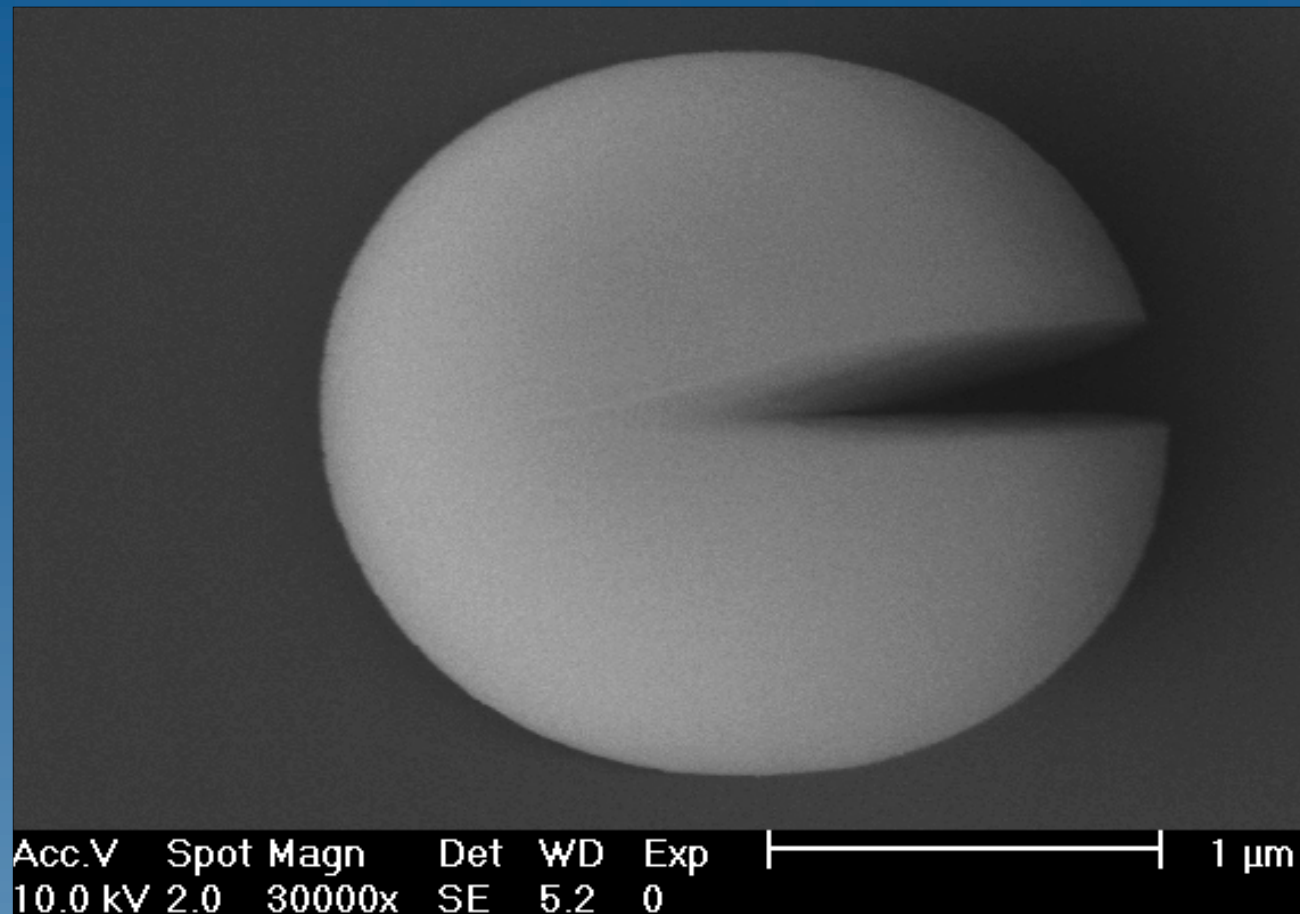
Affiliation: Southampton Nanofabrication Centre
University of Southampton, UK



Description:

That is a 2.06μm micro silica particle which got cracked during an imprint process.

Looks like
“Pac Man”



Magnification: 30KX

Submitted by: Marc Papenheim

Instrument: Philips XL30s FEG

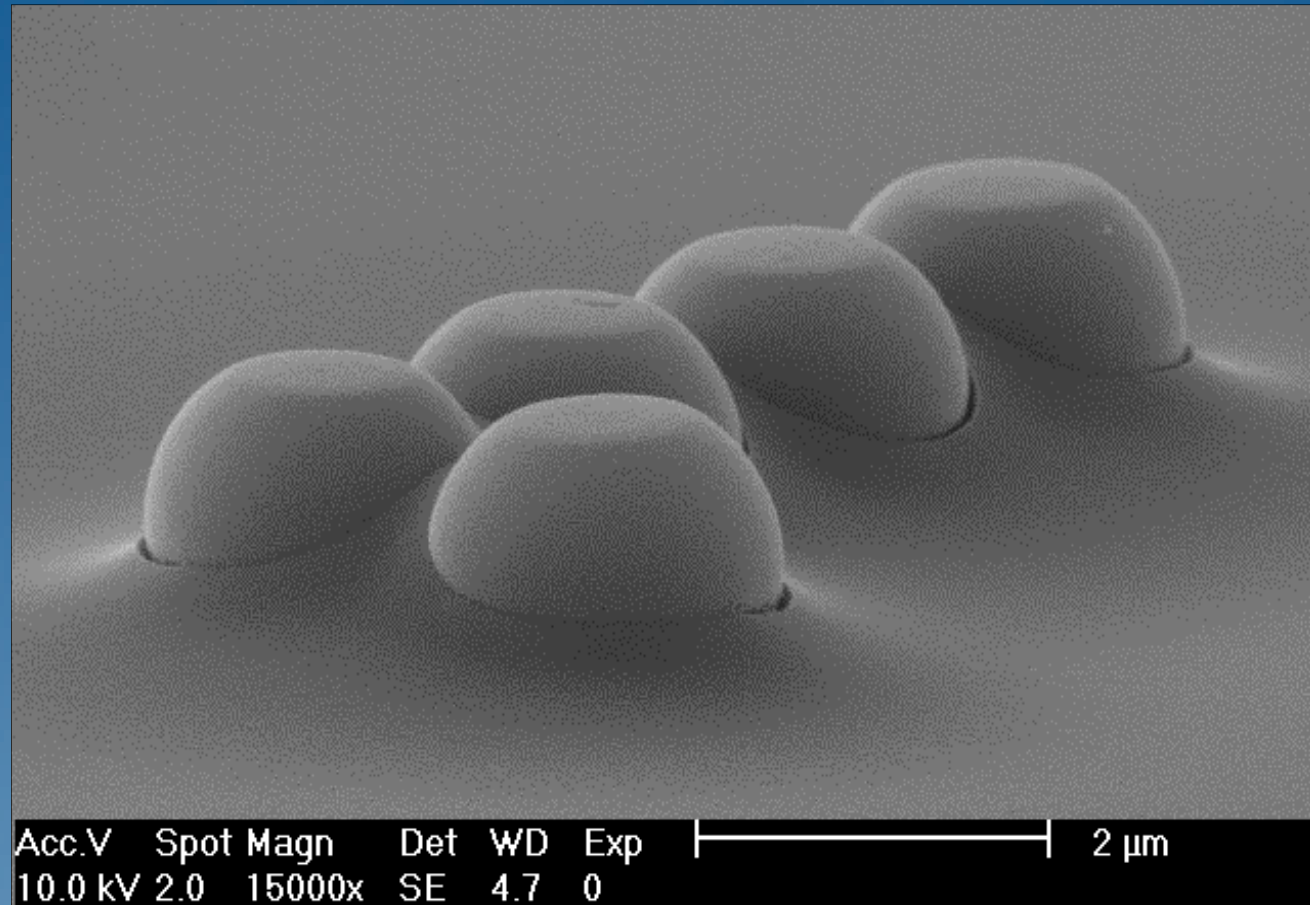
Affiliation: Microstructure Engineering,
University of Wuppertal, Germany



Description:

That is a $2.06\mu\text{m}$ micro silica particle which got cracked during an imprint process.

Looks like “the five deformed balls” in a “L” formation



Magnification: 15KX

Submitted by: Marc Papenheim

Instrument: Philips XL30s FEG

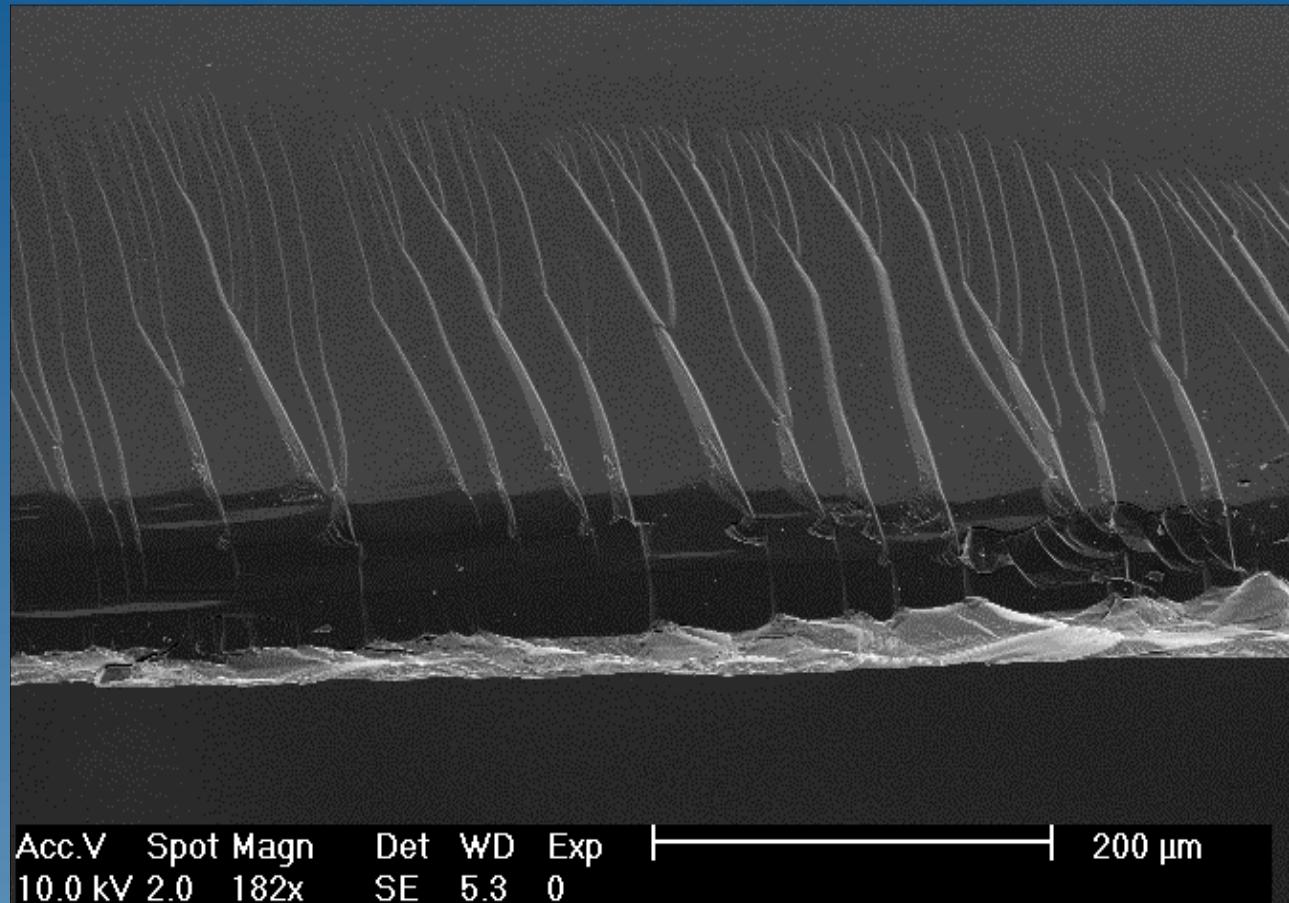
Affiliation: Microstructure Engineering,
University of Wuppertal, Germany



Description:

That is a fracture
SiO₂ wafer edge.
The top of the
wafer is below the
white structures.
The darker stripe is
the oxide.

This picture looks
like:
“bold cliffs” above
wild water



Magnification: 182X

Submitted by: Marc Papenheim

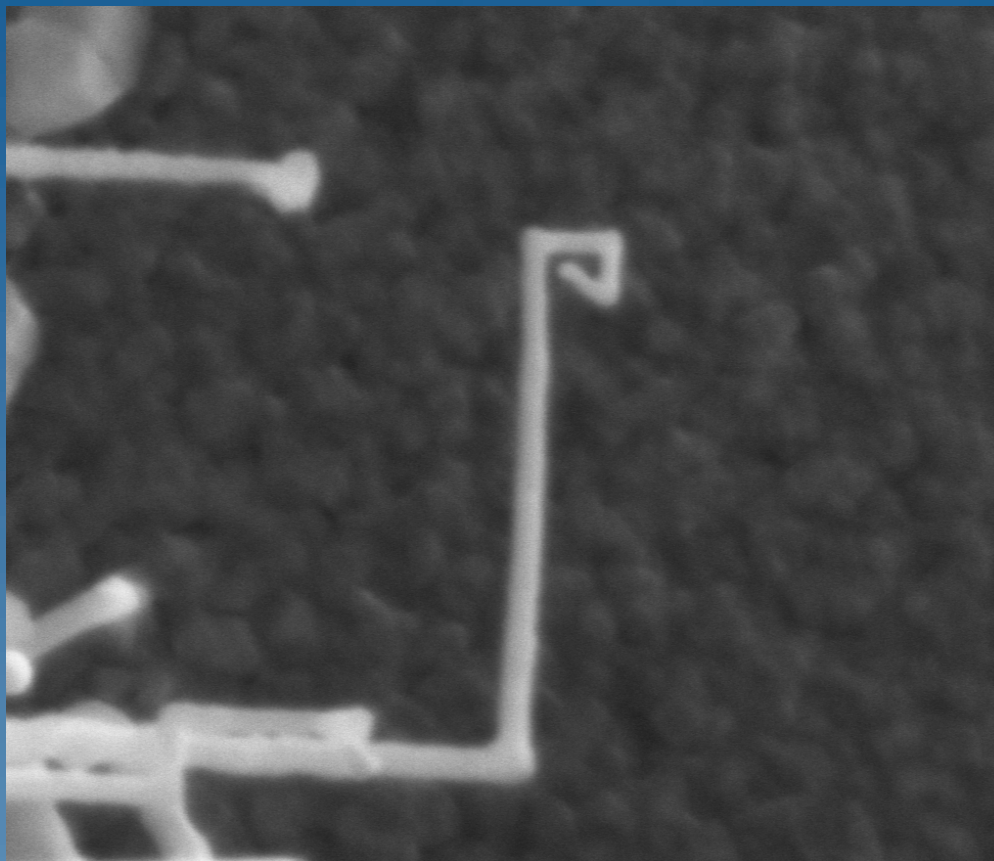
Instrument: Philips XL30s FEG

Affiliation: Microstructure Engineering,
University of Wuppertal, Germany



Description:

Si nanowires on
(001)Si
grown using gold
catalist by VLS
CVD.



Magnification: 100KX

Submitted by: Andrea Notargiacomo

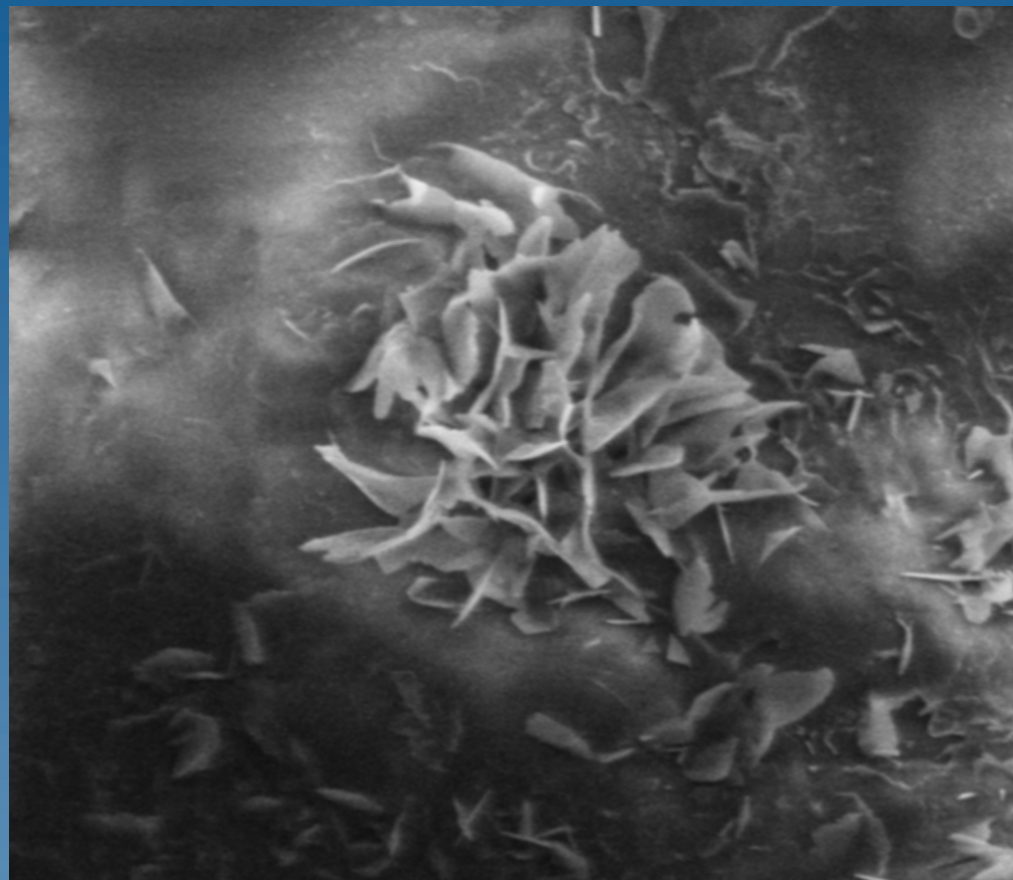
Instrument: FEI Helios Nanolab 600

Affiliation: Institute of Photonics and Nanotechnologies
Rome, Italy



Description:

Detail of a Ficus
Benamina leaf.



Magnification: 10KX

Submitted by: Andrea Notargiacomo

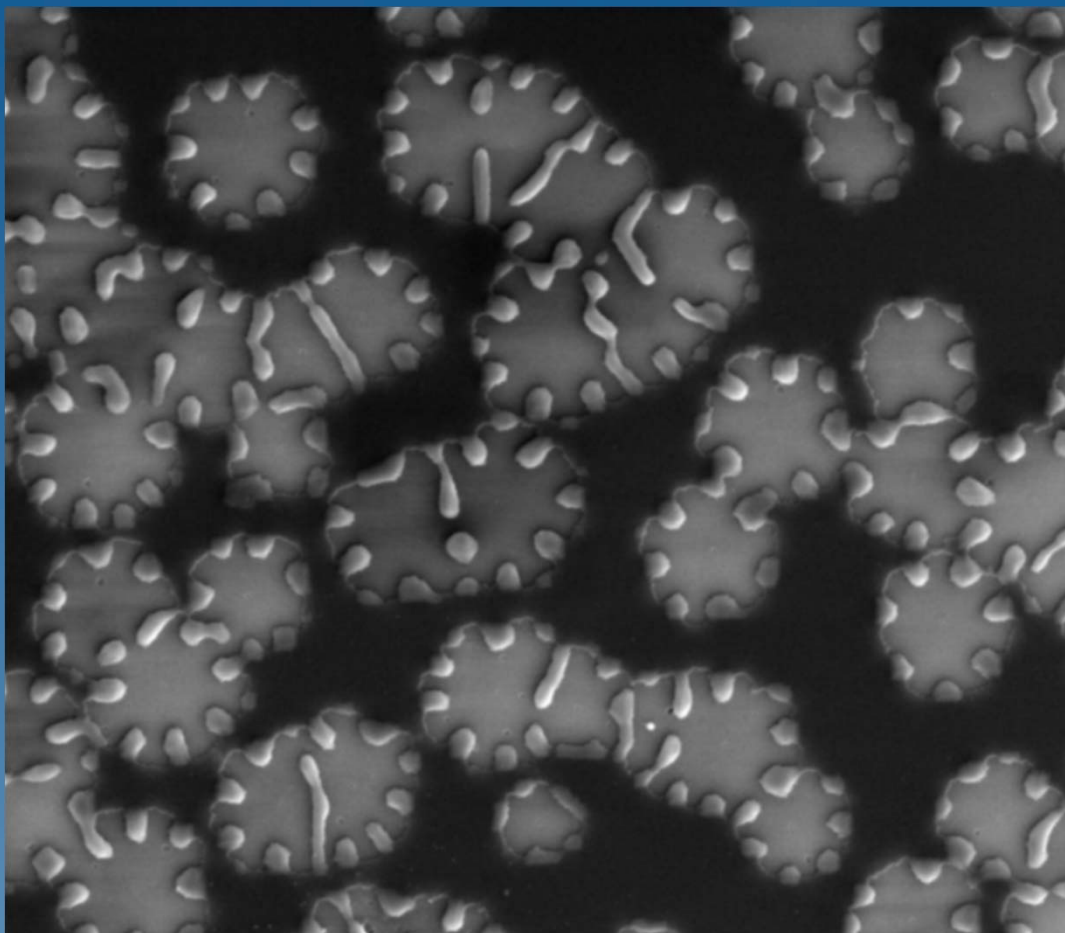
Instrument: FEI Helios Nanolab 600

Affiliation: Institute of Photonics and Nanotechnologies
Rome, Italy



Description:

Thermally induced
agglomeration of
the Si device layer
of SOI substrate



Magnification: 20KX

Submitted by: Andrea Notargiacomo

Instrument: FEI Helios Nanolab 600

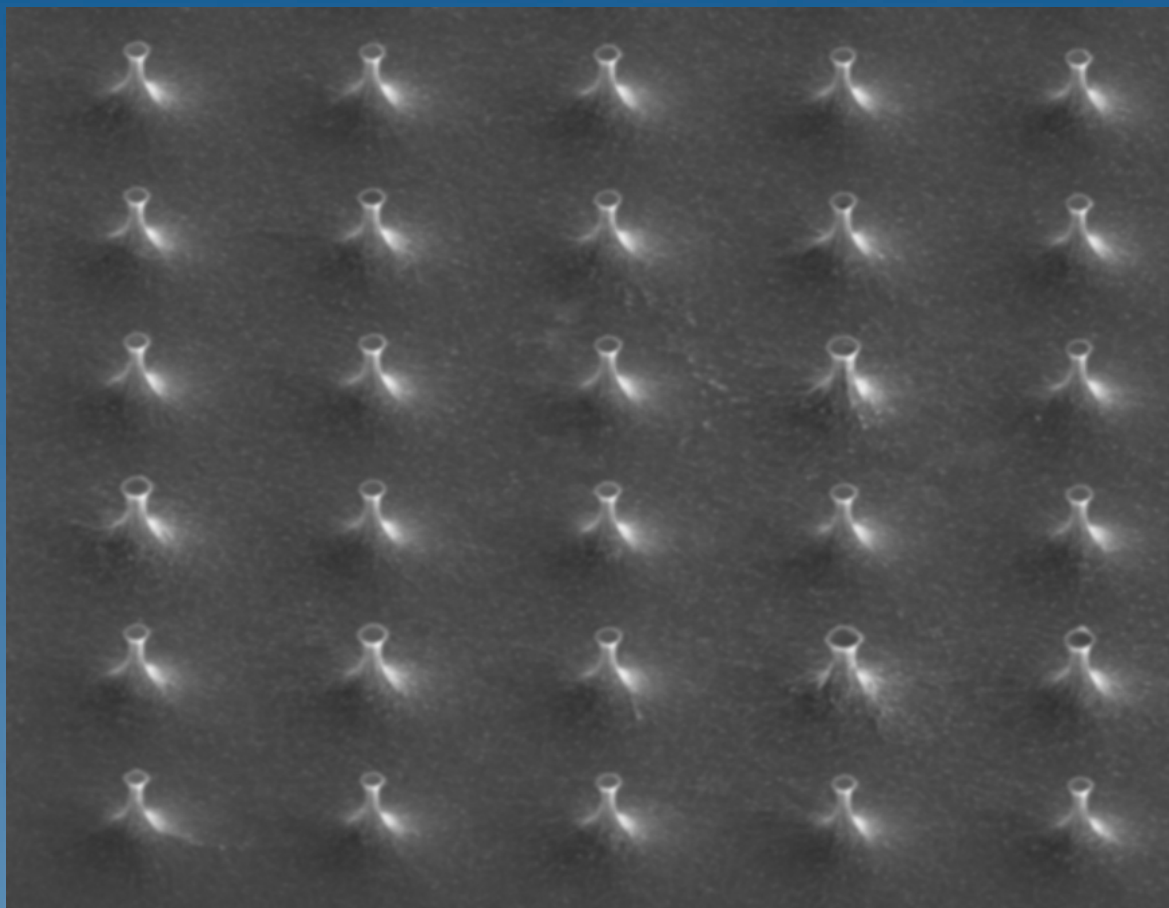
Affiliation: Institute of Photonics and Nanotechnologies
Rome, Italy

micro & nano - graph Title:
“Orchestra of trumpets”



Description:

Ge pillars etched
by isotropic
reactive ion
etching on a bulk
(001)Ge wafer



Magnification: 2500KX

Submitted by: Andrea Notargiacomo

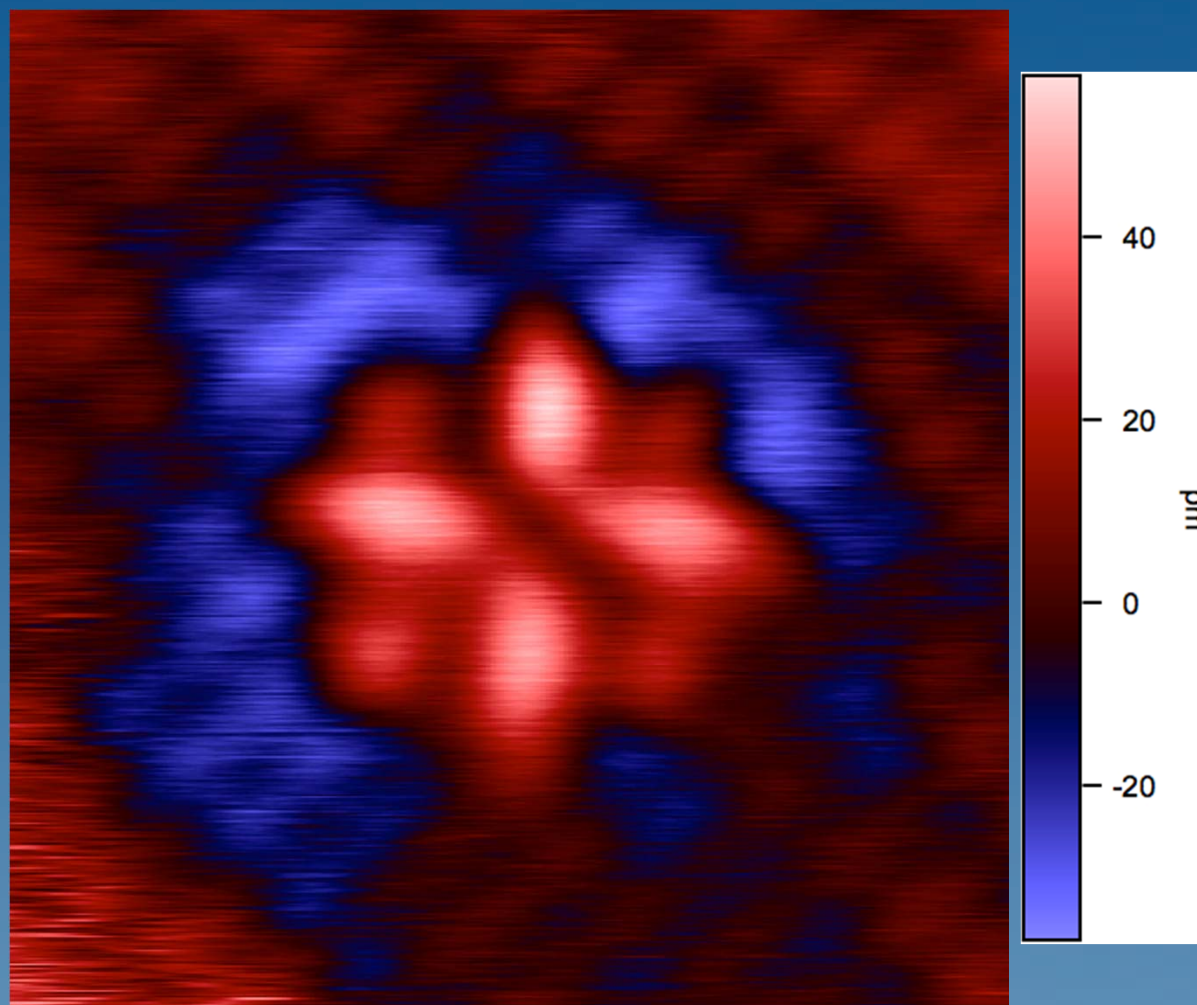
Instrument: FEI Helios Nanolab 600

Affiliation: Institute of Photonics and Nanotechnologies
Rome, Italy



Description:

Scanning tunnelling microscope (STM) image of four dangling bonds fabricated on a hydrogen terminated silicon (001) surface, by desorbing single hydrogen atoms using the STM tip. This image, taken at a sample bias of 1.6V and a tunnelling current set point of 5pA, exhibits two-dimensional extended quantum dot states between the dangling bonds.



Magnification: 4nm*4nm

Submitted by: Asif Suleman

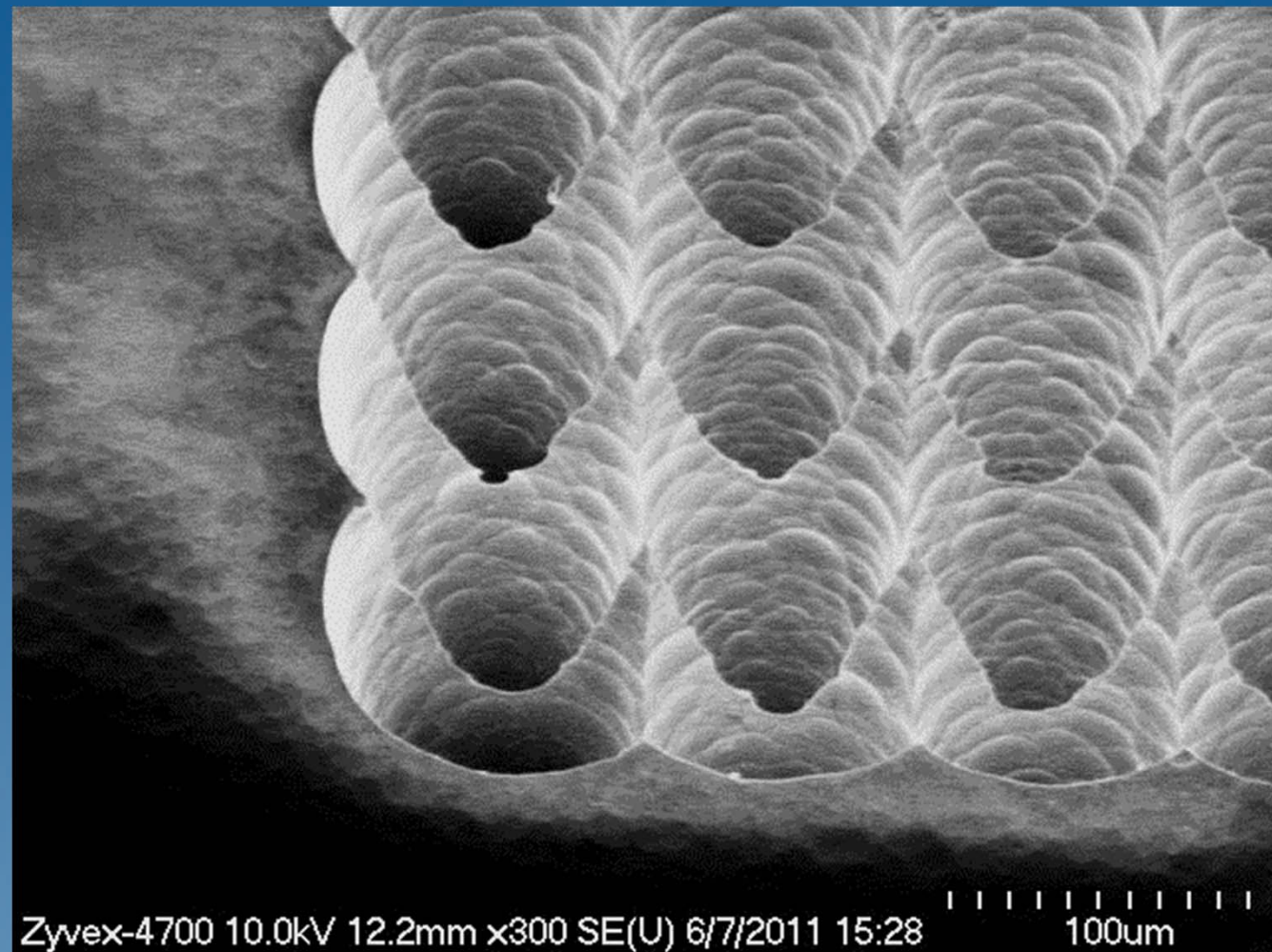
Instrument: Omicron LT STM

Affiliation: University College London,
London, UK



Description:

SEM image of nanohole array in glass using wet etching.



Magnification: 300X

Submitted by: James Owen

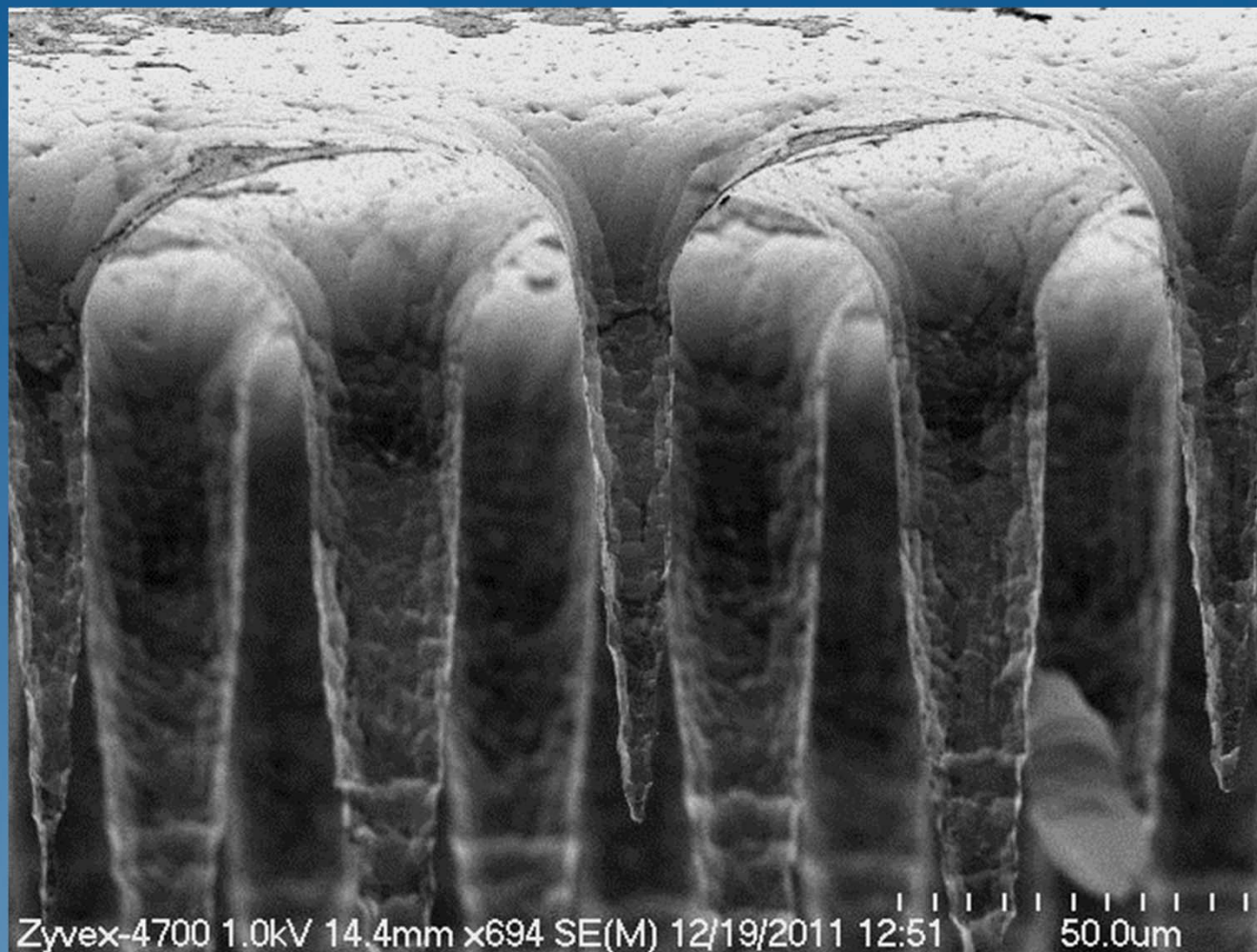
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

SEM image of
Deep Reactive
Ion Etched (DRIE)
microelectrodes
fabricated in SCS.



Magnification: 694X

Instrument: Hitachi S-4700 SEM

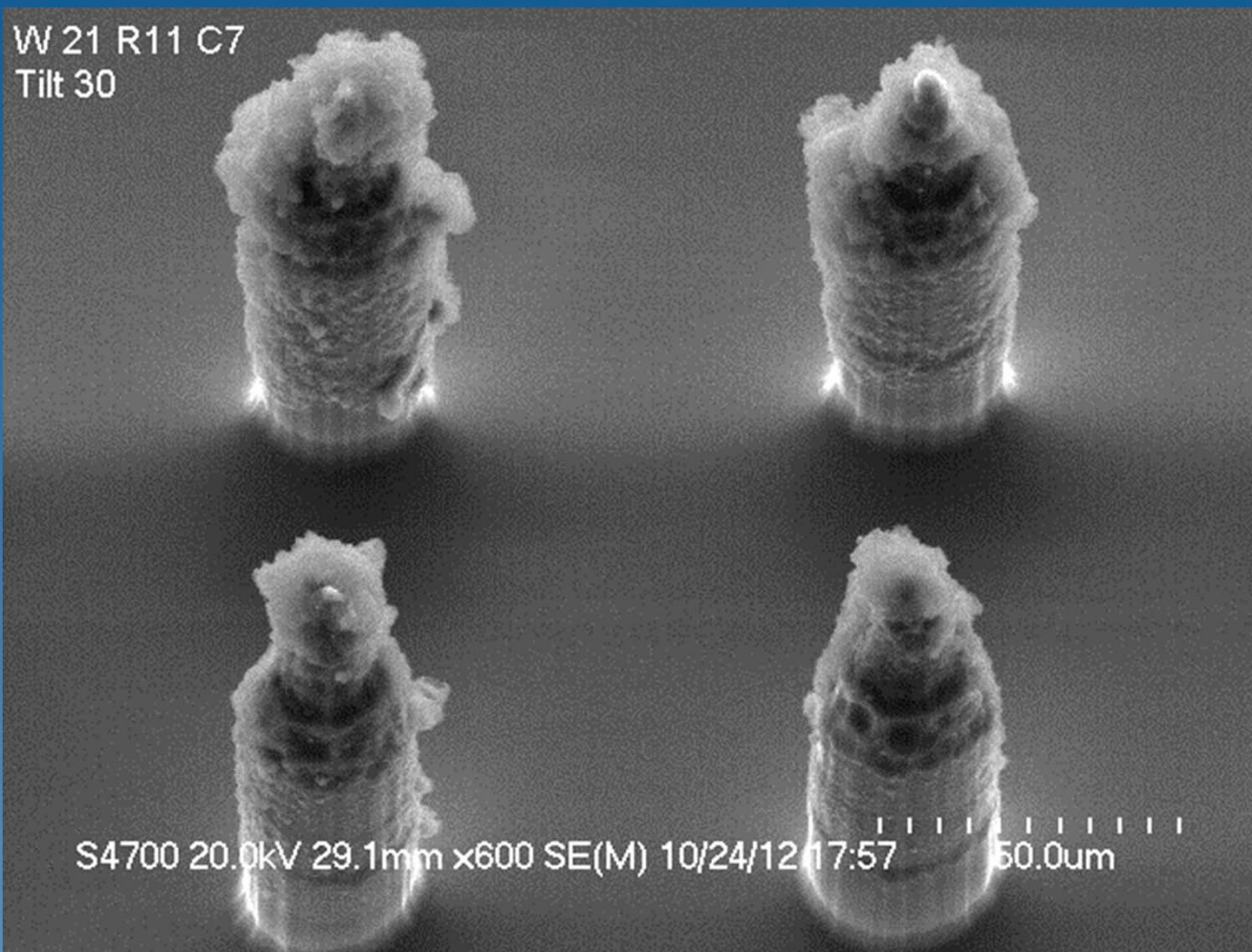
Submitted by: Justin Alexander

Affiliation: Zyvex Labs



Description:

SEM image of
Silicon pillars
fabricated using
DRIE and coated
with photo resist.



Magnification: 600X

Submitted by: Bill Owen

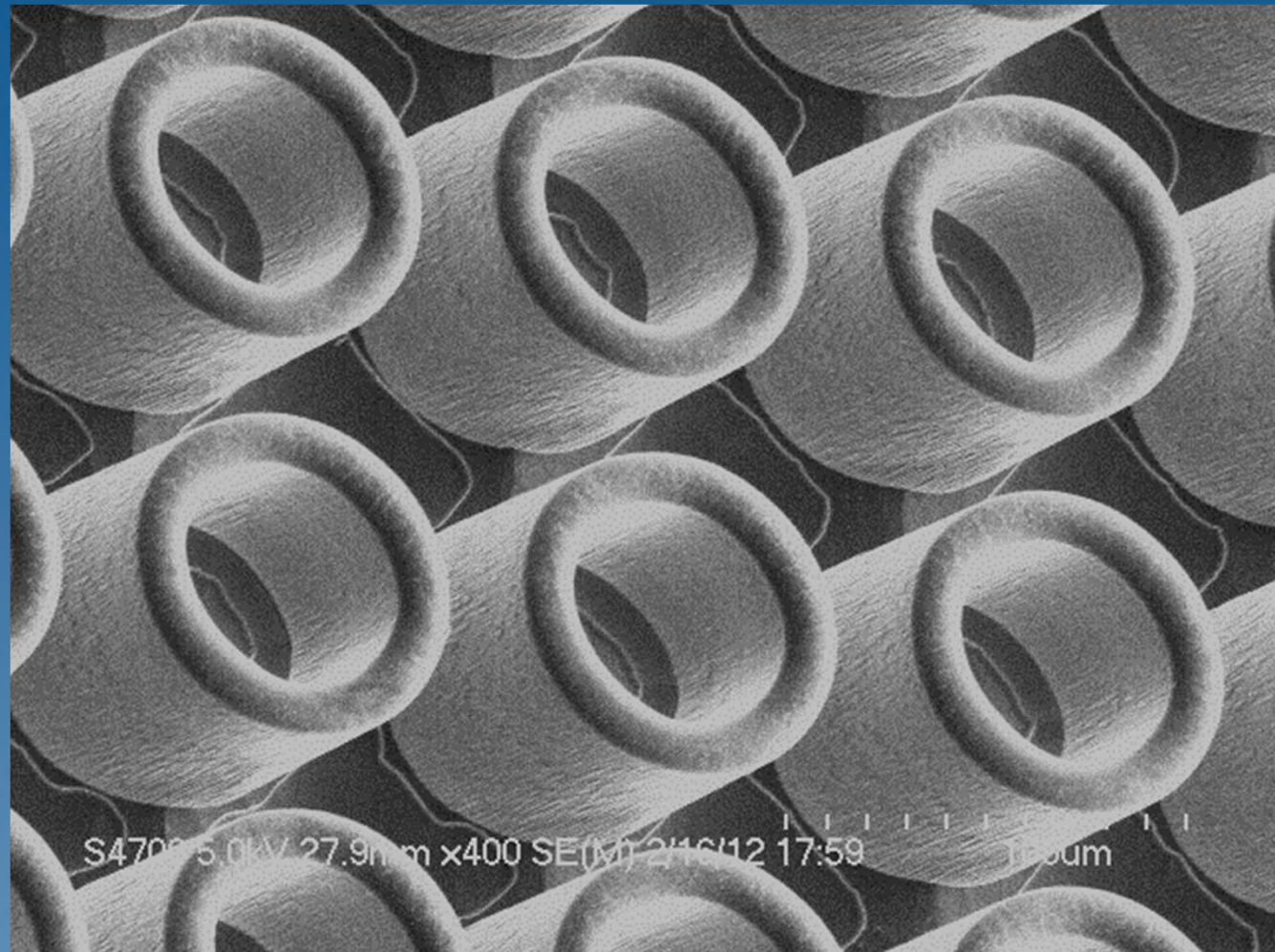
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

SEM image of glass rings filled with polysilicon exposed using DRIE.



Magnification: 400X

Submitted by: James Owen

Instrument: Hitachi S-4700 SEM

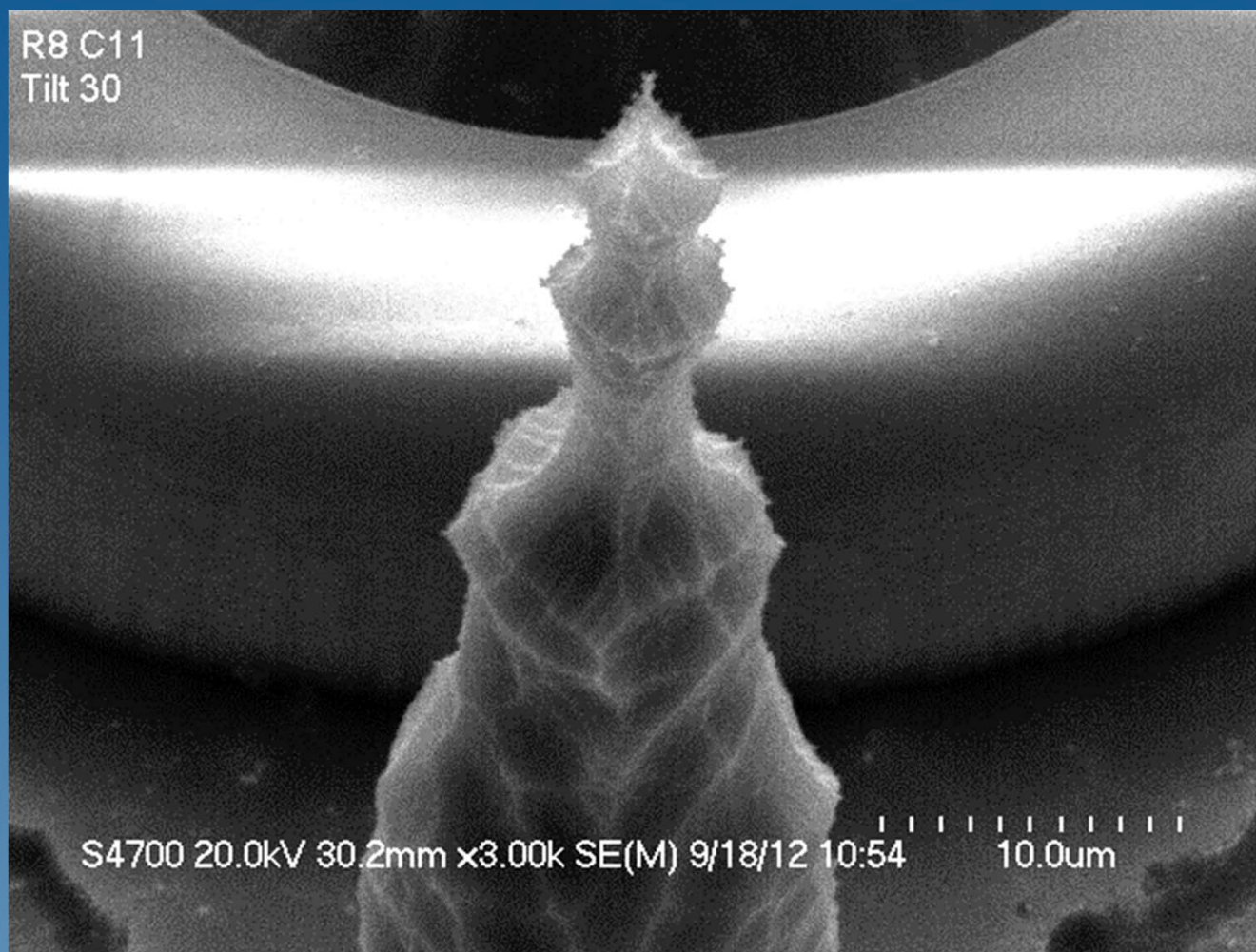
Affiliation: Zyvex Labs

micro & nano - graph Title:
“Miniature Jin Mao Tower (Top)”



Description:

SEM image of tip
of microelectrode
with a Parylene C
coating on it.



Magnification: 3KX

Submitted by: Bill Owen

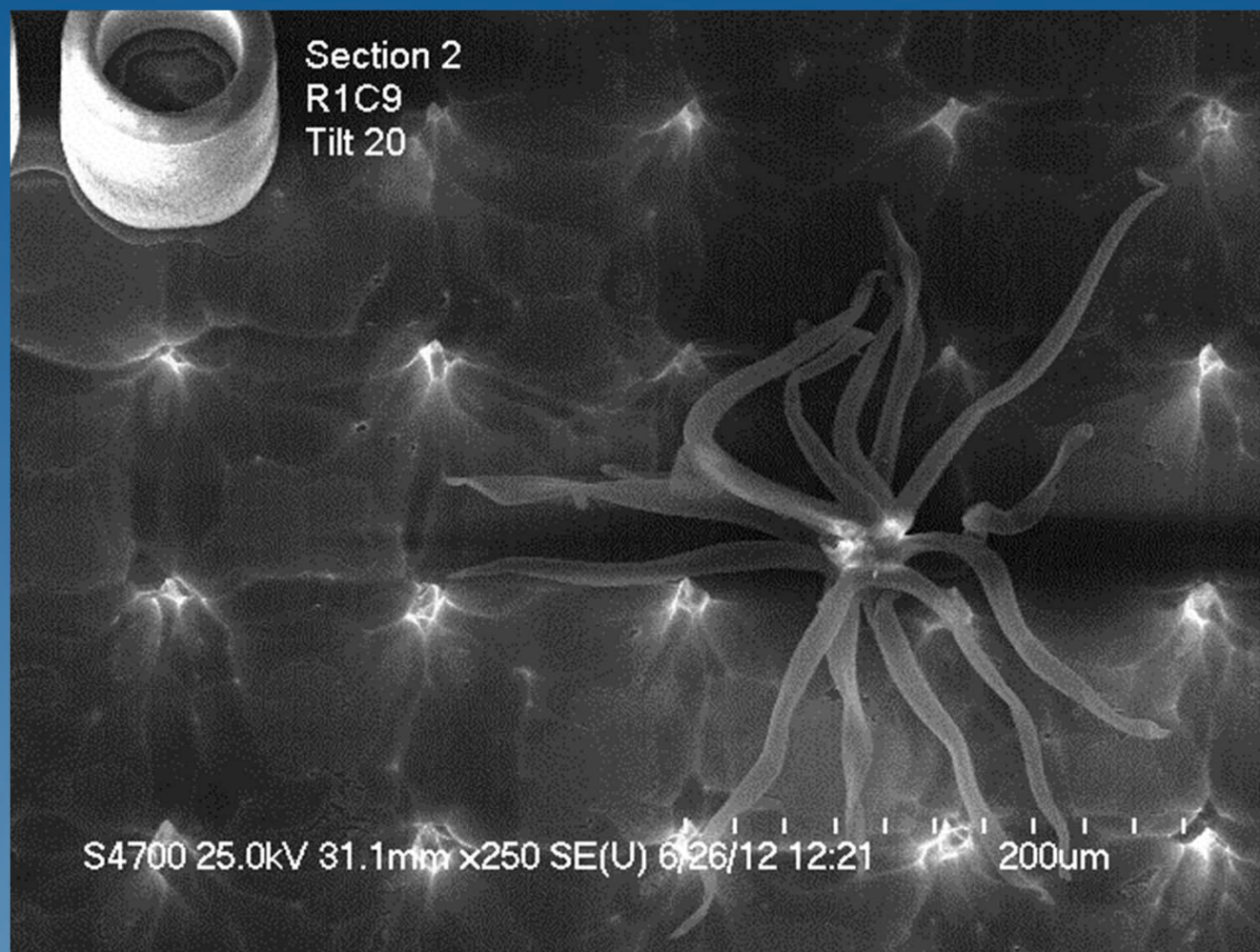
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

SEM image of
chem-wipe fibers
on reactive ion
etched Silicon
substrate.



Magnification: 250X

Submitted by: James Owen

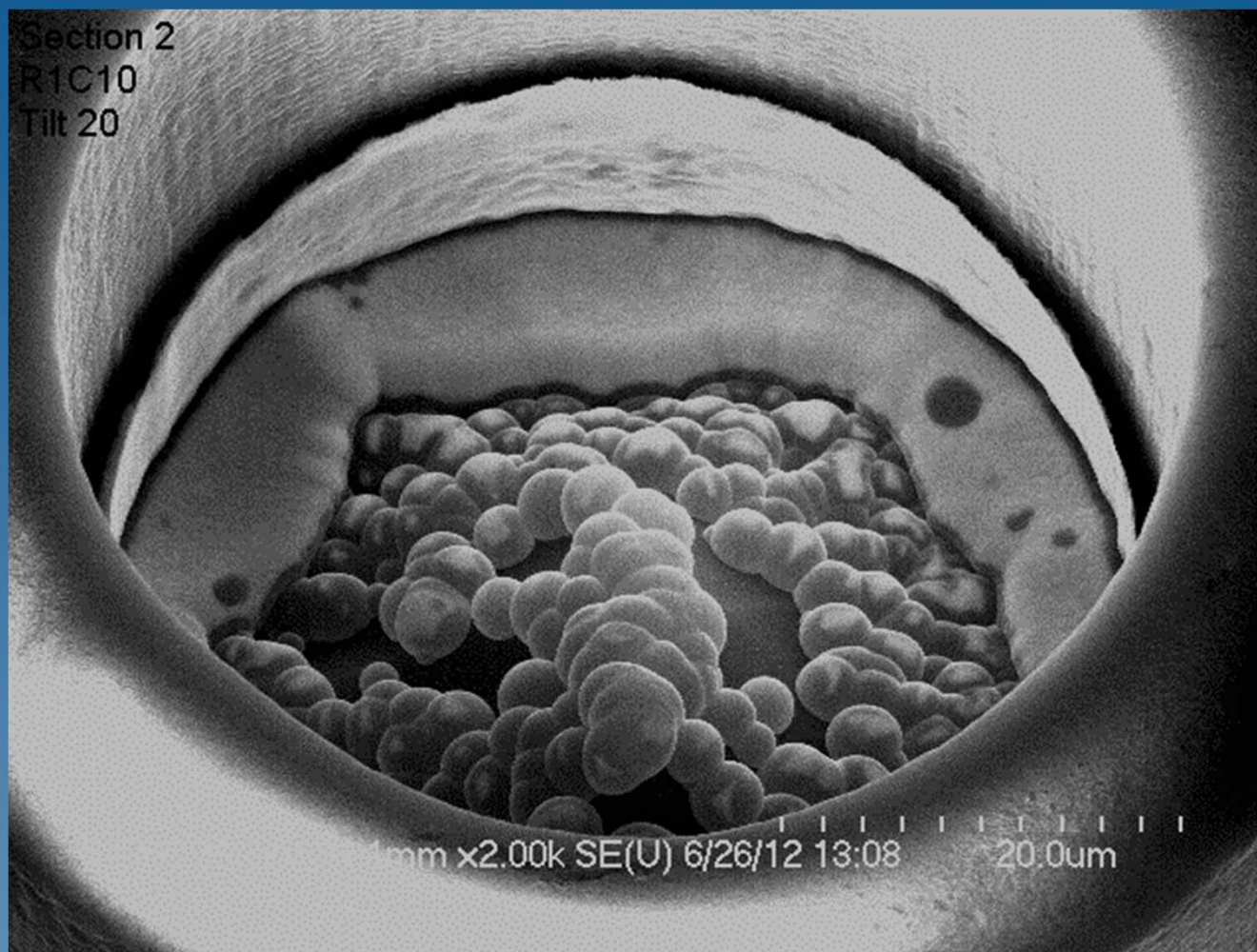
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

SEM image of residual silicon after wet etching inside a glass cavity.



Magnification: 2KX

Submitted by: James Owen

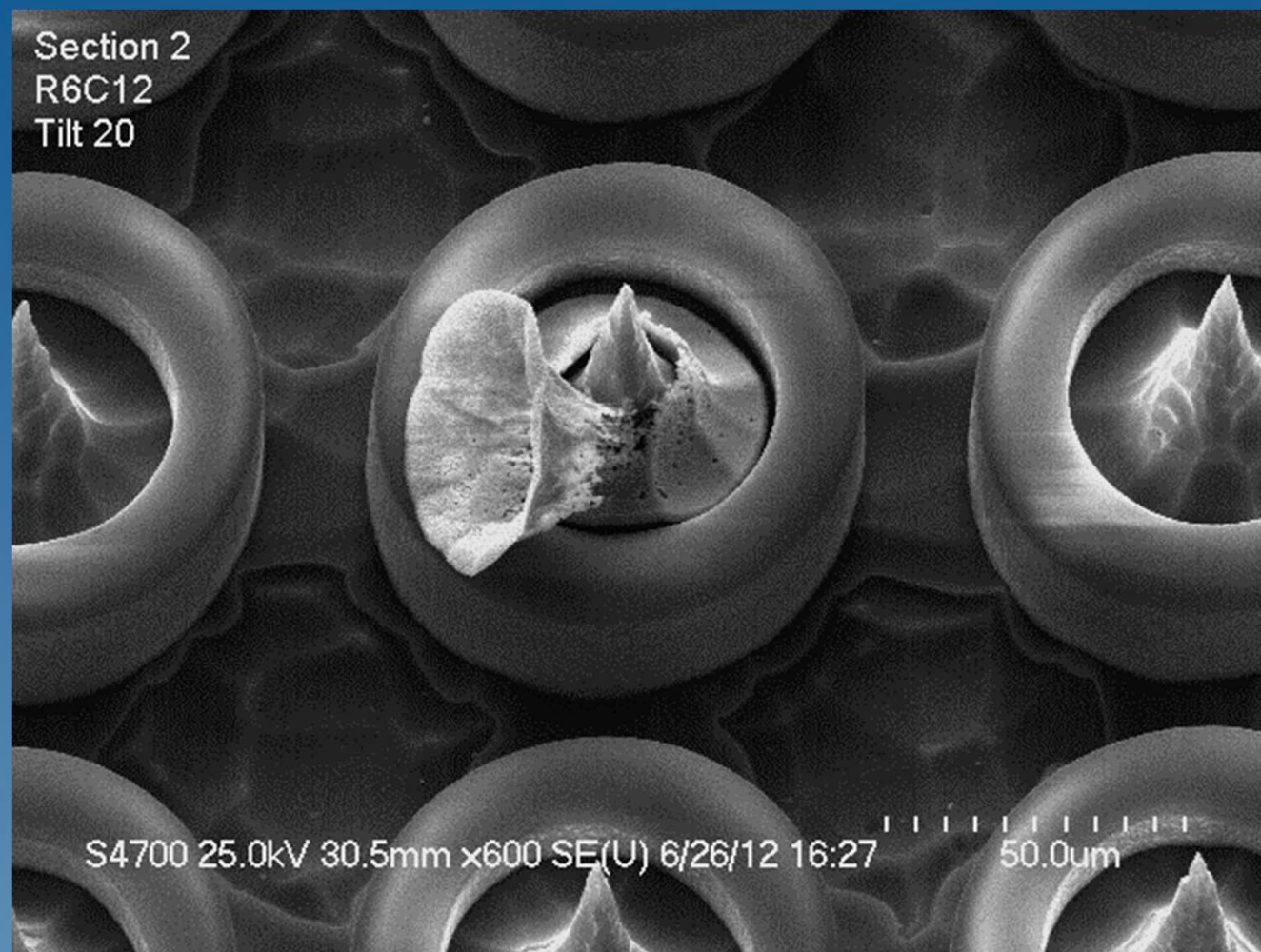
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

SEM image of photo resist bubbling and peeling off from microelectrode tip.



Magnification: 600X

Submitted by: Justin Alexander

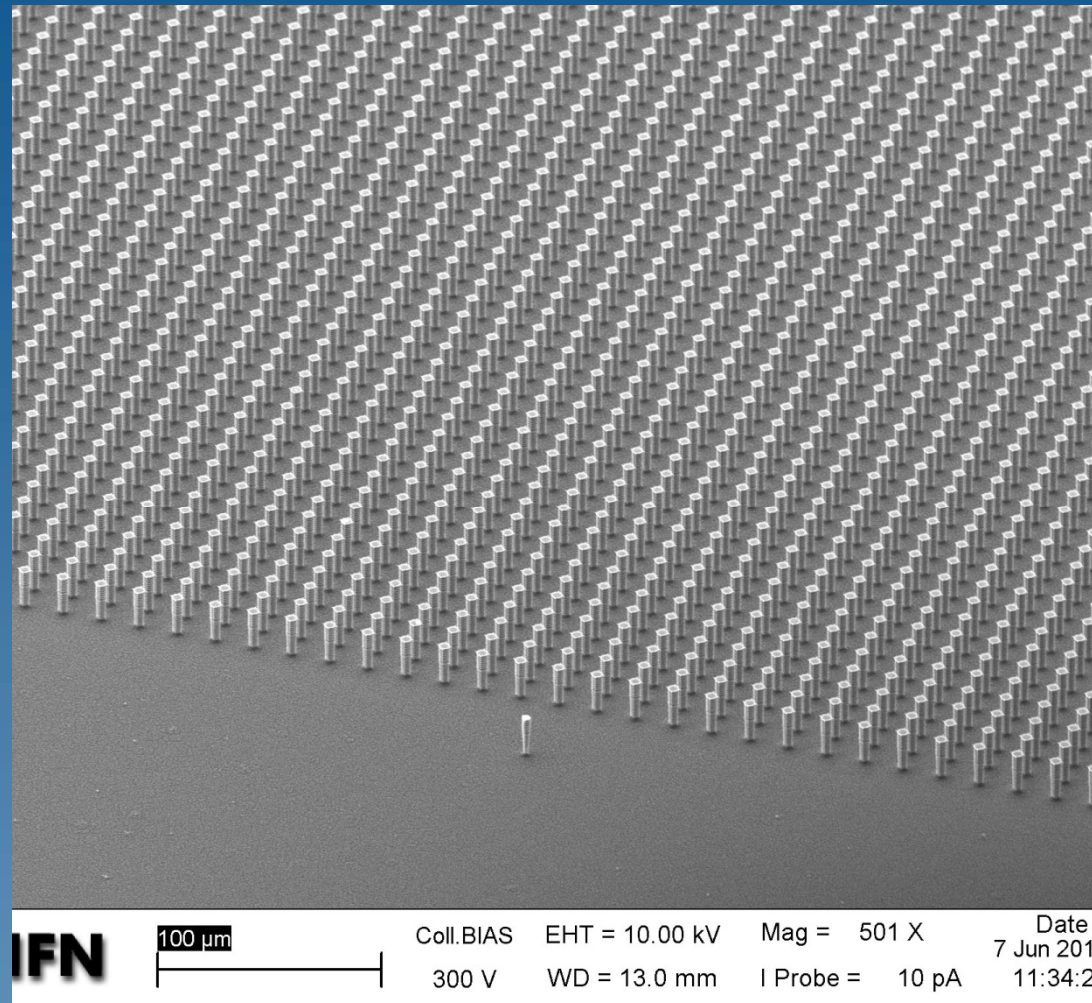
Instrument: Hitachi S-4700 SEM

Affiliation: Zyvex Labs



Description:

Superhydrophobic structure made of silicon pillars 3 microns in diameter, 20 microns height, 20 microns period. ICP Bosch process



Magnification: 500X

Submitted by: Luca Businaro

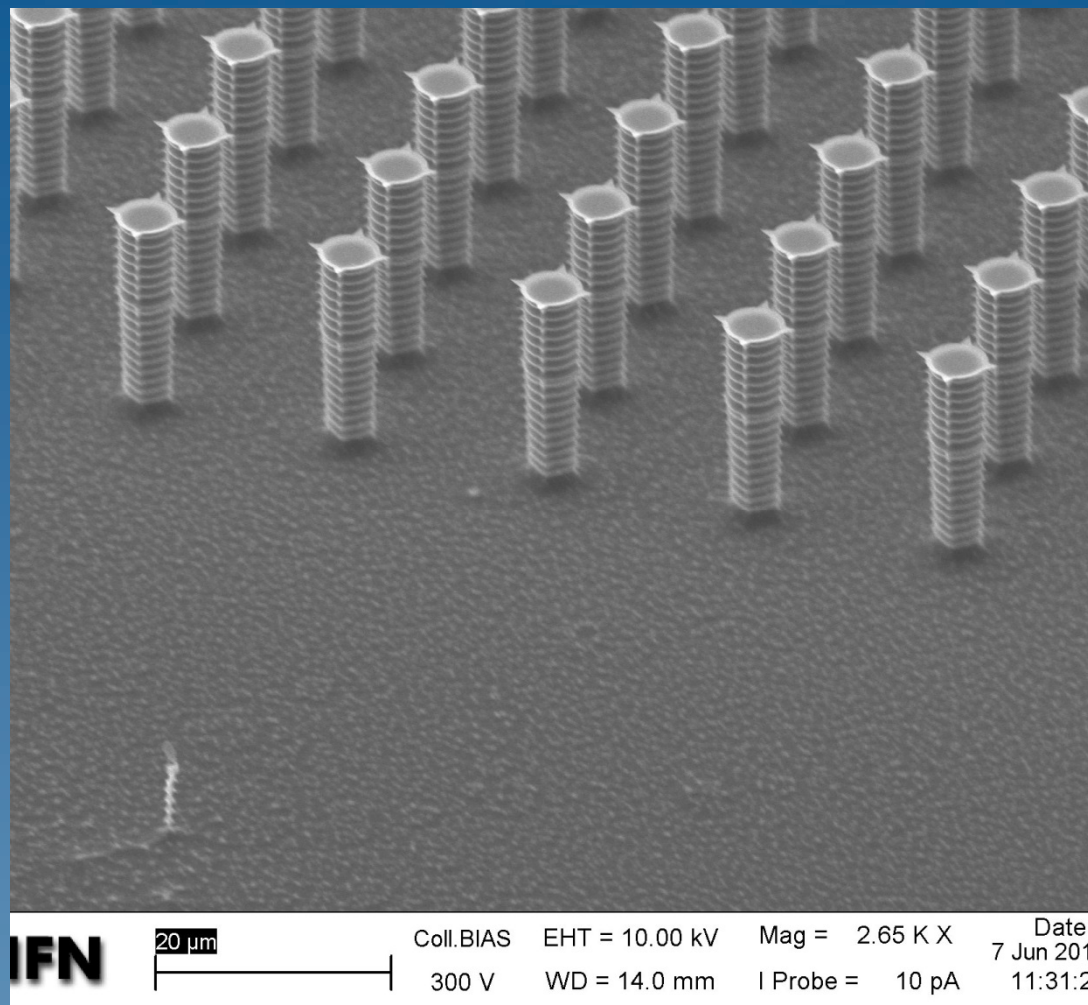
Instrument: Zeiss EVO MA10

Affiliation: CNR - Institute for Photonics and Nanotechnologies, Rome Italy



Description:

Superhydrophobic
structure made of
silicon pillars 3
microns in diameter,
20 microns height, 20
microns periodi.
ICP Bosch process



Magnification: 2650X

Submitted by: Luca Businaro

Instrument: Zeiss EVO MA10

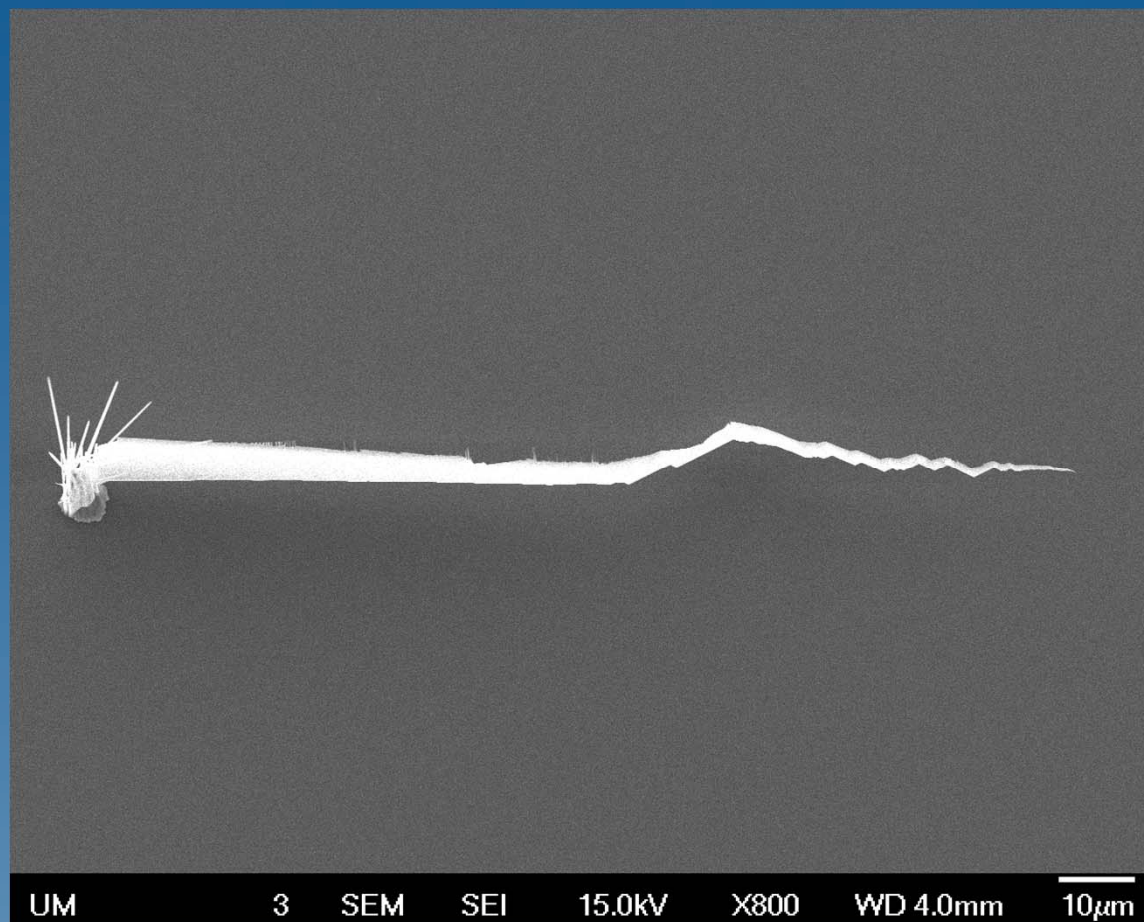
Affiliation: CNR - Institute for Photonics and Nanotechnologies, Rome Italy

micro & nano - graph Title: “The Fearsome Micro-Dragon”



Description:

It turns out fabricating nanostructures is not to be taken lightly... Things do go horribly wrong sometimes. Little did we know that we would end up creating a monster! Feast your eyes on this fearsome micro-dragon that lives only on semiconductor substrates and breathes zinc oxide nanowires. Beware, the dragon is micro but the fear is all too real.



Magnification: 800X

Submitted by: Sukru Senveli

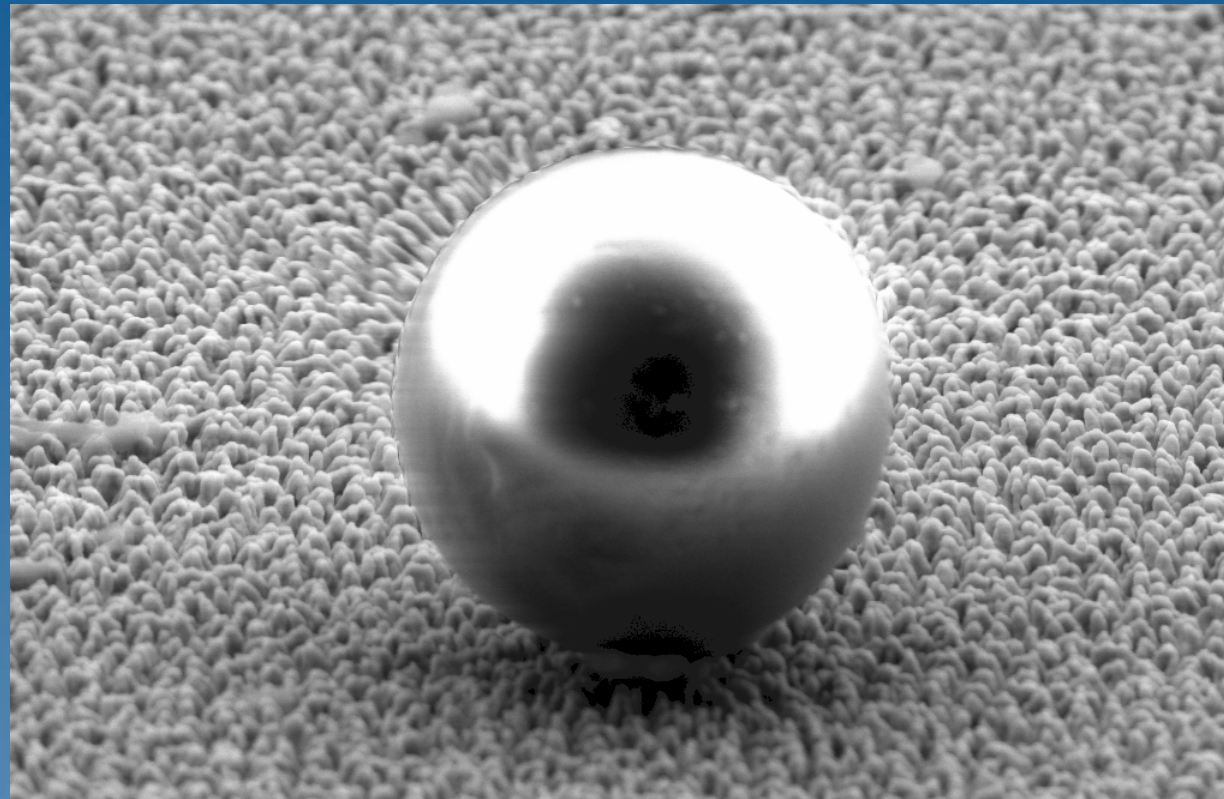
Instrument: JEOL 7000-F

Affiliation: University of Miami,
Coral Gables, FL, USA



Description:

This is an image of an artefact. We don't know what it is. Only that it could move by scanning it. Interestingly you can see the detector in the reflection.



Mag = 26.12 K X 2µm EHT = 6.00 kV Signal A = SE2 Date :23 Jun 2009
WD = 6 mm Photo No. = 4309 Time :12:20

Magnification: 26KX

Submitted by: Michael Schmidt

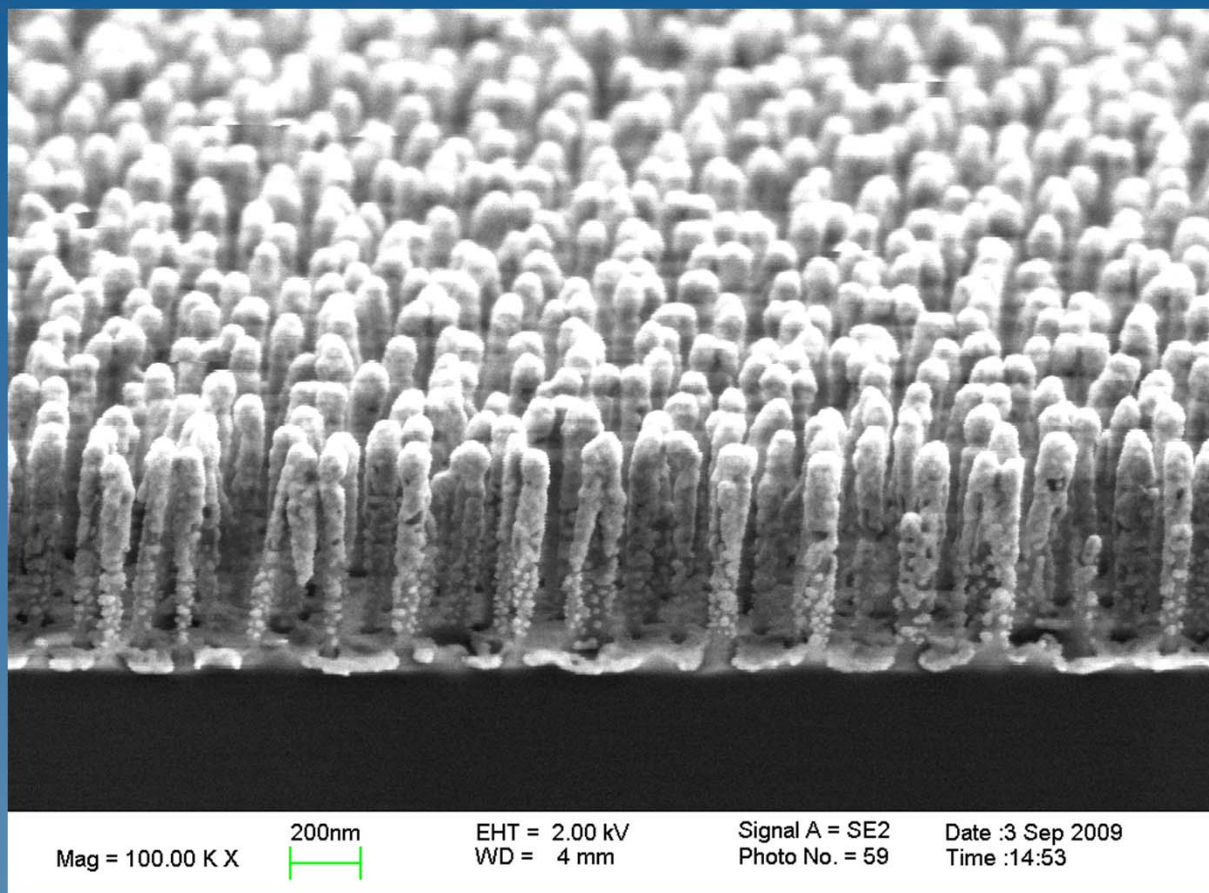
Instrument: Leo 1550

Affiliation: Dept. Micro- and Nanotechnology
Technical University of Denmark



Description:

Free standing
silicon nanopillars
covered with gold.
The pillars are
produced by a
waferscale
process. The
surface is used as
a surface
enhanced raman
substrate



Magnification: 100KX

Submitted by: Michael Schmidt

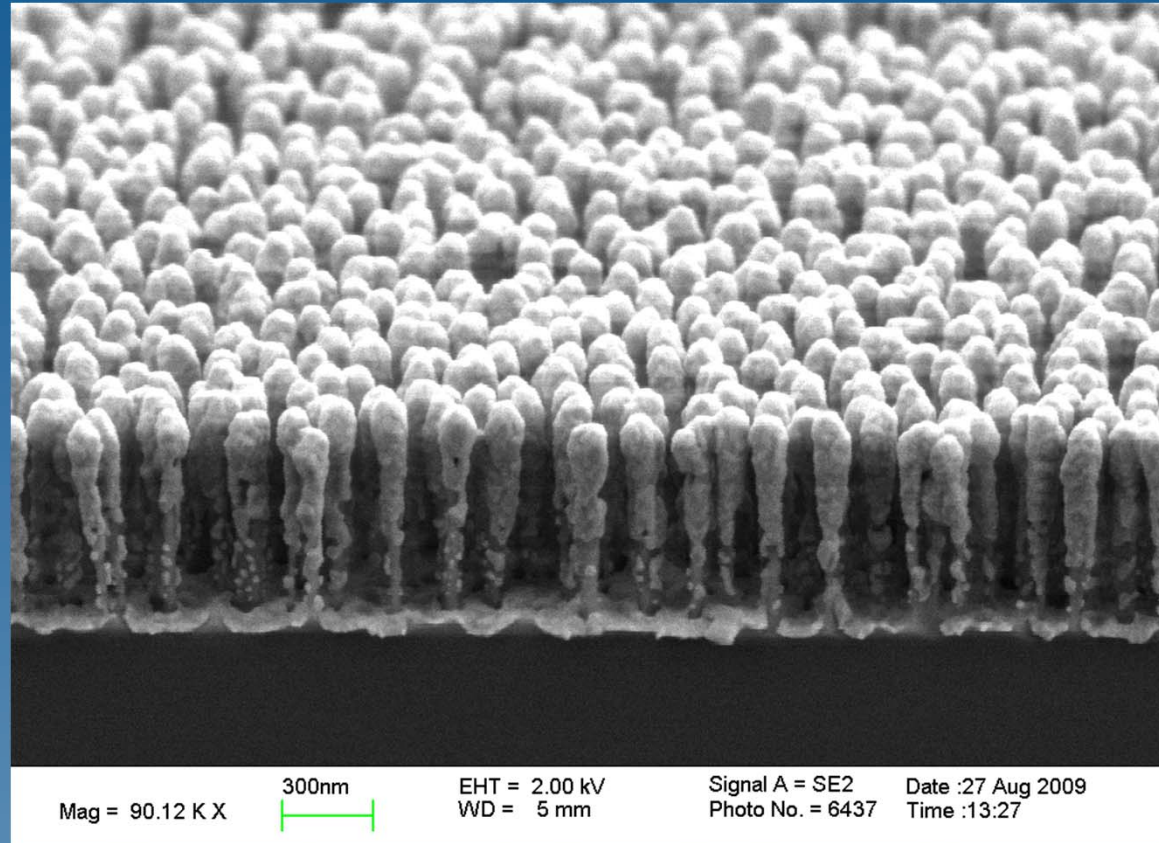
Instrument: Leo 1550

Affiliation: Dept. Micro- and Nanotechnology
Technical University of Denmark



Description:

Free standing silicon nanopillars covered with gold. The pillars are produced by a waferscale process. The surface is used as a surface enhanced raman substrate



Magnification: 90KX

Submitted by: Michael Schmidt

Instrument: Leo 1550

Affiliation: Dept. Micro- and Nanotechnology
Technical University of Denmark

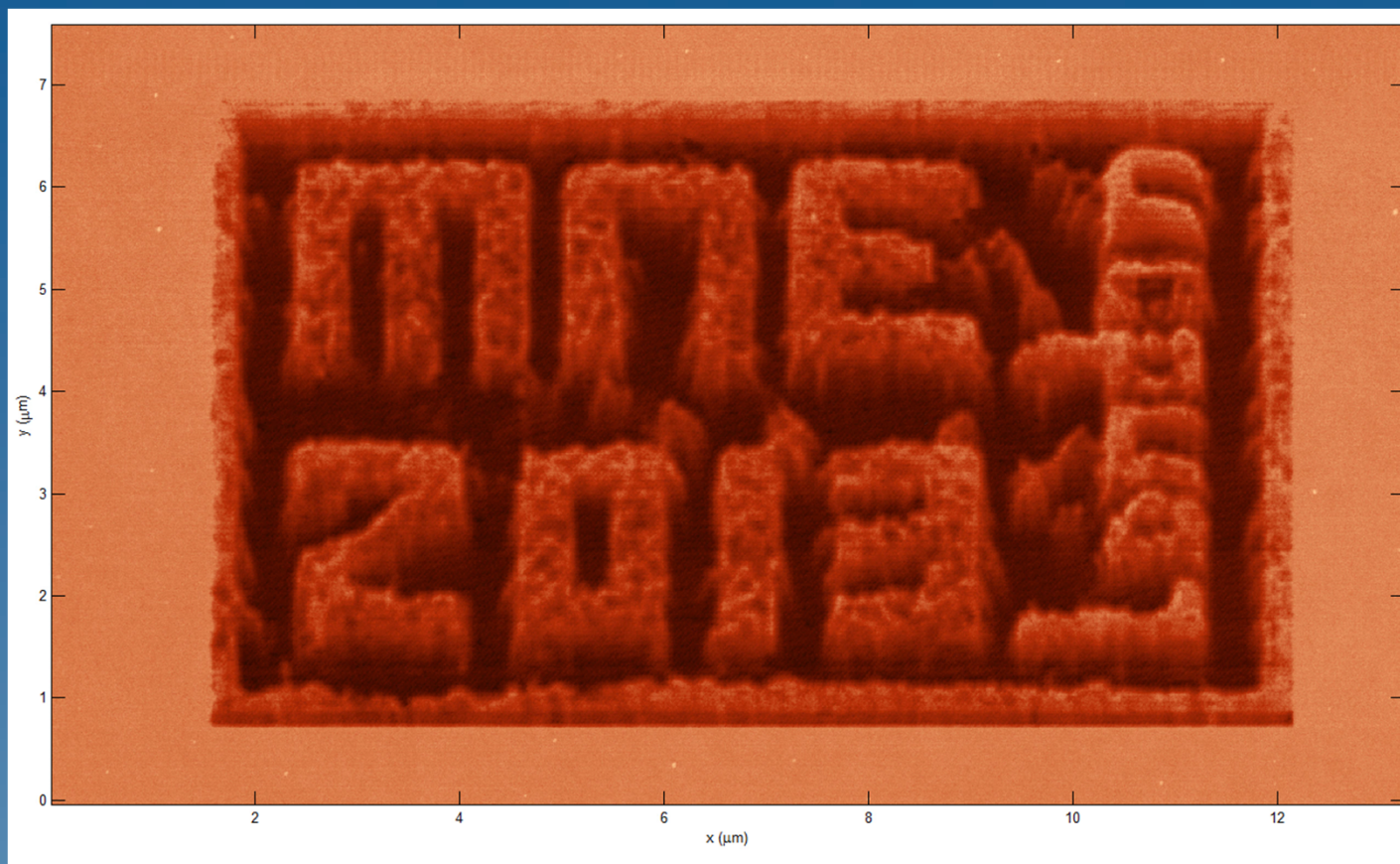


Description:

We thought it would be entertaining to copy Zahid's nano MNE logo.

12 nm write pixels

20 nm deep



Magnification: depends on your screen

Submitted by: Philip Paul

Instrument: SwissLitho NanoFrazor

Affiliation: SwissLitho

Zurich, Switzerland