



CEITEC Nano Research Infrastructure

What we do

The CEITEC Nano Research Infrastructure provides complex equipment, expertise and methods for nanotechnology and advanced materials R&D. The CEITEC Nano facilities for nanofabrication, nanocharacterization, structural analysis and X-ray tomography enable to carry out complete fabrication of nanostructures and nanodevices and their characterization down to the sub-nanometre level in an entirely clean environment. The nanofabrication laboratory is located in class 100 cleanroom with an area of 356 m² and nanocharacterization laboratory is located in class 100,000 cleanroom with an area of 1,337 m². The structural analysis laboratory occupies further 300 m² of class 100,000) cleanroom.

Originated from CEITEC project, the research infrastructure was financed by the EU structural funds between 2011–2015 and started its full operation in September 2016. The initial investment was 240 millions CZK for cleanroom technology and 660 millions CZK for the equipment. Currently, the CEITEC Nano is acknowledged on a national Roadmap of Large Research Infrastructures for 2016–2022 and its running costs of approx. 40 millions CZK per year are covered mainly by the Czech Ministry of Education, Youth and Sports and partially by Brno University of Technology and by Masaryk University.

CEITEC Nano Research Infrastructure

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Nanofabrication

Electron beam lithography lab (E-beam writer RAITH150 Two)



Nanofabrication

Electron beam lithography lab (Scanning Electron Microscope/E-beam writer TESCAN MIRA3/RAITH LIS)



Nanofabrication

Optical lithography lab (Fumehoods, Resist coating and development system SÜSS MicroTec RCD8)



Nanofabrication

PVD lab (Electron beam evaporator BESTEC)

Services and Methodologies Provided

We will help you to do your research.

Academic users:

most of the users of the research infrastructure come from academic institutions in the region and world-wide. Academic users typically use the infrastructure via selfservice system. They get training and support from CEITEC Nano staff and then do the nanofabrication and/or measurement on their own. The instrument hours are free of charge, the academic users pay only a service fee of 30 000 CZK per year per user.

Commercial users:

the research infrastructure also attracts high-tech companies giving them access to state-of-the-art equipment for nanotechnology and materials science. They typically order measurement or nanofabrication services and their samples are processed by CEITEC Nano staff. Commercial users pay hourly charge which includes the full instrument running cost and instrument depreciation. The hourly charge varies between 1600-7000 CZK per hour, depending on the equipment.

Equipment

Nanofabrication

Lithography

- EBL, FIB, UV, laser scanning, nanoimprint

Chemical lab

- Wet benches, multiple processes

(Plasma) chemical and thermal processes

- LPCVD, ALD, MOCVD
- PECVD, RIE, DRIE
- IBE, RIBE, CAIBE

Depositions (PVD)

- Magnetron sputtering
- E-beam evaporator
- IBAD

Packaging

- Wire bonder
- Laser dicer



Nanocharacterization

UHV lab (nanoScanning Auger Microscopy/
Scanning electron microscopy with polarization analysis Scienta Omicron nanoSAM Lab)



Nanocharacterization

Optical lab (NIR-UV spectroscopic ellipsometer
J. A. Woollam V-VASE)



Structural analysis

FIB lab (Focused Ion Beam/Scanning Electron
Microscope FEI Helios NanoLab 660)

Nanocharacterization

Microscopy

- SEM/FIB, SPM, SNOM, Kerr microscopy

UHV techniques

- XPS
- Scanning Auger microscopy
- SIMS, LEIS
- UHV complex system

Electrical and magnetic measurements

- 9T, 1.4K ppms
- LT probe station
- Automated probe station
- High-temperature probe station

Optical measurements

- VUV-VIS-MIR spectroscopic ellipsometers and spectrometers, FTIR microscope

Structural analysis

Microscopy

- HRTEM
- HRSEM with EDS, WDS
- FIB/SEM
- Sample preparation (TEM lamella, sample polishing)

X-ray diffraction

- High-resolution X-ray diffractometer
- Powder diffractometer

X-ray CT

Computer tomography

- Micro CT
- Nano CT



Central European Institute of Technology
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Contact and Location

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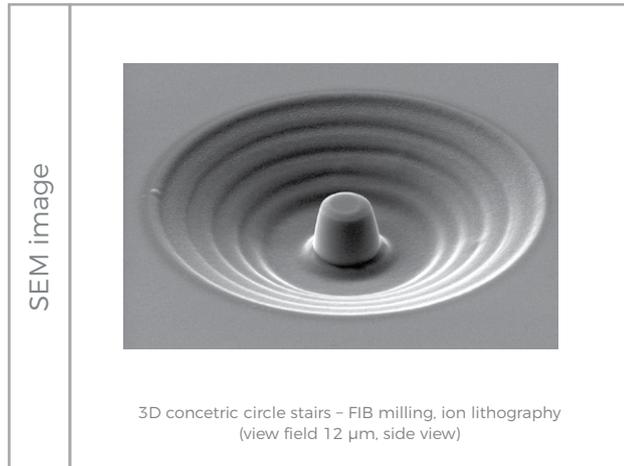
Czech Republic

www.nano.ceitec.cz

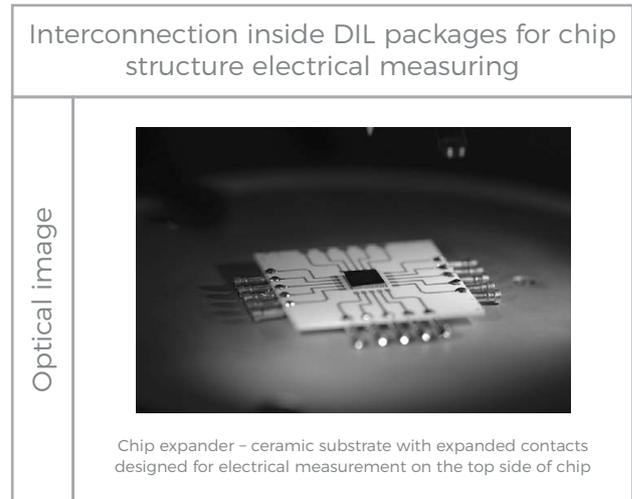
nano@ceitec.vutbr.cz

Core Facilities Outcomes

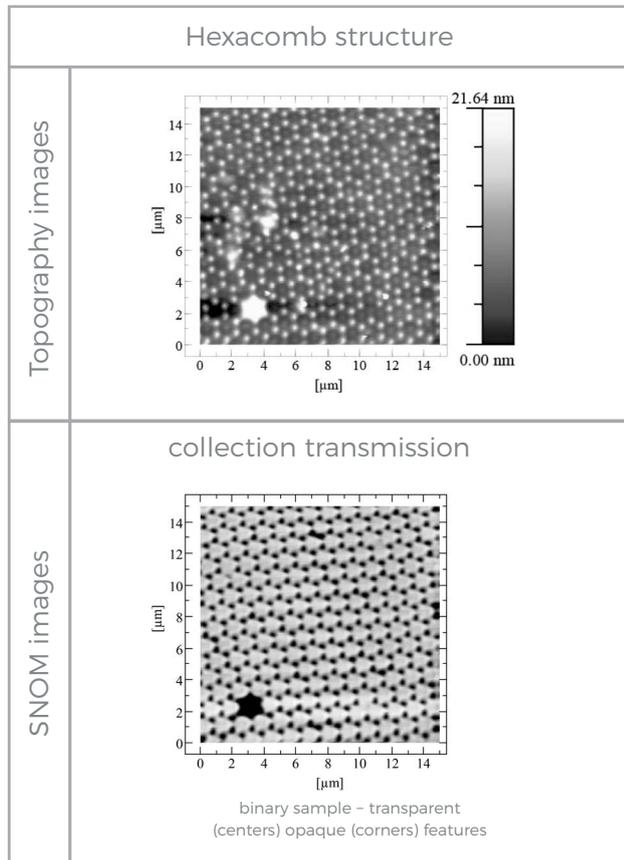
Focused ion beam combined with scanning electron microscope - Tescan Lyra3 XMH



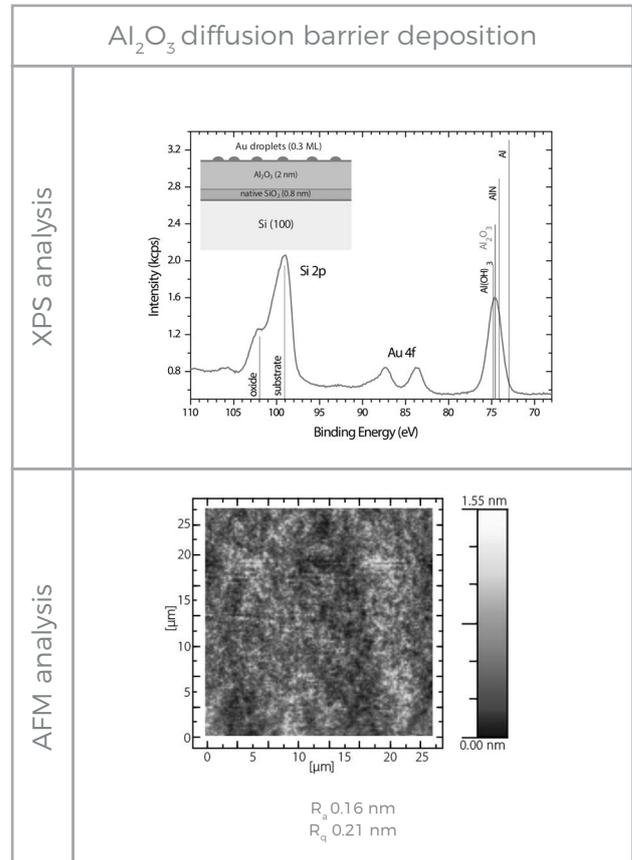
Wire bonder - TPT HB 16



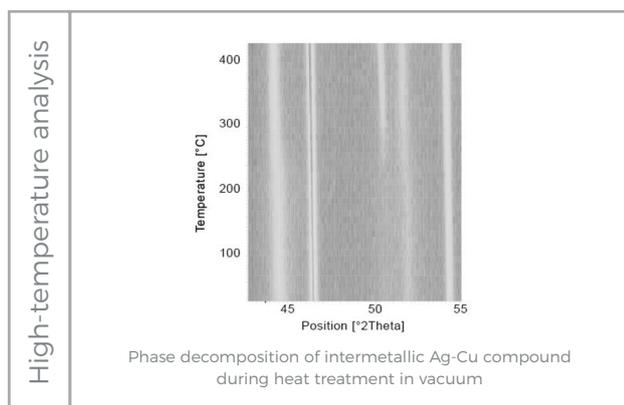
Scanning near-field optical microscope - Nanonics MultiView 4000



Atomic layer deposition - Cambridge NanoTech Fiji 200



X-ray diffractometer - Rigaku SmartLab 3 kW



X-ray diffractometer - Rigaku SmartLab 9 kW

