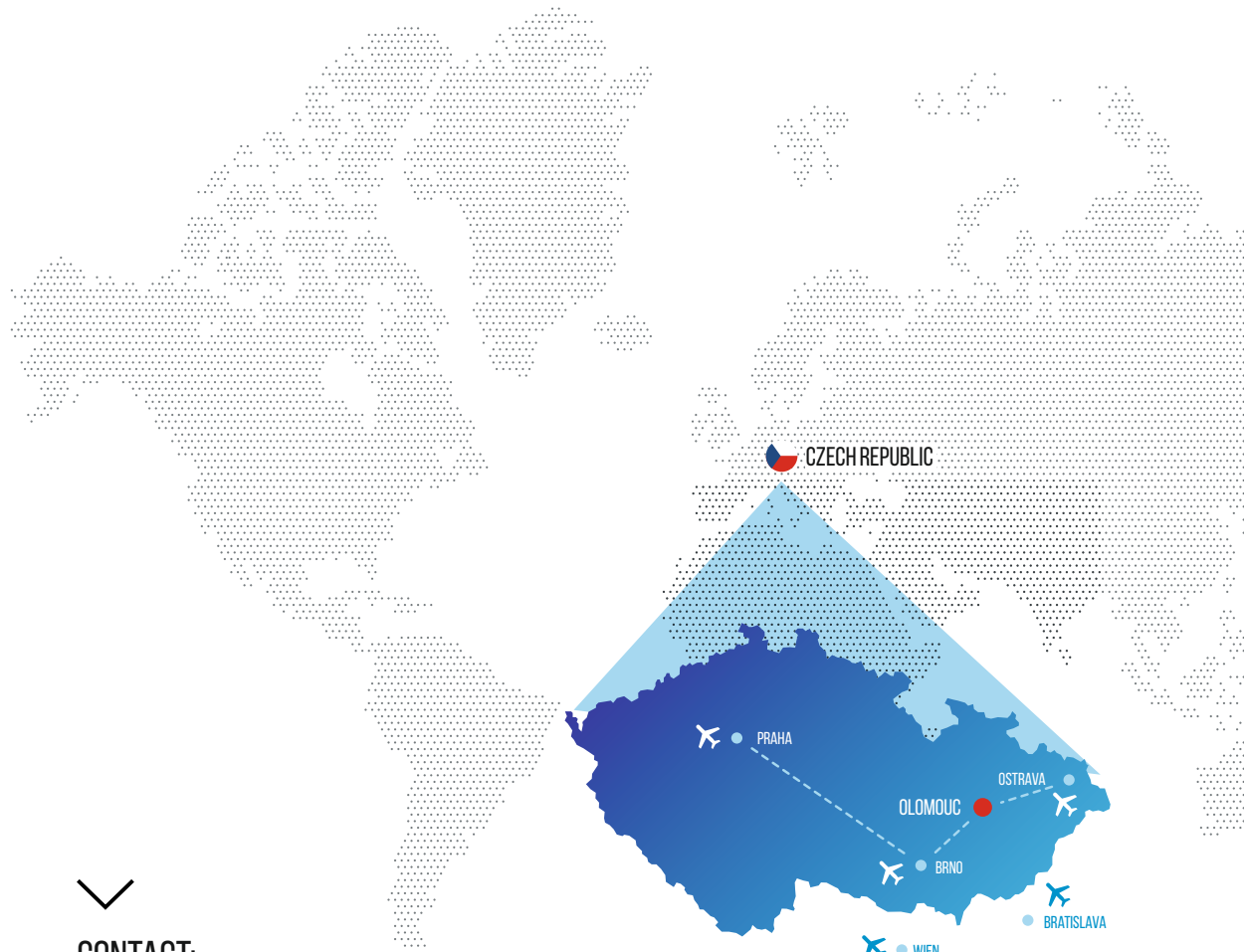


# ATOMIC FORCE MICROSCOPY SECM



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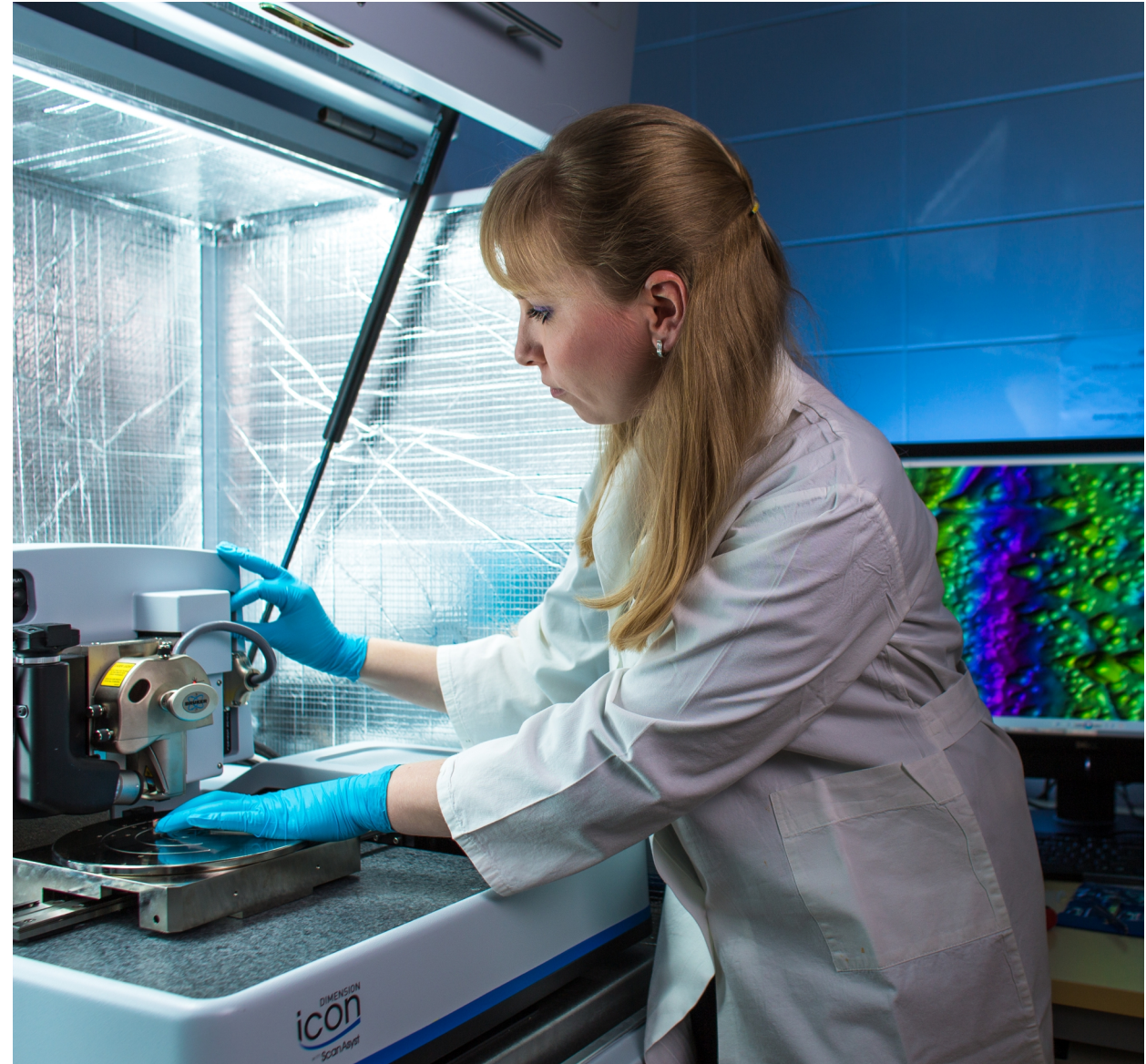
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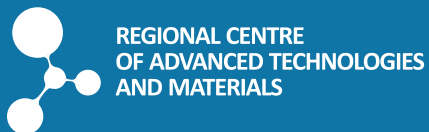
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MAPPING OF THE ELECTRICAL, ELECTROCHEMICAL AND MECHANICAL PROPERTIES OF SURFACES



REGIONAL CENTRE  
OF ADVANCED TECHNOLOGIES  
AND MATERIALS



Palacký University  
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## MAPPING OF THE ELECTRICAL, ELECTROCHEMICAL AND MECHANICAL PROPERTIES OF SURFACES

Bruker's Dimension Icon allows to track the topography of different types of samples in high-resolution while tracking other sample properties such as mechanical properties, conductivity, magnetic properties, or sensing the surface of the sample during the electrochemical process. The scanning electrochemical microscope in combination with the AFM allows the recording of electrochemical properties together with topography and mechanical properties at the same time, with a spatial resolution of less than 100 nm.



Dimension Icon with ScanAsyst (Bruker)

### ACQUIRED INFORMATION

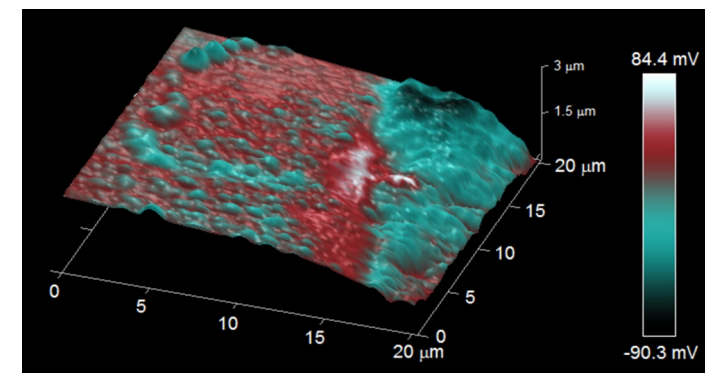
- > topography in nanoscale
- > nanomechanical properties - adhesion, modulus, deformation
- > nanoelectrical properties - conductivity, surface potential mapping
- > magnetic properties
- > electrochemistry in nanoscale

### SAMPLE TYPES

- > insulators, semiconductors, conductors
- > biological and fragile materials
- > nanoparticles, nanofibres
- > maximum size: height 15 mm, diameter 210 mm (50 mm for electrochemistry)

### MODES CONDITIONS AND PRECISION

- > measurements in contact mode, tapping mode and special PeakForce Tapping mode
- > measurements available on both air and liquid
- > maximal scan size 90 x 90 x 13  $\mu\text{m}$
- > high resolution (noise: lateral  $\leq 0.15$  nm, vertical  $\leq 35$  pm RMS at closed-loop)
- > system is capable to perform:
  - o surface topography (AFM)
  - o quantitative nanomechanical properties (QNM)
  - o electrical properties (C-AFM, PF-TUNA, KPFM)
  - o magnetic properties (MFM)
  - o electrochemical AFM (EC-AFM)
  - o scanning electrochemical microscopy (SECM-AFM)



Surface potential of coin: silver (green), copper (red).

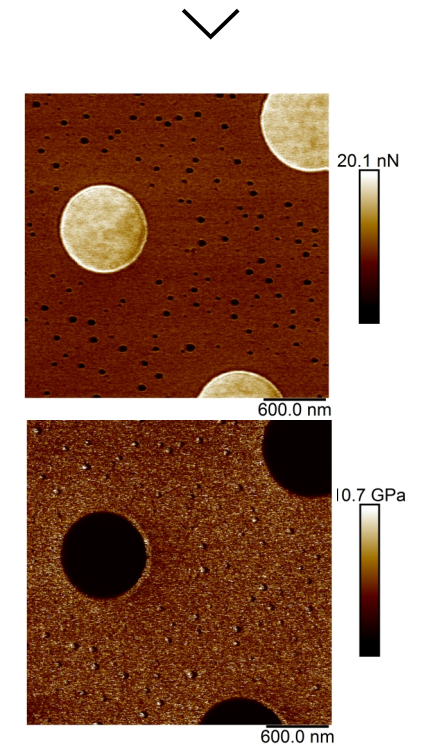
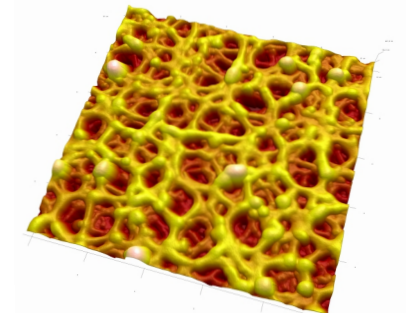
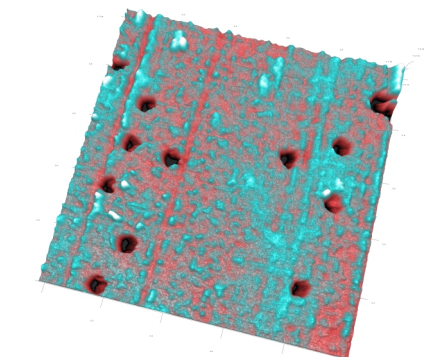


Image of nanomechanical properties of a blend of polystyrene and polyolefin elastomer measured on air. Adhesion (top), deformation (bottom).



Topography of syringe filter from cellulose.



Topography of polycarbonate filter.