



CEITEC

Central European Institute of Technology  
BRNO | CZECH REPUBLIC

MUNI

**Cryo-Electron Microscopy**

and tomography **COre**

**Facility**

**CEMCOF**

*Karel Skubnik*

**BioAFM workshop**

**06.09.2023**



# Content



Instrumentation



Users



Services

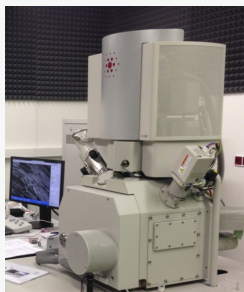


# Instrumentation

2014      2015      2016      2018      2020      2021      2022      2023



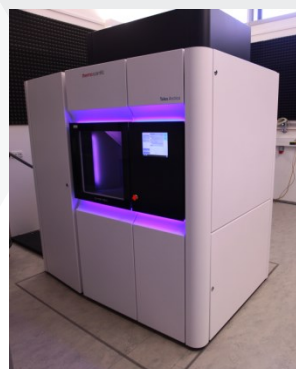
Titan Krios



Versa 3D



1<sup>st</sup> GPU cluster



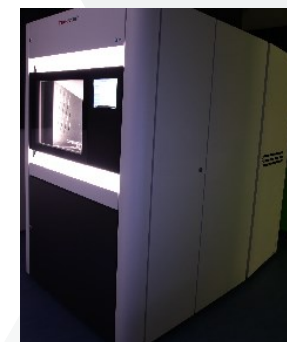
Talos Arctica



Leica EM ICE



2<sup>nd</sup> GPU cluster



Talos F200C



Helios Hydra



Glacios 2



Tecnai F20



Vitrobot



Bioquantum K2



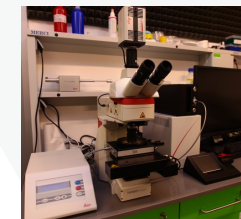
Leica EM AFS2



Leica EM UC7



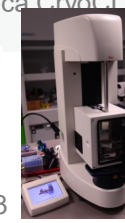
Gatan Solarus



Leica CryoCLEM



Bioquantum K3



Leica GP2



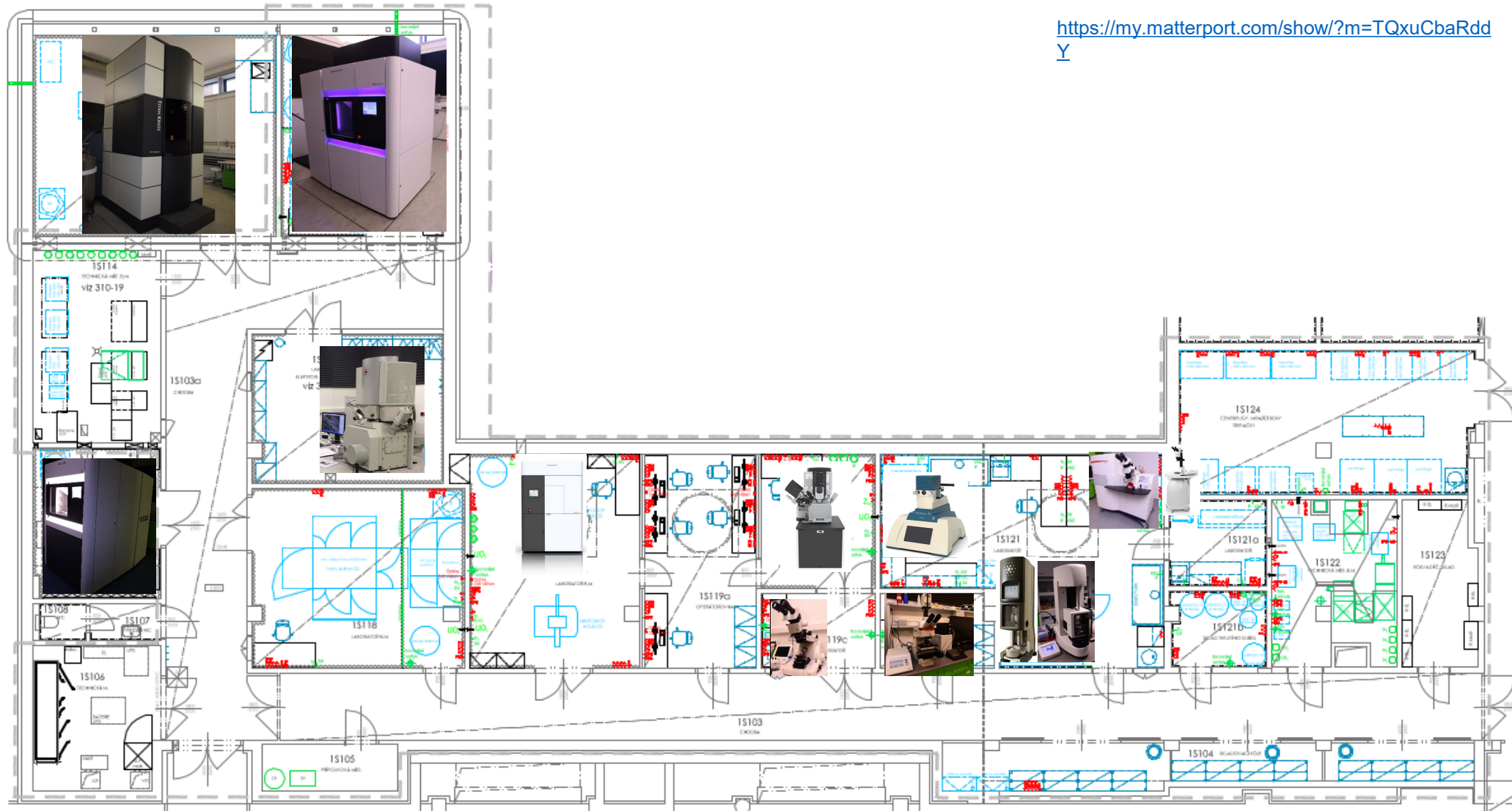
Arctis Cryo-Plasma-FIB



# Instrumentation

Virtual visit thanks to Jana Otoupalikova

<https://my.matterport.com/show/?m=TQxuCbRddY>





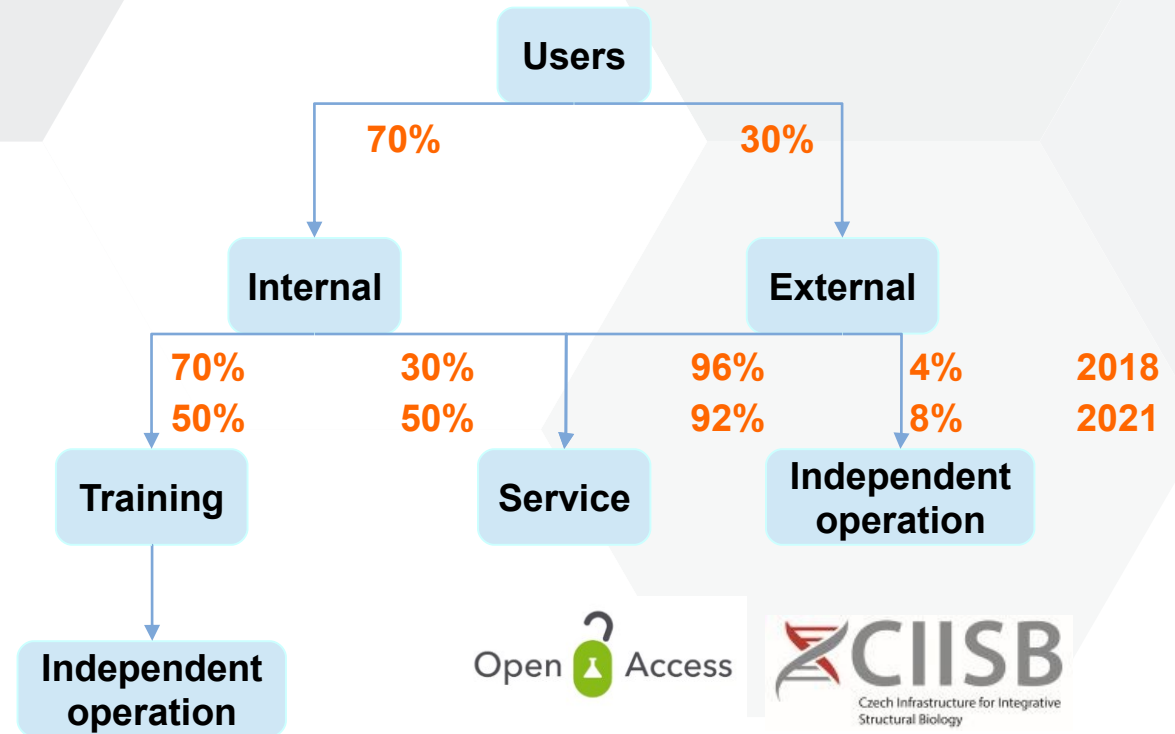


# CEMCOF – users & services

User mode or service mode available on all instruments

- **Services:**

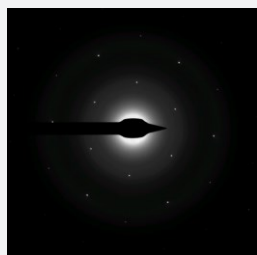
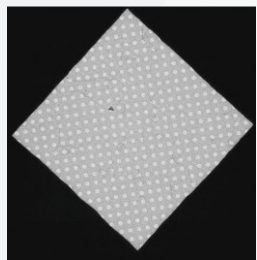
- TEM/SEM imaging
- Sample vitrification
- Resin embedding
- FIB-SEM tomography
- Initial structural screening
- Initial cryo-EM screening
- Cryo-FIB lamella preparation
- SPA data collection
- Cryo-ET data collection
- Electron diffraction tomography
- Data analysis



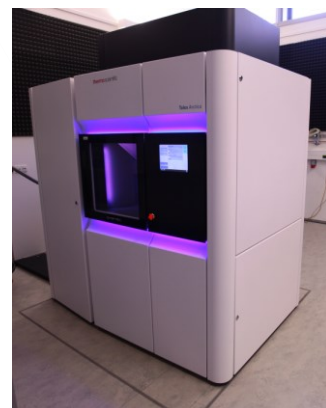
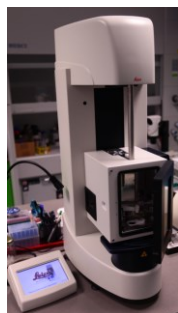


# Services

- **Single particle analysis**



Ar/O/H plasma



[ciisb.ceitec.muni.cz](http://ciisb.ceitec.muni.cz)

14 nodes á 2CPUs,  
4GPUs, 256 GB RAM

data acquisition: 750 movies/hour,  
one dataset: ~4TB

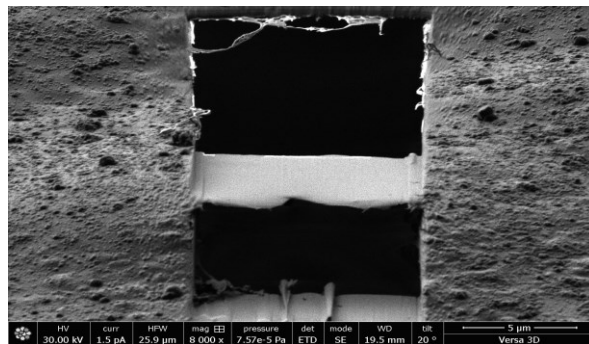
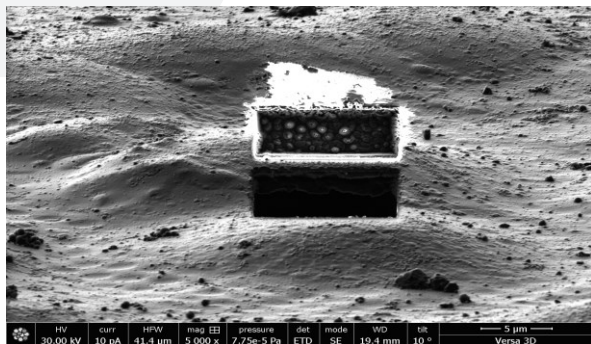
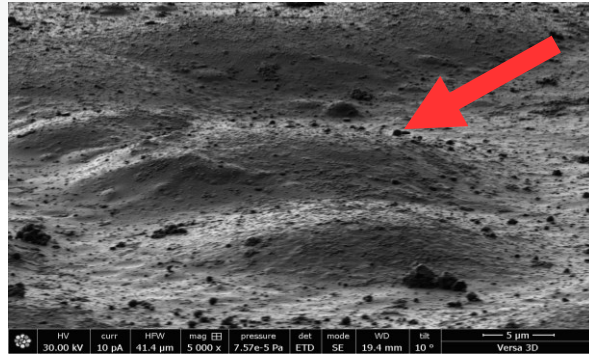
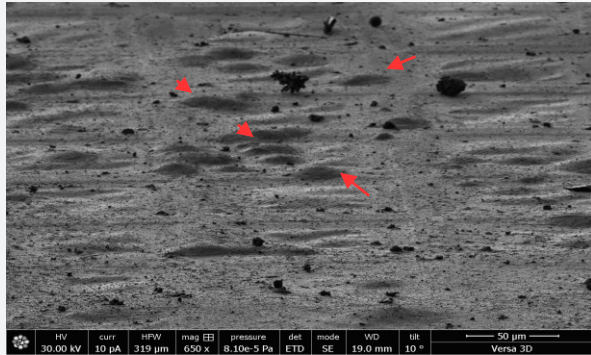
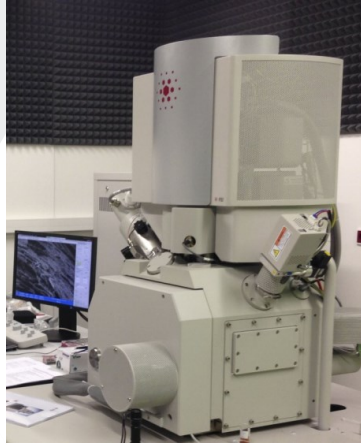
Graphene coated TEM grids  
(mono/bi-layer of graphene)

- problematic complexes  
(preferred orientation)
- samples available at low  
concentration



# Services

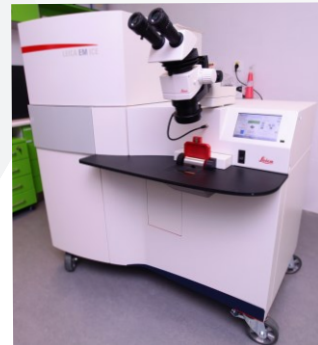
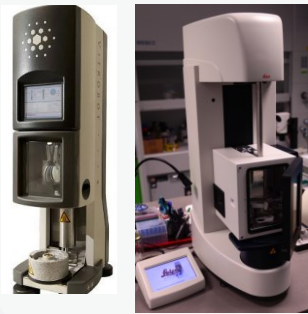
- Cryo-electron tomography workflow



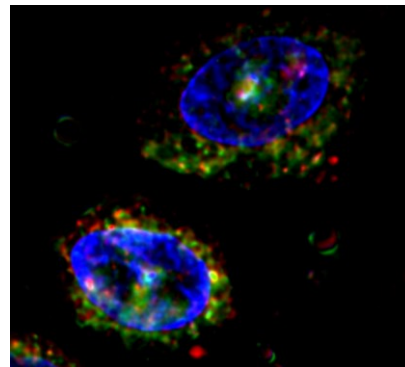
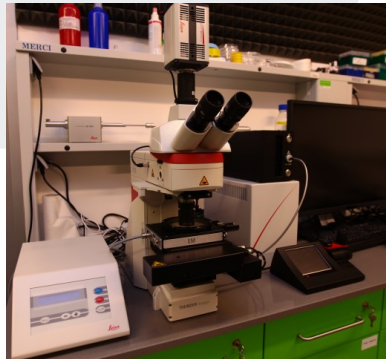


# Services

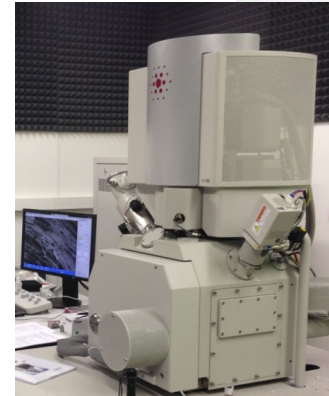
- Cryo-electron tomography workflow



High pressure freezing  
- vitrification of bulkier specimens (~200um thickness)



wide-field cryo-fluorescence microscope  
- organel targeting  
- identification from correlative light and electron microscopy data



pFIB/SEM microscope  
- high res. SEM (immersion), pFIB with 4 gases  
- cryo-lift out, integrated fluorescence microscopy module



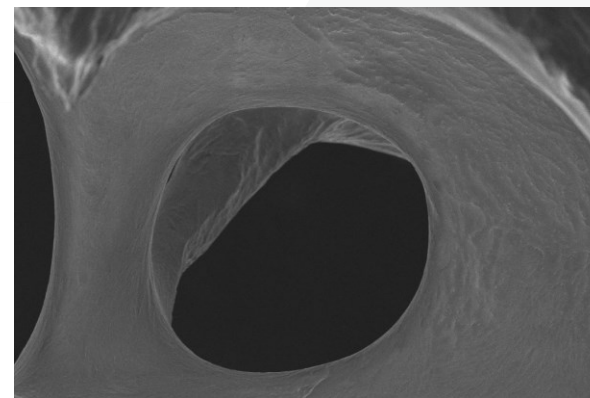
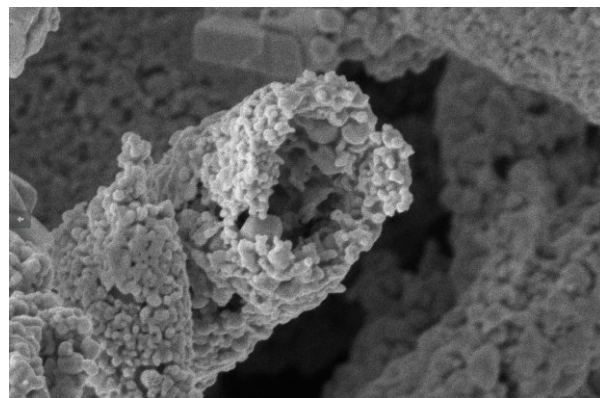
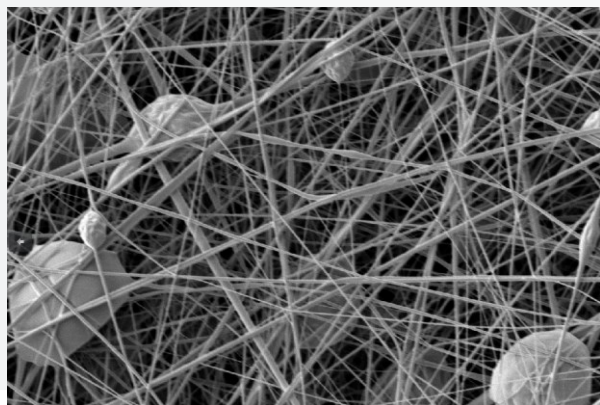
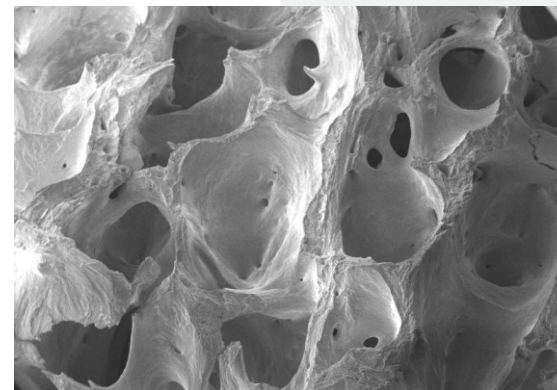
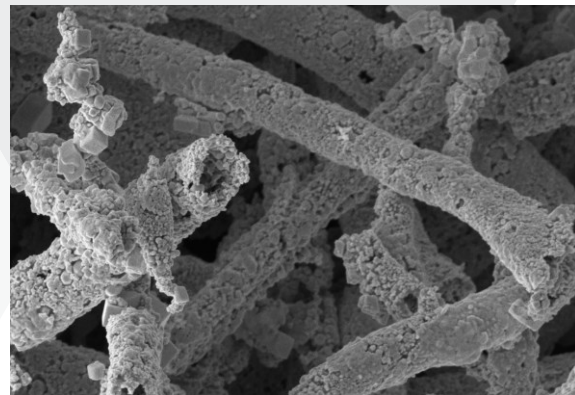
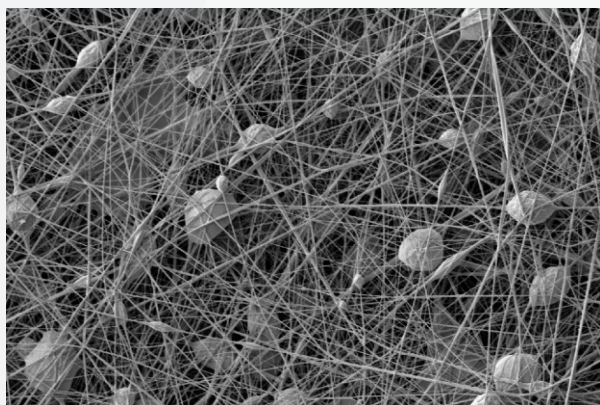
Amira  
- cryo-ET data segmentation





# Services

- SEM imaging – not only life-science



polymers

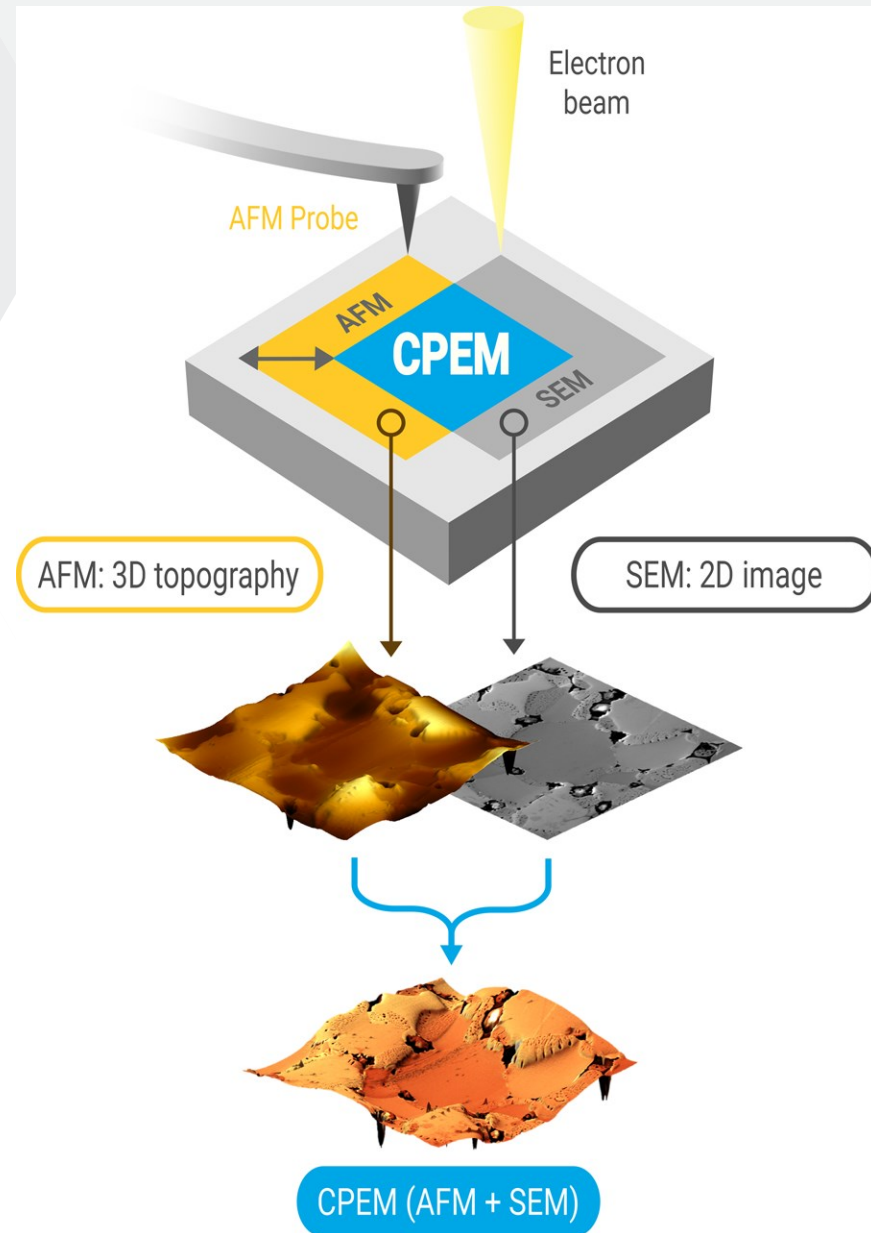
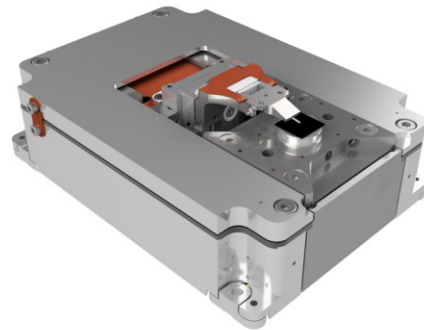
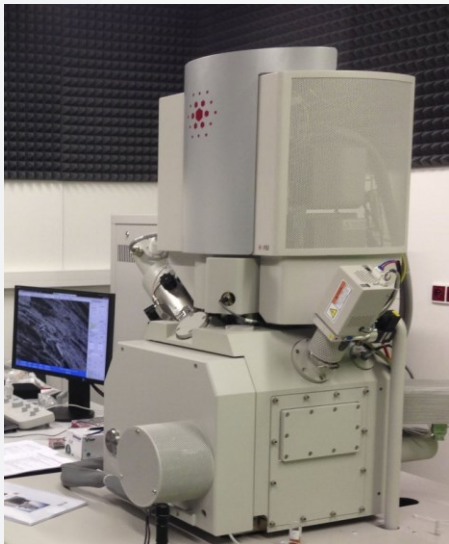
catalyzator

bones



# Services

- **AFM-in-SEM correlative microscopy**  
(Correlative Probe and Electron Microscopy)



Thank you for your attention