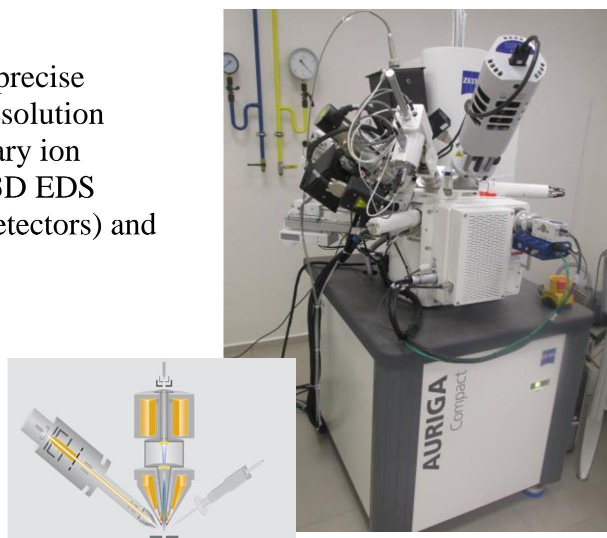
SEM/FIB laboratory

Ing. A. Kovalčíková, PhD., Institute of Materials Research SAS
akovalcikova@saske.sk



AURIGA™ CrossBeam®s: GEMINI® electron beam SEM (middle), ion beam FIB (left) and gas injection system (right)

<u>CrossBeam system AURIGA Compact:</u>
„dual beam" Focused ion beam microscope for precise structural and chemical analysis, 2D, 3D high resolution imaging (combined secondary electrons secondary ion detector, 4-quadrant solid state BSE detector, 3D EDS analysis, In-lens duo and multi-mode STEM detectors) and for micro/nano machining

SEM (scanning electron microscopy)
- resolution 0,9 nm at 30kV (STEM mode), 2,5 nm at 1kV
- magnification 12x-900 000x

FIB (focused ion beam)
- resolution 5 nm (30kV, 1pA)
- magnification 600x – 500 000x

<u>Applications:</u>

- 2D and 3D imaging and analysis of conductive and nonconductive materials with using of local charge compensator
- Ultra thin lamella preparation (<50 nm) for TEM (at any location of materials which are extremely difficult to prepare with another way – worn surfaces, oxidation, under the indenter...)
- Milling, implantation, ion-induced deposition, ion assisted etching of materials
- FIB lithography
- Analysis of cross sections, sub surfaces damage, cracking, oxidation, wear, corrosion, study of profile and associated plastic deformation of nanoindentations etc.
- Preparation of micro pillars for further nanomechanical testing