fit4nano

cost
EUROPEAN COOPERATION IN SCIENCE & TECHNOLOGY

Focused Ion Technology for Nanotechnology

Gregor Hlawacek[a], **Maja Popovic**[b], **Tom Wirtz**[c], **Gerhard Hobler**[d], **Katja Höflich**[e], **Gemma Rius**[f], **and Amy Gandy**[g]

[a] Helmholtz-Zentrum Dresden-Rossendorf, 01328 Dresden, Germany [b] Vinča Institute of Nuclear Sciences, Belgrade, Serbia
[c] Luxembourg Institute of Science and Technology, 4362 Esch-sur-Alzette, Luxemburg [d] Technische Universität Wien, 1040 Wien, Austria
[e] Ferdinand Braun Institute für Höchstfrequenz, 12489 Berlin , Germany [f] IMB-CNM-CSIC Campus UAB, 08193 Bellaterra, Spain
[g] University of Sheffield, Sheffield, United Kingdom

Focused Ion Beams are:

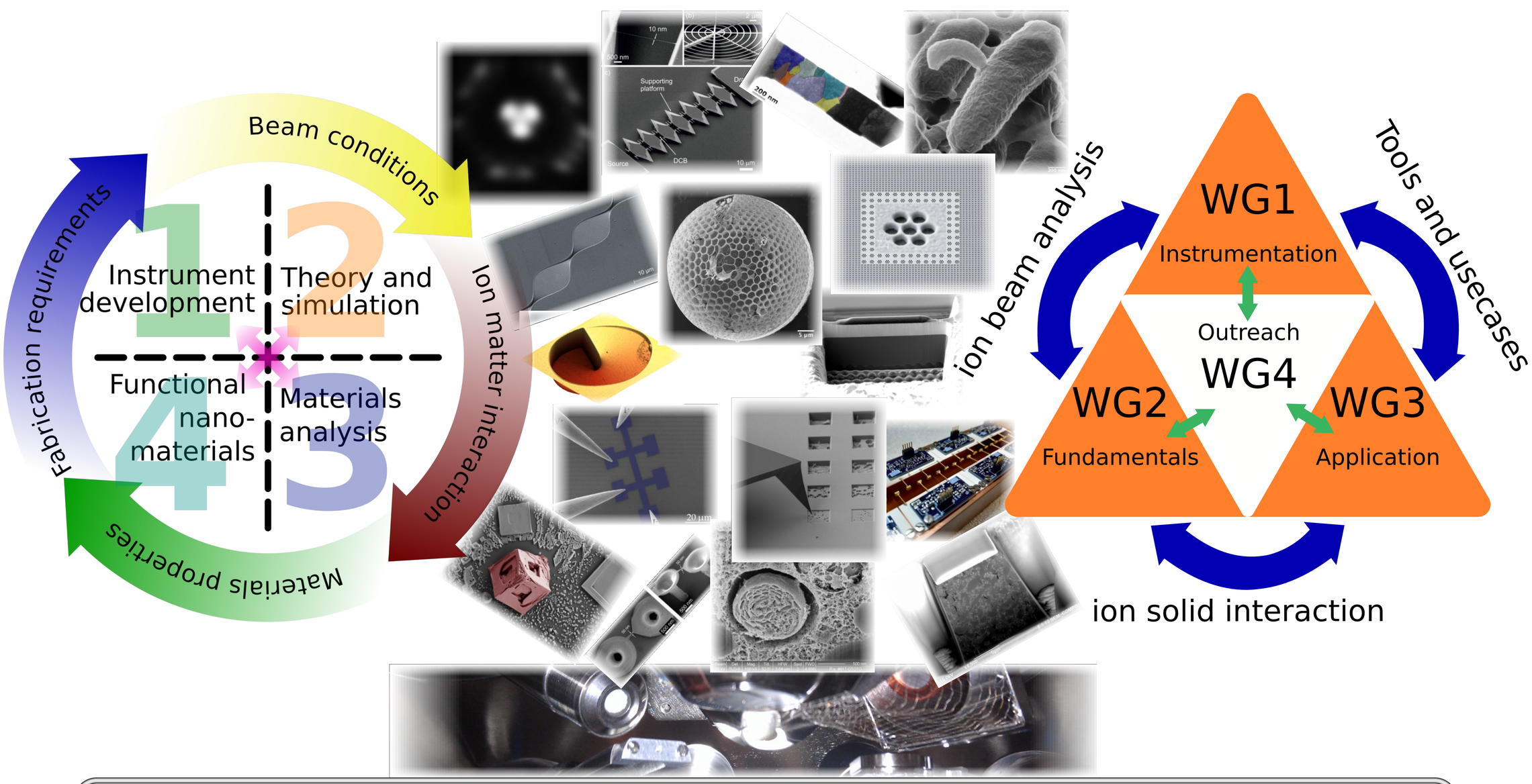
- charged particle beam instruments
- flexible nanofabrication tools
- high resolution imaging tools
- important for Semiconductor debugging
- crucial for Transmission Electron Microscopy (TEM)
- necessary for Atom Probe Tomography (APT)
- mostly based on Gallium ions
- using an energy range between 5 keV and 30 keV

Focused Ion Beams can:

- create functional nanostructures
- image complex materials including metals, semiconductors and insulators
- image biological samples without coating
- locally modify the crystal structure
- prepare TEM samples
- create local x-sections profiles
- create tomographic datasets

Aims of the Action are

- a coordinated effort in the field of focused ion beam based nanoengineering
- putting European researchers and businesses at the forefront of the field of functional nanostructured materials
- to unite developers and practitioners of focused ion beam technology
- to build the most efficient tool sets for the identification, fabrication and characterization of next generation functional nanomaterials
- the development of ion sources and instrumentation for the sub 10 nm fabrication and materials analysis.
- building a European network between researchers including theoretical and experimental groups
- to foster collaboration between theoretical groups working in FIB related fields.
- overcome increasing fragmentation of the FIB landscape
- create a roadmap based on input from all stake holders
- increase the number of advanced FIB systems
- provide training opportunities and material for early career investigators
- increase public awarness for nanotechnology via outreach projects



Focused Ion Beams will

- implant single dopants for semiconductor applications
- implant single atoms for quantum technology applications
- perform spatially resolved materials modification
- provide a larger number of primary ion species
- create tomographic datasets including information on structure, composition and morphology
- achieve better lateral resolution
- be used in and made accessible to widening countries
- work at lower acceleration voltages
- deliver cluster ions
- analyze materials using secondary ions
- analyze materials using secondary electrons
- become a correlative imaging technique
- perform in-situ and in-operando experiments

https://www.fit4nano.eu/