Research Center on Nanotechnology Applied to Engineering of Sapienza University (CNIS)

Sapienza Nanotechnology & Nanoscience Laboratory (SNN-Lab)

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SAPIENZA UNIVERSITÀ DI ROMA

CNIS

SNN Lab Sapienza Nanotechnology & Nanoscience Lab

C N I S

Research Centre for Nanotechnology Applied to Engineering of Sapienza University

- Founded in 2006
- Aim: To promote and develop research activities in nanotechnology, finalized to the technological transfer and to the creation of new materials and devices for wide filed of applications (engineering, electronics, energy, aerospace, medicine, biotech, ...)
- Multidisciplinary Research Intranetwork of Sapienza: More than 80 Senior Researchers from different scientific areas and faculties (Engineering, Science, Medicine) and 15 Departments (Industrial and ICT Engineering, Physics, Chemistry, Biology, Biology, Medical Science, etc.)
- Laboratories: a Core Facility (SNN-Lab) and network of specialistic Department Labs
- *Master degree in Nanotechnology Engineering*
- *PhD in Nanotechnology*

Sapienza Departments affiliated with CNIS

Engineering

Dept. of Astronautics, Electric and Energy (DIAEE)
Dept. of Basic Science Applied to Engineering(SBAI)
Dept. of Mechanical and Aerospace Engineering (DIMA)
Dept. of Structural and Geotechnic Engineering(DISG)
Dept. of Information Engineering, Electronics and Telecommunications (DIET)
Dipartimento Chemical Engineering, Materials and Environment (DICMA)

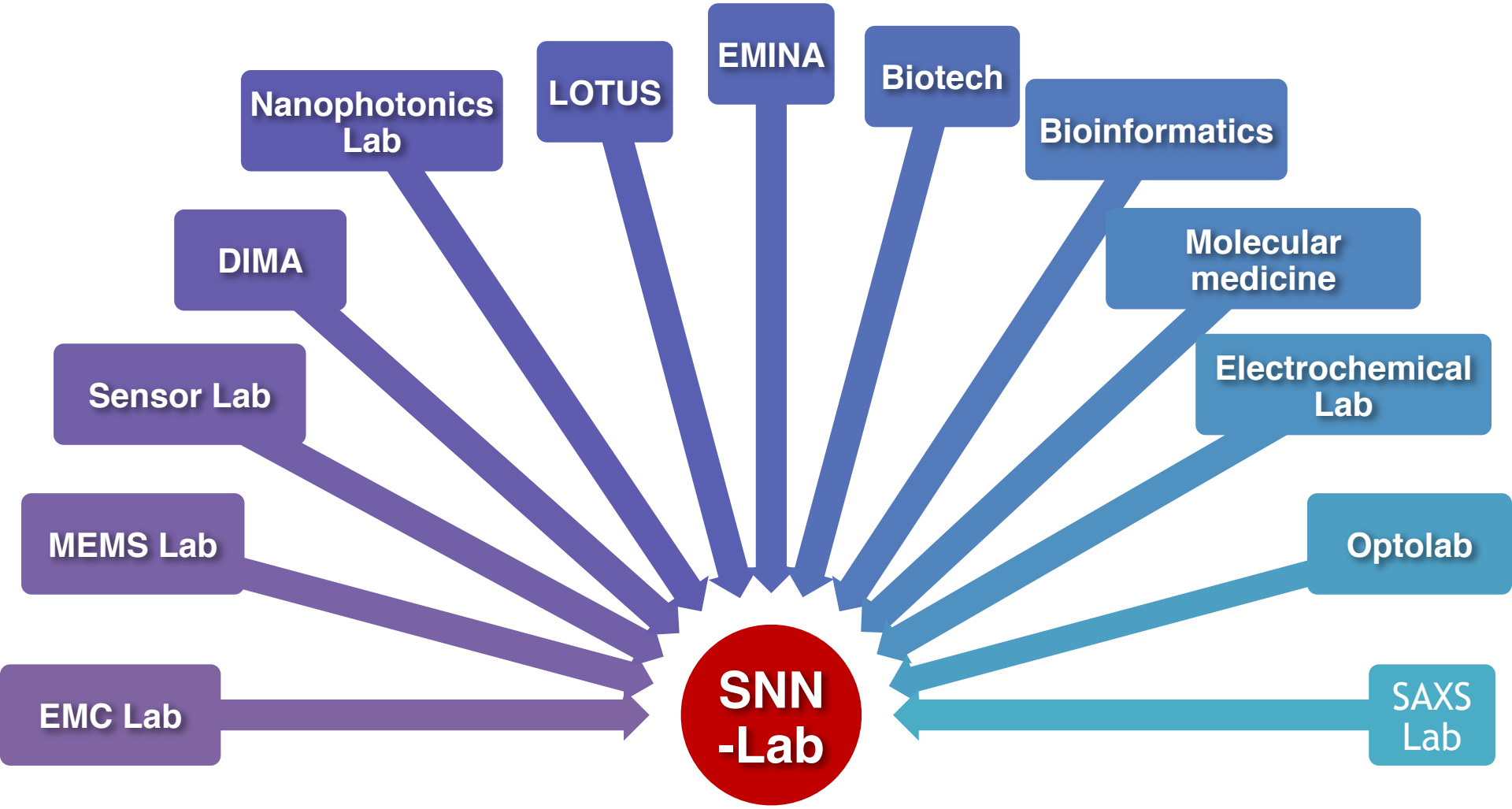
Science

Dept. of Physics (DF)
Dept. of Chemistry (DC)
Dept. of Earth Science(DST)
Dept. of Biology and Biotecnology “Charles Darwin” (DBBCD)
Dept. of Biochemical Science “A. Rossi Fanelli” (DSBARF)

Medicine

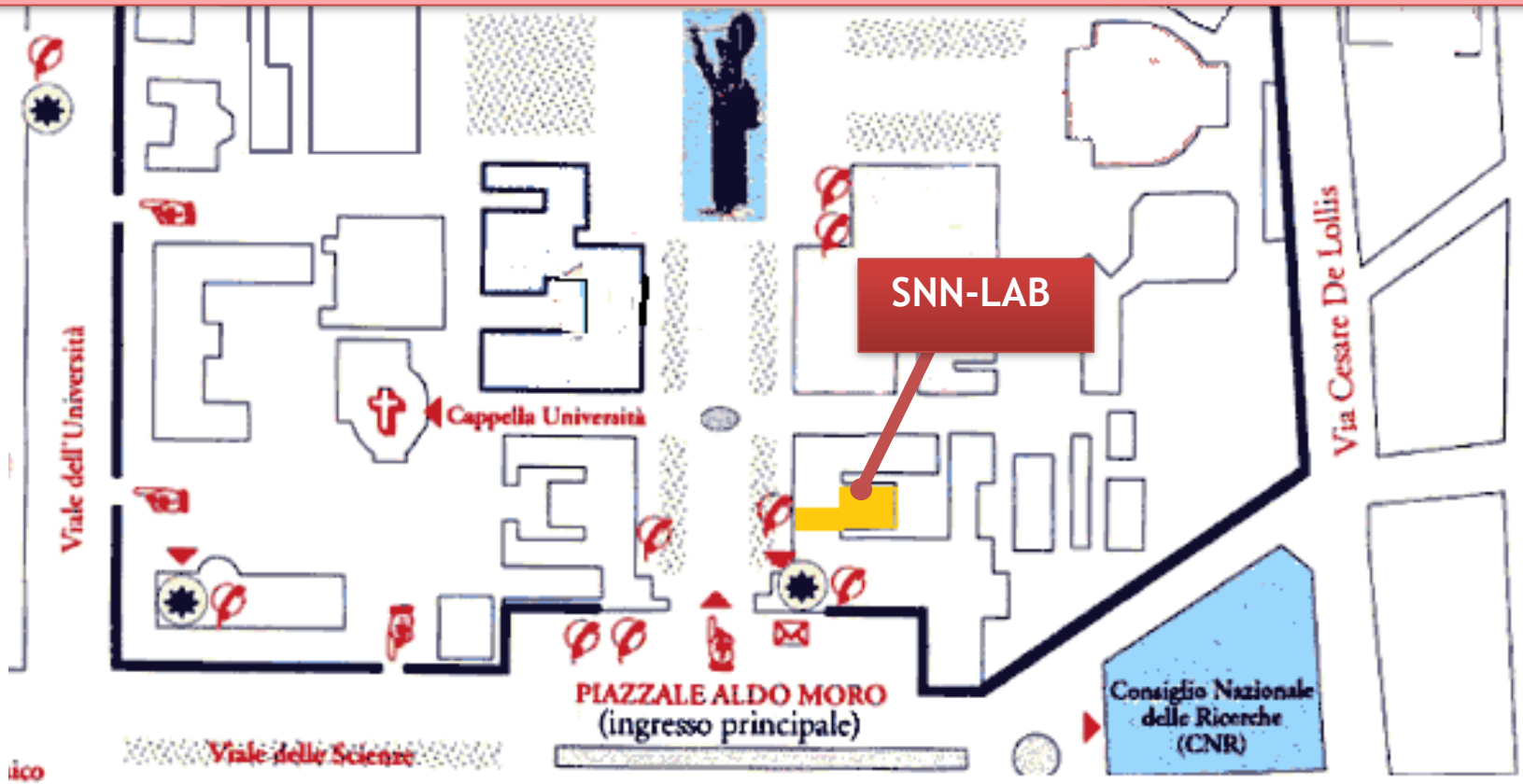
Dept. of Public Health and Infective Disease (DSPMI)
Dept. of Chemistry and Drug Technology (DCT)
Dept. of Clinic and Molecular Medicine (DMCM)
Dept. of Molecular Medicine (DMM)

SNN-Lab: a Research Infrastructure in Sapienza aimed at multidisciplinary research in Nanotechnology



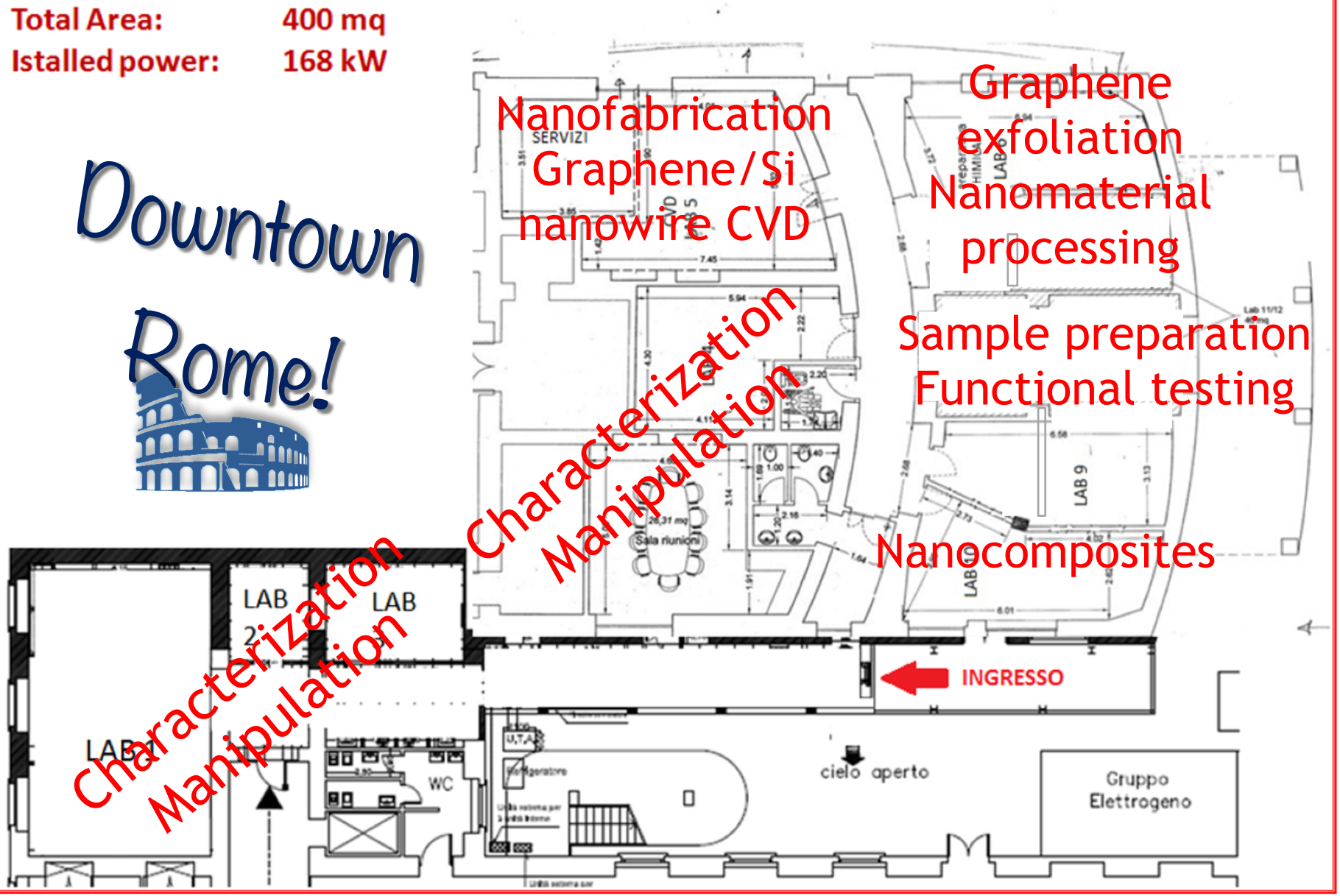
Sapienza Nanotechnology & Nanoscience Laboratory – SNN-Lab

A 400 m²-core facility at Sapienza University (building CU016) focused on advanced research and technology transfer



Total Area: 400 mq
Istalled power: 168 kW

Downtown Rome!



SAPIENZA UNIVERSITÀ DI ROMA

CNIS

SNI Lab
Sapienza Nanotechnology & Nanoscience Lab

Research lines

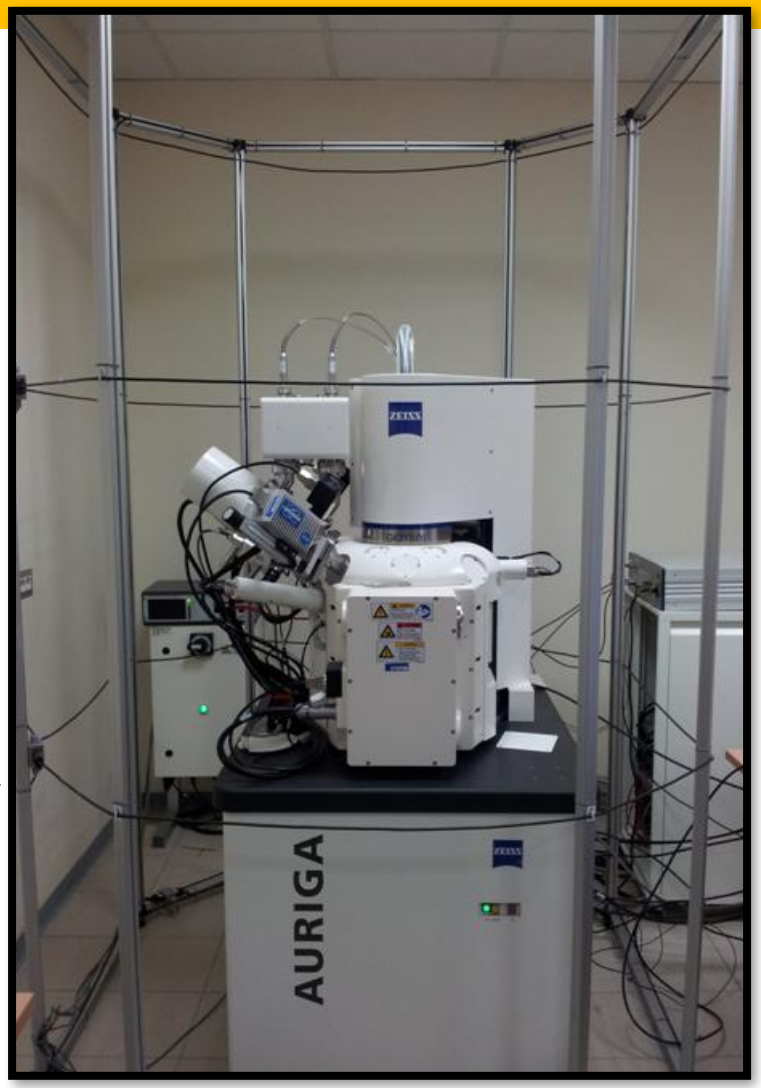
- *Graphene and graphene-based nanomaterials*
- *Multifunctional nano-materials for aerospace (stealthness, structural health monitoring)*
- *Nano - structures and nano - devices for electronics and photonics*
- *Nano - structured materials for energy harvesting, photovoltaics*
- *Nanomaterials and smart multifunctional surfaces for industrial applications*
- *Biomaterials for medical applications*
- *Nanotechnology for cultural heritage (conservation, diagnostics, protection)*
- *Nanotoxicity, antibiofilm devices*
- *Cultural Heritage Technologies (SNN In DTC Lazio)*

AREA 1: Microscopies and characterization at Nanoscale

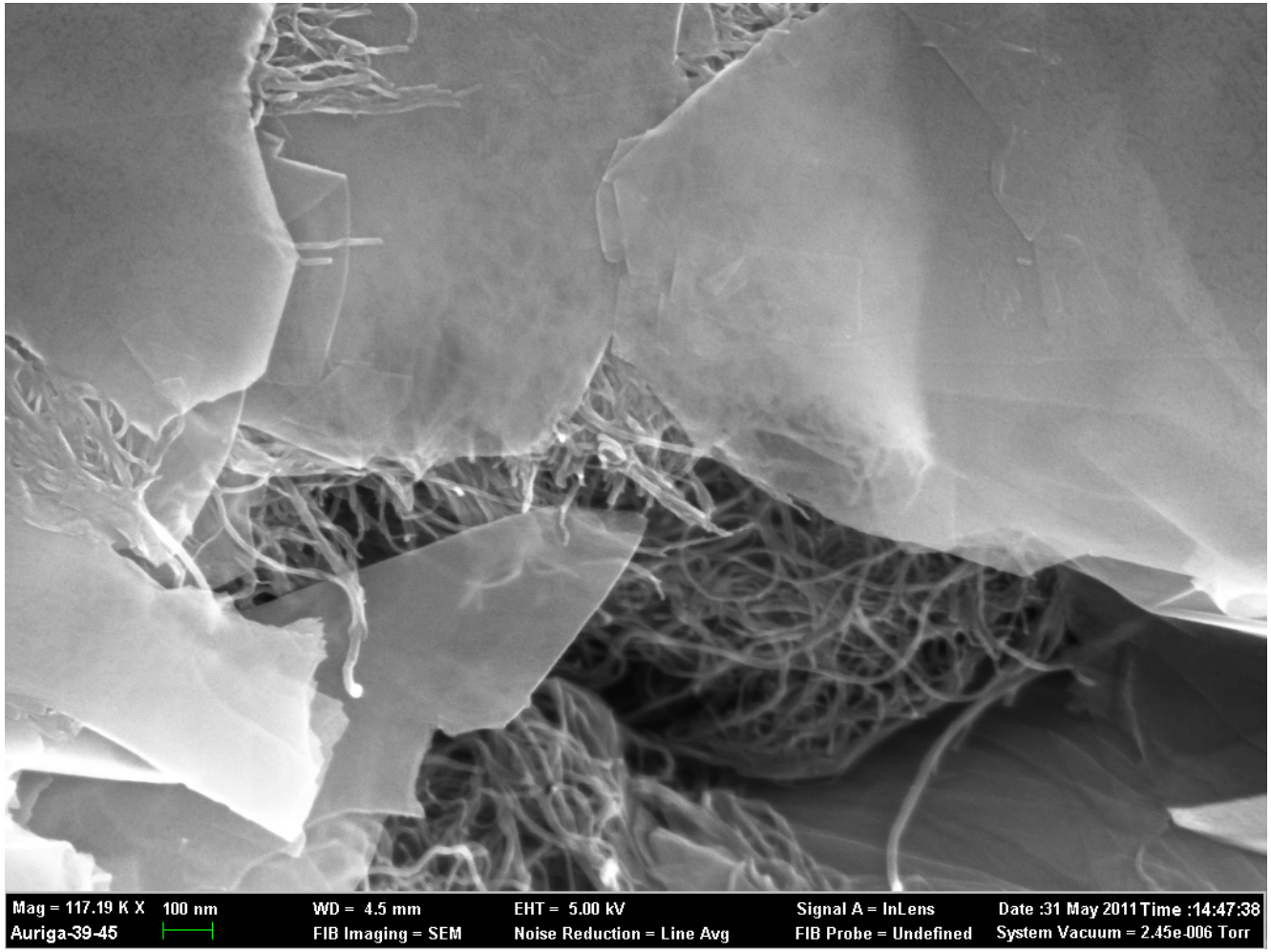
Electronic Microscopy Platform/ nanofabrication /nanomanipulation:

HR FESEM Zeiss Auriga Microscopy (resolution 1 nm), equipped with:

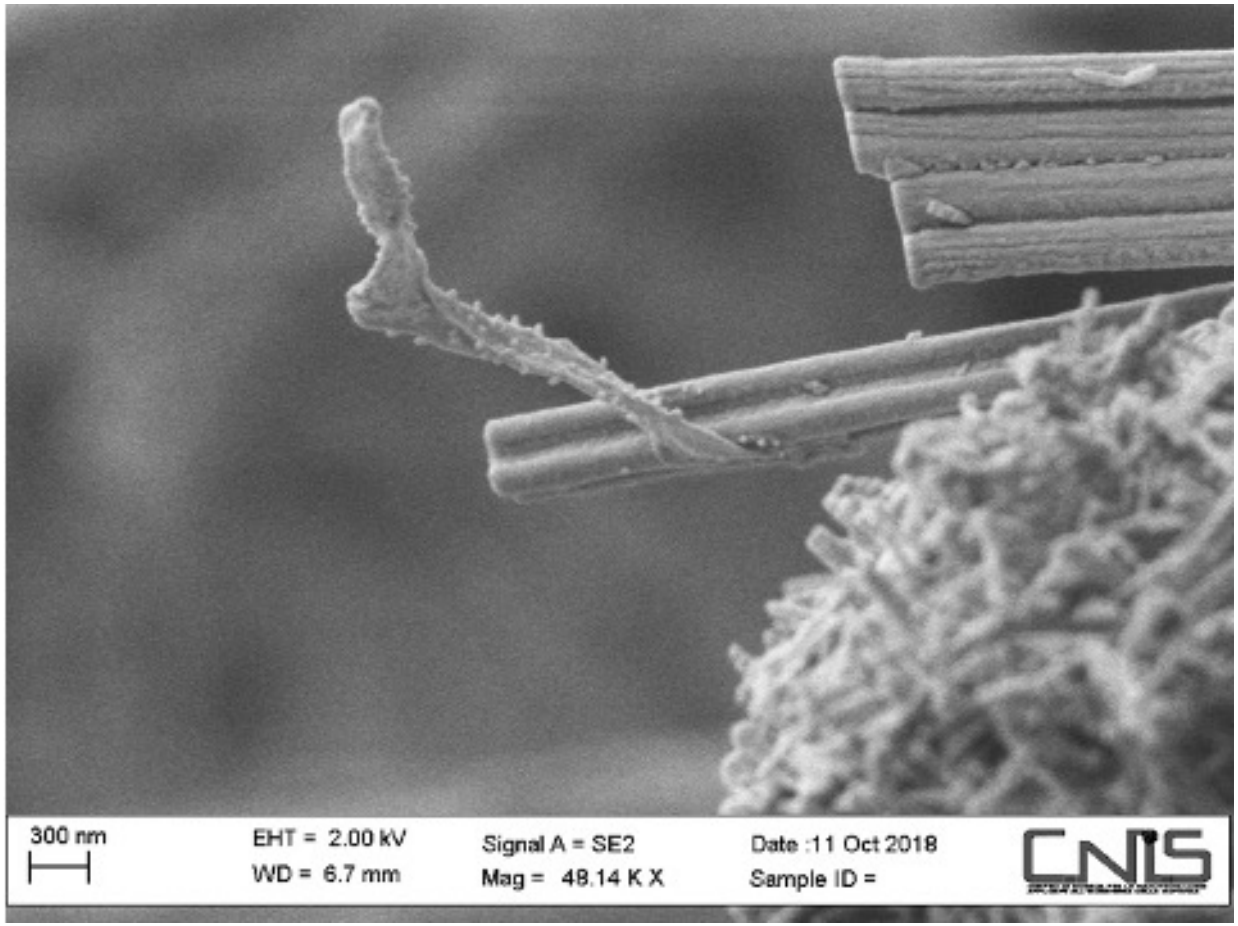
- STEM detector
- Microanalysis EDS ≤ 123 Mn-Kα eV (Bruker)
- Electron Beam Lithography - EBL (resolution 7 nm) (Raith)
- Focused Ion Beam- FIB (resolution 2.5 nm) and GIS
- 4 nanomanipulators Klendieck for electrical / mechanical characterizations on areas of 50 nm^2
- Correlative microscopy (from macro to nano)



Graphite Nanoplatelets and Carbon Nanotubes



Microorganisms in the Moonmilk in the Etruscan “Tomba del Cardinale”

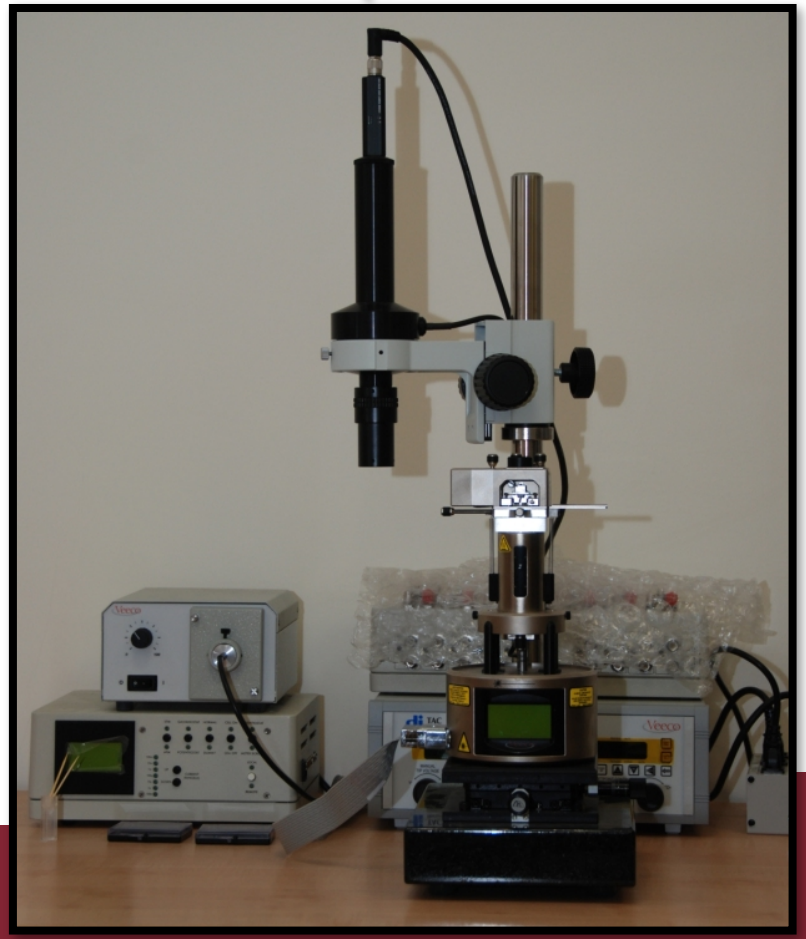


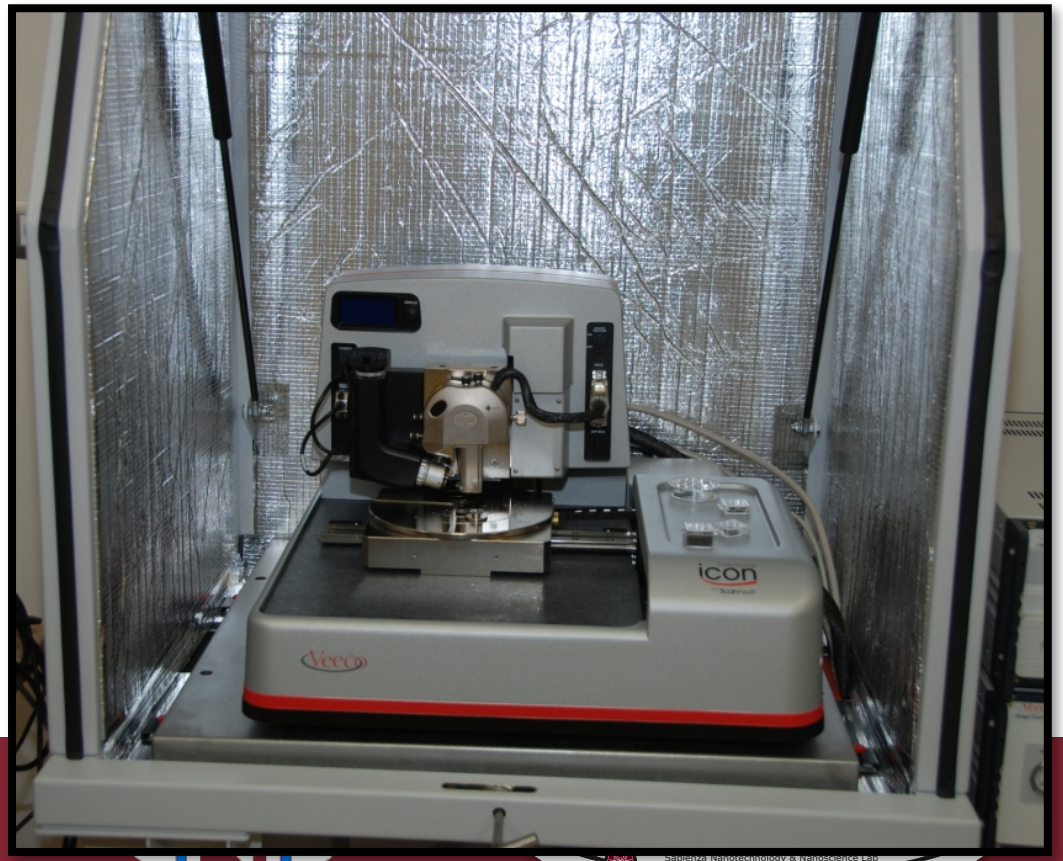
AREA 1: Microscopies and characterization at Nanoscale

Atomic Force Microscopy - AFM - Bruker (ex-VEECO) for nanocharacterization and nanomanipulation

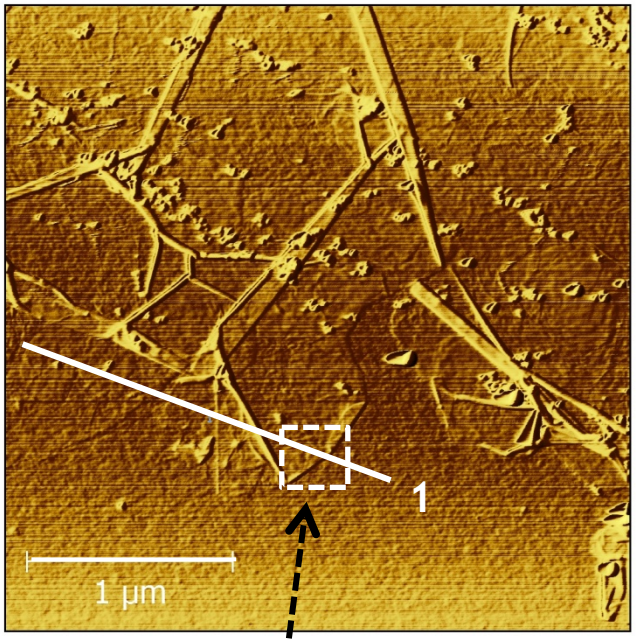
- ICON (controller Nanoscope 5 + Harmonics)
- Multimode (controller Nanoscope 3)

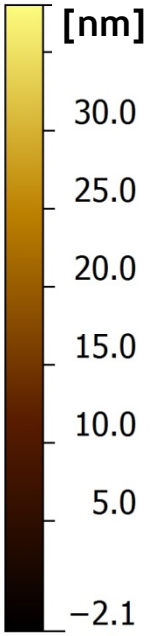
Modules for material characterizations (both solid, liquid and bio) and functional characterizations

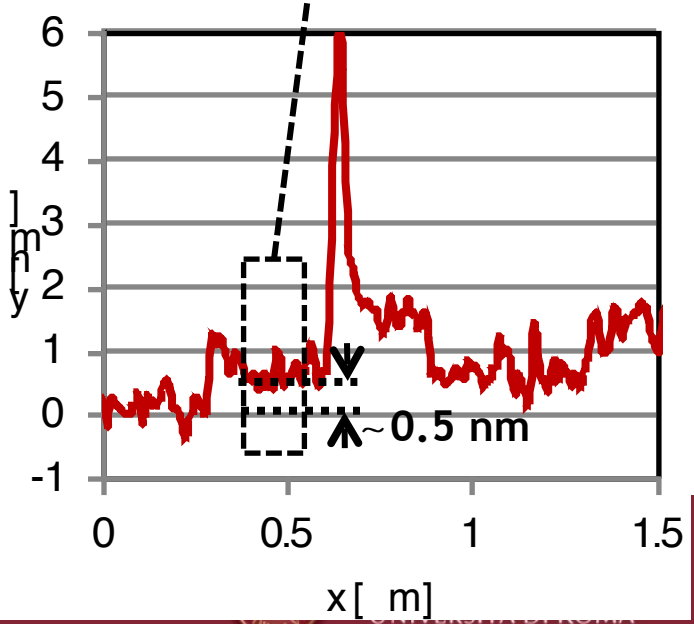


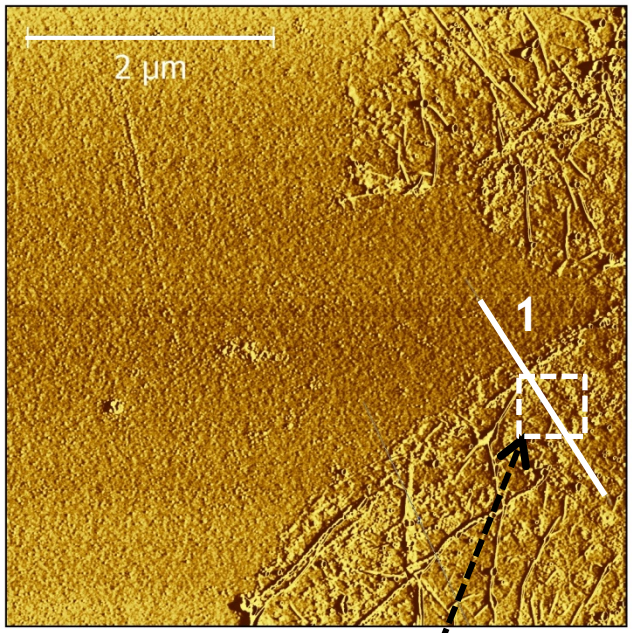


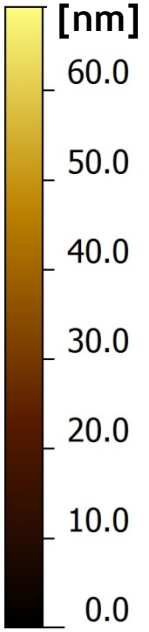
Graphene

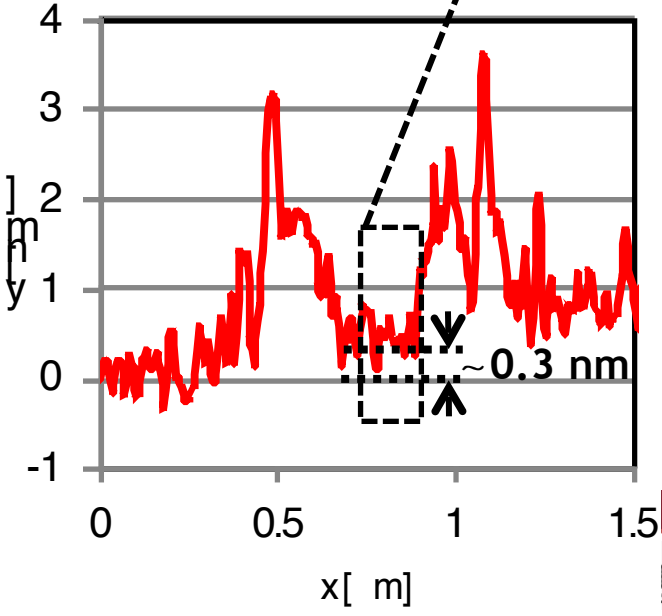

1
1 µm


[nm]
30.0
25.0
20.0
15.0
10.0
5.0
−2.1


6
5
4
3
2
1
0
-1
0
0.5
1
1.5
x[m]
~0.5 nm

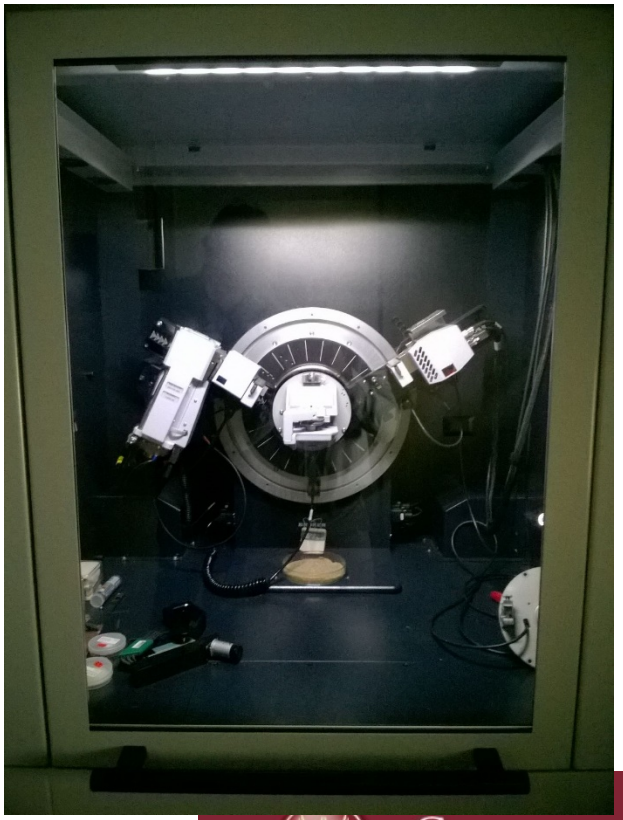

2 µm
1

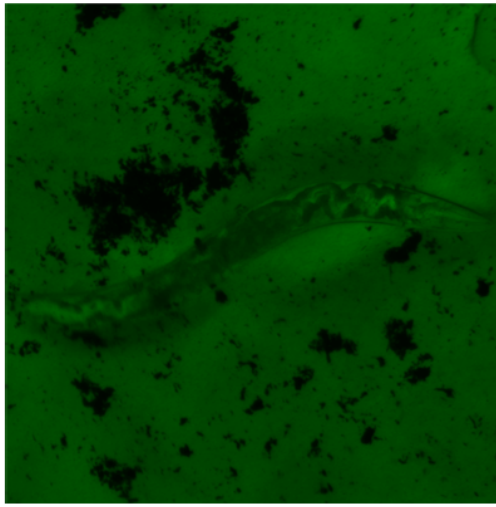

[nm]
60.0
50.0
40.0
30.0
20.0
10.0
0.0


4
3
2
1
0
-1
0
0.5
1
1.5
x[m]
~0.3 nm

AREA 1: Microscopies and characterization at Nanoscale

- X-ray diffractometer - XRD
- Zeiss fluorescence confocal optical microscopy for *live imaging*
- *Correlative microscopy (FESEM-Optical microscopy)*



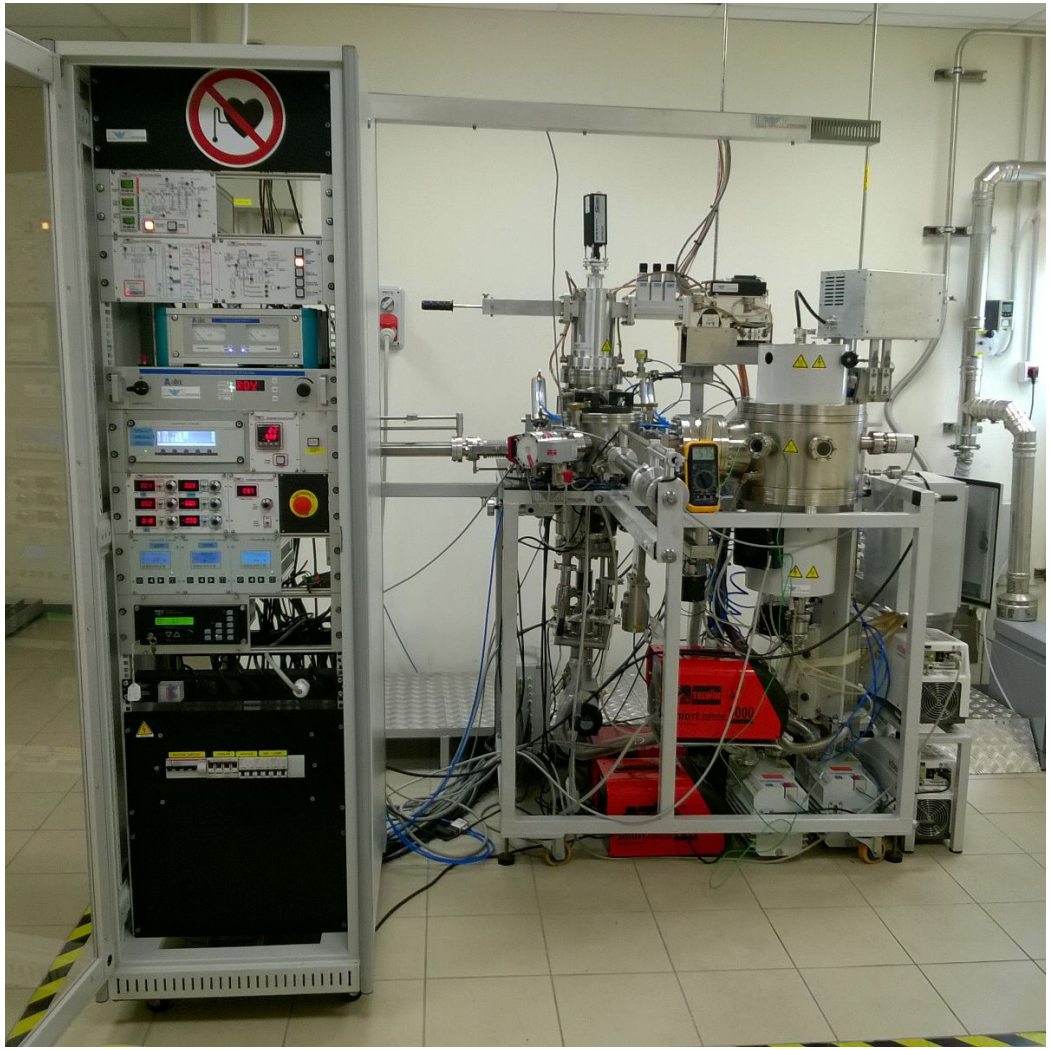


AREA 2: Nanofabrication

MWCVD deposition system for growth of silicon nanowires and carbon nanostructures, with a load lock chamber

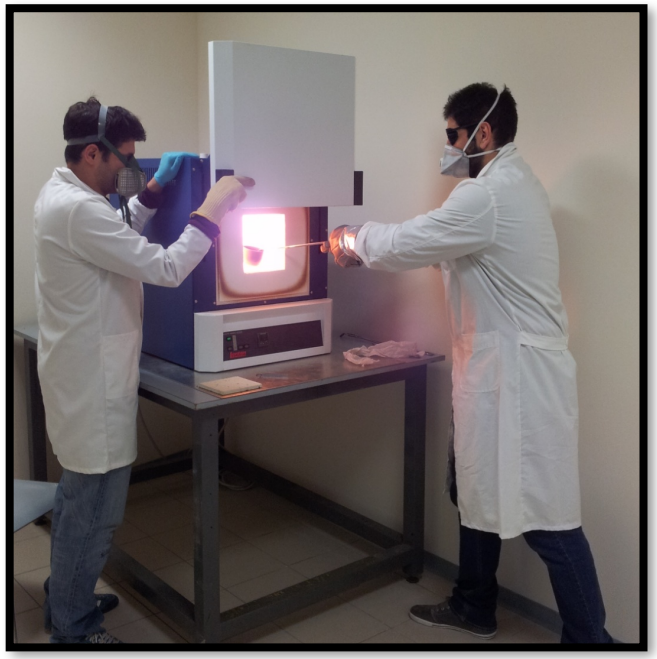
Applications:

- Nanostructured Solar Cells
  - NW-Si / ZnO junctions
  - Macroporous silicon thin films
- NW-MOS transistors, for biological nanosensors



AREA 3: Nanocomposites, graphene-based materials

- Muffle furnace (1400 ° C) for the production of graphene / graphite nanoplatelets (GNP)
- Rotational Rheometer with electro-module
- Nanocomposite processing and production



AREA 4: Processing and Chemistry

- Fume hood
- Metal Sputtering
- Carbon evaporator
- Furnace
- Functionalization / targeting of molecular and supramolecular structures

SNN-Lab is available for collaborations and research services

For SNN-Lab membership: https://web.uniroma1.it/sapienzanano/

THANKS FOR YOUR ATTENTION

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