OUR EQUIPMENT

1 Multimode 8 microscope in inert atmosphere

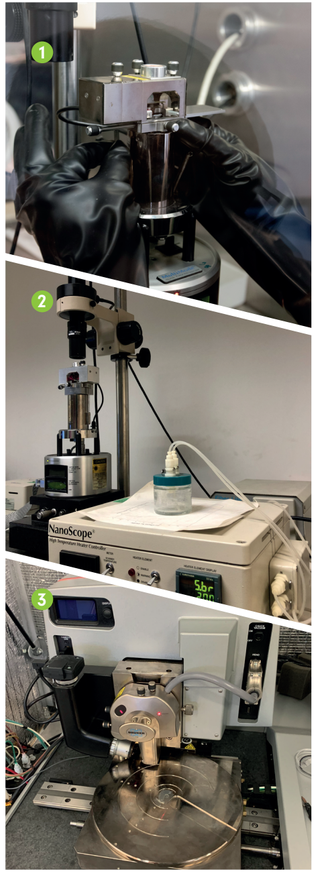
- Nanoscope V controller up to date hardware for topography imaging and for probing local mechanical properties (Contact mode, Friction mode, Tapping mode, Peak Force Tapping (PFT)), and electrical properties (Conducting AFM, Peak Force TUNA)
- Additional electronics SPECS (Nanonis) for Non-Contact AFM, Contact Resonant, Frequency Modulated AFM, Dual Frequency Resonant Tracking modes, Piezo Force Microscopy (PFM) and Kelvin Probe Force Microscopy (KPFM)
- Operating upon inert atmosphere and coupled with an ALD chamber for local study of material properties upon tailored chemical reactions

2 Multimode 3 microscope

- Nanoscope IIIa controller for topography mapping
- Operating in air/fluid and controlled temperature (20°C-100°C) for mechanical and morphological analysis

3 Dimension Icon in collaboration with our partner UMONS

- Nanoscope V controller for characterization of topography, mechanical, electrical properties and compatible with large sample dimensions (x,y,z). Operating in air.
- Focused and calibrated illumination module for the characterization of photovoltaic properties (photoconductive AFM platform).
- Environmental control chamber for imaging of sensitive samples.



ABOUT MATERIA NOVA

Materia Nova is recognized as a technological accelerator of sustainable innovations in the field of new materials and processes.

The R&D center offers five different services:

- **Materials and Processes conception and innovation**
- **Equipment Design and Process Upscaling**
- **Analysis and Characterization**
- **Life Cycle Thinking**
- **Project Development and Management**

The approach of Materia Nova is based on an open and collaborative innovation.

From the understanding of the problems and requirements of our customers, we jointly select the best scientific and technical solutions which are then tested on a pilot-scale before industrialization. The development and the service provided are always unique and customized and give effective solutions as well as a major competitive advantage to our customers.

OUR TECHNOLOGIES AND SOLUTIONS

Our expertise in **surface coatings and treatments**, in **polymers and composites** and in **biotechnology** is fertile ground for:

- **developing new functional performances of materials,**
- **taking up the energy and environmental challenges of our society,**
- **protecting and promoting the health sector.**

OUR STRENGTHS

- A multidisciplinary team of experts
- A wide range of cutting-edge equipment
- An open and collaborative innovation strategy at national and international level
- Innovative projects for and with industrial companies
- Collaborations with R&D centers and universities worldwide
- A strong network of companies, spin offs and start-ups (B-SENS, ESIX, IONICS and NANO4)

CONTACT

Pascal Viville : +32 65 55 49 60
Olivier Douheret : +32 65 55 49 67

Avenue Nicolas Copernic 3
B-7000 Mons
Belgium

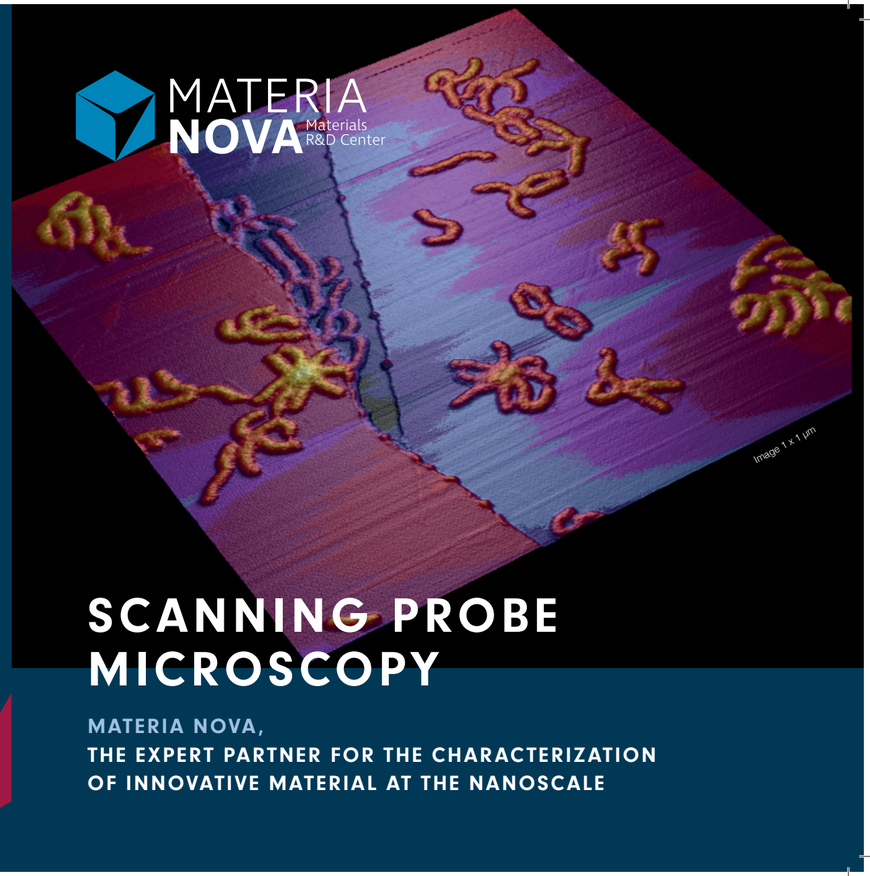
Fritz-Müller-Straße 137
D-73730 Esslingen
Germany

WWW.MATERIANOVA.BE

Chèques-entreprises

UMONS Innovation Center

MATERIA NOVA Materials R&D Center



SCANNING PROBE MICROSCOPY

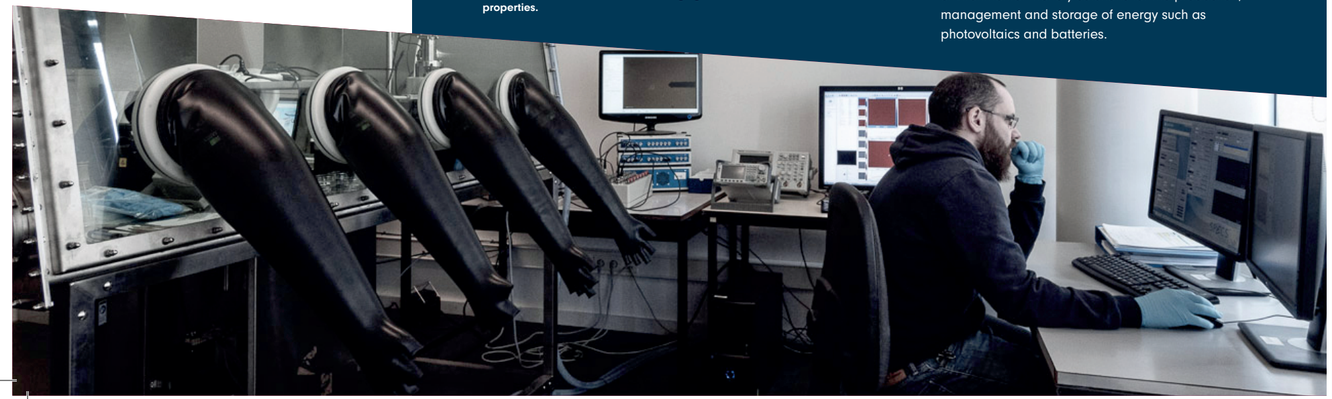
MATERIA NOVA,
THE EXPERT PARTNER FOR THE CHARACTERIZATION OF INNOVATIVE MATERIAL AT THE NANOSCALE

SCANNING PROBE MICROSCOPY (SPM)*

Thanks to 20 years of experience in scanning probe microscopy, Materia Nova is positioned as the expert partner for the characterization of innovative materials at the nanoscale.

SPM are high-resolution, non-destructive and quantitative characterization tools needed to develop new materials with nanoscale properties. They are however complex characterization instruments and despite 40 years of technological development, their use is still not standardized. Their relevant use requires an understanding of the scientific problem in order to define the appropriate protocol to validate the foreseen properties and mechanisms.

***SPM terminology encompasses all nanoscale sensing methods achieved by means of a probe-tip, frequently referred as AFM (Atomic Force Microscopy) that is routinely used for topographical analysis and recently declined towards measurements of new challenging and versatile properties.**



We observe

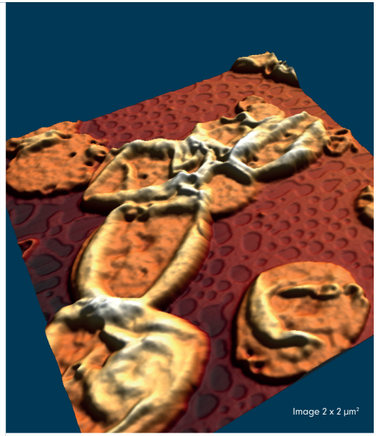
- Reliable map of local properties of all types of materials,
- Structures and properties (morphological, chemical, mechanical, electrical and electronic) - understanding of the physicochemical mechanisms and their synergies at the nanoscale.

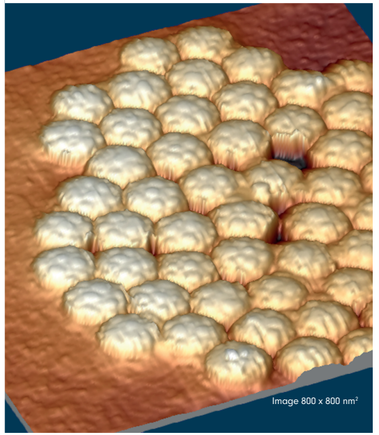
We understand

- These properties through the definition of relevant protocols for specific property measurements on request.

We develop

- New (nano)structures for sustainable and environmental friendly solutions for the production, management and storage of energy such as photovoltaics and batteries.





OUR EXPERTISE

Morphological and mechanical surface analysis

- Topography, roughness and film thickness
- High diversity of materials with no size and thickness limitation
- 2D topographical mapping with sub-10nm lateral resolution and atomic resolution in height
- Adhesion, Young's Modulus, deformation, dissipation mapped simultaneously with topography

Electrical properties and charge transport mechanisms in (semi)conducting materials

- 2D Mapping of local current, resistance, or work-function and surface potential
- Electrical current resolution down to 100fA with high spatial resolution
- Measurement performed under controlled environment

Smart measurements :

- Controlled environments (liquids, inert gas)
- Control of the sample temperature
- Implementation of new SPM modes