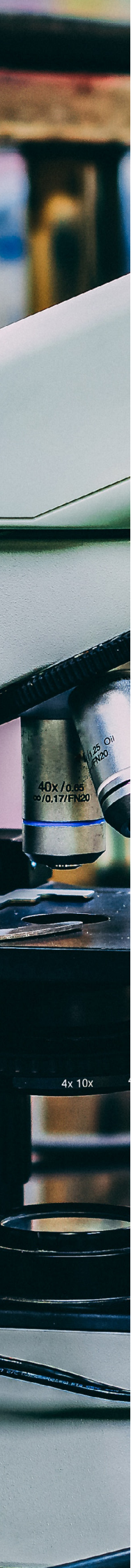




ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

MATERIALS CHARACTERIZATION

A knowledge driven use of materials requires a deep understanding of their characteristics, properties and function: the University of Bologna employs a wide range of state of the art characterization tools. The research of the University of Bologna handles different size scales to characterize a very different range of materials and provide researchers unprecedented insight into their properties for applications on different fields, spanning cultural heritage, medicine, chemistry, biology, ICT and engineering.



Employing electronic, electrochemical, photonic, spectroscopic, modelling, imaging, biomolecular as well as microscopy and mechanical techniques, the research of the University of Bologna covers characterization of:

- (Nano)materials for energy storage and energy conversion electrochemical systems (Li-ions and Li/O₂ batteries, fuel cells, etc)
- Liquid crystals for ICT applications via mesoscale modelling techniques
- Photoactive molecular materials and bio-molecules by time resolve multi-pulse non-linear spectroscopies on-silico
- Materials for cultural heritage and its preservation via combined spectroscopic, imaging and microscopy techniques
- Molecules of astrochemical and astrobiological interest in the ISM, as well as in extra-terrestrial atmospheres via vibro-rotational spectroscopy and modelling
- Supramolecular and nanomaterials for molecular and organic electronics, catalysis and nanotechnology: supramolecular organic systems, metal clusters, metal and inorganic nanoparticles, hybrid organic-inorganic nanoparticles, organometallic compounds
- Bioactive materials and nanomaterials for medical applications and drug delivery
- Composite materials and nanocomposites for high-tech applications
- Alloys for high-tech applications
- Inorganic nanocrystalline aggregates, non-crystallographic morphologies, biomorphs and bio-mimics
- Electronic and transport properties of materials (quantum dots, organic molecular materials, polymeric wires, etc) for optoelectronics
- New materials for energy storage in advanced batteries
- New materials for electrocatalyzed chemical processes
- Photoactive materials for water splitting
- New low band-gap materials and polymers for new flexible solar cells
- Biowastes (chemical-physical, structural and morphological properties)
- Bio-mimicking materials (polymers, biopolymers, etc)
- Biomaterials (proteins, genomic materials, etc) and their interactions via spectroscopic techniques

HIGHLIGHTS

The University of Bologna contributes to the European progress in research and innovation taking part to several European funded projects:

- H2020-**MAGNIFY**: From nano to macro: a ground-breaking actuation technology for robotic systems
- H2020-**ERC-STRATUS**: Structure and dynamics of biomolecules by two-dimensional ultraviolet
- FP7-**ERC-PROMETHEUS**: Pattern formation and mineral self-organization environments in highly alkaline natural
- FP7-**MINOTOR**: Liquid crystals characterization and properties
- FP7-**BIND**: Biaxial Nematic Devices