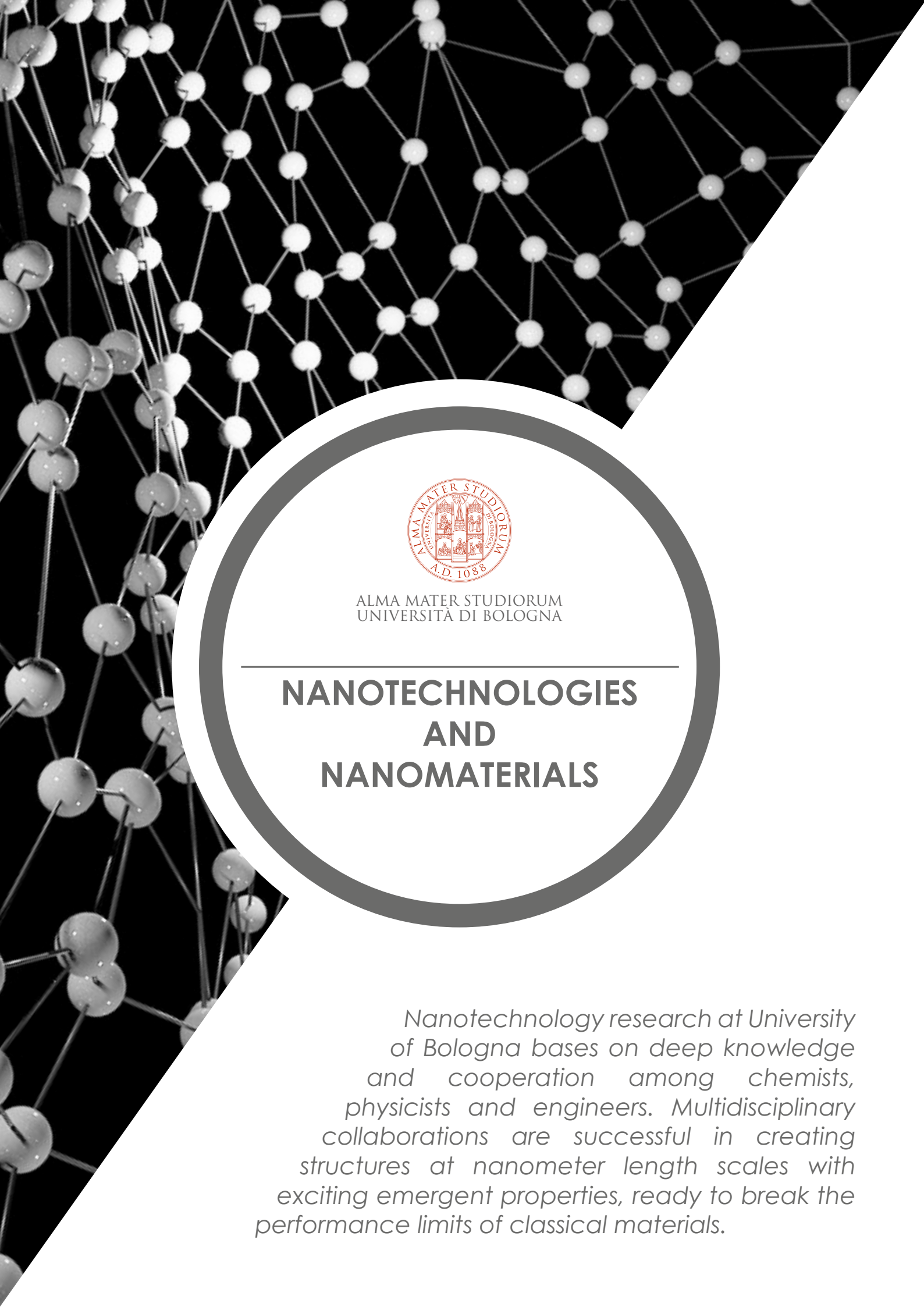

ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

NANOTECHNOLOGIES AND NANOMATERIALS

Nanotechnology research at University of Bologna bases on deep knowledge and cooperation among chemists, physicists and engineers. Multidisciplinary collaborations are successful in creating structures at nanometer length scales with exciting emergent properties, ready to break the performance limits of classical materials.

The focus of Nanotechnology and Nanomaterials research of the University of Bologna regards:

- Development of methods to synthesize metallic, oxide, semiconducting or polymer nanoparticles with diverse functionalities and fields of application
- Multifunctional nanocomposites for targeted drug release
- Realization of nanostructured surface coatings and thin-films
- Design and synthesis of supra-molecular structures that self-assemble into nanoscale molecular devices and machines
- Assembly of nanomaterials into hierarchical structures with active electrical or luminescent properties
- Chemical modification of nanostructured materials. Control of surface properties to achieve a homogeneous dispersion of nanomaterial in polymer
- Semiconductor quantum dots to enhance optical properties in novel sensor or solar cell architectures
- Design and fabrication of nanostructured surfaces and interfaces for energy applications
- Development of nanofillers to enhance properties of composite materials for packaging applications
- Development of biopolymer based nanomaterials to foster a more sustainable approach to nanotechnology
- Fabrication and investigation of nano-materials for electrochemical processes develoment of nanoparticle supported catalysts for chemical transformations
- Fabrication, modification and application of carbon based nanostructures synthetic DNA nanostructures

HIGHLIGHTS

Nanofibres through Electrospinning combine high-throughput fabrication and unprecedented material properties. Nanofibre mats are employed as scaffolds in regenerative medicine, as permeable membranes, or to enhance mechanical properties of construction materials.

Photonic nanoparticles combine highly specific optical properties with stability, biocompatibility and biological uptake. They are employed as future diagnostic tools or specific non-toxic vectors enabling better medical diagnostics and less invasive treatments.

Nanomaterials for Information and Communication Technologies allow the transition of traditional microelectronics into flexible, distributed electronics. Examples are stretchable bioelectrodes, flexible supercapacitors or highly sensitive electrochemical sensors.