

ENERGY AND ENVIRONMENT

- **Materials and Processes for environment protection and sustainability**
Composites and lightweight materials, smart surfaces and functionalization, materials for sensing and removal of pollutants from air and water, active materials for emerging contaminants, materials for advanced oxidation process, materials under extreme conditions, catalytic materials for environment protection and remediation.
- **2D materials for energy and environmental applications**
Mechanical properties of 2D materials composites, growth and synthesis of 2D materials, electronic/optical/magnetic/quantum properties of 2D materials, chemistry and functionalization of 2D materials.
- **Materials and Technologies for energy conversion**
Solar conversion (nanomaterials, perovskites, etc.), thermoelectrics and Piezoelectrics, hydrogen and fuel cells, superconductive materials, materials with ultra fast transitions, catalysts for energy conversion, application of functional energy materials, hybrid energy system.
- **Materials and Technologies for Energy storage**
Batteries and supercapacitors, phase Change Materials and materials for thermal storage, hydrogen storage, advanced bioenergy technologies.
- **Modelling of materials for environment and energy**
New and advanced theoretical and computational methodologies, multiscale calculation methods (ab initio, coarse grain, etc.).
- **Plasmonics**
Preparation of noble metal nanostructures, patterned structures and devices. Optical properties. Theory. Plasmon decay and energy/charge transfer. Applications in photovoltaics, biophotonics, sensing.