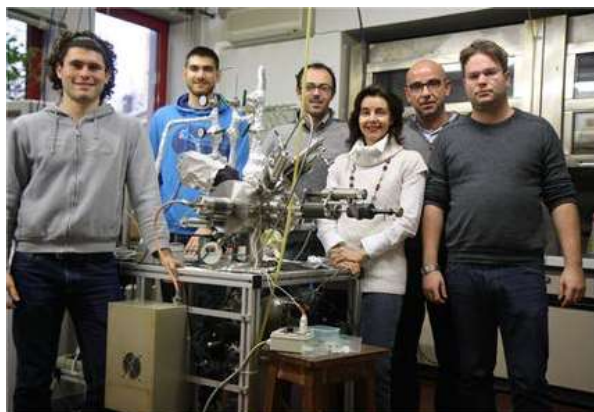


Multi-functional Nanomaterials

www.chimica.unipd.it/multi-functional-material-group/index.htm

+39 049 827 5234 (CM); 5192 (AG); 5170 (DB)



Chiara Maccato (chiara.maccato@unipd.it); Alberto Gasparotto (alberto.gasparotto@unipd.it); Davide Barreca (davide.barreca@unipd.it).

The Multi-functional Nanomaterials Group has an internationally recognized know-how in the fabrication of inorganic nanoarchitectures (thin films, supported nanoparticles, nanowires, nanoplatelets,...) by chemical vapor deposition (CVD), plasma enhanced-CVD, and radio frequency-sputtering. Attention is also devoted to the synthesis of novel molecular precursors for CVD and PE-CVD processes.

The developed nanosystems are deeply characterized to unravel structure-property relationships and investigated for sustainable end-uses, encompassing photo-activated applications (H₂ production by photocatalysis and photoelectrochemical water splitting, air/water purification, self-cleaning and anti-fogging systems), molecular detection of flammable/toxic gases, but also anodes for Li-ion batteries and magnetic materials.

- *Surface functionalization of nanostructured Fe₂O₃ polymorphs: from design to light-activated applications*, ACS Appl. Mater. Interfaces, **2013**, 5, 7130-7138.
- *Enhanced hydrogen production by photoreforming of renewable oxygenates through nanostructured Fe₂O₃ polymorphs*, Adv. Funct. Mater., **2014**, 24, 372-378.
- *Pt-functionalized Fe₂O₃ Photoanodes for Solar Water Splitting: the Role of Hematite Nano-organization and Platinum Redox State*, Phys. Chem. Chem. Phys., **2015**, 17, 12899-12907.
- *Advances in photocatalytic NO_x abatement through the use of Fe₂O₃/TiO₂ nanocomposites*, RSC Adv., **2016**, 6, 74878-74885.
- *Vapor phase fabrication of nanoheterostructures based on ZnO for photoelectrochemical water splitting*, Adv. Mater. Interfaces, **2017**, 4, 1700161-1700161-9.