

## Halide perovskite nanocrystals: synthesis and optical properties

L. Manna

*Department of Nanochemistry, Istituto Italiano di Tecnologia, Genova, Italy*

Halide perovskite semiconductors can merge the highly efficient operational principles of conventional inorganic semiconductors with the low temperature solution processability of emerging organic and hybrid materials, offering a promising route towards cheaply generating electricity as well as light. Following a surge of interest in this class of materials, research on halide perovskite nanocrystals (NCs) has gathered momentum in the last years. While most of the emphasis has been put on CsPbX<sub>3</sub> perovskite NCs, more recently the so-called double perovskite NCs, having chemical formula A<sub>2</sub>B<sub>2</sub>B<sub>3</sub>X<sub>6</sub>, have been identified as possible alternative materials, together with various other metal halides structures and compositions, often doped with different elements. This talk will also discuss the research efforts of our group on these materials. I will highlight how for example halide double perovskite NCs are less surface tolerant than the corresponding Pb-based perovskites. Other topics that will be covered are the role of surface ligands on stabilizing the NCs (including those with alloy compositions), doping, and our ongoing research on various other metal halides (for example the Mn-based ones). I will also show our recent results on the synthesis and advanced characterization of heterostructured nanocrystals in which one domain is a lead chalcogenide and the other domain is a cesium lead halide perovskite.