



***Ph.D. School in Chemical Sciences  
Cycle XXXVIII***

**Proposer:** *professor Luigi Paduano*

**Research project title:** Development and chemico-physical characterization of supramolecular assemblies of colloidal nanocrystals

**Key words:** Colloidal nanocrystals, nanostructured systems, gels, ligands; nanocomposites

**Research project abstract:** This project aims to develop and characterize organized systems of colloidal inorganic nanocrystals (NCs) that can optimize their intrinsic physico-chemical properties through a rational aggregation. Colloidal inorganic nanocrystals (NCs) have distinctive, synthetically tunable properties such as, for example, plasmonic response, electronic conductivity and catalytic activity. These properties can be improved and valorized if the NCs are organized in ordered supramolecular structures or in nanocomposite gels. The latter allow a reversible and continuous control over the number of adjacent particles, favoring the coupling of the intrinsic physical properties of the nanoparticles and enabling the achievement of important collective properties for applications in optics, catalysis, electronics or energy storage. Thus, the ultimate aim is to promote new opportunities for developing and engineering new functional materials.