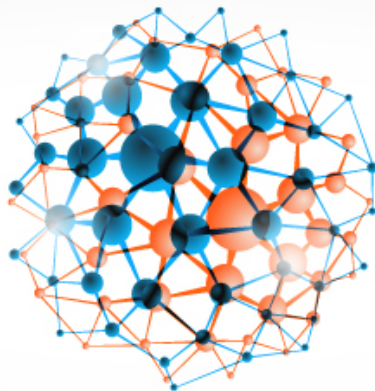


# ANNIC

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## New Routes to Nanosized Particles with Tunable Compositions

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Nanomaterials and nanostructured materials can provide new solutions for important societal concerns such as those related to energy, environment and health. Therefore there is an important need to amplify the set of nano-objects found in the “nanofoundries” of materials chemistry laboratories. Using innovative and integrative processing approaches and utilizing hybrid molecular metal complex precursors or nanoparticles as precursors, we are trying to push further the limits of the nanochemistry developed with inorganic or hybrid matter. New families of nano-oxides (nanoMagnéli phases, multicationic oxides at nanoscale, core-shell mesoporous silicas) will be presented which might host advanced properties at the nanoscale in various fields, such as, catalysis, energy harnessing and nanomedicine. Moreover the syntheses strategies allowing to obtain covalent nano-alloys such as metal borides and metal phosphides and their mixte alloys will also be discussed. The fabrication of the above-mentioned nanomaterials involve innovative molecular approaches with different stimuli (conventional heating, microwave heating...) and original reaction media, such as ionic solvents, polymers or nano-reactors. Multifunctional nanomaterials can be made via the controlled of multiple inorganic-organic and inorganic-inorganic interfaces. These strategies can also give rise to interesting core-shell mesoporous silicas obtained by double templating, core-shell hybrid Janus nanoparticles obtained via self-assembly driven “chemical”polarization and inorganic hetero-nanostructures obtained by nanophase segregation or insertion-crystallisation. This conference will described a few of the results we have obtained in this area. We bet that some of the described strategies will open a land of opportunities to create several families of “exotic nanomaterials”.

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