

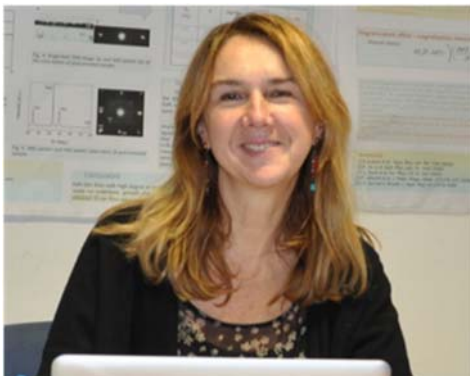
Séminaire de Franca ALBERTINI

Institute of Materials for Electronics and Magnetism - CNR, Parma, Italy

Mercredi 28 juin 2023 à 11h00

Salle 4-A014, Institut Jean Lamour, Campus Artem

Magnetic shape memory Heuslers for energy applications



Magnetic shape memory Heuslers are an exciting class of ferroic materials, constantly opening new fields of research and application, arising from the strong interplay between thermal, mechanical and magnetic degrees of freedom. They have a great potential for energy related applications, such as solid-state refrigeration, thermal and mechanical energy harvesting, remote actuation.

Their multifunctional properties arise from a reversible martensitic phase transformation associated with large changes in magnetization and/or magnetic order. In addition, their hierarchical twin-within-twin martensitic microstructure, and the strong spin-lattice coupling allow the

control of their magnetic and functional properties from the atomic to the micro-scale, by tuning growth conditions and applying external fields.

In my talk I will report on our recent results on NiMn-based MSM Heuslers, including micro/nanoscale materials obtained by different fabrication methods (e.g. epitaxial thin films [1], patterned and free-standing structures [2], ball milled powders [3]). Thin films and micro/nanostructures are of particular interest not only for the realization of miniaturized devices, but also for providing insights into the magneto-structural coupling at the different length scales. The talk will focus on microstructure tuning and microstructure-related effects on the martensitic transformation, in view of the fully exploitation of this class of materials in energy and smart applications.

[1] M. Takhsha Ghahfarokhi *et al.*, *Acta Mater.* 23 (2021), 117356; M. Takhsha Ghahfarokhi *et al.* *Acta Mater.* 245 (2023) 118603.

[2] M. Takhsha Ghahfarokhi *et al.*, *Appl. Mater. Today* 23 (2021), 101058.

[3] G. Cavazzini *et al.*, *J. All. & Comp.* 872 (2021) 159747; G. Cavazzini *et al.*, *J. All. & Comp.* 906 (2022) 164377.

Séminaire organisé par le Département Chimie et physique des surfaces et des solides