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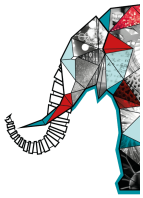

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# Ferrite nanoparticle chains studied using electron holography combined with magnetic force microscopy

*vendredi 12 juillet 2019 10:00 (15 minutes)*

Uniform nanoparticles with a narrow size distribution, precise composition and magnetic properties are nowadays considered for applications in areas such as spintronics and recording media, which are based on the miniaturization of devices. The use of magnetic nanoparticles would reduce the size limit of one bit of information from multigrain to one single nanoparticle. Nevertheless the main current limitation is the thermal stability of nanostructures below a given size. Indeed when the size of magnetic NP's decreases, they become superparamagnetic, i.e. the orientation of their magnetic moment becomes unstable against the thermal fluctuations. While superparamagnetic nanoparticles are well-suited for biomedical applications, they cannot fulfil the requirements necessary for the development of applications related to spintronics and magnetic recording. This behaviour may be circumvented by the synthesis of chains of nanoparticles to generate a local coupling and an enhancement of magnetic anisotropy. Therefore, the investigation of nanoparticle chains has become an appealing research topic to push back the superparamagnetic limit. The determination of the magnetic configuration in relation with the crystallography of each particle is necessary to understand the observed configurations. We combine micromagnetic calculations with off-axis holography, magnetic force microscopy, and high resolution transmission electron microscopy on the same chains to enlighten this relation.

## Choix de session parallèle

6.2 Techniques couplées et analyses multispectrales dans le domaine des matériaux

**Auteurs principaux:** Dr PIERRON-BOHNES, Véronique (IPCMS); Dr TOULEMON, Delphine (IPCMS); Dr PICHON, Benoit P.; BOUILLET, Corinne (IPCMS); Dr RASTEI, Mircea (IPCMS); Dr HERTEL, Riccardo (IPCMS)

**Orateur:** Dr PIERRON-BOHNES, Véronique (IPCMS)

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