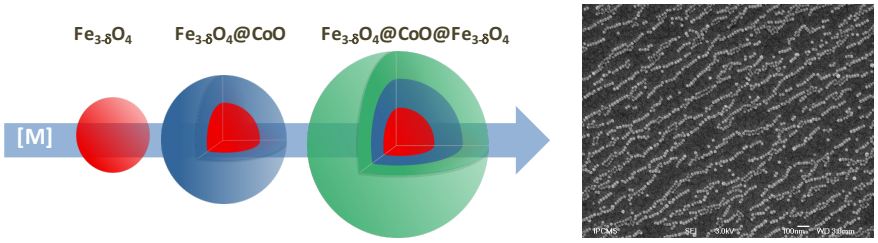
Post-doctoral position on

Design of rare earth free magnetic nanoparticles for sustainable applications

We are currently seeking a highly motivated postdoctoral researcher to join our team at the **Institut de Physique et Chimie des Matériaux de Strasbourg**.

By now, rare earths (RE) and noble metals have been used for technological applications such as magnetic data storage or sensors which require permanent magnets. Iron oxide – a cheap, abundant and non-toxic, material – represents a nice alternative to rare-earth elements. However, iron oxide nanoparticles are superparamagnetic (no permanent magnetization) at room temperature.



Left : Three-step synthesis process leading to onion magnetic nanoparticles. *Right :* Single – nanoparticle chains obtained under a magnetic field upon performing "click" chemistry.

Our team recently developed a multi-step synthesis process based on the thermal decomposition of metal complexes in order to design multi-component magnetic nanoparticles (NPs). We also reported on a new approach in order to integrate such nanoparticles as highly anisotropic assemblies into devices. The objective of this project is to show the interest of such onion structures for applications related to magnetism such as radiofrequency devices or magneto-resistive sensors.

The post-doctoral fellow will be in charge to establish of proof of–concept as efficent material for RF devices and sensors. The main activity will deal with (i) the synthesis of new types of magnetic nanoparticles, the (ii) the formation of single nanoparticle chains supported by a substrate and (iii) the characterization of physical properties (magnetic, dielectric and electric) as a function of the nanoparticle and assembly structures.

Previous experiences in nanoparticle synthesis, and related characterization techniques for chemical composition and structure (TEM, XMCD…) and/or electromagnetic properties are desired. High motivation, willingness to develop new synthetic procedures and to learn about electromagnetism are highly desirable. The applicant must hold a PhD in Material Chemistry after January 1st 2017. The postdoctoral position (18 months) is funded from the University of Strasbourg's idEx program.

Start on May 1st 2022 - Gross salary : from 2737,88€ (depending on the experience)

Contact: Please send CV and cover letter describing background and interest in the project to Prof. Benoit P. Pichon via email to benoit.pichon@unistra.fr.

References

Sartori *et al.* J. Amer. Chem. Soc. **2019**, 141, 9783, https://doi.org/10.1021/jacs.9b03965
Sartori *et al. ACS Appl. Mater. Interf.*, **2021**, http://dx.doi.org/10.1021/acsami.0c18310
Rastei *et al. Adv. Funct. Mater.*, **2019**, https://dx.doi.org/10.1002/adfm.201903927
Toulemon *et al. Adv. Funct. Mater.* **2016**, https://doi.org/10.1002/adfm.201505086