

## Job opening: Post-doctoral Position

### Laboratoire Léon Brillouin (CNRS-CEA) – Saclay (France)

Job Description	
Research Project Title	Exploring spin fluctuations in photosensitive molecules
Research Field(s)	Condensed Matter Physics ; Magnetism
Starting date & Duration	As early as September 2018 ; 18 months
Project supervisor(s)	Grégory Chaboussant (LLB Saclay), Talal Mallah, Laure Catala (ICMMO, University Paris-Sud and Paris-Saclay)

Detailed Job Profile	
<p><b>Scientific Context and Project summary:</b> In the general framework of nanomagnetism, this research subject deals with fundamental properties of new magnetic materials (molecular magnetic clusters, magnetic nanoparticles) displaying functional properties associated to the control of magnetization at the molecular level or at the individual nanoparticle level. These “switchable” molecular solids are promising materials for high-density optical memory devices, especially since synthesis and deposition techniques now allow thin-film organisation and the size/shape control of magnetic particles. Molecular materials with so-called “spin transition” properties are capable to drastically change their magnetic state (from a non-magnetic state to a ferromagnetic or antiferromagnetic state) upon temperature variation or under light radiation. In some materials, diamagnetic ions are converted into paramagnetic pairs through light excitations. These states are generally “metastable” and can be reversed with temperature.</p> <p><b>Research Program:</b> The tasks of the project are to study the structural and magnetic properties of coordination nanoparticles (CNPS's) based on Prussian Blue analogues complexes, CsNiCr and CsCoFe, and core-shell type CNP's. These novel systems open new possibilities for the design of molecule-based switchable objects where magnetism may be controlled or tuned by an external perturbation (light, temperature, field, etc.). The project aims at understanding the magnetic conformations of the nanoparticles and their eventual interactions. The methods of investigation will include small-angle scattering (SANS, SAXS), neutron diffraction, Inelastic Neutron Scattering (INS), and magnetometry (DC/AC) using SQUID and PPMS. Part of the work will also consists in developing new setups for in situ low-temperature photomagnetic studies under magnetic fields. Neutron experiments will be carried out at the LLB (CEA Saclay, south of Paris) and/or at the Institute Laue-Langevin (Grenoble).</p> <p><b>Candidate Profile:</b> The candidate should hold a Ph.D. in condensed matter physics or materials science, with a strong background in magnetism, and be capable of independent research as well as creativity. He/she should have experience in neutron/X scattering techniques (preferably SANS/SAXS) applied to condensed matter physics. This research project requires a strong taste for experimental physics (cryogenic work, superconducting coils, laser devices, sample preparation) and a substantial autonomy in both experimental and theoretical work. Strong communication skills in oral and written English is essential.</p>	
How to apply ?	Applications for this position should be sent by e-mail to <a href="mailto:gregory.chaboussant@cea.fr">gregory.chaboussant@cea.fr</a> , and include a C.V., the names of at least two references, and a cover letter summarizing current and future research initiatives.