

Post-doctoral position: Functional properties of high entropy oxides

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<https://www.icmmo.u-psud.fr/en/>

Context

Entropy-stabilized oxides (ESO), which belong to the family of high entropy oxides, are a new class of materials discovered in 2015 by Rost et al. (Nature Comm. 2015, 8485), and constitute a new paradigm in the design of new functional materials. ESO are metastable materials that are obtained by heating above a critical temperature a mixture of constituting oxides. A single phase compound crystallizing in a simple structure can form when the contribution of the entropy of configuration becomes predominant in the Gibbs free energy, and it can be frozen at room temperature by quenching. These new materials exhibit unexpected interesting functional properties, like colossal dielectric constant, long-range magnetic ordering, etc (for a recent review see Nature Rev Materials 2020, 5, 295). To date this research field is still in its infancy but is very rapidly growing with the discovery of new structures and properties.

Project

In the framework of a collaborative ANR-DFG project between ICMMO-Univ Paris Saclay and Max-Planck Institute in Stuttgart, our project aims at exploring new phases and investigating the functional properties, mainly electronic and magnetic, of new entropy-stabilized functional oxides with bi-cationic crystal structures (perovskites, pyrochlores, ...), in order to expand our knowledge on these materials and get a better understanding of the interplay between the chemical composition, the crystal structure, and the physical properties.

Based in Univ Paris Saclay at Orsay, France, with close collaboration with the team members and our partners in Stuttgart, the recruited candidate will:

- drive the synthesis of new compositions of entropy-stabilized oxides in bulk form
- perform structural, chemical and microstructural characterizations
- participate in the study of the electronic and magnetic properties.

Candidate profile and position

The candidate should hold a PhD in material science or solid state chemistry, with a good experience in the synthesis of oxide materials using solid state routes, as well as their structural and microstructural characterizations, and a previous experience with either magnetic properties or electrical properties of oxide materials.

Good English communication skills are required.

This position is funded for one year renewable and the standard net salary, after tax and social and health insurance, is 2150 euros per month and commensurate with experience. The applicant should have less than two year experience after PhD. The evaluation of the candidates will start immediately, the position will remain open until filled.

Application, as a single PDF file, should include a motivation letter, CV, list of publications and the names/contact details of at least two referees, and be submitted to :

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