LABORATOIRE DE CHIMIE DE COORDINATION
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PhD proposal (doctoral contract, 1rst October 2026): Synthesis and Characterization of Multiferroic Magnetoelectric Molecular Magnets

The energy demand of internet-related technologies (connected devices) and artificial intelligence continues to grow exponentially. In the context of sustainable development, there is an urgent need to develop materials that enable the design of less energy-intensive electronic systems. In this regard, the development of multiferroic magnetoelectric materials is particularly relevant.[1,2] Historically, inorganic oxides have dominated this field, but recent examples based on molecular materials have emerged, demonstrating their potential for the design of multiferroic compounds.[3-5]
This PhD project aligns with this objective. To achieve such materials, we propose an approach based on coordination networks that considers the need for strong magnetic interactions and the symmetry constraints required for the targeted properties.[6,7] To this end, chemical systems known to lead to magnets with high magnetic ordering temperatures will be assembled in the presence of chiral organic cations to promote crystallization in a polar point group (a necessary condition for the emergence of ferroelectricity). The goal of this thesis is to obtain a material exhibiting cross-interaction between magnetic and dielectric properties.
This study aims to develop new materials suitable for use in low-power electronic devices.

Work Description:
The PhD student will be responsible for the design of compounds and their preliminary characterization (crystallographic structure, magnetic properties). He/She will benefit from the team's expertise and have access to the full infrastructure of the host laboratory. He/She will also have the opportunity to collaborate with the LAPLACE laboratory in Toulouse for the characterization of dielectric properties (AFM).

Required Skills:
This project is open to a student holding a Master's degree in chemistry. Solid experience in synthesis (organic or inorganic) and supramolecular chemistry will be appreciated.

Application:
Applicants should send a CV and a cover letter to Drs. E. Delahaye and C. Pichon as soon as possible, including the names and contact details of at least one referee. The application deadline is **April 30**.

References:
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