

CHEMISTRY MASTER - M2 INTERNSHIP 2020-2021 (end of January – end of June)	
Options of Master (please tick the box(es) of the training that fits the field of the internship) : MA (Advanced Materials) <input checked="" type="checkbox"/> - COSV (Organic Chemistry and Life Sciences) <input checked="" type="checkbox"/> MMF (Functional Molecules and Macromolecules) <input checked="" type="checkbox"/> PCCP (Physical Chemistry and Chemical Physics) <input checked="" type="checkbox"/>	
TITLE	Synthesis, electrosynthesis and study of redox-active molecular nanomagnets
SUBJECT	<p>The miniaturization of electronic components is a major challenge. In computer sciences, it is expected by 2019 that Moore's law will not be able to be respected with classical "top-down" strategies for miniaturization (photolithography...). New approaches and new techniques need to be developed. For data storage and information processing, a potential solution to this large problem can come in the form of single-molecule magnets (SMMs) or single chain magnets (SCMs) as these materials show appealing and potentially useful properties at the molecular scale. Their ability to store information at a nanometric scale makes them ideal candidates for future information storage devices as they offer a potentially much higher information storage density. In addition, their quantum properties can also be used as "qubit" for future quantum computers.</p> <p>The research project aims at the (electro-)synthesis and the study of new redox-active molecular nanomagnets with enhanced properties, through a rational design of the molecular components, using coordination chemistry and electrocrystallisation. The redox activity will be provided either by the metal centre or the bridging ligand, or both. This will allow us to tune and sometimes to enhance significantly the magnetic properties of the resulting molecular architectures, with the goal of making molecular magnets with higher operating temperatures, which is a long-standing challenge in this research area and a requirement for industrial applications.</p> <p>See the recent published paper from our group: <i>Angew. Chem. Int. Ed.</i> (2018), 57, 7841 and <i>J. Am. Chem. Soc.</i> (2019), 141, 7721.</p>
TECHNIQUES USED	<p>Synthesis: Organic & coordination chemistry; electrocrystallization. Characterizations: IR, UV, NMR spectroscopies; cyclic voltammetry, X-ray diffraction (single-crystal & powder); magnetic susceptibility, optical and photomagnetic, calorimetric measurements...</p> <p>This internship will take place inside a multi-nationality team. Therefore, good knowledge in English will facilitate the communication with the other group members.</p>
HOST LABORATORY	Centre de Recherche Paul Pascal – UMR 5031
TEAM	Molecular Materials & Magnetism (M ₃ - CRPP)
SCIENTIFIC DIRECTOR	Name: Rodolphe Clérac & Pierre Dechambenoit Tel: 06 03 51 74 16 eMail: clerac@crpp-bordeaux.cnrs.fr Tel: 06 08 45 33 92 eMail: pierre.dechambenoit@u-bordeaux.fr Address: 115 avenue Dr. Albert Schweitzer, 33600 Pessac – France
Possibility to pursue the internship until the end of JULY: YES <input checked="" type="checkbox"/> / NO <input type="checkbox"/> Possibility to offer the internship to a M1 if not attributed to a M2: YES <input checked="" type="checkbox"/> / NO <input type="checkbox"/>	

