



## INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

### INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	Laboratoire de Chimie Moléculaire
Website of the Host Laboratory	www.gregory.nocton.fr
Research Group	Nocton Group
Internship Supervisor	Grégory Nocton
Internship Subject	Synthesis and magnetic studies of organolanthanide complexes with slow magnetic relaxation
Student's level	<input checked="" type="checkbox"/> Advanced Undergraduate Students (3 <sup>rd</sup> or 4 <sup>th</sup> year) <input checked="" type="checkbox"/> Master's students (1 <sup>st</sup> or 2 <sup>nd</sup> year) <input checked="" type="checkbox"/> PhD students
Proposed Duration	<input checked="" type="checkbox"/> 3 months <input checked="" type="checkbox"/> 4 months <input checked="" type="checkbox"/> 5 months <input checked="" type="checkbox"/> 6 months
Prerequisites	Chemistry student with good knowledge of synthetic chemistry.
Internship description (max. 15 lines)	<p>The use of molecules as <b>Single Molecules Magnets</b> is extremely relevant for the design of quantum computers. On the last 20 years this field has moved very rapidly and the temperature at which the molecules start to behave as a magnet increased to reach 60 K, which is very close to the 77 K of the liquid nitrogen. Closing the gap would be really beneficial for applications. The rare earth metal complexes have largely contributed to the fast increase on the field with their natural large magnetic anisotropy and high magnetic susceptibility. Recently, <b>organolanthanide complexes</b> have proven to be extremely useful in this area as well since the metal – carbon bonds enhance the magnetic slow relaxation <i>via</i> multiple vibronic coupling. The group has long experience on the difficult synthesis of organolanthanide complexes with trivalent but also divalent metal ions of the rare earths. For example, we have recently developed a very original ligand, specifically designed for divalent organolanthanide chemistry (Figure). Therefore, the research we propose within this project will be devoted to <b>the synthesis of original organolanthanide complexes with this new ligand in order to study their slow magnetic relaxation</b> and approach the targeted 77 K.</p>

The boxes marked with cross implies eligible