



## INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

### INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	Molecular Chemistry Laboratory
Website of the Host Laboratory	<a href="https://portail.polytechnique.edu/lcm/fr">https://portail.polytechnique.edu/lcm/fr</a>
Research Group	
Internship Supervisor	Dr. Audrey Auffrant
Internship Subject	Catalysis with cooperative ligands
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 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 type="checkbox"/> 6 months
Prerequisites	Knowledge in organic chemistry or organometallic chemistry
Internship description (max. 15 lines): Cooperative catalysis	<p>With the aim to develop efficient and selective catalysts which corresponds to the societal demand for more sustainable chemistry, we are specialized in the synthesis of original phosphorus based ligand and the study of their coordination to various metals.</p> <p>To achieve catalysis with cheap and abundant metals, one of the successful strategies is to associate this metal with proton responsive cooperative ligand allowing the catalytic system to store and release H<sub>2</sub> depending on the reaction conditions (see hereafter). This so called borrowing hydrogen strategy allows synthesizing sophisticated molecules from alcohols.</p> <p>Based on the experience of the Laboratory the preparation of ligands, complexes and their use in catalysis will be conducted. The student will learn to handle sensitive chemicals, characterize organic and organometallic molecules with multinuclear NMR spectroscopy, and grow single crystals for X-ray diffraction analysis. The catalytic trials will be most probably followed by GC analysis.</p>