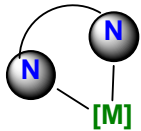
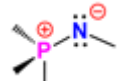




INTERNSHIP PROGRAM FOR INTERNATIONAL STUDENTS

INTERNSHIP SUBJECT FORM

Name of the Host Laboratory	Molecular Chemistry lab
Website of the Host Laboratory	https://portail.polytechnique.edu/lcm/en
Research Group	
Internship Supervisor	Audrey Auffrant
Internship Subject	Earth abundant metal complexes featuring electron rich ylide ligand for optics and catalysis
Student's level	<input checked="" type="checkbox"/> Advanced Undergraduate Students (3 rd or 4 th year) <input checked="" type="checkbox"/> Master's students (1 st or 2 nd 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 checked="" type="checkbox"/> 6 months
Prerequisites	
Internship description (max. 15 lines)	<p>Economic and industrial development has led to an increasing consumption of a large number of rare and expensive metals so that the most employed, will become even rarer and even more expensive in the coming decades. Alternatives to such noble metals (Pd, Pt, Rh, Ru or Ir) involved in main transition metal-catalyzed processes or in the production of photoactive smart material and optoelectronic devices constitute an immense issue. This requires a significant ligand improvement through rational design.</p> <p>Electron rich ligands have been shown to have a positive impact on the catalytic activity of earth abundant metal complexes as well as on their optical properties. Given our expertise in iminophosphorane ligand engineering, we want to use them to synthesize complexes incorporating earth abundant metal (Ni, Co, Fe) with improved catalytic and photophysical properties in order to offer alternatives the traditional ones based on noble metals. Indeed iminophosphorane ligands exhibit better electron donating ability than conventional ones are as they feature a negatively charged nitrogen stabilized by a positively charged phosphorus (see figure).</p>   <p>The student involved will synthesize ligands, prepare the complexes and characterize them by different spectroscopies among which UV-visible one in order to analyse their photophysical properties.</p>