

## M2 internship 2026 - PhD thesis funded



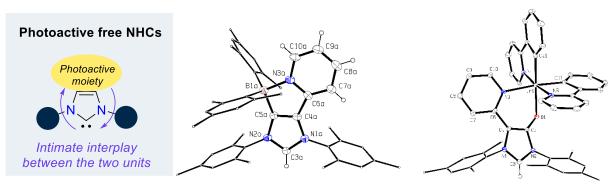
## Photoactive N-Heterocyclic Carbenes: Synthesis and unconventional Reactivity

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Context and state-of-the-art. Beyond their extensive applications in different areas of chemistry and homogeneous catalysis, [1] N-heterocyclic carbenes (NHCs) have recently become key components in the design of highly efficient luminescent transition metal complexes. [2] By contrast, photo-induced transformations of free NHCs are extremely rare and require high-energy UV irradiation. [3] Furthermore, no viable examples of free carbenes with luminescent properties have been reported in the literature.

Research objectives. Our team has recently developed a synthetic approach to the imidazolium salts incorporating conventional organoboron and transition metal chromophores in the ligand backbone (see the scheme below). Upon deprotonation these compounds can be transformed to the first examples of stable luminescent imidazol-2-ylidenes showing a strong absorption in the visible region. The main aim of this internship is to explore the **unprecedented photo-induced reactivity** of these unique species towards the activation of small molecules and inert chemical bonds. Regular imidazole-based NHCs remain completely inefficient in such processes and an ultimate goal of the project consists in development of new photocatalytic transformations that are useful for organic synthesis.



**Environment.** The successful candidate will work in a stimulating, dynamic and international environment at the CNRS Coordination Chemistry Laboratory in Toulouse, France, as part of the "Molecular Design of Transition Metal Catalysts" group. The technical and scientific environment is of a high standard and perfectly suited to the project.

<u>Profile.</u> We are looking for a highly motivated candidate with a strong interest in molecular chemistry. This internship will enable the candidate to acquire a strong knowledge in organic/organometallic synthesis, the handling of highly air/moisture sensitive compounds, photochemistry and advanced spectroscopic techniques.

<u>How to apply.</u> Please email your CV, along with the contact details of your M1 supervisors and a copy of your L3/M1 grades and a cover letter.

This project, funded by the French National Research Agency (ANR), will lead to the opening of a PhD offer in October 2026.

## **References**

[1] M. N. Hopkinson, C. Richter, M. Schedler, F. Glorius, Nature 2014, 510, 485.

[2] a) H. Amouri, Chem. Rev. 2023, 123, 230; b) C. Wegeberg, O. S. Wenger, JACS Au 2021, 1, 1860.

[3] a) T. A. Perera, E. W. Reinheimer, T. W. Hudnall, *J. Am. Chem. Soc.* **2017**, *139*, 14807. b) T. A. Perera, W. V. Taylor, M. B. Gildner, E. W. Reinheimer, S. Ito, A. Nelson, S. R. Yost, T. W. Hudnall, *Chem. Sci.* **2023**, *14*, 7867; c) A. J. Teator, Y. Tian, M. Chen, J. K. Lee, C. W. Bielawski, *Angew. Chem. Int. Ed.* **2015**, *54*, 11559.

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