

LAC L. M. Venanzi Distinguished Lecture 2024

Prof. Guy Bertrand

University of California, San Diego

1st lecture

Tuesday May 7th - 17.15h

ETH Zürich, HCI J7

«Carbenes as Powerful Transition-Metal Surrogates»

A decade ago, we recognized that due to their lone pair of electrons and accessible vacant orbital, singlet carbenes resemble transition metal centers, and thus are able to mimic their chemical behavior. We will discuss recent results demonstrating that, for some catalytic reactions including those involving single electron transfers, carbenes can indeed compete with transition metal complexes.

The development of catalytic processes promoted by carbenes, which are genuine organic compounds, could address the major drawbacks of current transition metal catalysis technology that are the excessive cost of metal complexes (metal + ligands) and in many cases the toxicity of the metal.

For recent papers, see:

W. Liu, A. Vianna, Z. Zhang, S. Huang, L. Huang, M. Melaimi, G. Bertrand, X. Yan. *Chem. Catal.* 2021, 1, 196-206.

Z. Zhang, S. Huang, C.-Y. Li, L.-L. Zhao, W. Liu, M. Melaimi, G. Bertrand, X. Yan. *Chem Catal.* 2022, 2, 3517-3527.

C. Liu, Z. Zhang, L.-L. Zhao, G. Bertrand, X. Yan. *Angew. Chem. Int. Ed.* 2023, e202303478.

M. Addellaoui, K. Oppel, A. Vianna, M. Soleilhavoup, X. Yan, M. Melaimi, G. Bertrand. *J. Am. Chem. Soc.* 2024, 146, 2933–2938