

Abstract:

In this presentation, I will focus on two different topics from my research group, moving from direct photochemistry to photoredox catalysis.

1) We have performed in-depth mechanistic investigation on light-mediated [2+2] heterocycloadditions, that have allowed us to gain control of the diastereoselectivity of this process.[1a] We were able to deliberately switch the stereochemistry by just selecting the light-source from UV- to visible-light.[1b]

2) We have designed and developed a new class of organophotoredox catalysts (PCs) capable of activating redox inert substrates towards reduction. To do so, we have exploited an unprecedented catalytic proton-coupled electron-transfer (PCET) mechanism.[2] By using the same

PCs, we were also able to promote atom-transfer-radical polymerization processes under batch and flow conditions.

1 a) Mateos J. Rigodanza; F., Costa, P.; Natali, M.; Vega-Peñaloza, A.; Fresch, E.; Collini, E.; Bonchio, M.;

Sartorel, A.; Dell'Amico, L. Nat. Synth. 2022, 2, 26–36. b) Franceschi, P.; Cuadros, S.; Goti, G.; Dell'Amico,

L. Angew. Chem. Int. Ed. 2023, 62, e20221720.

2 Bortolato, T.; Simionato, G.; Vayer, M.; Rosso, C.; Paoloni, L.; Benetti, E. M.; Sartorel, A.; Leboeuf, D.;

Dell'Amico, L. J. Am. Chem. Soc. 2023, 145, 1835–1846.