



Prof. Jean-François Nierengarten

“From fullerene-based nanostructures to luminescent copper(I) complexes and giant multiporphyrin arrays”

17 listopada 2025 r.

godz. 12:00

Wykład w formie tradycyjnej

Sala 3.65, Wydział Chemii UAM

WYKŁAD ODBYWA SIĘ W RAMACH PROJEKTU

UAM Excellence Visiting Professors (IDUB, POB3)

Abstract Colors Coordination compounds possessing low-lying metal-to-ligand charge transfer (MLCT) excited states with marked reducing character are excellent partners for [60]fullerene in photoactive multicomponent hybrid systems. As part of this research, we have prepared a large number of molecular and supramolecular dyads in which [60]fullerene is coupled with photoactive coordination compounds. During the photophysical studies carried out on these dyads, we have also systematically investigated the electronic properties of the corresponding model compounds and thus became progressively involved in the field of phosphorescent metal complexes.^{1,2} In particular, we have developed strongly luminescent Cu(I) complexes and have been among the first to show the potential of such compounds for light emitting applications. Indeed, such non-toxic Cu(I) complexes are interesting alternatives to the heavy metal complexes (Ir(III) and Pt(II) derivatives) typically used as electrophosphorescent materials in LEDs. On the other hand, our

group is also involved in the development of supramolecular systems combining porphyrin building blocks with fullerene acceptors and different strategies have been developed to obtain stable non-covalent conjugates.³ These results will be presented with special emphasis on positive cooperative effects resulting from the existence of secondary weak intramolecular interactions in the supramolecular assemblies. . Our group has also developed multiporphyrinic arrays that mimic natural photosynthetic light-harvesting systems, where porphyrin antennas collect and transfer energy to a single acceptor. Weak coordination between metalloporphyrins and triazole subunits enables control over the conformation of these complex assemblies.

Selected references:

- [1] T.-A. Phan, M. Jouffroy, D. Matt, N. Armaroli, A. Saavedra, E. Bandini, B. Delavaux-Nicot, J.-F. Nierengarten, D. Armspach, *Chem. Eur. J.* **2024**, 30, e202302750.
- [2] T.-A. Phan, N. Armaroli, A. Saavedra Moncada, E. Bandini, B. Delavaux-Nicot, J.-F. Nierengarten, D. Armspach, *Angew. Chem. Int. Ed.* **2023**, 62, e202214638.
- [3] J.-F. Nierengarten, *Eur. J. Inorg. Chem.* **2019**, 4865-4878.

