Photoredox mechanisms and photocatalyst development

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This first half of this talk will concentrate on the application of transient UV-Vis absorption spectroscopy to elucidate photoredox mechanisms, with particular focus on the usefulness of triplet-triplet annihilation upconversion for challenging reduction reactions. By combining the energy input from two photons, a variety of reductive dehalogenation and detosylation reactions requiring very negative reduction potentials become achievable using long-wavelength irradiation instead of UV light.[1]

The second half of the talk will focus on recent advances in the development of precious metal-based sensitizers for triplet energy transfer catalysis, and on the development of new luminophores and photocatalysts based on first-row transition metals. This will include conceptually new types of coordination compounds made from manganese, cobalt, and chromium, which complement the well-known photophysical and photochemical properties of traditional ruthenium- or iridium-based complexes.[2]

(1) Glaser, F.; Wenger, O. S., *JACS Au* **2022,** *2,* 1488.

(2) Schmid, L.; Glaser, F.; Schaer, R.; Wenger, O. S., *J. Am. Chem. Soc.* **2022,** *144,* 963.