Abstract:

Colloidal quantum dots (QDs) combine many of the advantages of heterogeneous and homogeneous catalysts. Their broad, intense absorption spectra and sharp emission lines also make them excellent photosensitizers for photocatalysis. But QDs can be more than photosensitizers -- their surfaces, if properly designed, can serve as templates for stereoselective organic reactions or activators of small-molecule substrates for energy conversion reactions.

This talk will explore two case studies in colloidal photocatalysis: the regio- and diastereo-selective [2+2] cycloadditions of chalcone-type substrates, and the photoreduction of CO2 to CO with unprecedented turnover number in pure water.