ABSTRACT
Since the landmark publication by O'Regan and Grätzel in 1991, nanocrystalline films of semiconducting metal oxides have been widely used in dye-sensitized solar cells. Studies of fundamental events in these systems have been complicated by the presence of many different dye binding sites and other nonuniformities inherent in the nanocrystalline films. Deconstructing nanocrystalline films into individual nanocrystals has provided access to more uniform environments for the study of fundamental events involved in dye cells. The presentation will focus on structure reactivity relationships of the excited state electron transfer from dyes to well-defined zinc oxide nanocrystals. The nanocrystals range in size from 3 – 6 nm, which places them in the quantum-confined regime. Ultrafast pump-probe spectroscopy was used for measurement of the faster rates, while time-correlated single photon counting fluorescence was used for the slower ones. The impact of changes in the chromophore and anchoring group will be discussed along with the impact of varying the nanocrystal diameter.

BIOGRAPHY
Professor Wayne Glafelter received his B.S. in Mineral Engineering Chemistry from the Colorado School of Mines in 1975, followed by his Ph.D at Penn State University in 1978. Wayne completed his Post Doctorate as a National Science Foundation Fellow at CalTech in 1979. He has been a Professor of Chemistry at the University of Minnesota since 1988, during which time he has received numerous honors and awards, and has served as both the Department of Chemistry Chair (1999-2005) and Associate Dean of Academic Affairs (2007-2013). Wayne's principal research topics include Inorganic and Organometallic Chemistry, Nanoscience and Materials Chemistry, and Energy and Catalysis.