GUEST SEMINAR SPEAKER
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Biography: Scott received her B.Sc. in Chemistry from the University of Alberta (Canada) in 1987, and her Ph.D. in Inorganic Chemistry from Iowa State University in 1991, where she worked with J. Espenson and A. Bakac on the activation of O2 and organic oxidation mechanisms. She was a NATO Postdoctoral Fellow with Jean-Marie Basset at the Institut de recherches sur la catalyse (CNRS) in Lyon, France, before joining the faculty of the University of Ottawa (Canada) in 1994 as an Assistant Professor of Chemistry. She held an NSERC Women's Faculty Award, a Cottrell Scholar Award, a Union Carbide Innovation Award and was named a Canada Research Chair in 2001. She moved to the University of California, Santa Barbara in 2003, where she is currently holds the Duncan and Suzanne Mellichamp Chair in Sustainable Catalysis, with joint faculty appointments in both Chemical Engineering and Chemistry & Biochemistry. She directs the NSF-sponsored Partnership for International Research and Education in Electron Chemistry and Catalysis at Interfaces, a collaborative research program involving UCSB and several prominent catalysis research groups in China. Her research interests include surface organometallic chemistry, olefin polymerization, nanomaterials, biomass conversion, environmental catalysis and the development of new kinetic and spectroscopic methods to probe reaction mechanisms at surfaces. In 2013, Scott became an Associate Editor for the journal ACS Catalysis.

“Spectroscopic Probes for Catalysts and Mechanisms of Carbohydrate Reactions in Porous Solids”

Abstract: The tandem isomerization-dehydration of glucose to 5-HMF via fructose is an important step in the conversion of cellulosic biomass to useful chemicals. The reaction is catalyzed by porous solids, including mesoporous functionalized silicas and faujasite zeolites. Using a combination of kinetic measurements and solid-state NMR, we can monitor the evolution of adsorbed glucose and detect reactants and products in situ at elevated temperatures. In semi-aqueous solvent mixtures, the solvent composition affects the amount of glucose taken up by the catalyst as well as the tautomer ratio. Direct, time-resolved observation of reactive species in porous materials and in particular adsorbed molecules undergoing reaction allows a fuller description of the complex interplay of substrate, solvent, and catalyst.