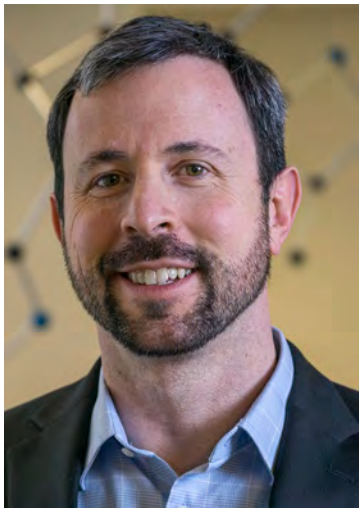

2019-2020 POCC Lecture Series

November 21, 2019, 7:30 PM

6:30 reception in the Nobel Hall

The POCC Student Choice Lecture

Prof. Matthew S. Sigman

University of Utah

Developing Data-Driven Reaction Analysis Tools for Reaction Optimization and Interrogation

Carolyn Hoff Lynch Lecture Hall, Chemistry Building, University of Pennsylvania

The Philadelphia Organic Chemist's Club

POCClub.org

Matt Sigman was born in Los Angeles, California in 1970. He received a B.S. in chemistry from Sonoma State University in 1992 before obtaining his Ph.D. at Washington State University with Professor Bruce Eaton in 1996 in organometallic chemistry. He then moved to Harvard University to complete an NIH funded postdoctoral stint with Professor Eric Jacobsen. In 1999, he joined the faculty of the University of Utah where his research group has focused on the development of new synthetic methodology with an underlying interest in reaction mechanism. His research program explores the broad areas of oxidation catalysis, asymmetric catalysis, and the relationship between structure and function in complex reactions. He currently is the Peter J. Christine S. Stang Presidential Endowed Chair of Chemistry at the rank of Distinguished Professor and is the department chair.

Sigman's research efforts have been recognized by several awards including the Pfizer Award for Creativity in Organic Chemistry (2004), the Camille and Henry Dreyfus Teacher Scholar Award (2004), the Arthur C. Cope Scholar Award (2010), the University of Utah Distinguished Research Award (2011) and ACS Award for Creative Work in Synthetic Organic Chemistry (2017). Additionally, he has been recognized for outstanding teaching at the University of Utah as highlighted by being named the University of Utah Distinguished Honors Professor (2008) and the Robert W. Parry Award (2009). He currently serves on several editorial boards as well as an associate editor of the Journal of the American Chemical Society.

Abstract: Chemists are often guided by intuition when predicting the how and where an organic molecule will react. This is based on wisdom and a fundamental understanding of reactivity. However, while this method facilitates the majority of reaction development in organic and related chemical fields, the reality is that we rely significantly on optimizing reactions and structures for a desired outcome and/or function. While a routine process, optimization protocols can cause a considerable investment of time and do not always provide an adequate solution. Therefore, we have aimed to develop a program that assists the rapid analysis of structure function relationships to reveal not only better systems, but also the underlying reasons for improved performance of substrates, catalysts, or other functional materials. The lecture will outline how we have put into practice a method that combines the foundational promise of traditional physical organic chemistry with modern "big data" analysis tools to ultimately precisely predict and understand the performance of new reaction components and energy materials.