Seminar
Paul G. Gassman Lectureship in Chemistry #3
4 p.m.
Friday, March 8, 2019
331 Smith Hall

Using Physical Organic Chemistry Principles to Develop Molecules for Electrical Energy Storage

Professor Melanie Sanford
Department of Chemistry, University of Michigan
Host: Professor Lawrence Que Jr.

This presentation will describe our group’s recent efforts in the design of organic and inorganic molecules for applications in redox flow batteries. It will show how physical organic chemistry and predictive modeling approaches can be used to optimize molecular properties that are critical for this application, including redox potential, stability, solubility, and cross-over. These fundamental advances are leveraged to implement some of the first high potential, high energy density flow batteries in non-aqueous media.

Melanie S. Sanford is currently the Moses Gomberg Distinguished University Professor of Chemistry and Arthur F. Thurnau Professor of Chemistry at the University of Michigan, Ann Arbor. She received her Bachelor of Science and Master of Science degrees at Yale University in 1996, where she carried out undergraduate research in the laboratory of Professor Robert Crabtree. She pursued graduate studies at the California Institute of Technology working with Professor Robert Grubbs. Following post-doctoral work at Princeton University with Professor John Groves, she joined the faculty at the University of Michigan in the summer of 2003, as an assistant professor of chemistry. She was promoted to associate professor in 2007, to full professor in 2010, to Arthur F. Thurnau Professor of Chemistry in 2011, and to Moses Gomberg Collegiate Professor of Chemistry in 2012. She has won a number of awards, including the American Chemical Society (ACS) Award in Pure Chemistry, the Sackler Prize, the Blavatnik Award, and a MacArthur Foundation Fellowship. She is a member of the National Academy of Sciences and a Fellow of the ACS.

Research in the Sanford group aims to develop new chemical reactions that enable the production of pharmaceuticals, agrochemicals, and fuels in a more efficient and environmentally friendly manner. For example, her research focuses on converting simple and readily available starting materials (for example carbon dioxide, carbon-hydrogen bonds) into much more complex products through the use of transition metal catalysis.

Regents Professor Paul G. Gassman died in April 1993, at the age of 57. He was internationally known in the chemical community, and left behind a legacy of achievement. During his career, he served as mentor and adviser to 85 doctoral and master’s candidates as well as dozens of postdoctoral associates and undergraduate students. Numerous awards, honors, and honorary degrees were bestowed in recognition of his contributions to research and his service to the scientific, professional, and university communities. Some of these awards include election to the National Academy of Sciences (1989) and to the American Academy of Arts and Sciences (1992); the James Flack Norris Award in Physical Organic Chemistry (1985); Arthur C. Cope Scholar Award (1986); and the National Catalyst Award of the Chemical Manufacturers Association (1990). He served as president of the American Chemical Society in 1990. He was co-chair of the organizing committees of the National Organic Symposium (1991) and the National Conferences on Undergraduate Research meeting (1992), on the University of Minnesota campus. It was his wish that a lectureship be established to bring distinguished organic chemists to the Department of Chemistry. We are proud to present this lecture series in his honor.