



The University of Arizona

Chemical and Environmental Engineering Department – Seminar

®“Molecular Engineering of Materials for Chemical Sensing and Microelectronics”

Katherine Mirica, PhD
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Department of Chemistry
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Monday, April 19, 2021 – 3:00-3:50 PM

Zoom: <https://arizona.zoom.us/j/82143054824>

Stick around for more Q&A after the seminar



ABSTRACT

Molecular engineering of new materials holds promise for improving human health, safety, efficiency, and quality of life. This presentation will describe strategies for molecular engineering of stimuli-responsive multifunctional materials. The first part of the presentation will describe several approaches for design, synthesis, and device integration of two-dimensional (2D) conductive metal–organic frameworks (MOFs) and covalent organic frameworks (COFs) to create devices with promising utility in electroanalysis. An emphasis will be placed on the fundamental understanding and molecular design of modular structure–property relationships within this class of 2D materials. The second part of this talk will introduce a novel approach to designing materials for temporary adhesion, which relies on the use of sublimable molecular solids, with promising utility in the fabrication of microelectronic devices. Taken together, these research thrusts will demonstrate how molecular-level features within solid state materials can be used to tune their stimuli-responsive function.

Lab Website: www.miricagroup.com

BIOSKETCH

Katherine was born and raised in Eastern Ukraine and emigrated with her family to the United States as she was starting high school. She obtained her B.S. in Chemistry at Boston College, where she developed a passion for Materials Chemistry, working in the laboratory of Lawrence T. Scott. She earned her Ph.D. in Chemistry from Harvard University under the guidance of George M. Whitesides and completed her postdoctoral training with Timothy M. Swager at the Massachusetts Institute of Technology. Katherine began her independent scientific career as an Assistant Professor in the Department of Chemistry at Dartmouth College in July 2015. Her research at Dartmouth focuses on the development of multifunctional materials using methods of bottom-up chemical synthesis and self-assembly for solving challenges in electroanalysis, microelectronics, and energy. She is a recipient of the Army Research Office Young Investigator Award (2017), Sloan Research Fellowship (2018), PMSE Young Investigator Award (2018), 3M Non-Tenured Faculty Award (2018), Cottrell Scholar Award (2019), NSF CAREER Award (2020), Camille Dreyfus Teacher-Scholar Award (2020), and NIH Maximizing Investigators' Research Award (2020).