Title: Advances in Nanometrology: From Engineered to Incidental Nanomaterials

Abstract: The unique properties of engineered nanomaterials (ENMs) have enabled their increased use for a range of environmental, medicinal, and commercial applications. However, the uncontrolled release of ENMs into the environment (e.g., through human waste repositories) can have detrimental impacts. Beyond direct release of NMs, incidental NMs can form through degradation of bulk materials that are released into the environment. For example, nano- and microscale plastic particles are formed from macroscale sources (e.g., plastic water bottles and plastic bags). To understand the impact of engineered and incidental NMs on human and environmental health, *in situ* and quantitative analytical tools are needed, which our group works to address. However, the analysis of NMs in relevant matrices is complicated by the dynamic physicochemical transformations that NMs undergo in environmental and biological matrices (e.g., dissolution, aggregation, adsorption of small molecules, etc.). This talk will explore the development and application of several *in situ* analytical techniques, including capillary electrophoresis and electrochemistry, for the analysis of engineered and incidental NMs and their physicochemical transformations.

Bio: Dr. Kathryn Riley is an Assistant Professor in the Department of Chemistry and Biochemistry at Swarthmore College. She received her Ph.D. from Wake Forest University in 2014 and was a National Research Council (NRC) postdoctoral fellow at the National Institute of Standards and Technology (NIST) from 2015-2016. Before her current appointment, she was a Consortium for Faculty Diversity (CFD) postdoctoral fellow at Swarthmore from 2016-2018. Dr. Riley's research involves the development of analytical techniques for the characterization of nanomaterials (NMs) and their dynamic physical and chemical transformations in biological and environmental matrices. Her research group specifically aims to broaden participation in the field by developing techniques that provide new quantitative insights in less time and at a reduced cost when compared to more commonly employed methods. Projects in her group span the analysis of engineered NMs (metal and metal oxide NMs, DNA origami) and incidental NMs (nano and microplastics).