

September 20, 2023 | Behrakis 010 | 12:00 PM

Hosted by the Department of Chemical Engineering

Distinguished Seminar Speaker

***Colloidal and Aerosol Synthesis of Novel Nanomaterials
for Energy, Environment, and Human Health***

Prof. Mark Swihart

Distinguished Prof. & Chair of Chemical and Biological Eng. | Univ. of Buffalo (SUNY) | Buffalo, NY



Abstract: This talk will provide an overview of efforts in the Colloidal and Aerosol Nanomaterials Laboratory (CANLab) at the University at Buffalo (SUNY) to develop new nanomaterials for a broad range of applications. The first part of the talk will discuss the colloidal and hydrothermal synthesis of metallic nanowires and nanowire networks with applications in antimicrobial textiles, hydrogen/CO₂ separation, and hydrogen sensing. In each of these applications, the combination of high surface area and high aspect ratio contributes to the performance of the final device. The second part of the talk will discuss a novel flame-based aerosol route for producing a wide range of nanomaterials, including metallic nanoparticles, high entropy oxides, mesoporous silica, and supported catalysts. It will highlight the flexibility of the approach and its advantages in applications. As a key example, new high-performance and exceptionally stable catalysts for the dry reforming of methane ($\text{CH}_4 + \text{CO}_2 \leftrightarrow 2 \text{CO} + 2 \text{H}_2$) will be discussed.

Biography: Mark T. Swihart is SUNY Distinguished Professor and Chair of the department of Chemical and Biological Engineering at the University at Buffalo, the State University of New York, where he leads the Colloidal and Aerosol Nanomaterials laboratory (CANLab). His research focuses on creating new nanomaterials and new methods of preparing them, and then applying them to address important challenges in energy, environment, and human health. He has co-authored more than 300 refereed journal publications and has advised 35 current and former Ph.D. students in his group, along with dozens of master's students and more than 100 undergraduate researchers. He is an editor of *Aerosol Science and Technology* and a fellow of the American Institute of Chemical Engineers and the American Association for the Advancement of Science.