



Rensselaer

The HOWARD P. ISERMANN
DEPARTMENT OF CHEMICAL AND
BIOLOGICAL ENGINEERING

CBE Seminar Series – Fall 2023

Dr. Steven McIntosh

Zisman Family Professor & Department Chair | Chemical and Biomolecular Engineering
Lehigh University

Seminar: Wednesday, October 25, 2023

9:30 a.m. (Academy Hall Auditorium)

“Collaborations in Electrocatalysis: From Biosynthesized Quantum Dot Photocatalysts to Cooperative Metal Nanoparticles”

Abstract:

Research is increasingly a collaborative endeavor. Innovative and impactful solutions to society’s grand challenge will arguably only be found by researchers working across and between disciplines. In this talk, I will discuss how collaboration has enriched and expanded my own research over the past several years, and the steps that Lehigh ChBE has taken to create and enrich a collaborative environment. Specifically, I will discuss the creation of a biosynthetic route for the synthesis of quantum confined nanomaterials and the collaborative discovery of a new cooperative phenomenon in catalysis. In both cases, collaboration between those with different research backgrounds and ‘languages’ was critical to making key breakthroughs to advance the fundamental scientific understanding. The result of the first project, a casual dinner conversation led to a novel route to enable the low cost, aqueous phase, low temperature, size-controlled synthesis of a heterostructure photocatalyst that can convert solar energy to hydrogen fuel at rates comparable to the best materials formed through traditional chemical syntheses. In the second project, a simple request for help interpreting data led to the application of fundamental principles in electrochemistry to reveal a cooperative redox enhancement in heterogeneous catalysis that can be leveraged to design highly active catalysts for biomass upgrading.

Biography:



Steven McIntosh is the Zisman Family Professor and the Department Chair of Chemical and Biomolecular Engineering at Lehigh University. McIntosh received his BEng in Chemical Engineering from the University of Edinburgh, and his MS and PhD degrees in Chemical Engineering from the University of Pennsylvania. He spent a postdoctoral period as a Marie Curie IntraEuropean Fellow at the University of Twente. McIntosh’s research focuses on the development of functional materials for energy systems, with topics ranging from solid oxide fuel cell electrodes to green synthesis of quantum confined nanomaterials. McIntosh is a Fellow of the Royal Society of Chemistry, and recipient of the NSF CAREER award. He is an associate editor for RSC Advances and editor for the RSC Specialist Periodical Reports Electrochemistry. From 2018-2021 he served as the founding Associate Director of Lehigh’s Interdisciplinary Research Institute for Functional Materials and Devices, and served from 2017-current as a lead faculty member in the design and implementation of Lehigh’s new collaborative Health, Science, and Technology building.

Refreshments will be available at 9:00 a.m. in the Academy Hall Auditorium

For more information, please contact Lisa Martin (swishl@rpi.edu)