

BOUNDARY-SPANNING SEMINAR SERIES

Embracing the Complexity of Heterogeneous Catalytic Structures for Energy and Chemical Conversion

Dr. Eranda Nikolla, Wayne State University



Abstract: The goal of our research group is to design active, selective and stable heterogeneous catalysts and electrocatalysts for energy and chemical conversion processes. We focus on utilizing the versatile structure of non-stoichiometric mixed metal oxides, along with controlling the 3-dimensional environment of heterogeneous catalytic sites via “inverted” catalytic architectures, as potential avenues for addressing limitations with the current state-of-the-art catalytic/

electrocatalytic systems for energy and chemical conversion processes. In this presentation, I will discuss our work on designing non-stoichiometric mixed metal oxide electrocatalysts for electrochemical oxygen reduction and evolution reactions (ORR/OER). These processes play an important role in electrochemical energy conversion and storage technologies, such as fuel cells, electrolyzers and Li-air batteries. I also will highlight our efforts on controlling the 3-dimensional environment of heterogeneous catalytic sites via “inverted” metal@metal oxide catalytic architectures or surface bound ligands on metal nanoparticles as levers to tune activity/selectivity in thermal catalytic reactions.

Bio: Eranda Nikolla is a Professor in the Department of Chemical Engineering and Materials Science at Wayne State University. Her research interests lie in the development of heterogeneous catalysts and electrocatalysts for chemical conversion processes and electrochemical systems (i.e., fuel cells, electrolyzers) using a combination of experimental and theoretical techniques. Dr. Nikolla received her Ph.D. in Chemical Engineering from University of Michigan in 2009, working with Profs. Suljo Linic and Johannes Schwank in the area of solid-state electrocatalysis. She conducted a two-year postdoctoral work at California Institute of Technology with Prof. Mark E. Davis prior to joining Wayne State University. At Caltech, she developed expertise in synthesis and characterization of meso/microporous materials and functionalized surfaces. Her group’s impact to catalytic science has been recognized through the National Science Foundation CAREER Award, the Department of Energy Early Career Research Award, Camille Dreyfus Teacher-Scholar Award, the Young Scientist Award from the International Congress on Catalysis, the 2019 ACS Women Chemists Committee (WCC) Rising Star Award, and the 2021 The Michigan Catalysis Society Parravano Award for Excellence in Catalysis Research and Development.

Seminar overview: this seminar series nurtures learning across academic boundaries. Expect rich conversations, spanning machine learning to catalysts, from lab bench to smokestack, with an eye toward protecting nature. Sponsoring units include: KU’s Center for Environmentally Beneficial Catalysis (CEBC), the Internet of Catalysis National Science Foundation Research Traineeship (NRT), Information and Telecommunication Technology Center (ITTC), and the Departments of Chemistry, Chemical and Petroleum Engineering, and Electrical Engineering and Computer Science.

You belong here! We invite everyone from the KU community to join us for this inclusive seminar

9:00 a.m.
Tuesday
November 30, 2021

Join us by Zoom:
<https://kansas.zoom.us/j/93403833438>
Passcode: 0802

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