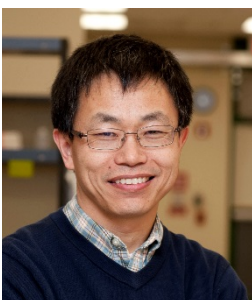


**SEMINAR SERIES****HIGHLIGHTS IN ENERGY RESEARCH**09.05.2019, 16:00 - 17:00, EPFL Valais, 4<sup>th</sup> floor, ZEUZIER room**Towards Platinum-Free Fuel Cells for Affordable Zero-Emission Cars*****Prof. Yushan YAN****Department of Chemical and Biomolecular Engineering, University of Delaware, USA*Host : Prof. Kumar Agrawal

One of the grand challenges facing humanity today is the development of an alternative energy system that is safe, clean, and sustainable. A distributed renewable electrochemical energy and mobility system (DREEMS) can meet this challenge. At the foundation of this new energy system, we have chosen to study fuel cells, electrolyzers, and flow batteries. For all these devices polymer electrolytes and electrocatalysis play a critical role in controlling their performance, cost, and durability, and thus their economic viability. In this presentation, I will focus on our recent work on hydroxide exchange membrane fuel cells (HEMFCs) for which we have developed inexpensive hydrocarbon polymer membranes and nonprecious metal catalysts. More specifically I will show the roadmap we have developed for this technology, the progress we have made in developing the most stable membranes and the most active nonprecious metal catalysts. I will also try to answer the fundamental question: why are hydrogen oxidation reactions are slower in base than in acid for precious metal catalysts?



**Bio:** Yushan Yan is a Distinguished Engineering Professor in the Department of Chemical and Biomolecular Engineering at the University of Delaware. He also served as the founding Associate Dean for Research and Entrepreneurship for the College of Engineering. He studied Chemical Physics (BS) at the University of Science and Technology of China, Heterogeneous Catalysis at the Dalian Institute of Chemical Physics of the Chinese Academy of Sciences, and Chemical Engineering (MS/PhD) at the California Institute of Technology. He worked for AlliedSignal as Senior Staff Engineer and Project Leader before joining the faculty at the University of California Riverside where he held the position of University Scholar, University of California Presidential Chair, and Department Chair. His major recognitions include the Donald Breck Award from the International Zeolite Association, the Nanoscale Science and Engineering Forum Award from the American Institute of Chemical Engineers, the Energy Technology Division Award from the Electrochemical Society, Fellow of the American Association for the Advancement of Science, and Fellow of the National Academy of Inventors. He has been an inventor on 25+ issued or pending patents, some of which were licensed to form startup companies (e.g., NanoH<sub>2</sub>O and W7energy). His research has led to ~250 publications (17,000+ citations, h-index = 72 and average citation/paper = 72, Web of Science). He has advised ~30 PhD students and ~30 postdoctoral researchers in the past ~20 years, ~20 of whom now hold faculty positions worldwide.