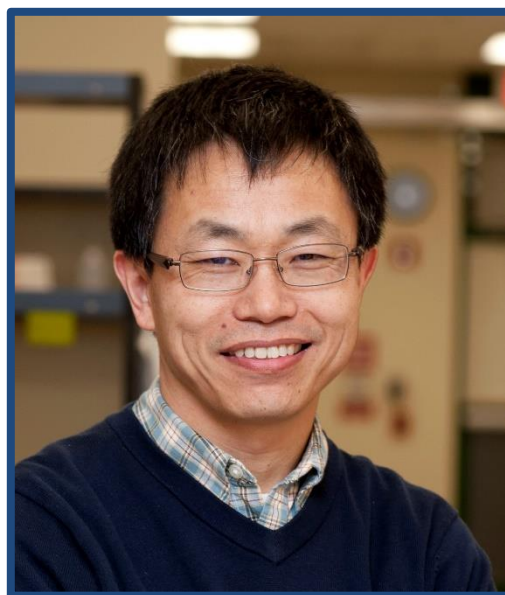


“Toward Platinum-free Fuel Cells for Affordable Zero-emission Vehicles”

Wednesday
October 23, 2019
3:00 pm
Wu and Chen Auditorium
Levine Hall



Yushan Yan
Henry B. duPont Chair
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Abstract

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 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). More specifically, I will focus on our recent discovery of a new family of polymer hydroxide (and other anions) conductors that is chemically stable, ionically conductive, and mechanically robust; and HEMFCs with this new class of polymers showed record fuel cell performance and stability at 95 °C. I will also briefly introduce a new class of crystalline porous polymers that are the most stable among all crystalline porous materials.

Bio

Yushan Yan is the Henry B. du Pont Chair of Chemical and Biomolecular Engineering at the University of Delaware, and the CEO and President of W7energy LLC, a Delaware startup he founded in 2017 to commercialize a new class of ionically conducting polymers. He also recently served as the founding Associate Dean for Research and Entrepreneurship. He studied Chemical Physics (BS) at the University of Science and Technology of China, Catalysis at the Dalian Institute of Chemical Physics, and Chemical Engineering (PhD) at the California Institute of Technology. He worked for AlliedSignal as a senior staff engineer, before joining 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 Breck Award from the International Zeolite Association, the Nanoscale Science and Engineering Award and the Braskem Award for Materials Science and Engineering from the American Institute of Chemical Engineers, the Energy Technology Award from the Electrochemical Society, Fellow of the American Association for the Advancement of Science, Fellow of the National Academy of Inventors, and Fellow of the Electrochemical Society. He is an inventor on 25+ issued or pending patents that have led to startups (e.g., NanoH₂O and W7energy); an author on 250+ journal publications (18,000+ citations, h-index = 73 and average citation/paper = 73, Web of Science); and an advisor for 30+ PhD students and 30+ postdoctoral researchers, with 20+ of them holding faculty positions.