**Fuel Cells and Electrolyzers – From Nano to Macro in 2D and 3D … and More**

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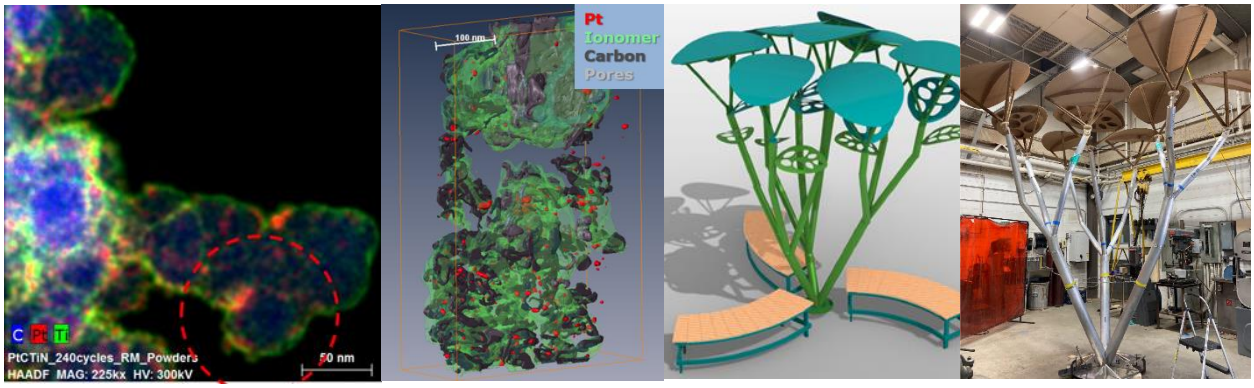
Governments around the world are showing a renewed, unprecedented interest in clean, renewable energy systems, such as fuel cells, electrolyzers, batteries, wind and solar. An especially increased focus is on hydrogen, a zero-carbon and renewable fuel, accelerating the transition to a global hydrogen economy. World-wide, governments, companies and other organizations are announcing new developments, consortia, infrastructure programs, and financial commitments to propel renewable hydrogen production and use [1-3]. The global hydrogen market value is expected to increase from 130 billion USD in 2020 to 201 billion USD by 2025 [4]. Hydrogen offers a unique chance to decarbonize transportation, power generation, and manufacturing sectors and, thereby, address pollution and climate change challenges.

Elecetrolyzers and fuel cells, devices that produce green hydrogen and use the same to generate power, respectively, are at the hearth of this global hydrogen economy boom. However, they still face challenges with performance, cost and durability, which originate from the nano-scale of these devices. This talk will offer an overview of the research activities in the presenter's lab, in particular, the nano-world of fuel cells and electrolyzers. The talk will review advanced 2D and 3D characterization approaches in understanding the catalyst and electrode microstructures and degradation mechanisms. The talk will then cover novel fuel cell designs and fabrication recently completed in the lab. Finally, an interesting project, focused on education in Science Technology Engineering Arts and Math and development of a solar tree to attract interest in clean energy – the UConn STEAM Tree – will be presented.




1. Hydrogen Council. Hydrogen Scaling Up. J Child Psychol Psychiatry Allied Discip. 2017;50(10):1218-1226.
2. Adams J. DOE Hydrogen Heavy Duty Truck Targets. 2020.
3. Papageorgopoulos D. Fuel Cell R&D Overview. 2019 Annu Merit Rev Peer Eval Meet. 2019:33.
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**Biography**

Dr. Jasna Jankovic is an Associate Professor in the Materials Science and Engineering Department at the University of Connecticut (UConn) since 2018. Prior to joining UConn, she completed her Bachelors at Chemical Engineering Department at the University of Belgrade, and Master's and Ph.D. at the University of British Columbia, Department of Chemical and Biological Engineering. After graduation Dr. Jankovic worker for 7 years as a Senior Research Scientist at the Automotive Fuel Cell Cooperation in Burnaby, Canada, a joint venture between Ford Motor Company and Daimler. Dr. Jankovic's research focus is in advanced characterization of fuel cells, electrolyzers and batteries using microscopy and spectroscopy techniques, fabrication of novel electrodes for electrochemical devices, as well as Science, Technology, Engineering and Mathematics (STEM) and clean energy education. She has more than 25 years of experience in clean energy sector, more than 50 publications and 2 patents. Dr. Jankovic is a recipient of several Natural Sciences and Engineering Research Council (NSERC) awards in Canada, and a number of National Science Foundation (NSF) awards and Department of Energy (DOE) sub-awards in the US.