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Halifax, NS

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Location: Atrium AT101



Electronic and Ionically Conducting Polymers for Biologically Inspired Sensing and Advanced Energy Storage Applications

Abstract:

Ionically and electronically conducting polymers are key components in emerging electronic, sensing and energy applications. Understanding their structure and properties is important for designing new systems with higher performance and reduced cost. Our group develops these materials to advance a range of technologies. This presentation will focus on two current areas being pursued in the group including the development of biologically inspired artificial olfaction and the development of membranes for sustainable hydrogen generation. In the area of artificial olfaction, we are developing chemically diverse sensor arrays and signal processing approaches with the goal of creating CMOS integrated circuits that would impart the one remaining sense to machines. In the area of sustainable hydrogen generation, we are developing PEM based electrolyzers capable of using earth abundant catalysts. The goal of this work is to lower the cost and enable the wider use of electrolyzers for green hydrogen generation.

Biography and lab info:

Dr. Freund was born in Gainesville Florida in 1964. He received a B.S. Degree in Chemistry from Florida Atlantic University in 1987 and his Ph.D. in 1992 from the University of Florida. Subsequently, he became a Postdoctoral Fellow in the Department of Chemistry at the California Institute of Technology where his research contributions helped to establish a multi-investigator interdisciplinary research program on the development olfactory-inspired sensor arrays. He began his academic career as an Assistant Professor of Chemistry at Lehigh University before moving back to Caltech as the Director of the Materials Science Center in the Beckman Institute. In 2002, he moved to the University of Manitoba where he attained the rank of Professor and Tier 1 Canada Research Chair in Electronic Materials. During his thirteen years at the University of Manitoba, he has been either lead or co-PI on projects securing over \$30M in research and infrastructure funding through federal and regional funding



sources, which he leveraged to establish the Manitoba Institute for Materials as Director (<http://materials.umanitoba.ca>). He joined the faculty at Dalhousie University in 2018 where he is the Harry Shirreff Professor of Chemical Research and Director of the Clean Technologies Research Institute (<http://dal.ca/ctri>). While at Dal he has established an NSERC funded, graduate training program in energy sustainability (<http://energy.dal.ca>) and has been involved in raising over \$10M in research and infrastructure funding. Dr. Freund has published over 125 articles with over 9,000 citations and has been issued 28 US and 15 international patents.