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An NJIT-BGU Partnership

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CIVIL & ENVIRONMENTAL ENGINEERING SEMINAR SERIES

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Electro assisted adsorption and desorption of per- and polyfluoroalkyl substances

per- and polyfluoroalkyl substances (PFAS) are a group of synthetic organofluorine compounds that are increasingly detected in many environmental matrices such as groundwater. PFAS are linked to liver damage, cancers, and many other health issues. Control of PFAS in groundwater by granular carbon adsorption or ion exchange was shown less efficient for short chained (4-6 carbons) PFAS. Therefore, based on the literature and preliminary data, we hypothesize that externally controlling the surface zeta potential of the adsorbing materials could significantly enhance PFAS adsorption and also regulate the desorption for adsorbent regeneration and further degradation treatment or proper disposal. The proposed research will unravel novel separation and concentration approaches for trace-level short-chained PFAS from groundwater.

This project will develop and evaluate electrically assisted adsorption of a broad range of short chained PFAS using externally charged electrically conducting membranes (ECMs) made of selected carbonaceous nanomaterials (CNMs) or transition metal carbides (MXenes). We will study the adsorption kinetics and capacity under variations of DC charges/currents. Furthermore, we will address electrically assisted desorption and develop mechanistic models accordingly. **Specific Objectives:** (1) Determine PFAS adsorption kinetics and capacities on electrically conductive membranes under electrostatic control in dynamic filtration (2) Characterization of surface adsorption and desorption of PFAS from electrode membrane. (3) Assess the impact of water chemistry on adsorption and desorption of PFAS.

Thursday, March 31st, 2022 | 11:00 AM EDT | 6:00 PM Israel
Click Here: Zoom Meeting Link