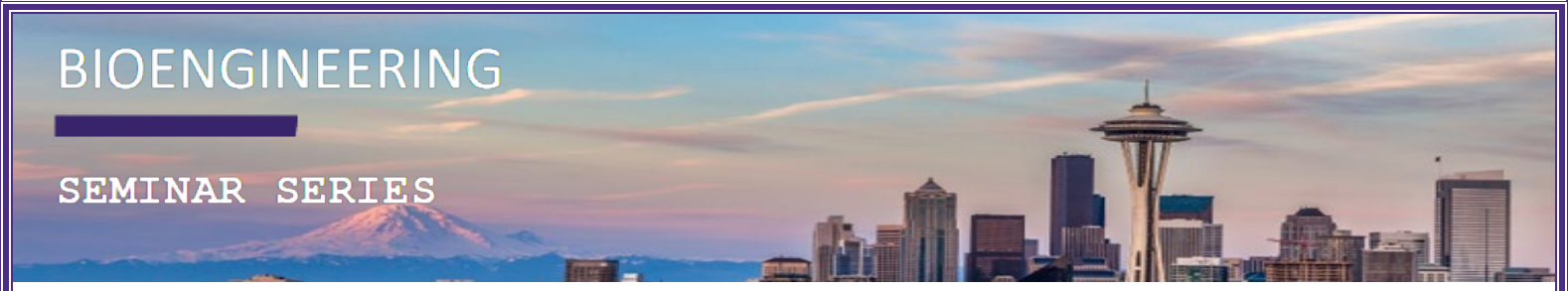

Jessica Ray, Ph.D.

Assistant Professor, University of Washington

Department of Civil & Environmental Engineering

April 11th, 2024

12:30 – 1:00 PM Coffee/Pastry Mixer

1:00 – 1:50 PM, Foege N130

live stream: https://washington.zoom.us/j/92391823761

"Selective, polymer-imprinted activated carbon composite adsorbents for targeted removal of per- and polyfluoroalkyl substances (PFAS) in wastewater"

ABSTRACT: Per- and polyfluoroalkyl substances (PFAS) are a class of over 9,000 different compounds with high thermal and chemical stability due to their C–F bonds. These toxic compounds have been used in many applications and in consumer-end products which has led to widespread dispersion in the environment—particularly in water sources. During water treatment, granular activated carbon is commonly used to separate PFAS from water. Granular activated carbons are sourced from coal and other materials, and thermally and chemically activated to generate a high surface area, high porosity adsorbent. However, granular activated carbon is a nonselective adsorbent with low removal efficiency for small PFAS. Furthermore, once the adsorbent is spent, it is either landfilled where loaded PFAS will be leached, or it is thermally regenerated which can form fluorinated greenhouse gases. To overcome these limitations, our team has developed a new activated carbon sourced from used coffee grounds functionalized with a polymer coating that enables selective adsorption and recovery of PFAS. This talk will highlight our work in developing this novel composite media and its performance under conditions relevant to wastewater treatment.

BIO: Dr. Jessica Ray (she/her/hers) is the Robert and Irene Sylvester assistant professor in the Department of Civil & Environmental Engineering at the University of Washington. Ray joined the University of Washington in January 2019. Previously, Ray was a Miller Institute Postdoctoral Fellow at the University of California, Berkeley investigating low-cost engineered adsorbents for removal of trace contaminants in urban stormwater. This research was part of the NSF Reinventing the Nation's Urban Water Infrastructure (ReNUWIt) engineering research center at Berkeley. Dr. Ray received her B.S. degree in Chemical Engineering from Washington University in St. Louis in 2009. Upon graduation, Ray remained at Washington University in St. Louis to obtain a M.S. degree (2010, funded by the NSF GK-12 Graduate Research Fellowship) and a Ph.D. in Energy, Environmental Engineering & Chemical Engineering (2015, funded by the EPA Students to Achieve Results (STAR) Fellowship). During her Ph.D., Ray employed surface chemistry techniques to investigate interfacial reactions of nanomaterials in water. At the University of Washington, Ray's research program utilizes a multidisciplinary platform that bridges materials science, and environmental and surface chemistry to increase urban water supply sustainability.