DEPARTMENT OF CHEMISTRY AND ENVIRONMENTAL SCIENCE
SEMINAR SERIES
FALL 2022

WEDNESDAY, OCTOBER 12, 2022
TIERNAN HALL – LECT. HALL 1
1:00PM-2:20PM

GUEST SPEAKER

Dr. Anyin Li
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University of New Hampshire
Durham, NH

TOPIC

Exploring Electrospray Ionization Mass Spectrometry in the femto Regimes

ABSTRACT

Electrospray ionization (ESI) is an indispensable mass spectrometry method that has won Nobel prize in 2002. Decades' research has witnessed the development of ESI in microflow, nanoflow, and picoflow regimes. These conventional ESI methods are known to produce ionization currents higher than nanoamps (nA).

Recent research has developed methods to generate ESI in femtoamp (fA) currents and femto flow (fL/min) flow rates. In this seminar, we will inspect the new look of ESI in the femto regimes, in which theoretical limits of ionization current, flow rate and ionization efficiency are yet to be established. When generating nanoscale initial charged droplets, the femto ionization regimes provide improved performances for hydrophilic analytes including glycans, glycopeptide, and intact proteins. This seminar also showcases how the low ion current regime may be utilized to directly ionize environmental contaminants in nonpolar extraction solvent. Lastly, we explore how the individual ions generated by femto ESI may be applied for charge detection mass spectrometry and preparing single atom catalyst.

BIO

Dr. **Anyin Li**, B.S. in Chemistry from the Beijing Normal University; Ph.D. in Analytical Chemistry from Purdue University under the supervision of Dr. Graham Cooks; and then Post doctorate training with Dr. Facundo Fernandez in the NSF-NASA CCE center in the Georgia Institute of Technology. Since 2017, Dr. Li has joined the University of New Hampshire (UNH) as an assistant professor in the Department of Chemistry.

Dr. Anyin Li's research interest is focused on the fundamental science of ionization for mass spectrometry and beyond. His research group has developed methods to push electrospray ionization mass spectrometry into the femto territories for the first time. femto ionization regimes are explored to boost the sensitivity for hydrophilic analytes such as glycans and native proteins, to directly ionize environmental contaminants, to generate individual ions for charge-detection mass spectrometry, and to deposit individual noble metal atoms on nanostructures. In his research career, Dr. Li has yielded >20 peer-reviewed publications and 3 patents.

Outside scientific research, Dr. Li is interested in the technologies of fishing and cooking, which is largely overruled by his recent duty of being father of three children.

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