

Analytical Chemistry Seminar

Tuesday, January 23, 2024
3:30 p.m. ~ WTHR 320

"Harmony in Vibrations: Exploring Analytical Frontiers with ATR SEIRA"



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Abstract:

The fusion of Attenuated Total Reflection (ATR) and Surface-Enhanced Infrared Absorption (SEIRA) spectroscopy in ATR SEIRA has given rise to a potent analytical tool for investigating molecular vibrations at the nanoscale. This technique combines the strengths of ATR and SEIRA, allowing for nuanced exploration of molecular adsorbates on surfaces with heightened sensitivity. By leveraging the resonance of localized surface plasmons in nanostructured materials, such as metal nanoparticles, ATR SEIRA amplifies infrared signals from adsorbed molecules, finding applications in catalysis, biochemistry, and environmental monitoring. ATR SEIRA's exceptional spatial resolution and sensitivity make it indispensable for scrutinizing molecular monolayers and thin films on surfaces. In biomolecular studies, it has proven crucial for dissecting the structure and dynamics of proteins and nucleic acids at interfaces. Additionally, its role in catalyst and nanomaterial characterization has contributed to the development of advanced materials. As a non-destructive and label-free analytical technique, ATR SEIRA continues to advance surface science, promising ongoing innovations in nanotechnology and analytical chemistry.

Bio:

Temitope Olayemi is a second-year graduate student in the Alex Laskin group. He graduated from the University of Lagos in 2015 with a B.S. in chemistry. His undergraduate research, advised by Dr. Akeem Abayomi, involved evaluating the Redfield ratio, and balance between phosphates and nitrates in the Lagos lagoon. In the fall of 2022, he joined Dr. Alexander Laskin's lab where he focuses on the use of Spectromicroscopy, specifically x-ray imaging, for the characterization of atmospheric aerosols for single and bulk analysis.