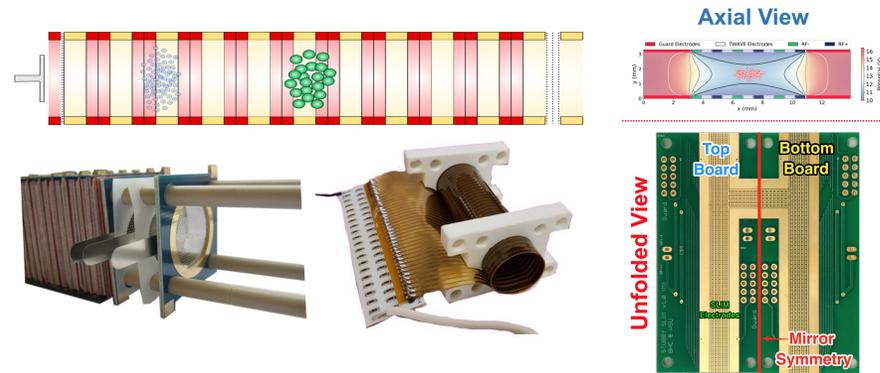




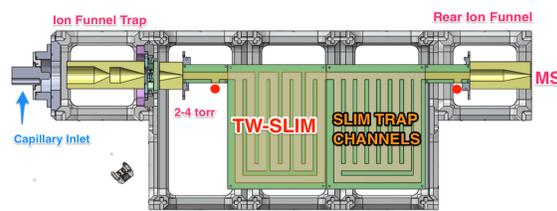
Who We Are

Our group broadly focuses on the development and application of ion mobility spectrometry (IMS) and mass spectrometry (MS). In addition to a core focus on analytical chemistry, group interests often intersect with other fields including physics, computer science, forensics, biochemistry, and electrical engineering.



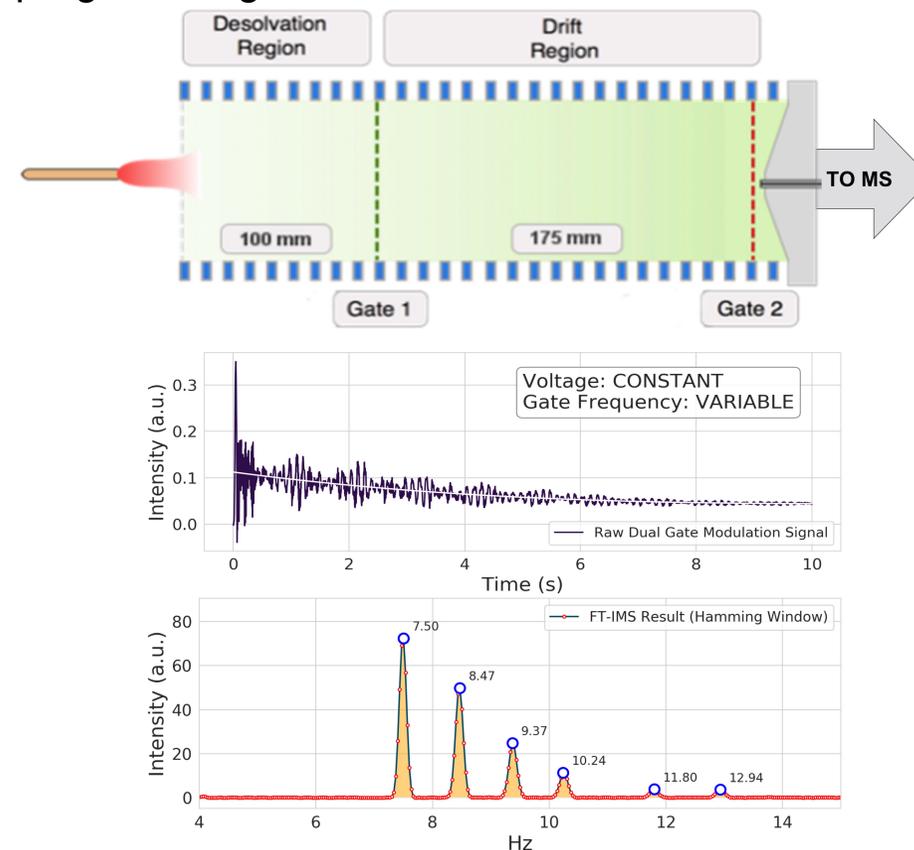
Instrumentation

To augment student development, our research group has access to a wide variety of ion mobility and mass spectrometers including multiple linear ion traps, a triple quadrupole mass spectrometer, and a prototype trapped ion mobility-time of flight mass spectrometer. Students are encouraged to construct and apply their own ion mobility instrumentation using the tools established by our group and an open-sourced ion mobility initiative.



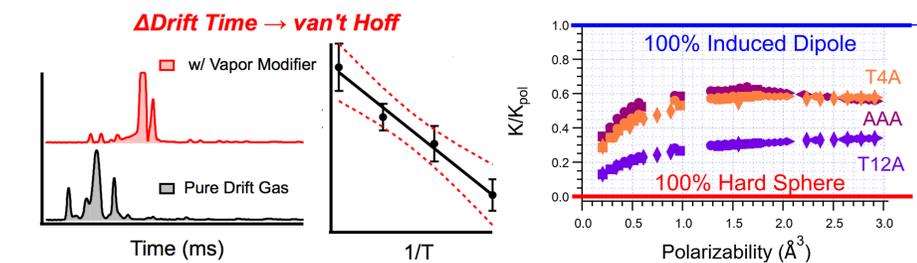
Signal Processing and Data Analysis

To maximize the efficiency of data collection our group has pioneered a range of signal modulation approaches that find utility in the fields of IMS and MS. Signal modulation approaches remain an essential aspect of the research portfolio within the group. The increased throughput and complexity of datasets will allow students develop and strengthen their programming skills.



Theory

While the underlying theories behind IMS are well established, the consequences of some key assumptions are not always recognized or truly understood. Our group aims to experimentally challenge these common assumptions using experiments such as those those which probe ion clustering, reaction kinetics, and thermodynamics.



Applications

Driven largely by the interests of the students and the existing group funding profile, applications include enhancing resolution for security application, glycan analysis using ultraviolet photofragmentation, and untargeted metabolomics and proteomics using hybrid separation schemes and mass spectrometry.

