

## **Big Particles – Practical Aspects to Trapping Ultra High Masses**

A workshop hosted by the Ion Trap Interest Group at the  
69<sup>th</sup> ASMS Meeting on Mass Spectrometry and Allied Topics  
Tuesday, November 2, 2021

Presided by: Theresa Evans-Nguyen and Dalton Snyder

The workshop began with a brief introduction of the speakers. Desmond Kaplan opened with a heartfelt tribute to Jochen Franzen in light of his recent passing. The Bruker pioneer left an incredible legacy of work in mass spectrometry with major contributions to the field of ion traps. The presentation included fond remarks gathered from friends and collaborators spanning his long and impactful career.

Earlier in the day, an oral session was notably featured on the formation and detection of big ions. By contrast, the objective of our evening workshop was to open a discussion of the current state of the art in ultra-high mass ion traps as experienced by leading research groups in the field. Given restrictions of panelists' in-person attendance, only three speakers were able to commit: Prof. Peter Reilly from Washington State University, post-doctoral fellow Kenny Lee at the University of Wisconsin, and graduate student Daniel Botaman at Indiana University. In the end, this panel make-up ended up providing different career stage perspectives on the topic of big ions. Peter Reilly kicked off the talks with a history of his work beginning in aerosol analysis using digital ion trapping technology. Kenny Lee, currently in Joshua Coon's lab, then spoke of his graduate work in McLuckey lab where he built a digital ion trap for high mass protein complexes towards native mass spectrometry. Finally, Daniel Botamanenko presented from Martin Jarrold's lab where work continues in charge detection mass spectrometry. He presented on their simulation and design work for next generation traps.

Among questions for the speakers, it was conveyed that obstacles of highly specialized electronics integration and development constrain progress and more widespread investigation. Dr. Reilly provided context for prior aerosol studies and the limitations of digital trapping electronics which had hindered adoption of digital waveforms. Audience questions were also openly solicited and indicated some industry interest in future development such as in applications for the biopharmaceutical market. It appeared that some potential stakeholders/ end-users had unique perspectives to advise on the application space and further input should be sought.

Attendance was roughly only 20 attendees, unsurprisingly light given the on-going pandemic. The topic of big ion trapping may be worthwhile re-visiting in a future ion trap workshop.