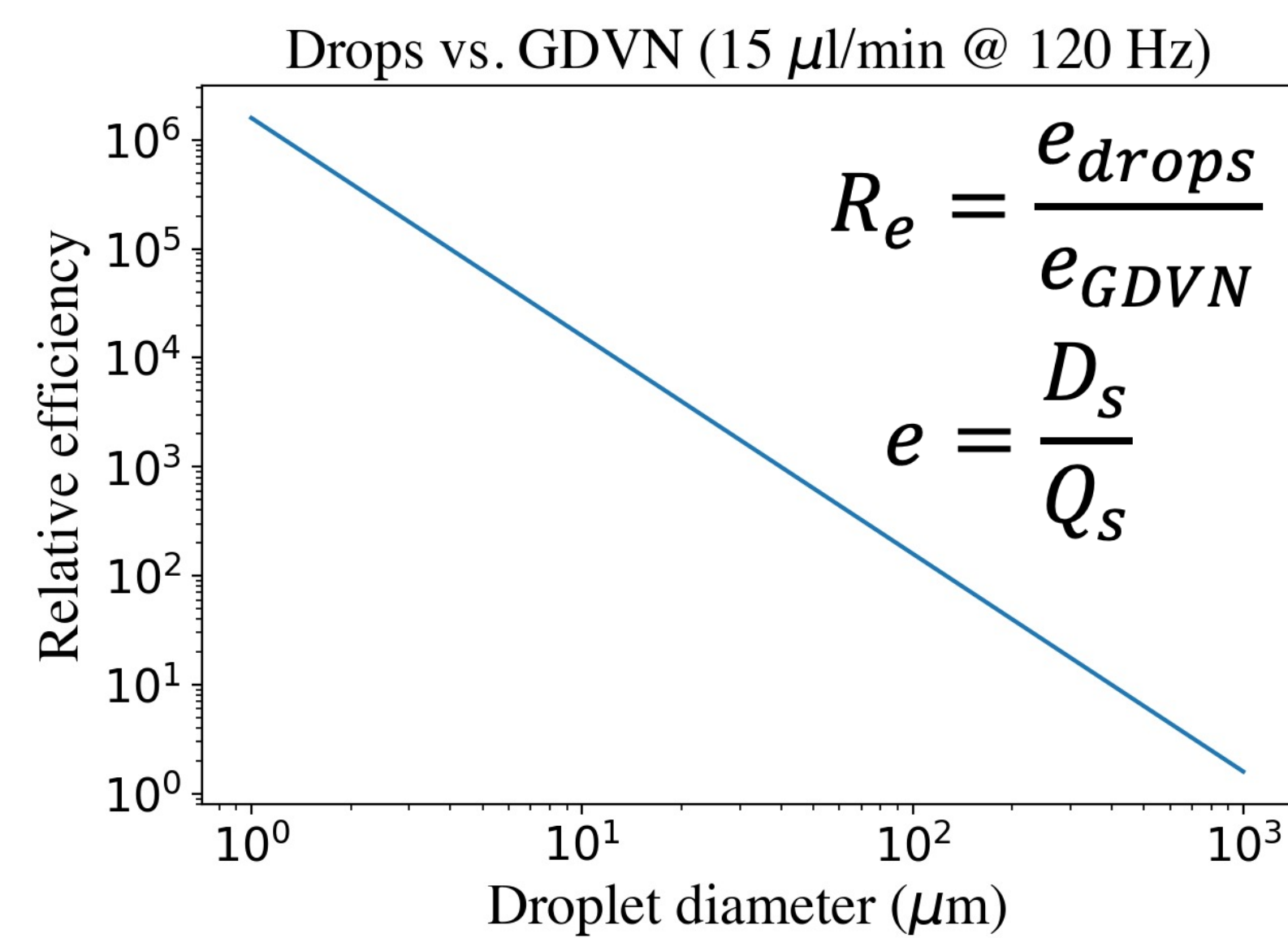


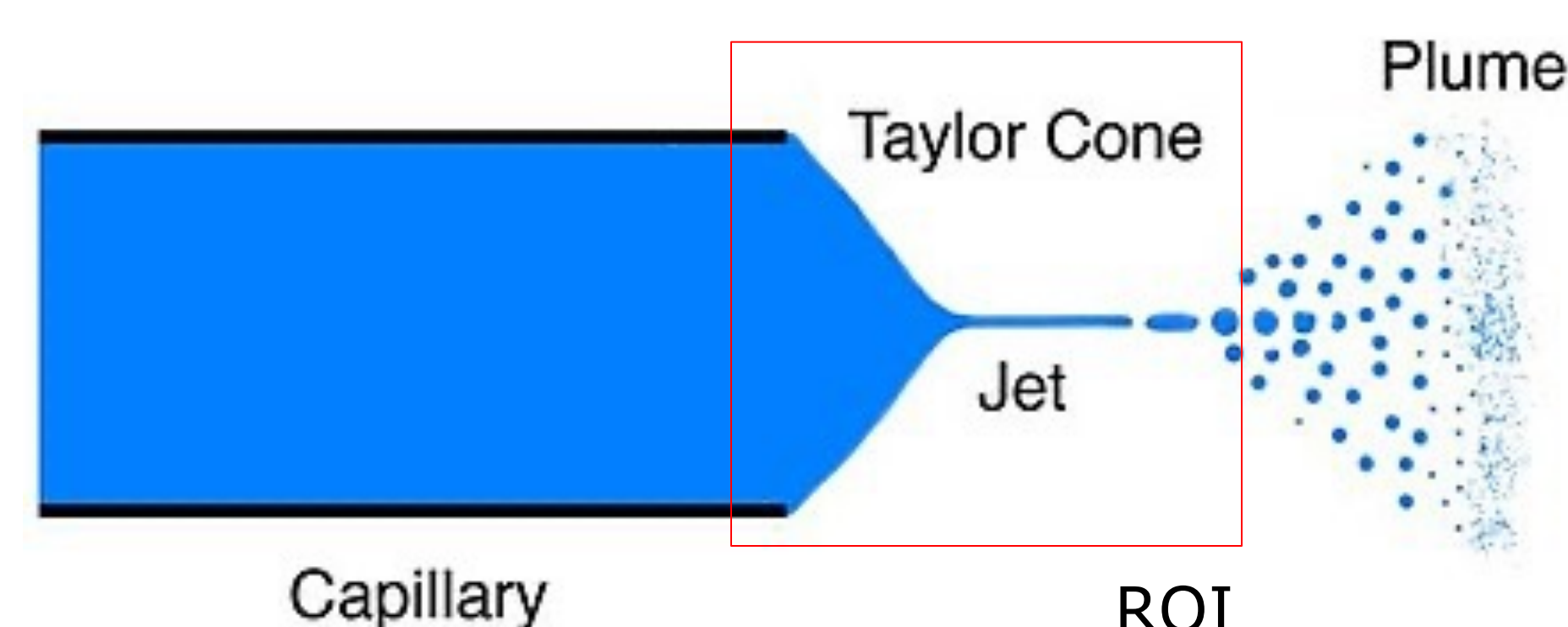
Towards Nano-Droplets: Construction and Characterization of Electrospray Droplet Generator

Roberto A. Alvarez¹, Yulia Lisova¹, Adil Ansari¹, Richard A. Kirian², Ray G. Sierra², and Mark S. Hunter²

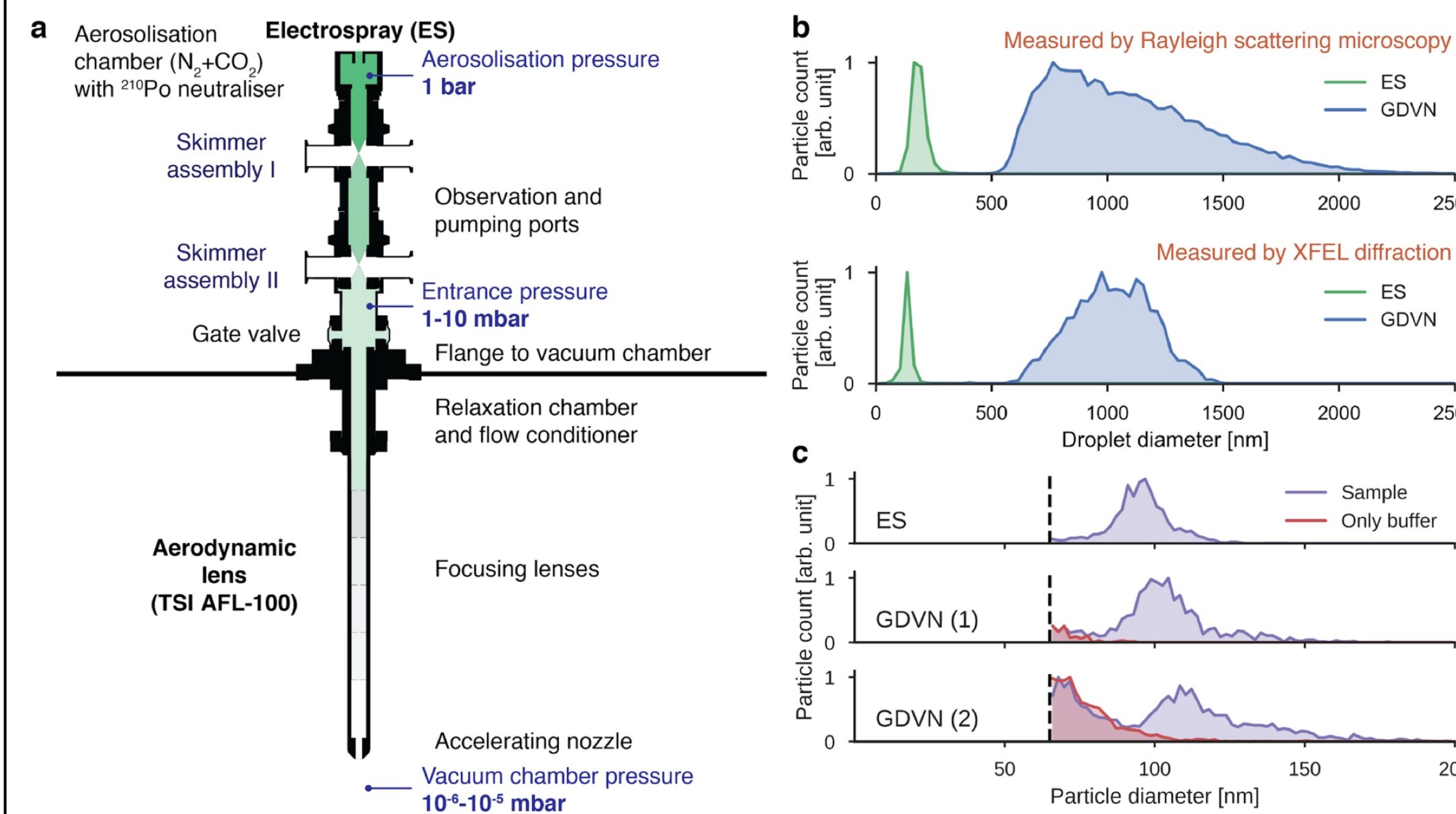
Introduction



- Fluctuation X-ray Scattering
- isotropic solutions generate angularly non-isotropic scattering patterns
- Single Particle Imaging
- Nanodrops
 - Improved Signal to Noise
 - Reduced Sample Consumption
 - Synchronous Sample Delivery
- Electropray
 - Wilson and Taylor (1925)
 1. Applied electric fields to soap bubbles
 2. High electric fields caused the bubbles to stretch
 3. Eventually part of the bubble pulls apart and becomes a separate bubble
 - Charging by Induction

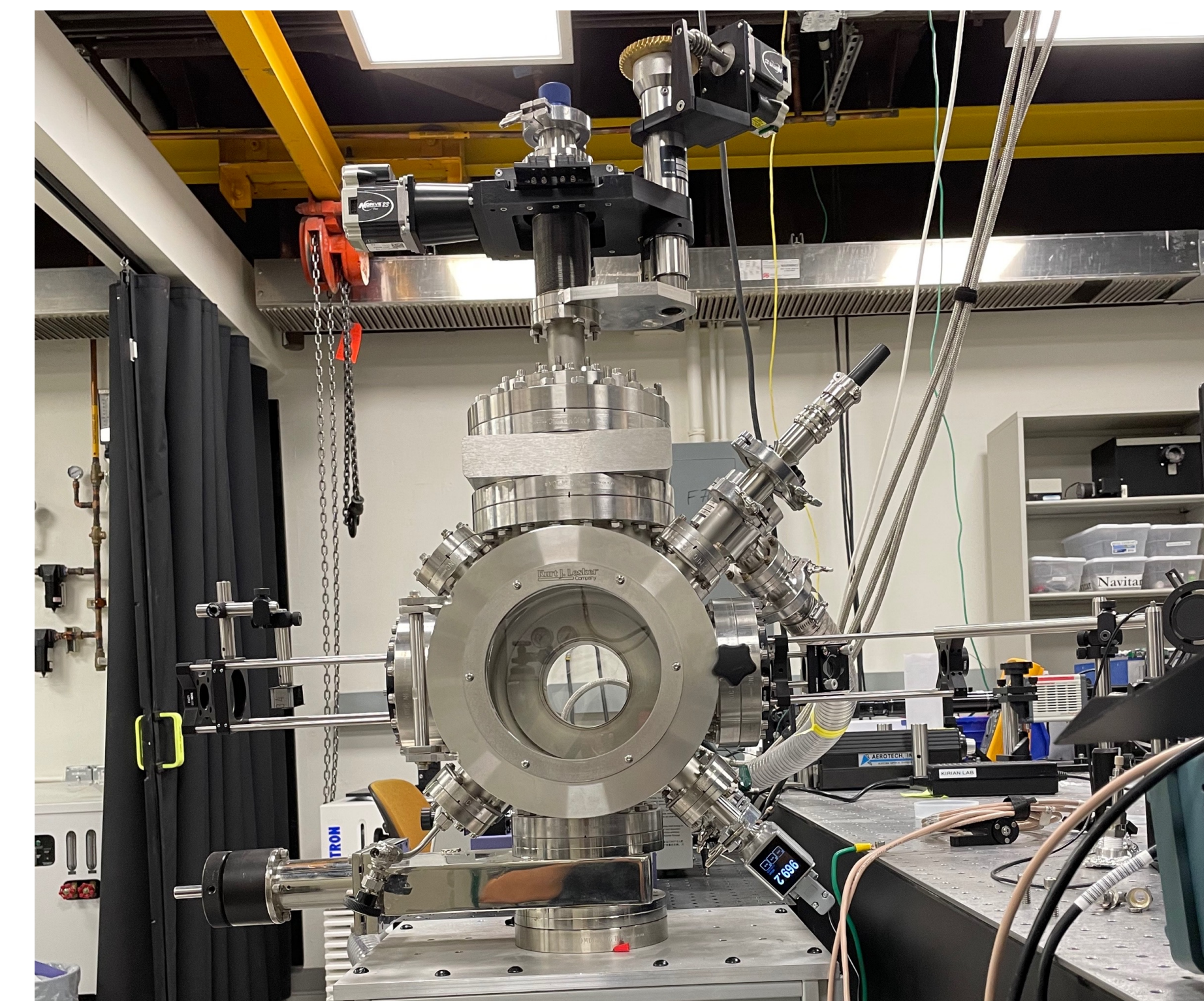
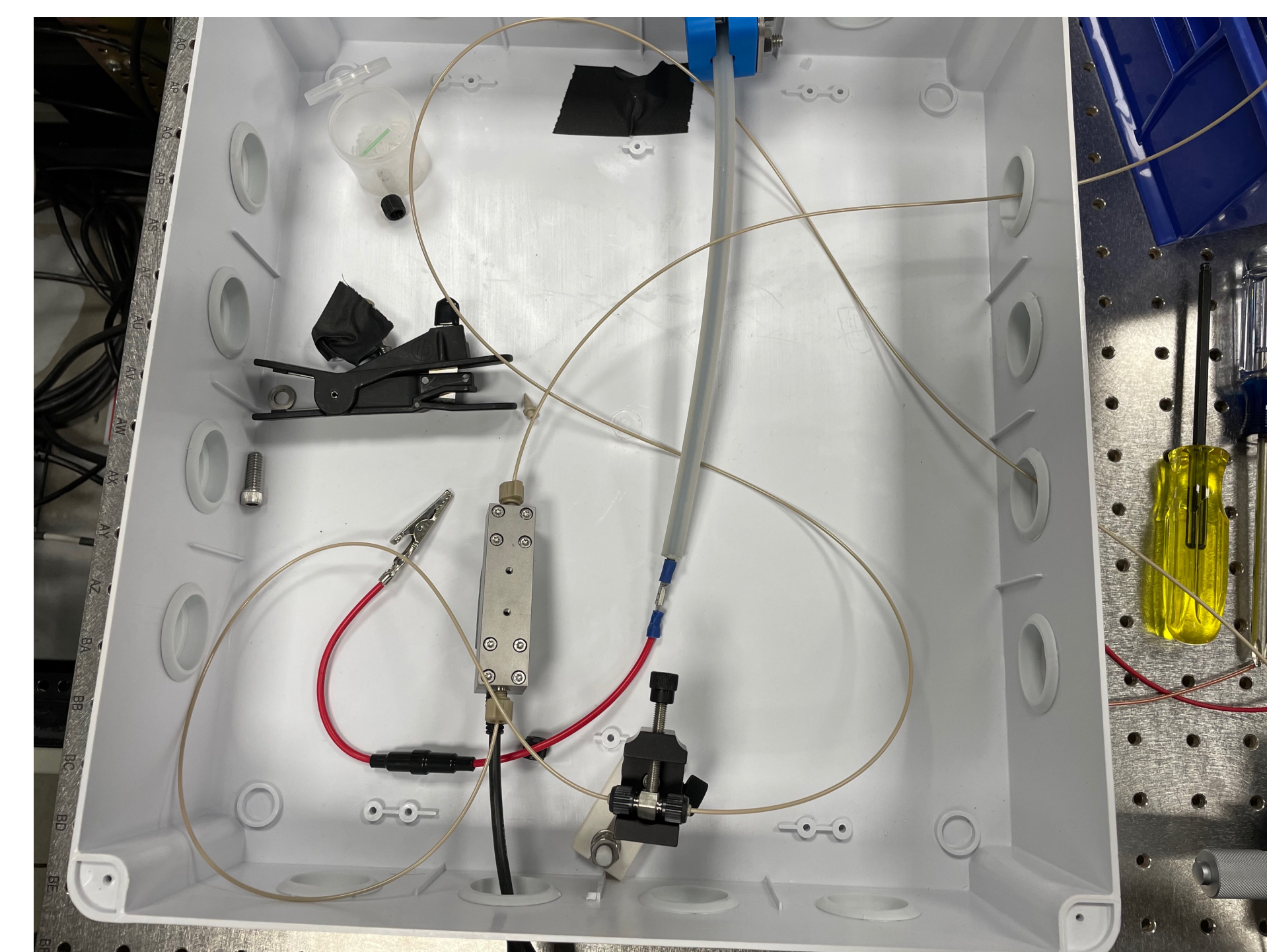
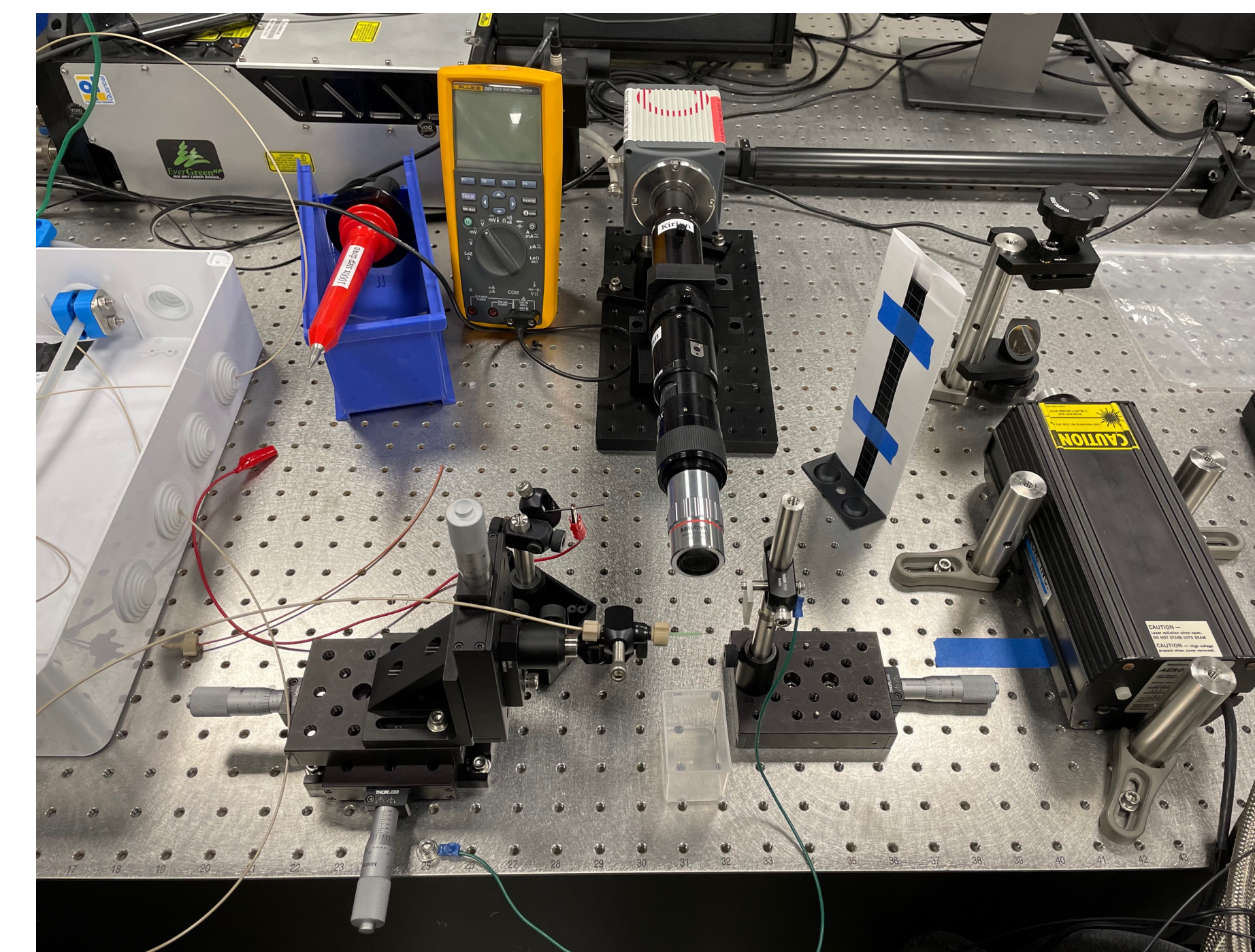
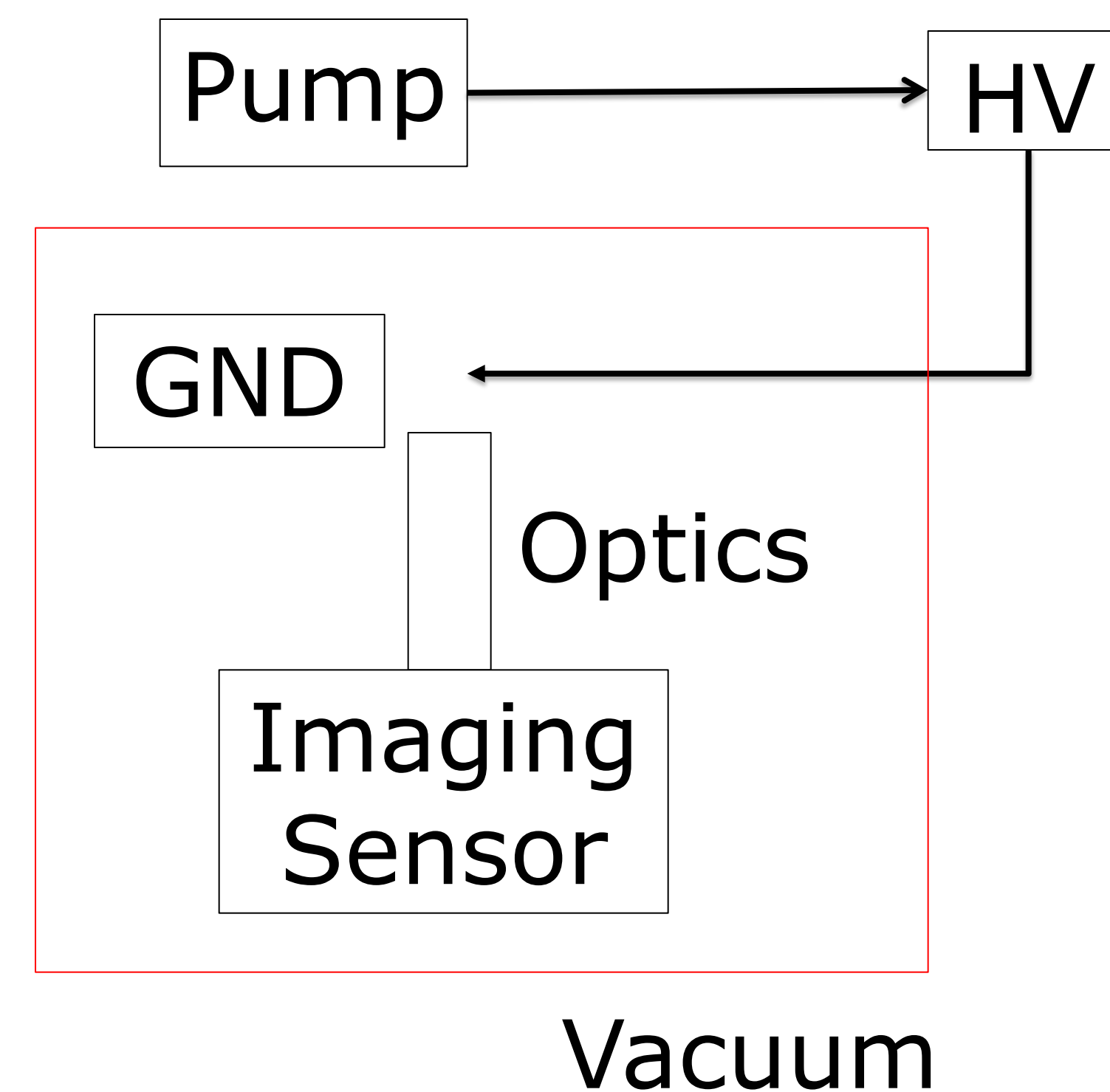


Electrospray

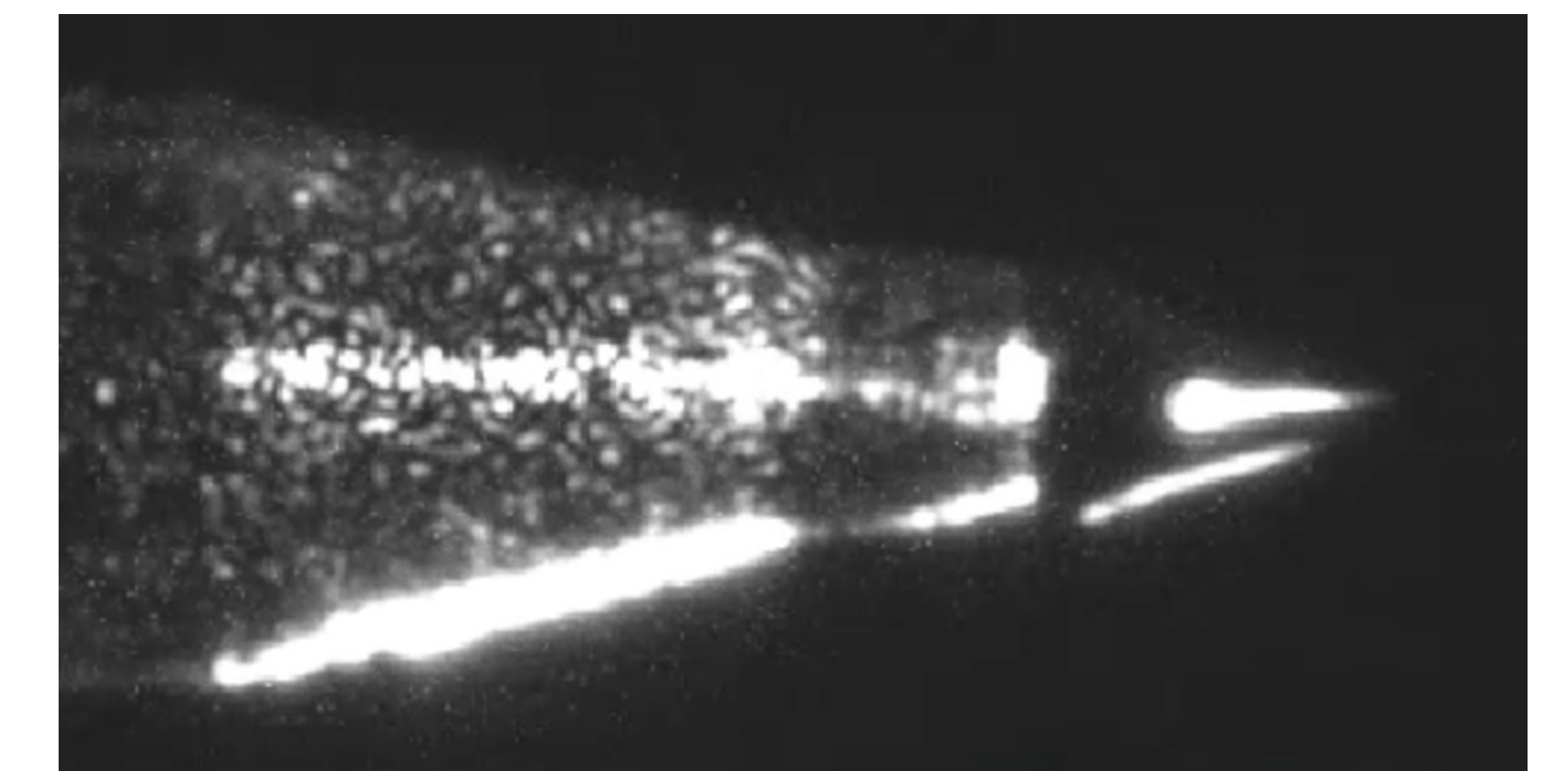


- Taylor cone $\phi \approx 98.6^\circ$
- Taylor Cones:
 - 0.1 M $\text{NH}_3\text{CH}_3\text{COOH}$
 - Peg solutions
 - Conical capillary
 - Flat capillary
 - Not on GDVN

Bielecki, Johan, et al. "Electrospray sample injection for single-particle imaging with x-ray lasers." *Science advances* 5.5 (2019): eaav8801.



Conclusion



- Conclusions:
 - Electro spraying at 2.5-3.5 kV
 - More charge carriers
- Future Work:
 - Hydrodynamic resistance
 - GDVMesh

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