Design and Placement for SiPMs in ALPHA's Atom Trap

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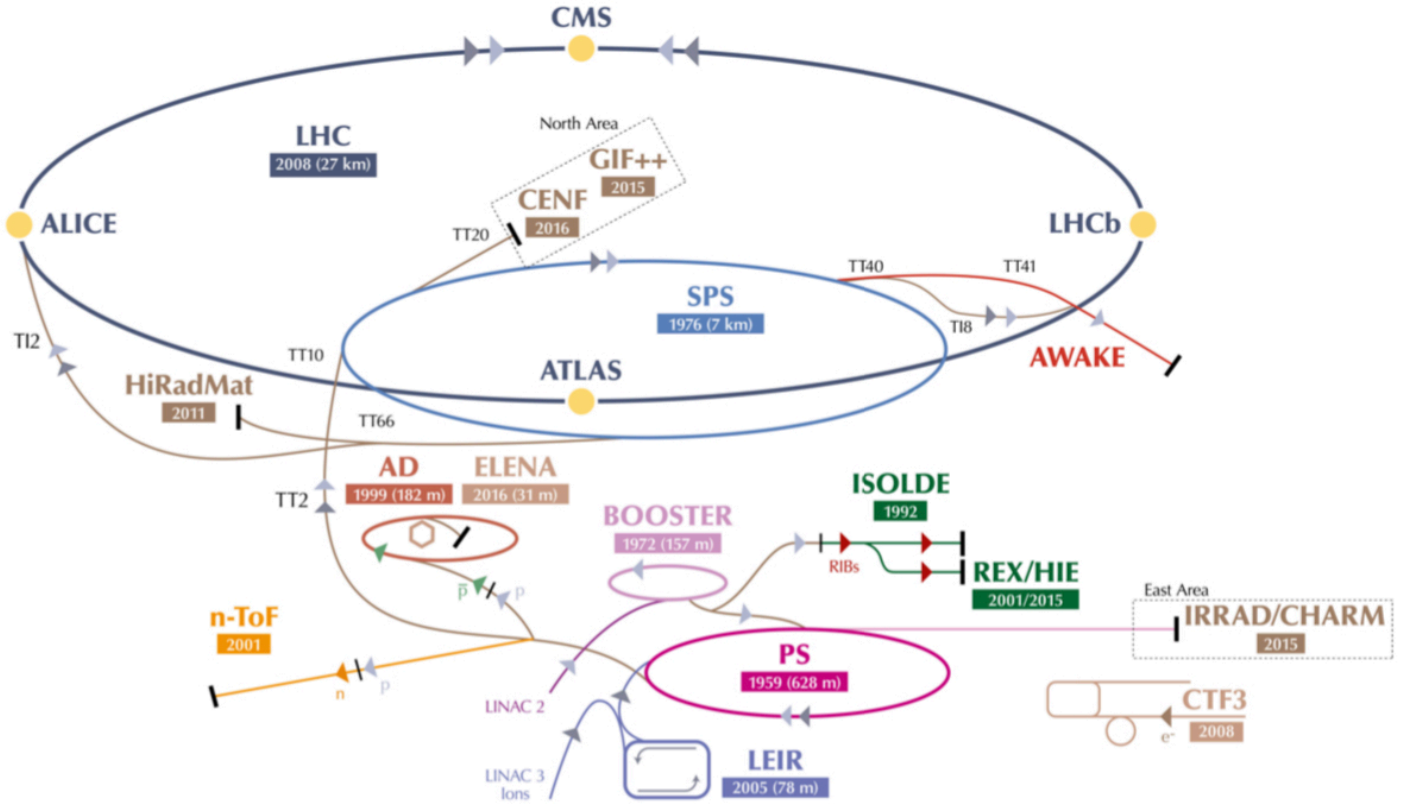
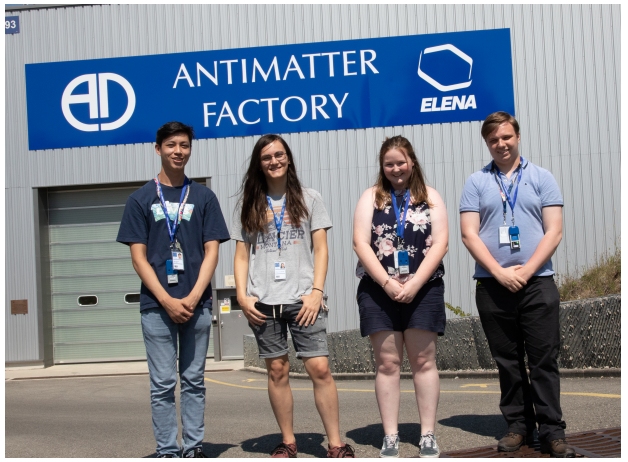
CERN Summer Student 2022

What do we do at ALPHA?





Two main experiments

- Spectroscopy measurements,
- Gravity measurements on antihydrogen.

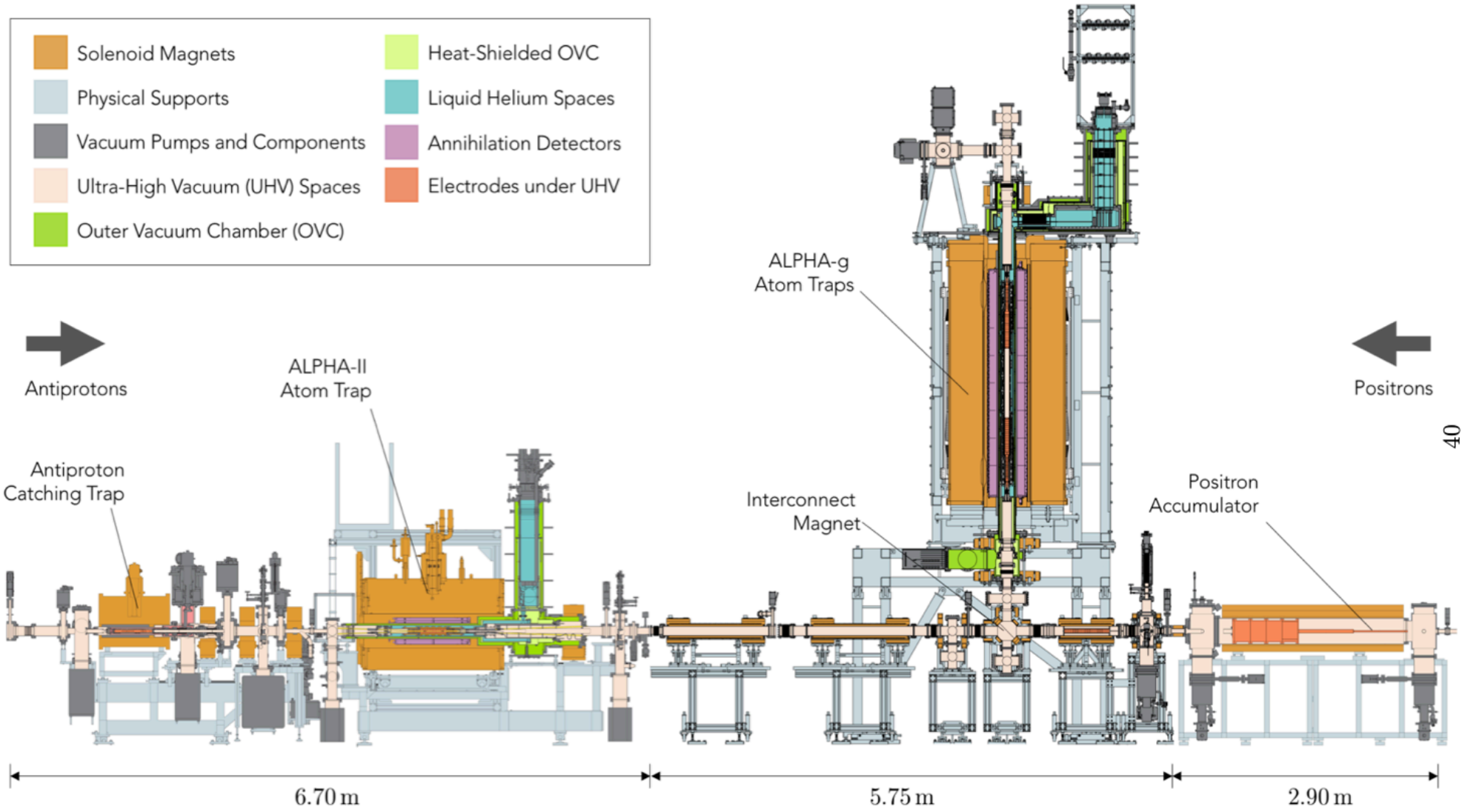
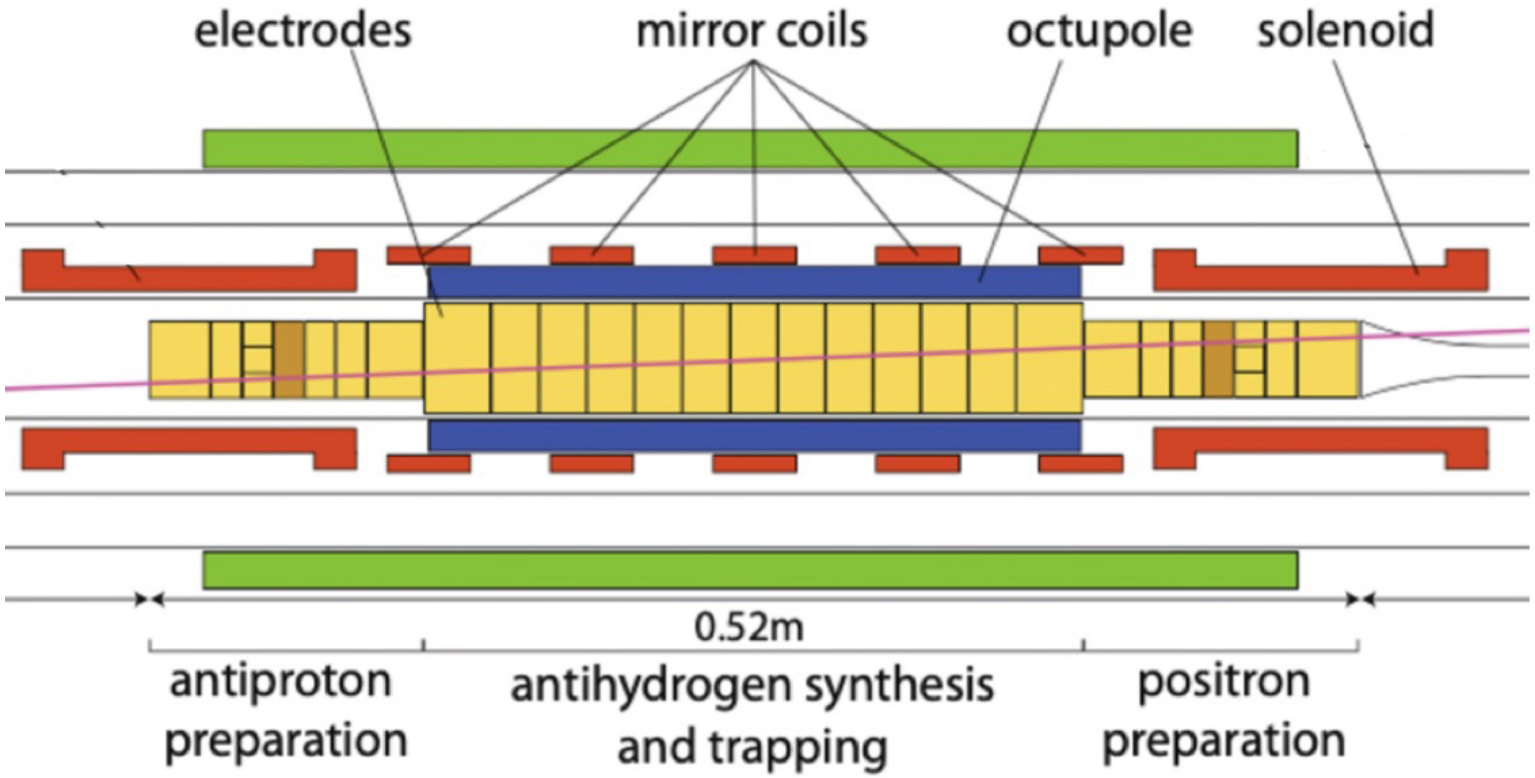


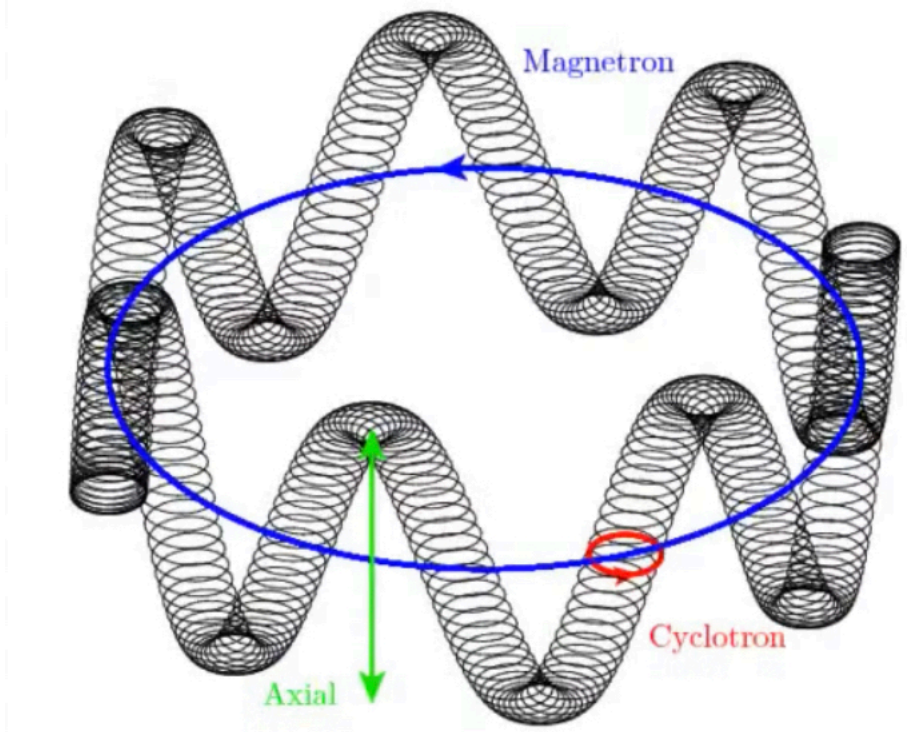
Figure courtesy of Dr. Mark Johnson



ALPHA's unique magnetic minimum trap for neutral particles
Penning malberg traps for charged particles

ALPHA-2 diagram from https://doi.org/10.1038/s41467-021-26086-1

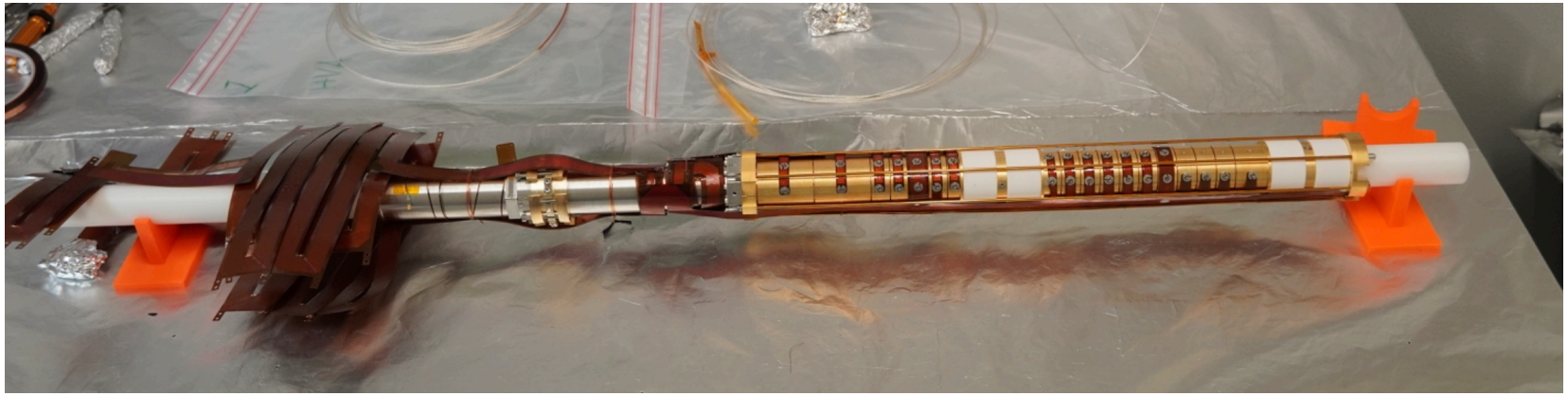
Trapping charged particles

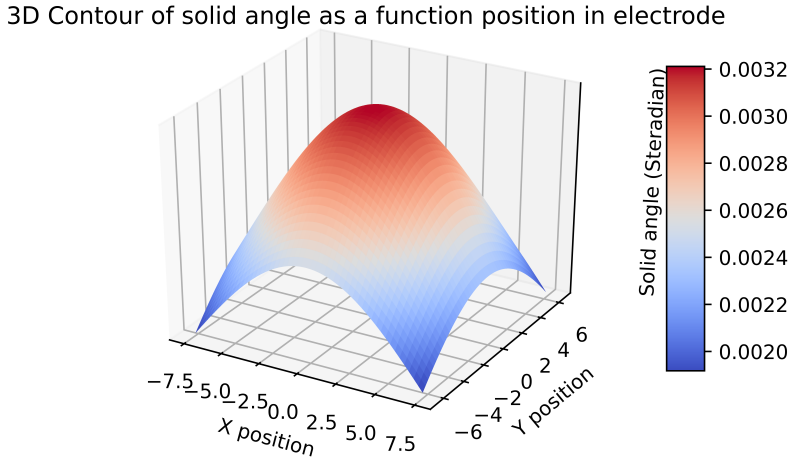


Superposition of three harmonic oscillators

Cryogenic Penning-Malberg trap.

- Combination of static electric and magnetic fields to trap particles.





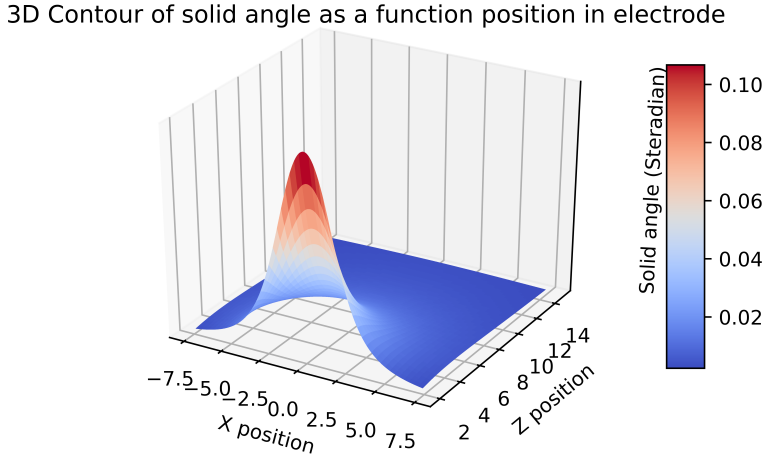
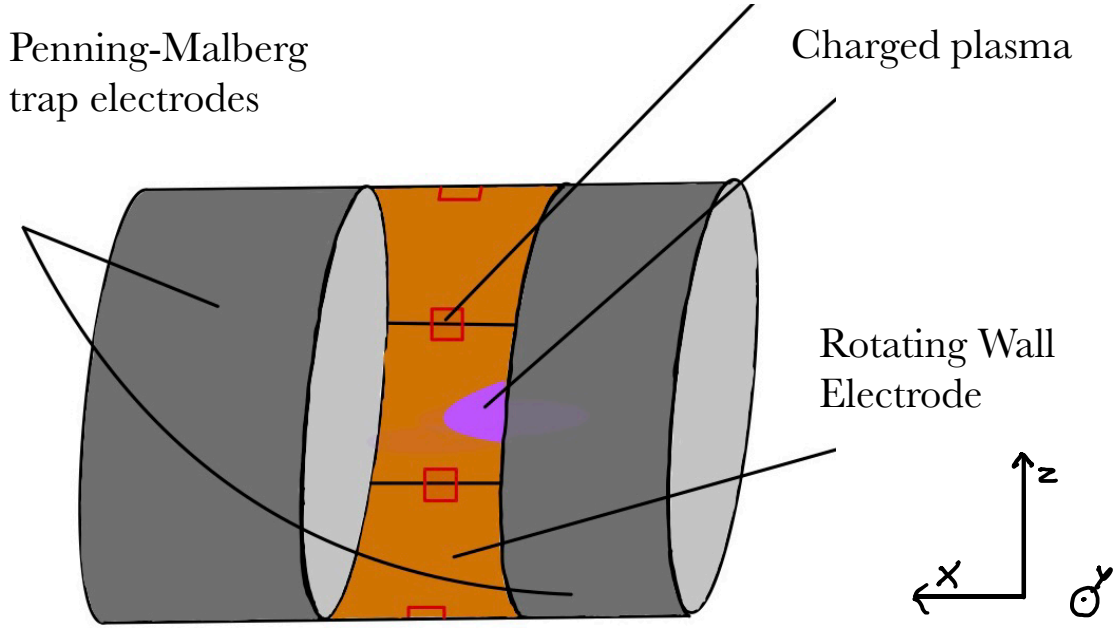
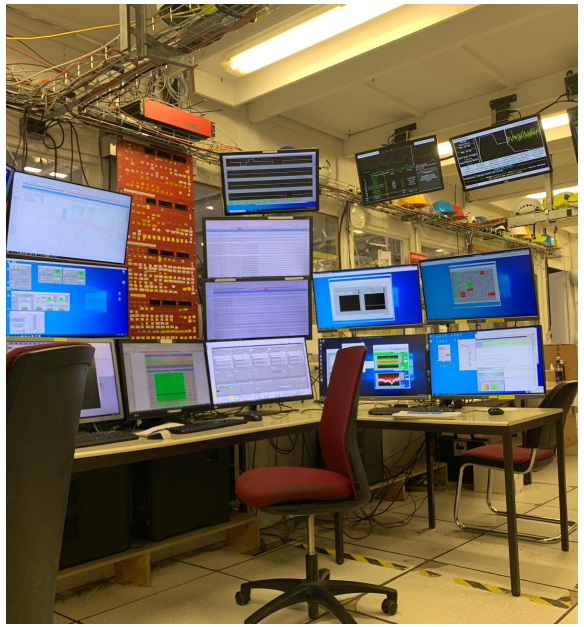
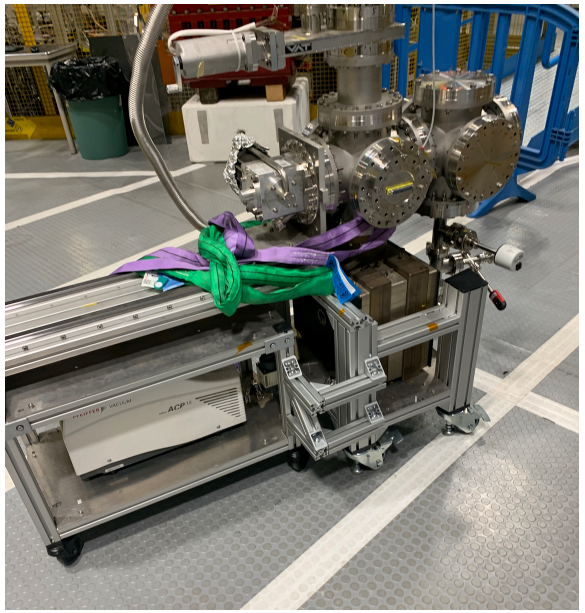


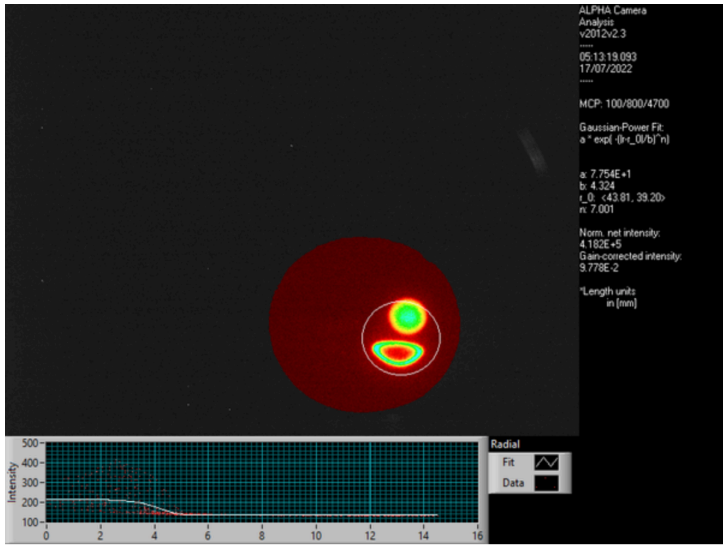
Diagram showing “the plan” for upgraded electrodes, with incorporated dectectors.



The running, maintenance, and data taking within the ALPHA experiment...







Thank you for listening!