How to Assemble a Cryocube

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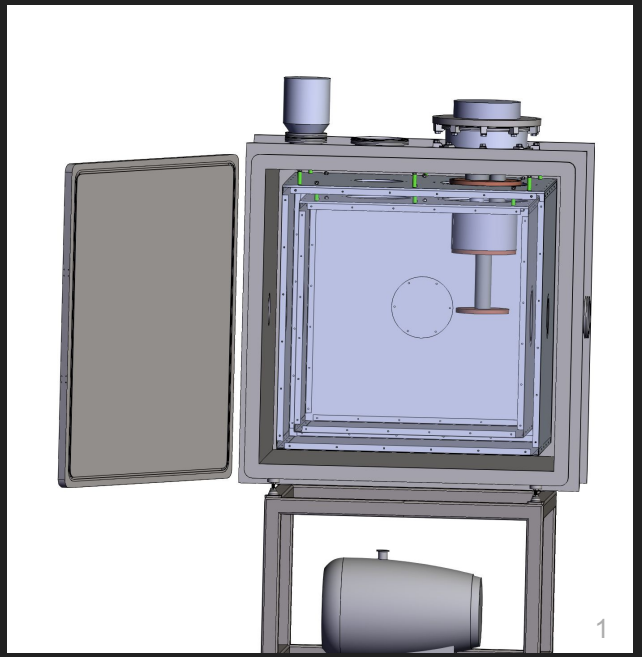
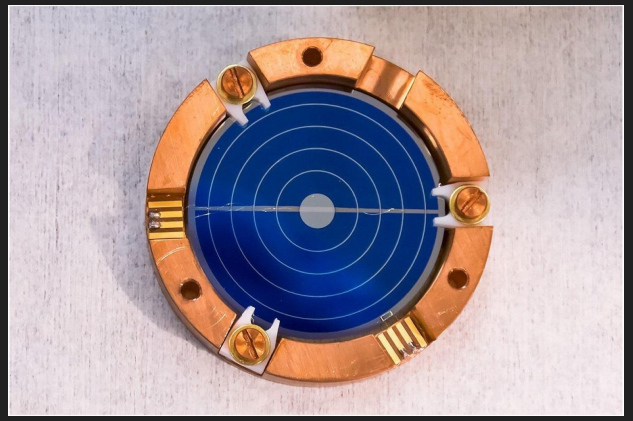
Maruyama-Heeger Group

ALPHA, HAYSTAC, CUORE, CUPID

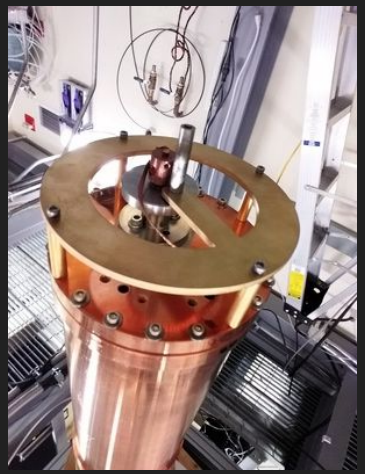


Experimental Setup and Goals

- Cryocube is a cryogenic testing environment



Light Detector
(V. Novati et al, 2018)

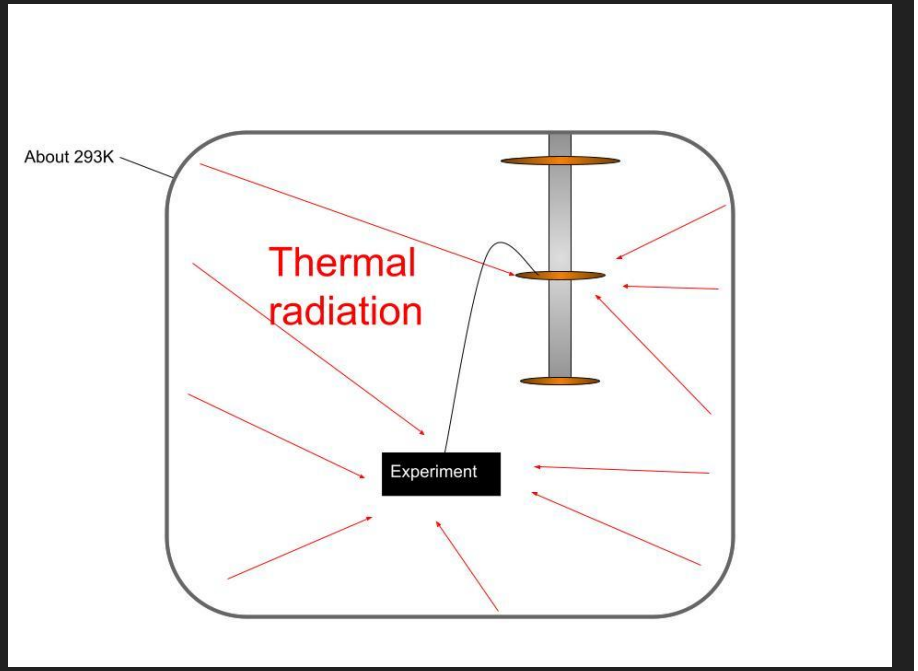


HAYSTAC cavity
Steve Lamoreaux,
LabArchives

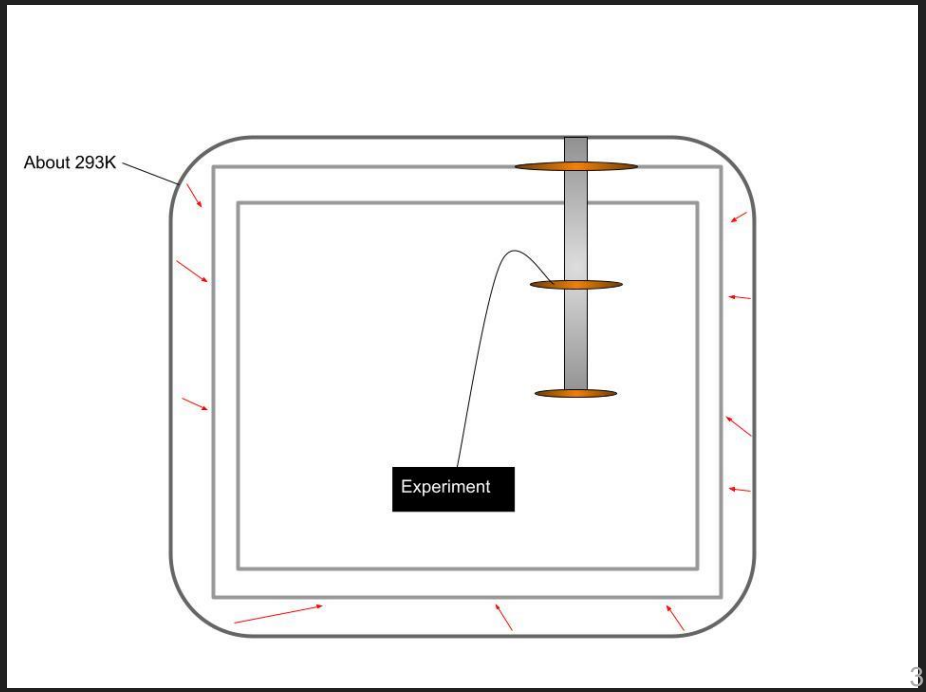
- More efficient than putting them in their experimental setups

Experimental Setup and Goals

Problem:



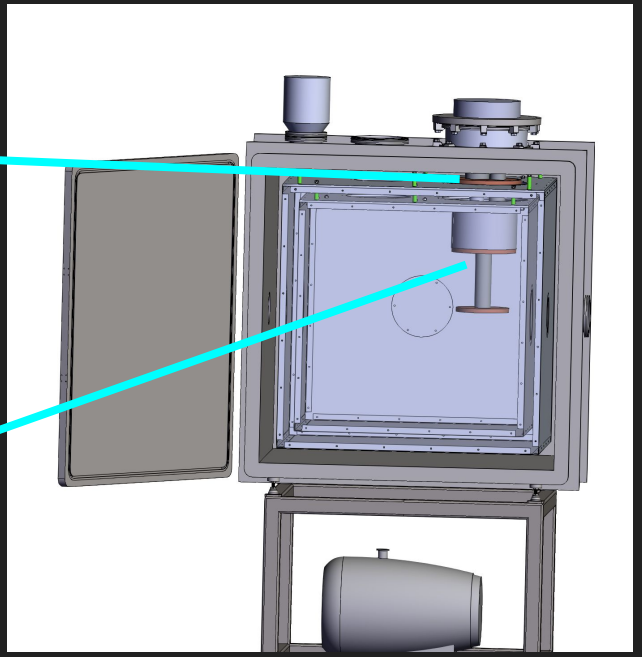
Solution:



Experimental Setup and Goals

40K stage

4K stage



Challenges and Achievements

Cleaning Plates

Plates very dirty

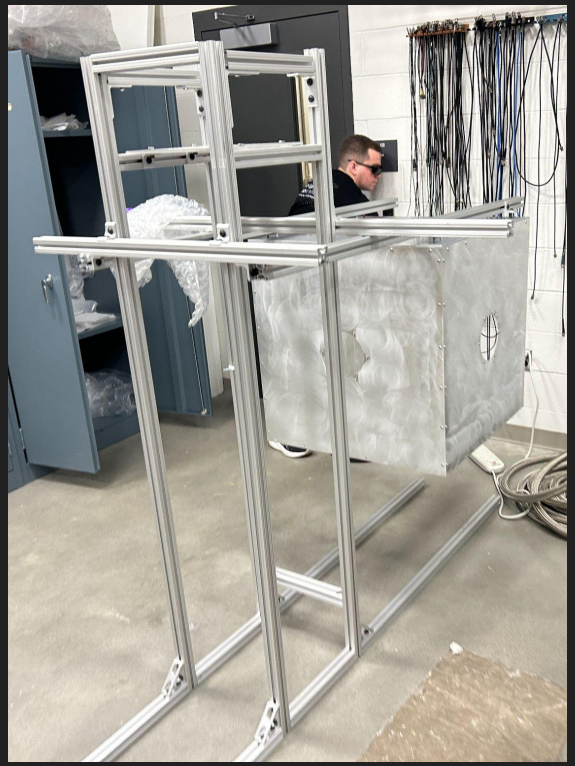
Orbital sanded, which produced aluminum dust

Cleaned with water→Simple Green→ethanol

Assembly Stand

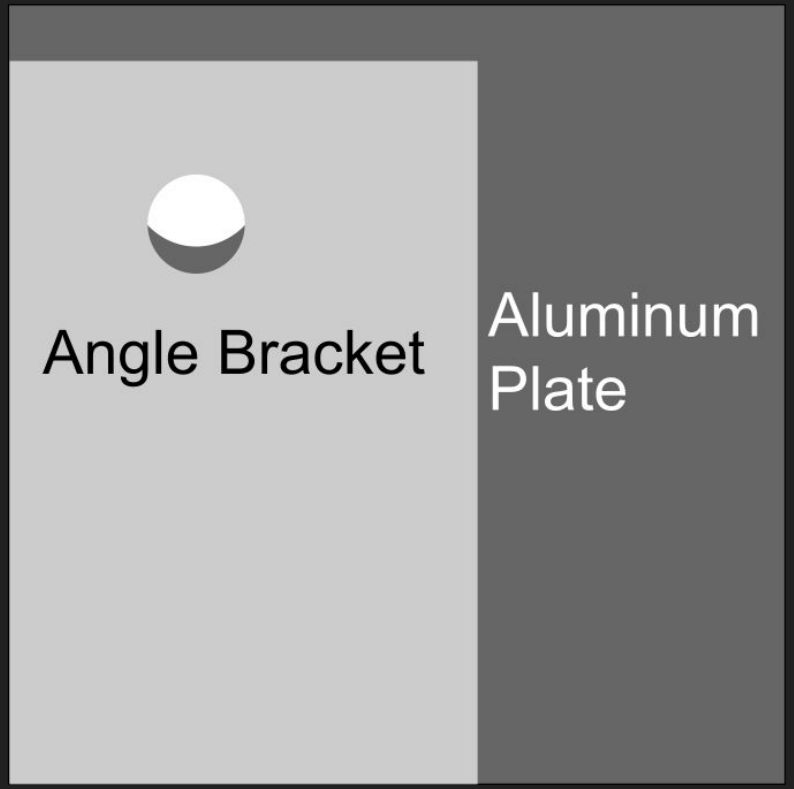
Upgraded this thing

Has arms and legs now

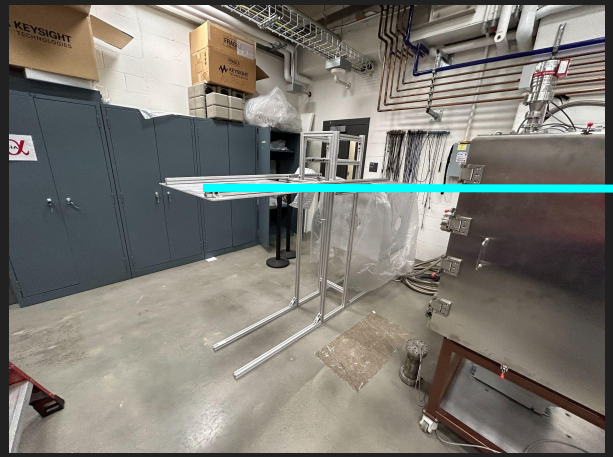


(box hanging off the arms was not attached at this point yet)

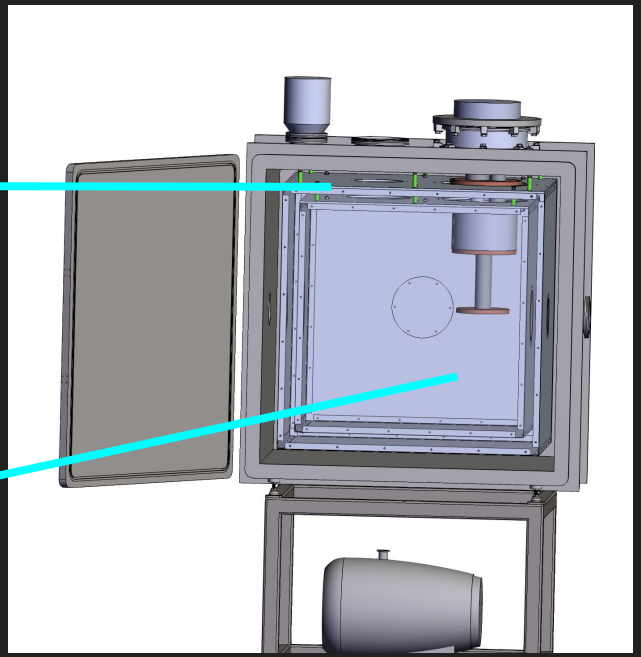
Angle Bracket-Mediated Assembly



4K Preliminary Completion and 40K Initiation



Top of 40K shield

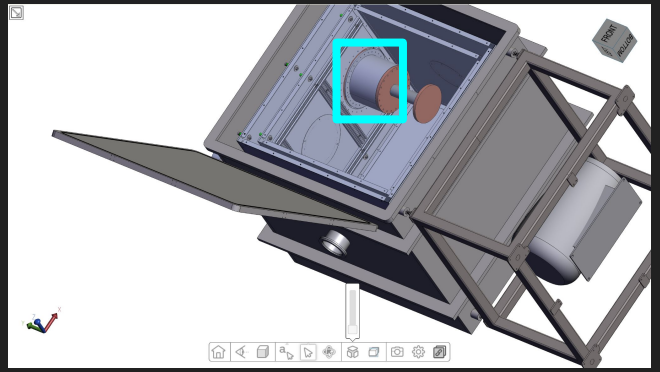


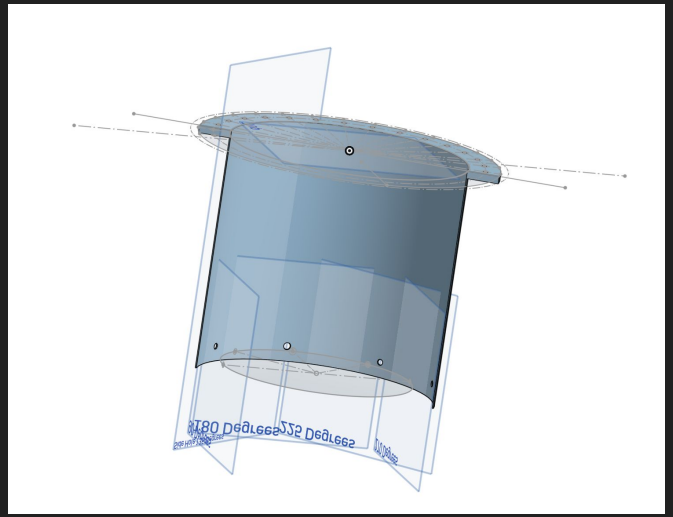
4K Shield

Tophat

The tophat, which is the metal piece that connects the 4K stage to the 4K shield, needed to be slightly redesigned for better thermal contact.

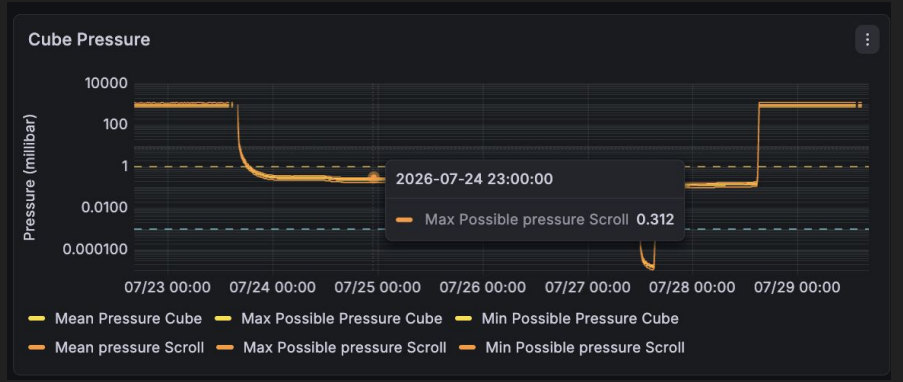
I learned some free CAD and made a model, and now must be machined





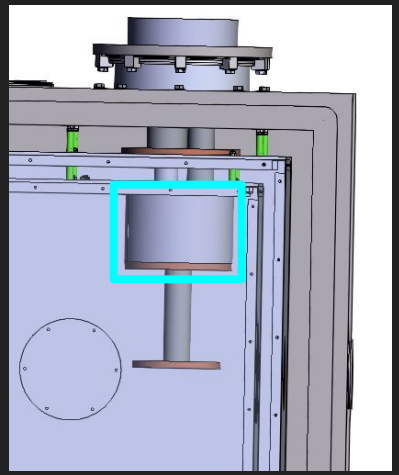
Grafana Calibration

Output was only in volts

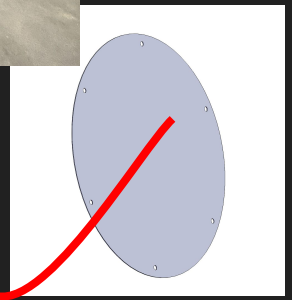


Output in pressure

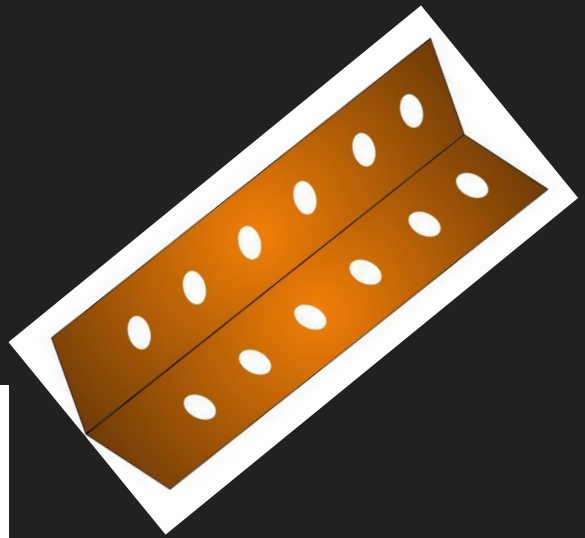
Next Steps



Machine Tophat



Add flanges

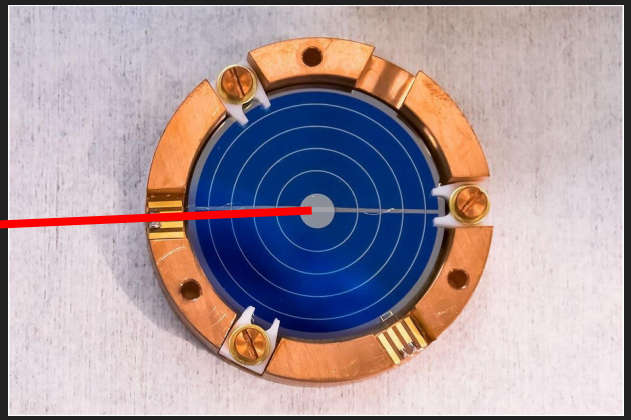


Once copper foil arrives, cut into heat straps and hole-punch

Ultimate goals:

Installation and testing light detector

Longer Term Goals



Light Detector
(V. Novati et al, 2018)

Acknowledgements