

Intern Power

Kevin Shimbo¹, Matt Hayes⁺

¹Your Affiliation.

²Linac Coherent Light Source, SLAC National Accelerator Laboratory, 2575 Sand Hill Road, Menlo Park, CA 94025, USA.

⁺Contact: hayes@slac.stanford.edu

Introduction

In short, my job was to aid in projects, to keep the FEH clean, organized, and supplied with coffee. I assisted in a multitude of tasks such as designing a space for gas cylinders, crafting X-ray shielding for the MFX Instrument, and building an outgassing chamber.

Research

During my stay at SLAC I have been a part of many projects inside the FEH from putting up whiteboards to making schematics for a new Liquid Nitrogen Dewar low level sensor. The accomplishments I am most proud of are constructing a vacuum chamber to outgas cables, building a sheetrock X-ray shielding system, and a step-up stool for MFX.

For the vacuum chamber, (fig.2) my mentor, Matt Hayes, showed me the basics then left me to my own devices. There were many places where I could have made an error but I pulled through and we were able to use it for outgassing wires used for the Epixs CCD detector inside the sample environment chamber on the CXI instrument.

The sheetrock X-ray shielding was how I was introduced to the basics in the LCLS. I was able to use the skills I learned from Robotics to piece together the 80/20 aluminum extrusion structure that holds up the shield. It required multiple parts that had to be bracketed together. Once built, we placed the structure over the instruments in MFX in order to make sure no radiation got out.

I also worked on a helium flight tube used to transport the FEL beam from a diamond window at the end of the MFX beamline into the interaction area. This tube had to be filled with helium to prevent the beam from scattering off normal atmospheric particles and gasses.

My final major project was to build a step up stool for MFX. (Fig.3) In a sense, it was a test to see what I have learned in my internship here as he only gave me the idea of what he wanted and left me to my own devices. I had to find what parts and tools I needed to build the stool. The process of building the stool was fun as I used everything I learned to build it. The stool is a very important part of the MFX system that enables access to the top of the robot used to move sample material.

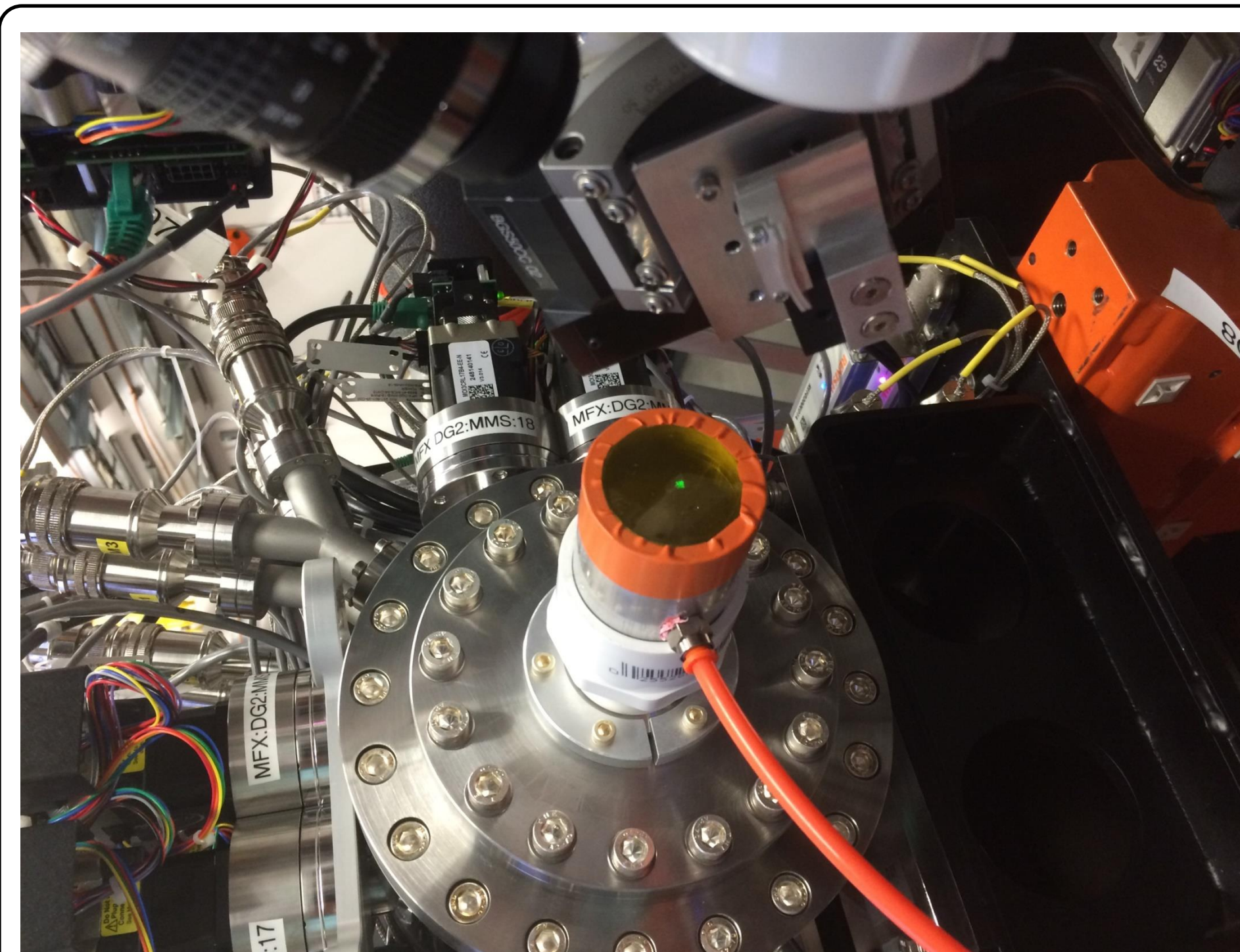


Fig.1-Helium Flight Tube: The orange tape holds a kapton window in place and the small orange tube delivers helium.

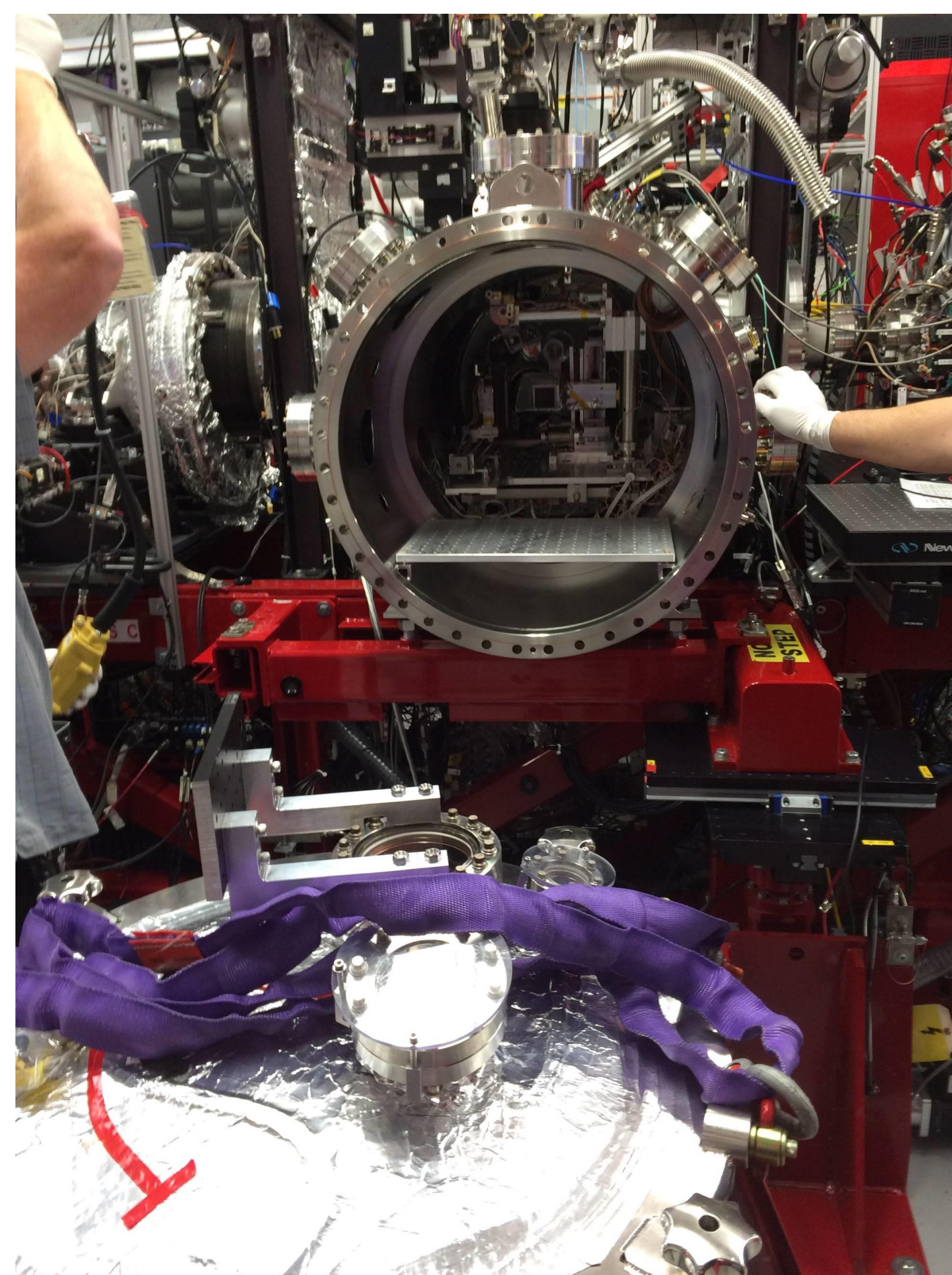


Fig.2: Large extension chamber installed on the CXI sample chamber to make room for a spectrometer.



Fig.3: Step Stool used in the MFX area.

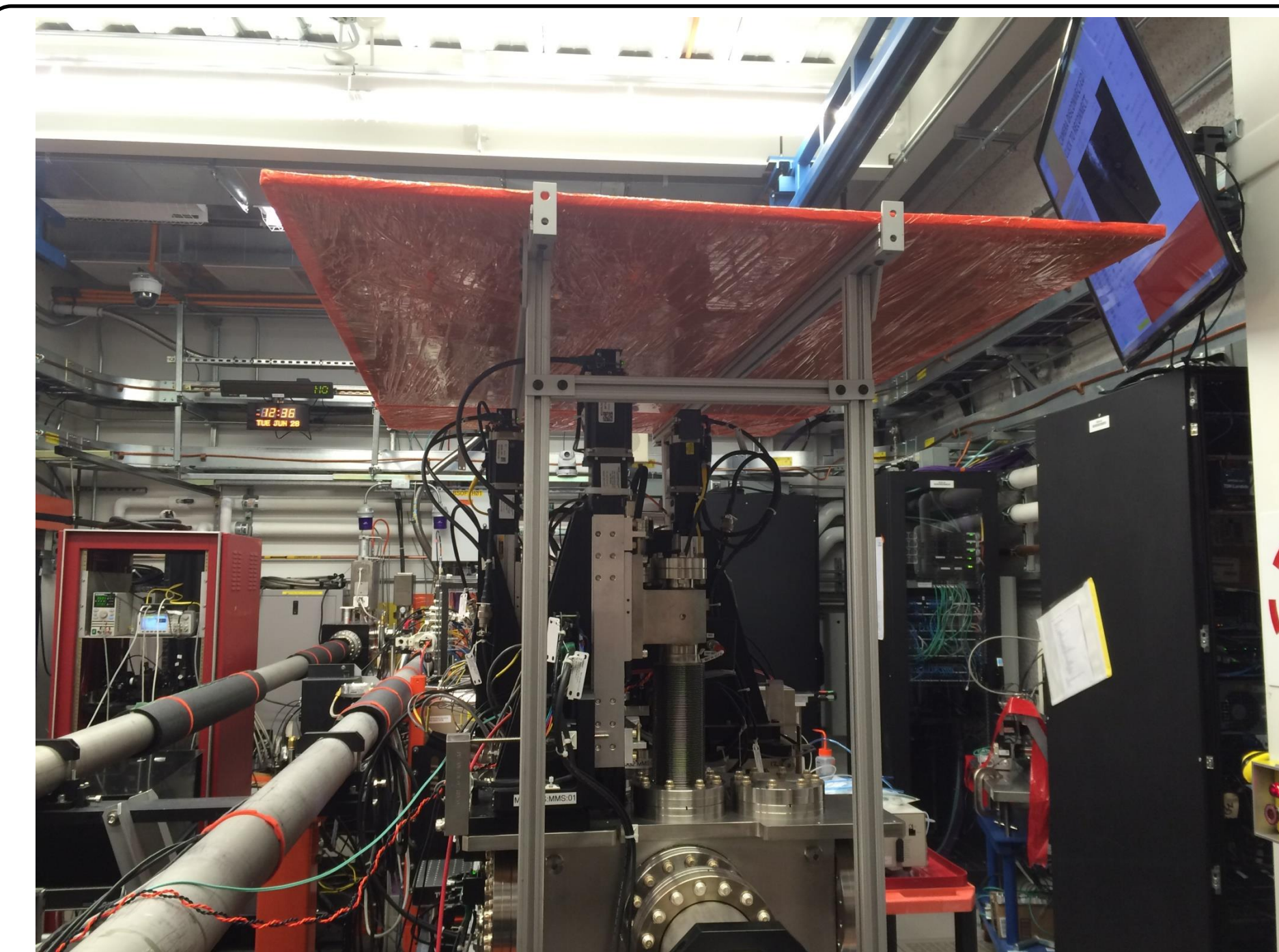


Fig.4: X-ray Shield: The orange cover is sheetrock shielding wrapped in orange shrink wrap.

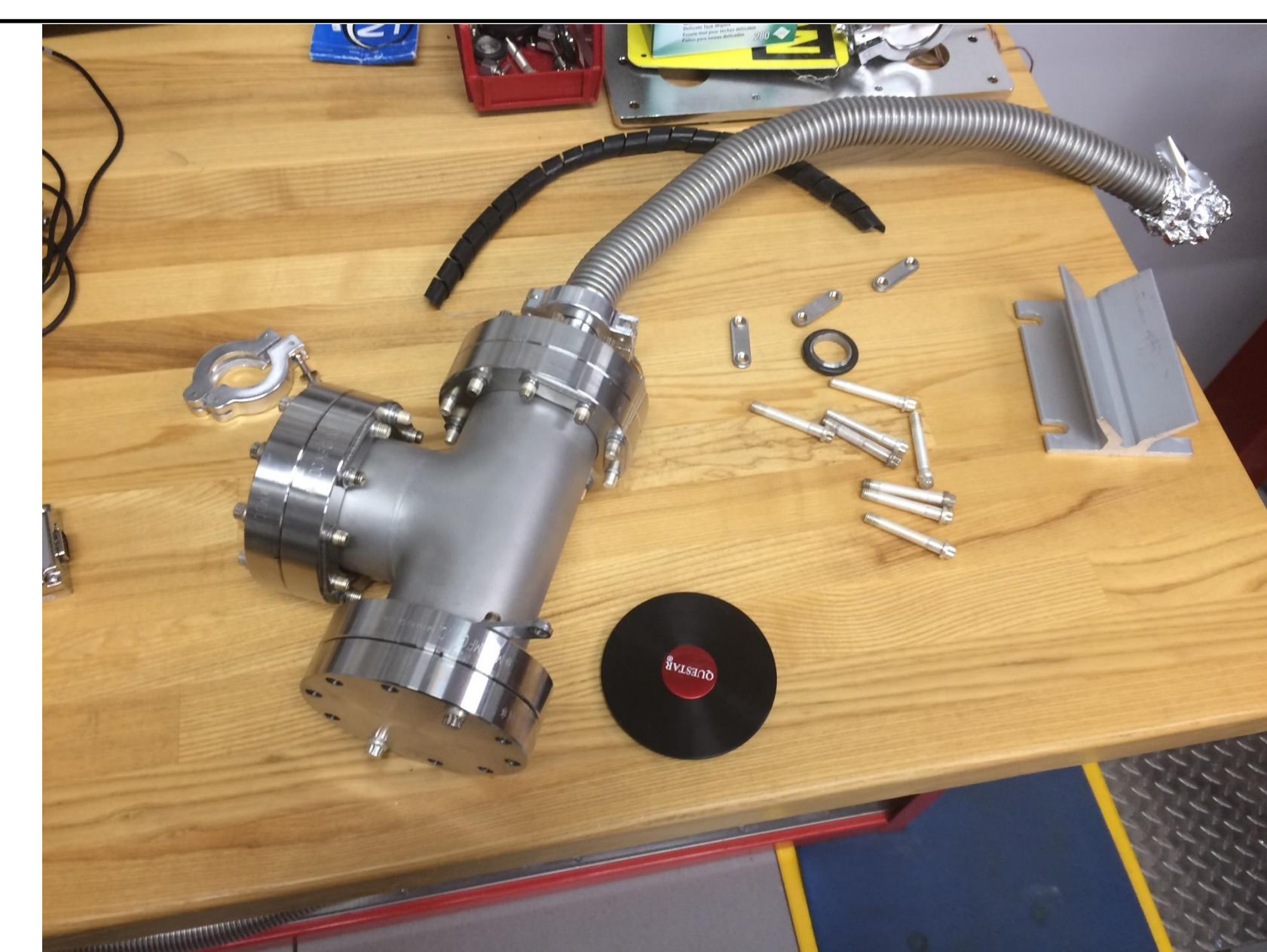


Fig.5: This is a vacuum chamber that I built to outgas a set of wires that would eventually be placed into the CXI instrument.

Conclusions

In the time that I have been at SLAC, I have learned multiple things such as, how to work in a lab, office etiquette, basic building and engineering. Also, coffee is very important to the scientific process, without it everything stops. The only complaint that I have is the gas canisters never come on time or they never get the full order. Sometimes we would have to go to other sources in order to have enough liquid nitrogen to run experiments. Other than that everything in FEH was amazing.

Acknowledgments

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