

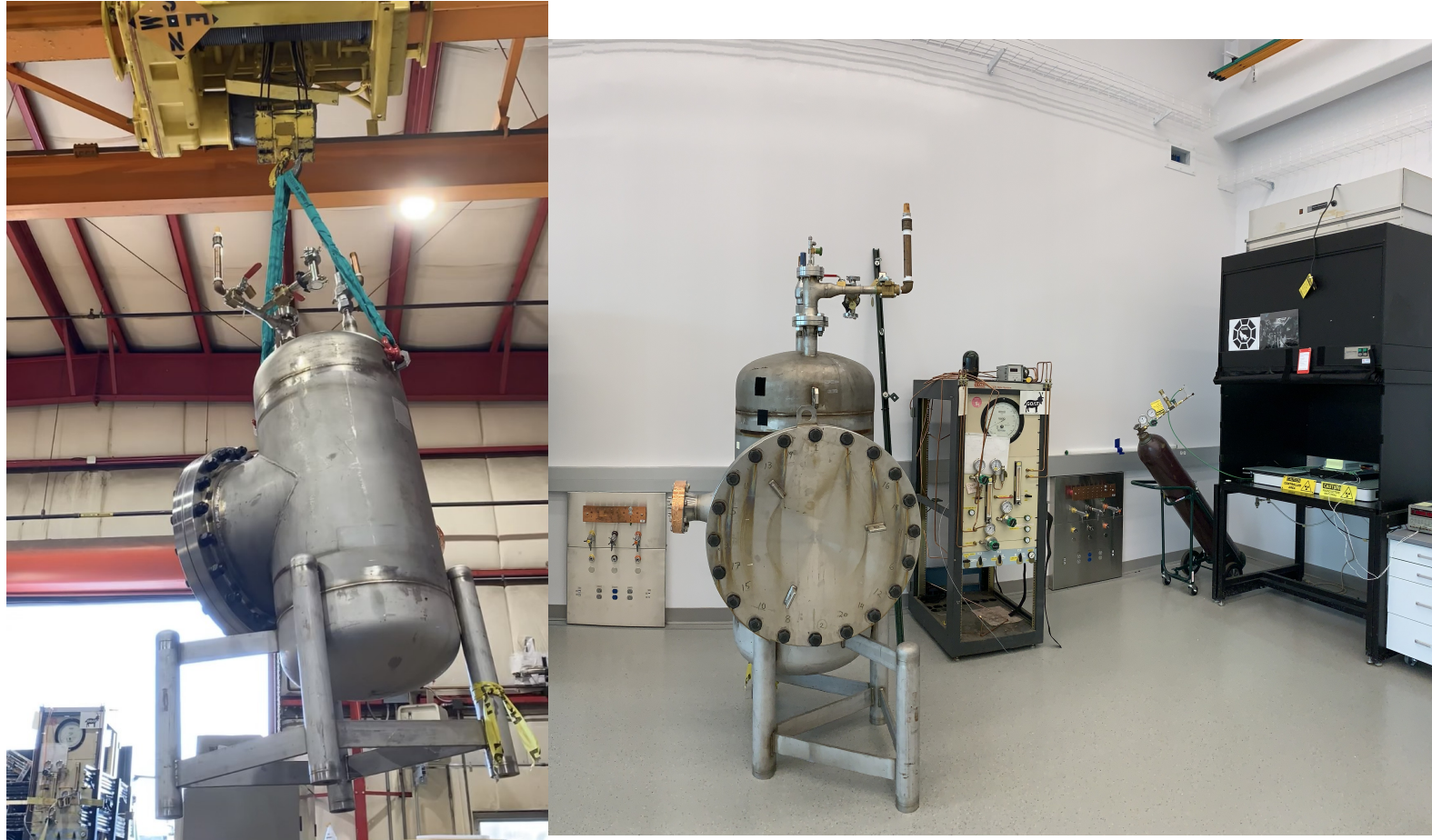
# GEMs (GORG) Timeline



Miranda Rabelhofer

# What We Have Done So Far

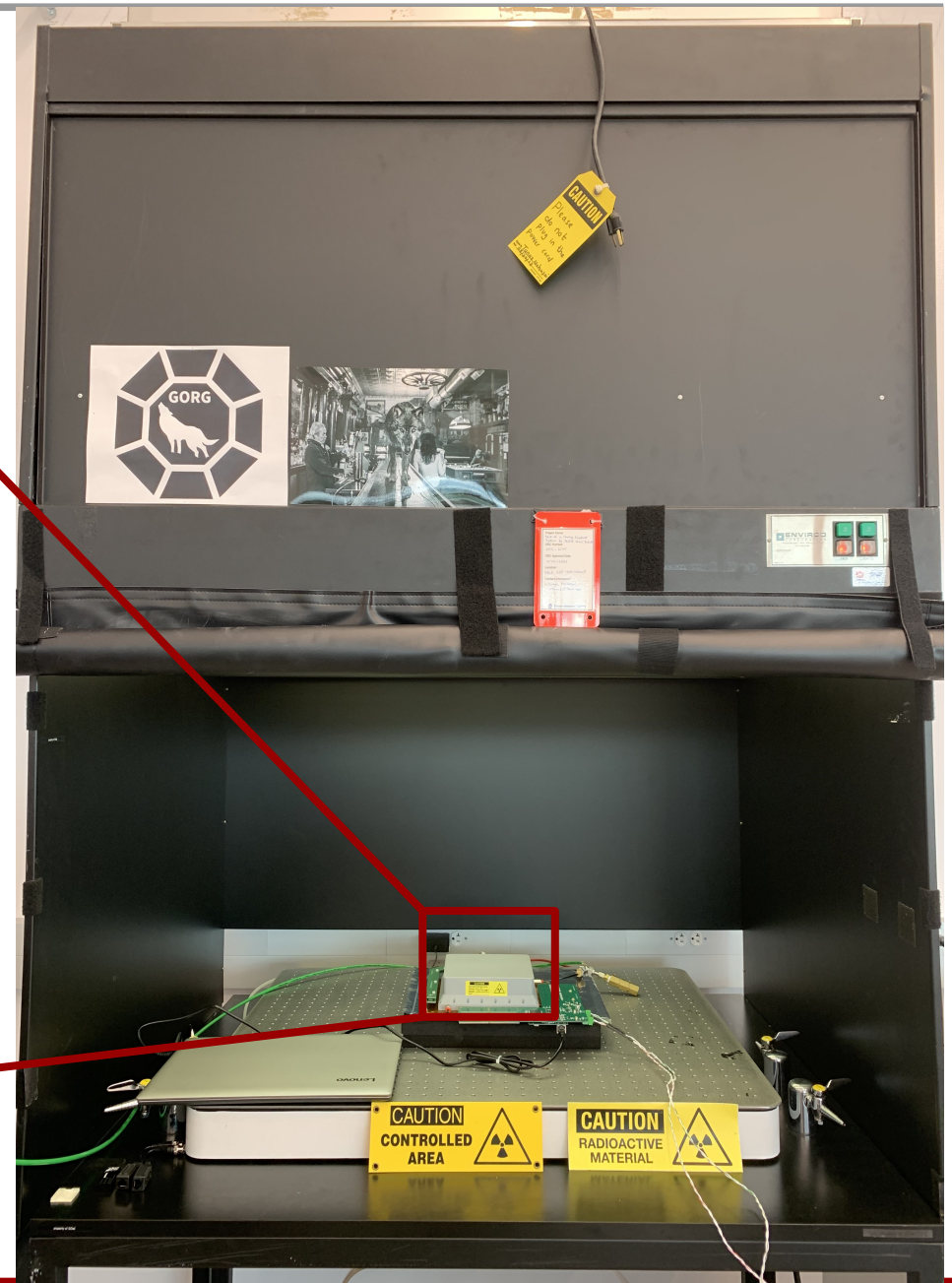
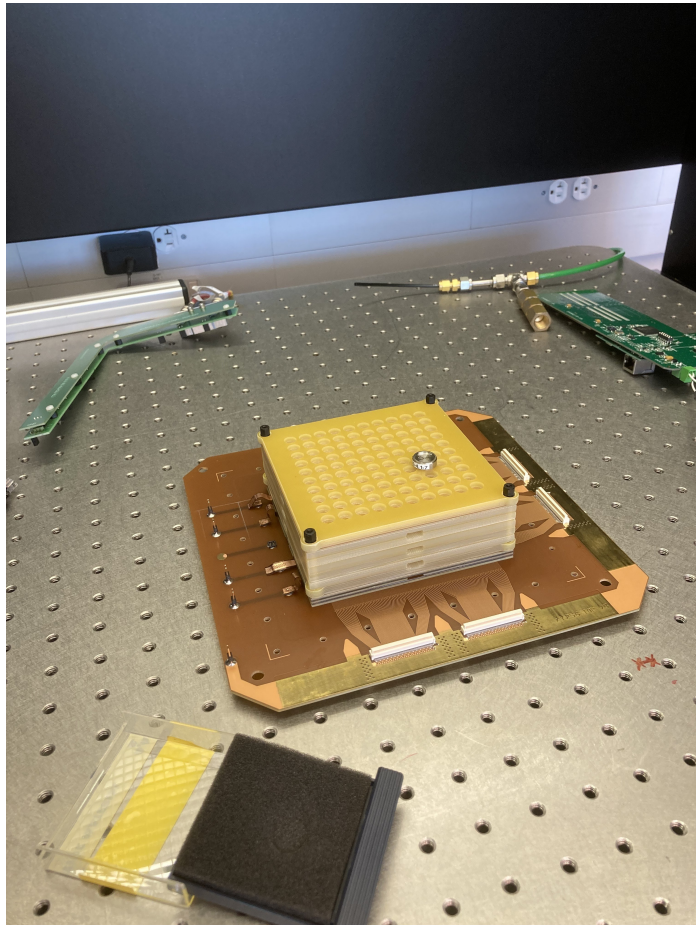
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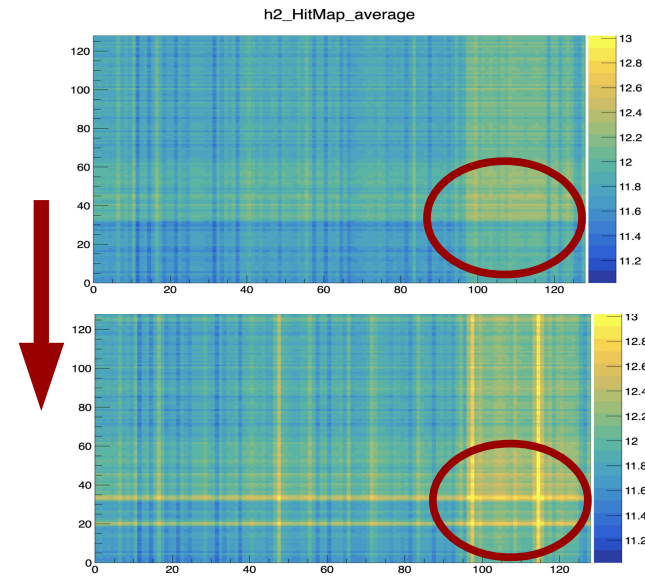
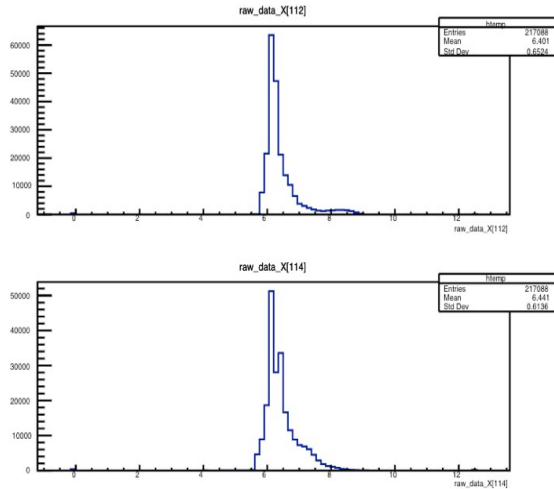
Officially moved to the DUNE warm lab in the new IERC building



# What We Have Done So Far



# Since We Moved to the IERC



Started developing code infrastructure to analyze the data.

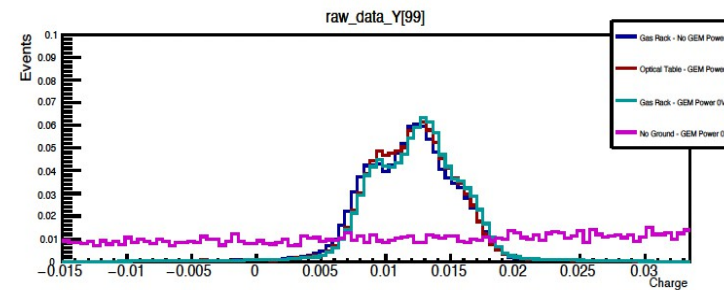
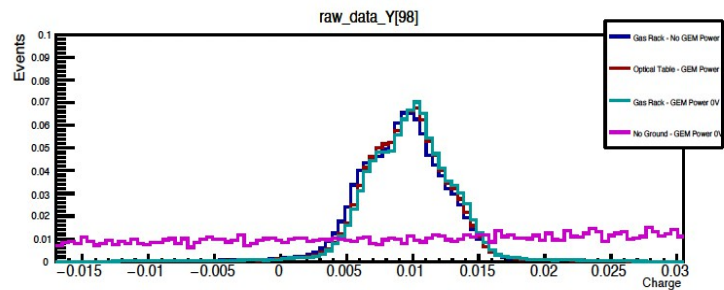
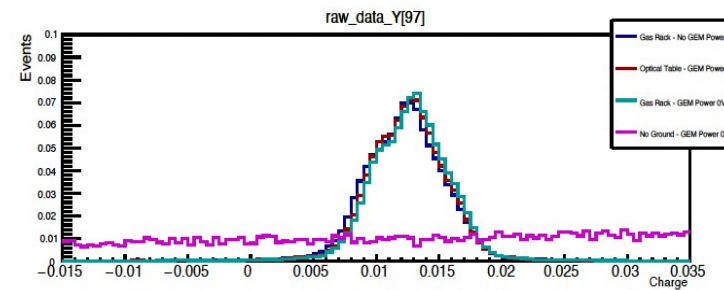
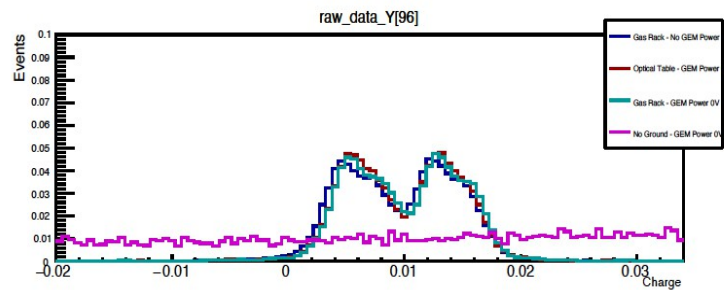
Took data at various voltages with an Fe-55 source. 3000V – 3350V to the divider. Observed potential spark-like behavior at  $V > 3200$

September

September



# Since We Moved to the IERC



**Checked various grounding options to see if this would help with noise, which we were characterizing in parallel.**

**Started characterizing the response of each of the 256 strips. Non-uniformities in the responses have been observed.**

October

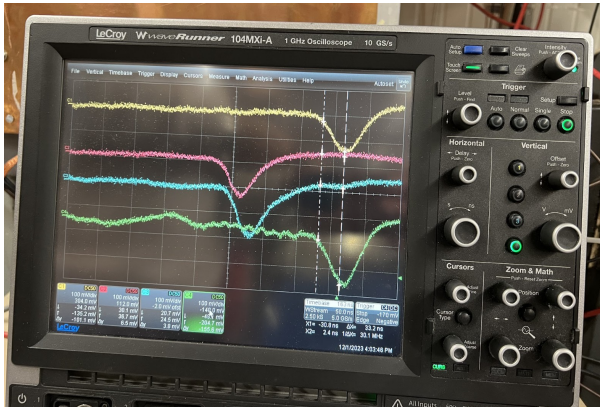
October / November

# Most Recent



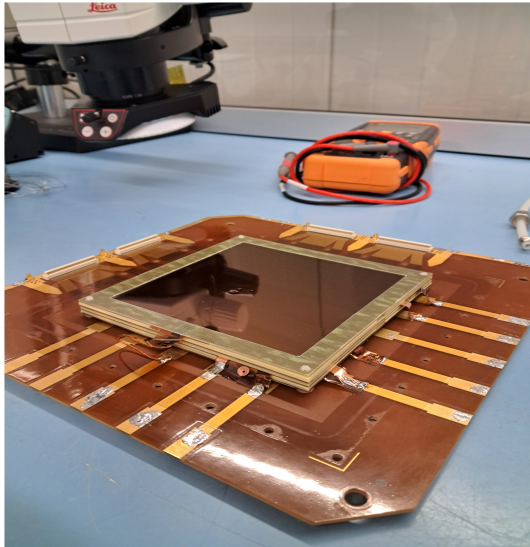
**Started the procurement process to obtain a soft wall cleanroom from Terra Universal for the GEMs.**

**November**



**Attended the Micro Pattern Gaseous Detector school by RD51 to learn about GEMs.**

**November/December**



**Brought back a second GEM detector that was loaned to Indiana University to use as a control**

**December**



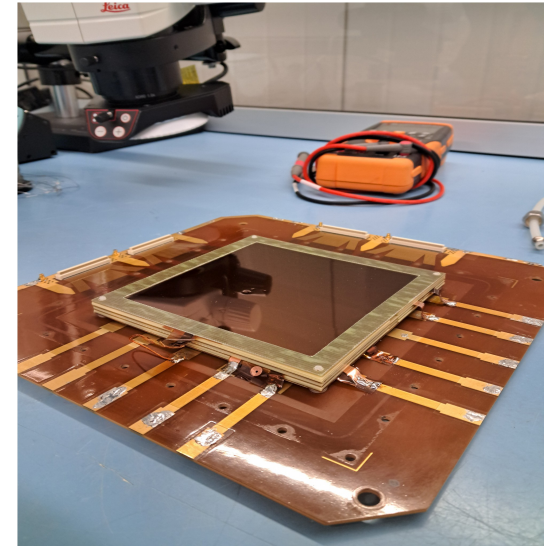
# Most Recent



Many thanks to Flor B. and Monica N. for help with the process! Our order is currently approved.



Attended the Micro Pattern Gaseous Detector school by RD51 to learn about GEMs.



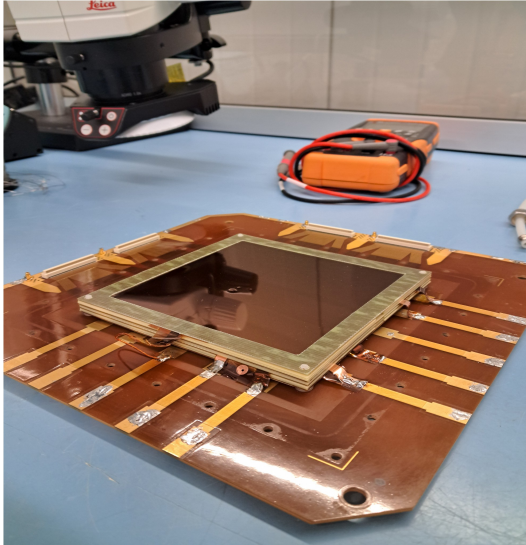
Brought back a second GEM detector that was loaned to Indiana University to use as a control

November

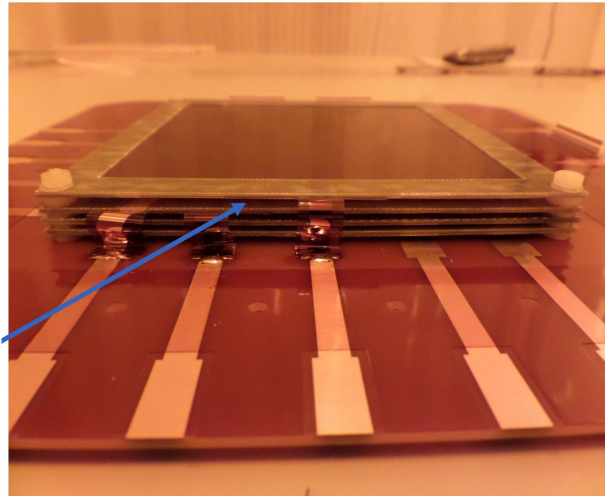
November/December

December

# Next Steps



Get the loaned GEMs ready. Need to attach the voltage divider. Minimize noise. Take data similar to the test GEMS and check for inconsistencies.



Obtain the cleanroom. Open and clean the GEM foils. If we still see sparks, enlist help from GEM experts in the DRD1 group.

Ar : CO<sub>2</sub> (90 : 10)  
Ar : CH<sub>4</sub> (92 : 8 )  
Others?

Replace the Fe-55 source, attenuating it to mitigate sparks, and calculate our gain using the gas tight box and Ar mixtures.

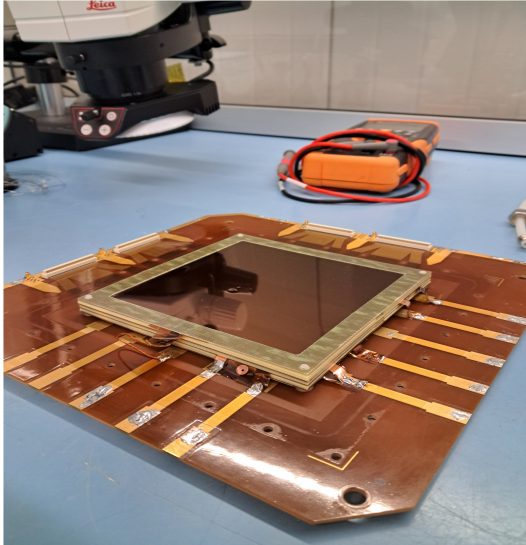
December

January

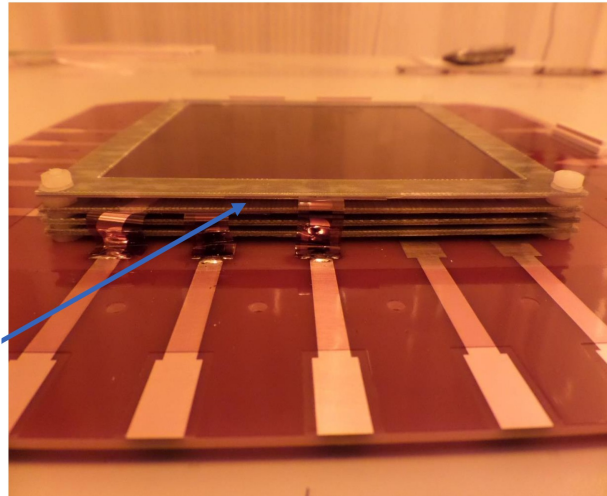
January



# Next Steps



Get the loaned GEMs ready. Need to attach the voltage divider. Minimize noise. Take data similar to the test GEMs and check for sparks.



Depending on timeline, might use Fermilab cleanroom for first GEM cleaning. Ultrasonic bath or nitrogen.

Ar : CO<sub>2</sub> (90 : 10)  
Ar : CH<sub>4</sub> (92 : 8)  
Others?

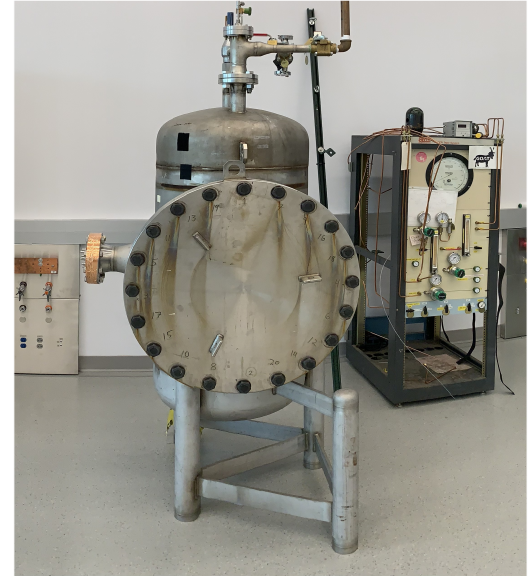
Replace the Fe-55 source, attenuating it to mitigate sparks, and calculate our gain using just the gas tight box and Ar mixtures

December

January

January

# Next Steps



**Start designing the pressure vessel setup and preparing. Submit paperwork for ORC to get approval to use the GEMs in the pressure vessel.**

**Setup a system so we can remote monitor the environment the GEMs are in while they are in the vessel.**

**Put the GEMs into the pressure vessel and start taking data. Characterize the gain at different pressures using Ar:CH<sub>4</sub>**

January / February

February

March

10



