

# 260-L LAr System Progress Report

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# Lab Safety and Space Management

- COVID level in Suffolk County is still HIGH now
- Face masks are mandatory onsite at BNL
- CRP coldbox fill with the 6000-gallon LN2 tank
  - The second filling cycle was completed, CRP lifted out for flipping
  - The third fill is planned for this Thursday
  - 2x LN2 level needed for full immersion, i.e. 20+cm
  - Yale may take the coldbox and a meeting was held to discuss the operation



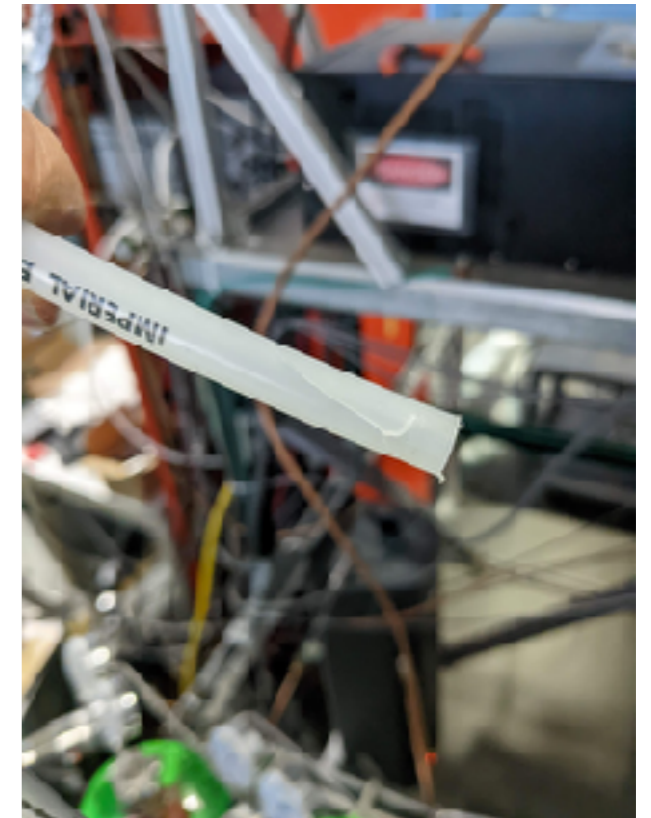
# Lab Safety and Space Management

- sPHENIX TPC moved into Higbay
  - Located under the tent next to the coldbox site
  - We were instructed to avoid lifting any load over it
  - Confirmed with Achim, moving the crane with no load and hoist on the side is still fine
  - Please be cautious when going by the TPC



# Preparation for the next run

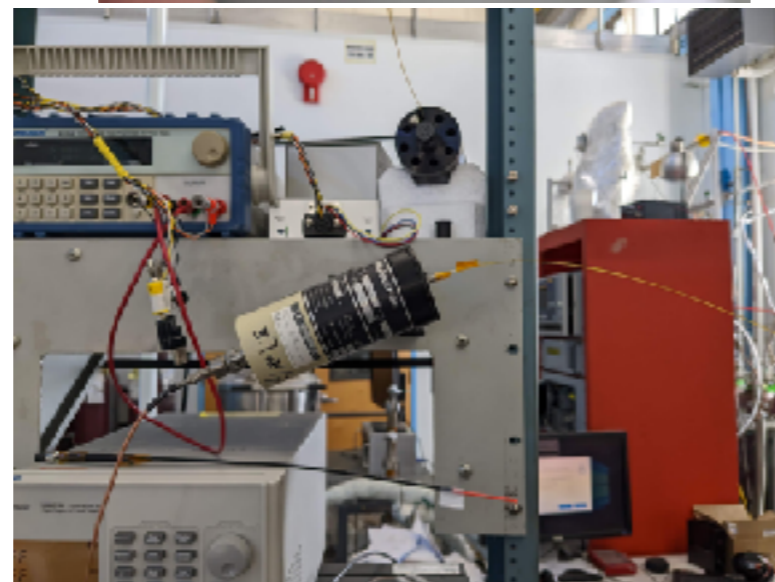
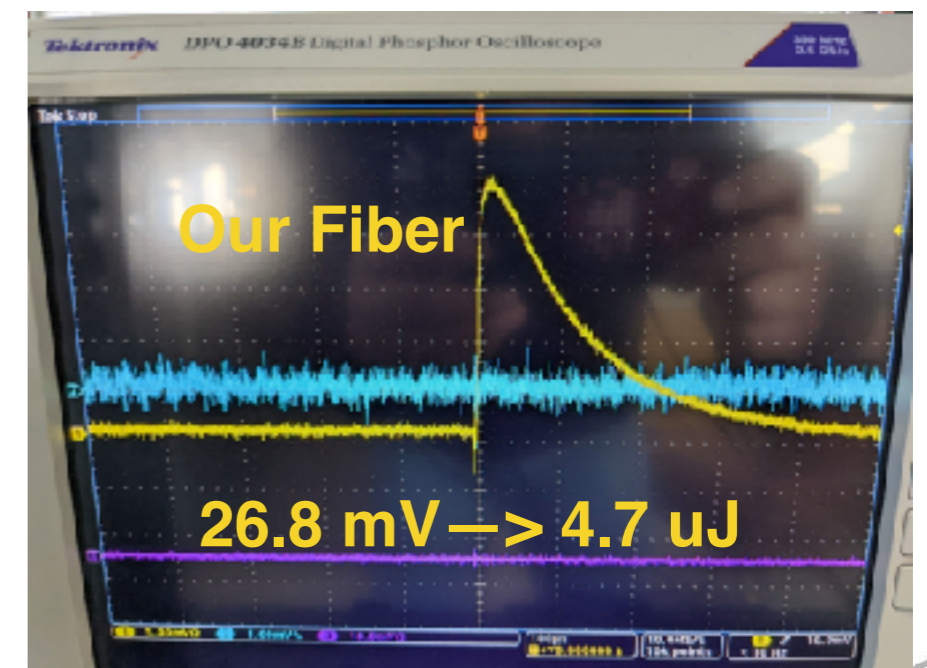
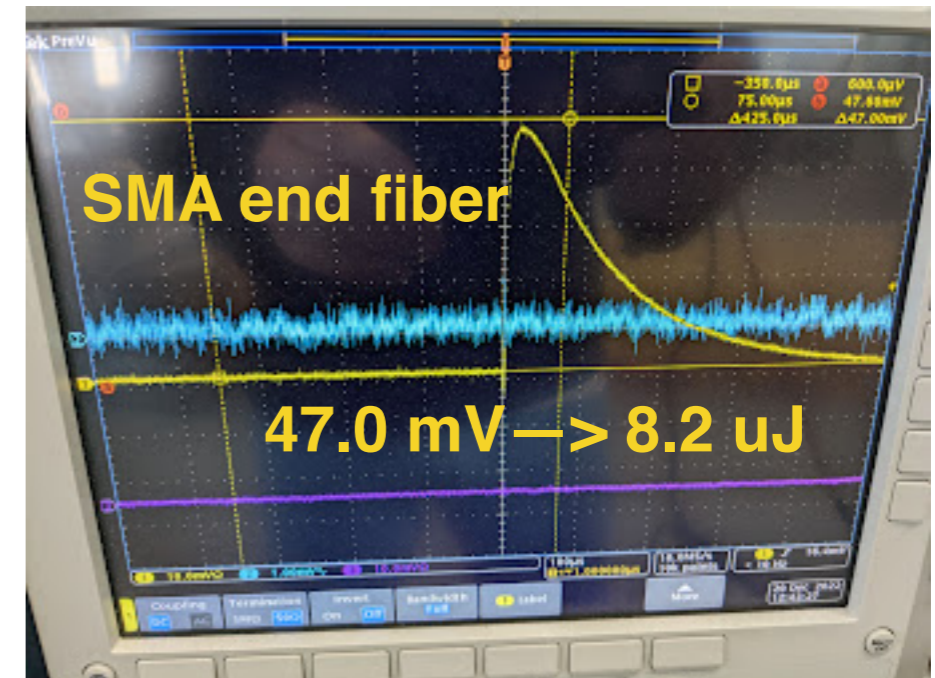
- Compressed tubing leak
  - Noticed by Shanshan about excessive noise and alarm in the lab
  - The compressed air tubing has a crack on the connector on top of the shelf
  - Insufficient pneumatic pressure triggered the alarm on hot getter and gas analyzer
  - The semi-transparent tubing is known for non-UV resistance
  - Going to replace with colored tubings



# Preparation for the next run

## ► Purity Monitor Xenon lamp intensity measurement

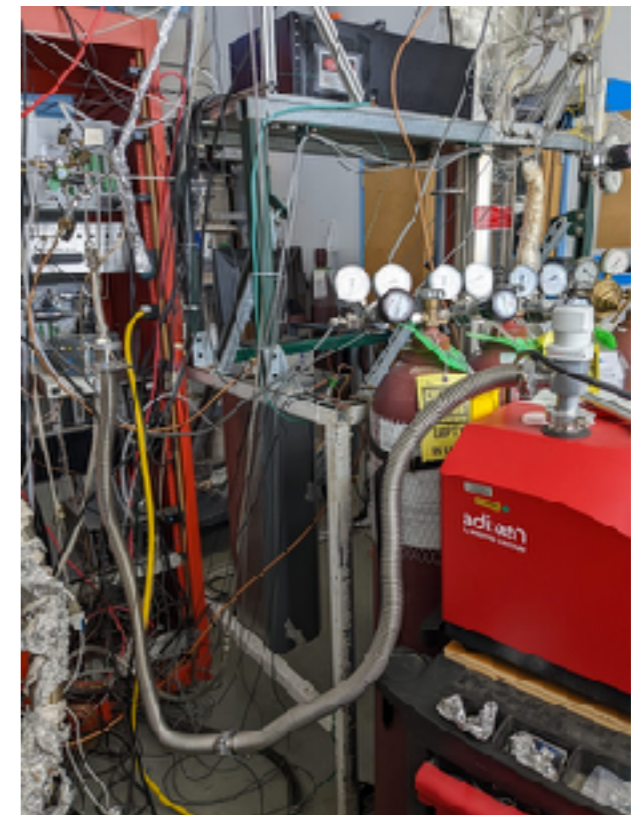
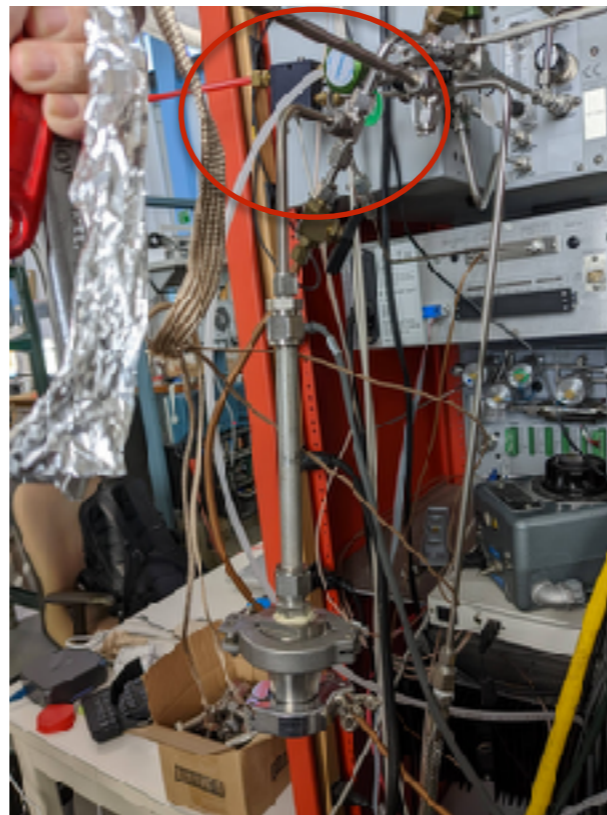
- The Xenon intensity was measured with a power meter at the output end
  - Our bare fiber measured with  $\sim 5.0 \mu\text{J}$
  - Slightly lower than a factory-made fiber with SMA connector with  $8.2 \mu\text{J}$
  - Light intensity is expected to improve to the same level with better polishing
  - First measurement of light intensity to PrM cathode



# Preparation for the next run

## ▸ Gas analyzer leak check

- Leak check setup
  - Pumping on the inlet from the system with the leak detector
  - The upstream plumbing for the gas analyzers and hot getter is included
  - Minor leaks resolved on the new pumping fittings
  - Asked Servomex about pumping on the upstream of the analyzers
- The leak detector was taken back to Will for a quick QA test
- Expect to get the leak detector back by Thursday, to continue



# 6000-gal LN2 tank implementation - Stage 2

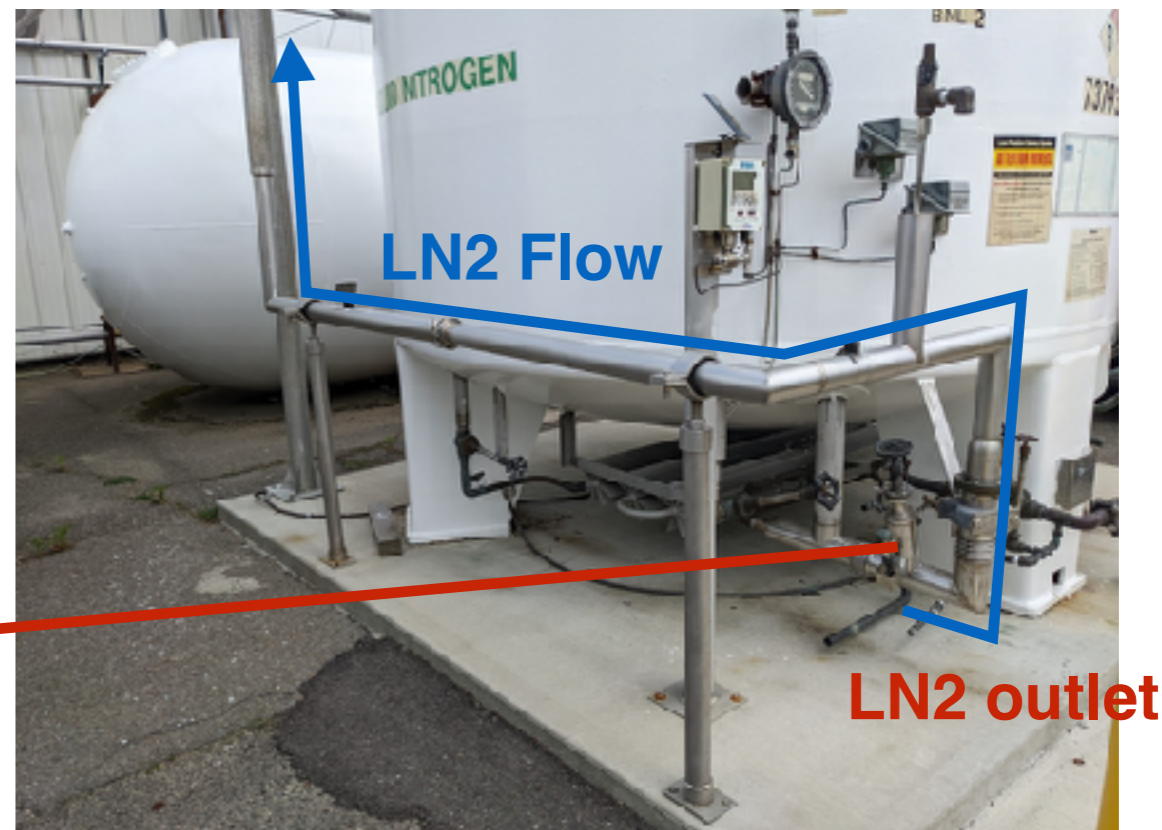
## ► **Modify the corner room of highbay to DUNE chip testing lab**

- It is in line with our original plan of implementing the LN2 tank by stages
- **Stage 1 (completed):**
  - Move the tank over to outside highbay lab
  - Passing the lab safety review
  - Filling portable dewars and large cold box with long hose
- **Stage 2:**
  - Plumbing the cryogenic pumping in the lab with outlets in the corner room and highbay
  - Pass the lab safety review
  - Establish facility cryogenic supply capability
- **Current status and plan:**
  - Volodya is planning to set up 2x robotic chip testing stations in the corner room
  - DUNE project can pay part of it and the rest could be from the department facility upgrade fund

# 11000 gallon LN2 tank at Magnet Division

## ▶ 11000 gallon LN2 tank Magnet Division

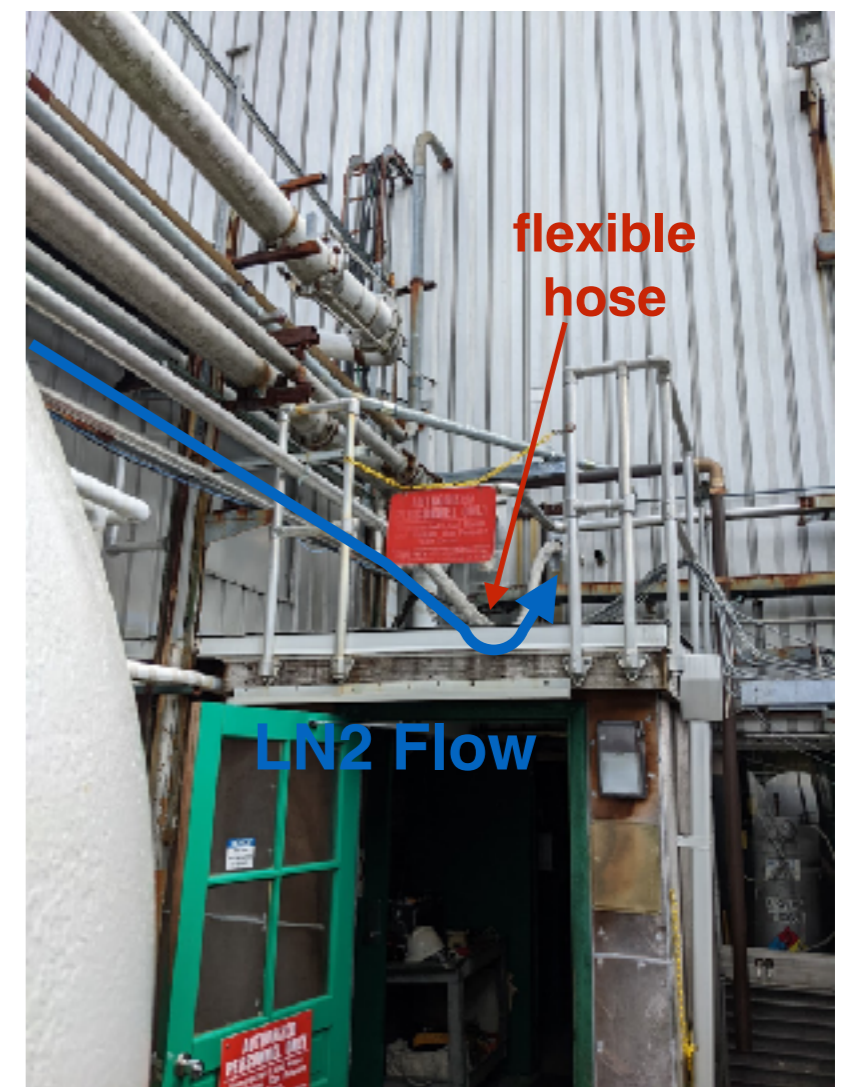
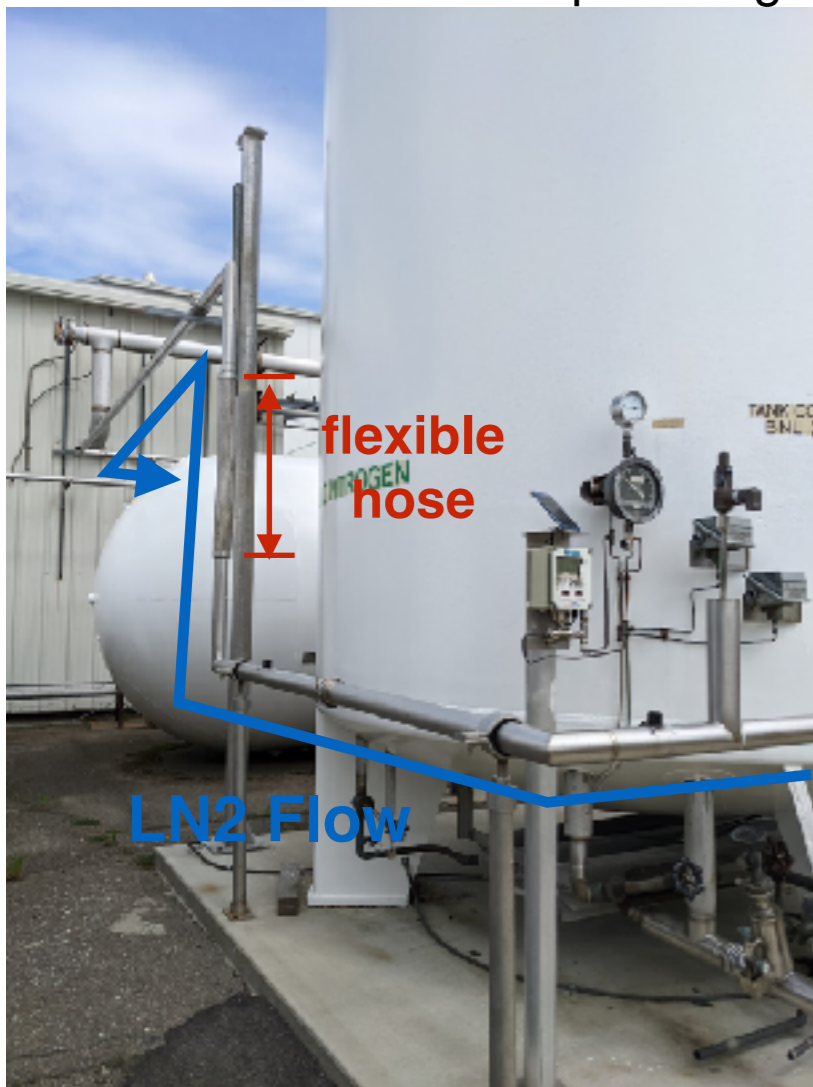
- The 11000 gallon LN2 tank originally located by NSLS-I, moved to Magnet Division
- Our effort of getting the 6000 gallon LN2 tank was motivated by the work, and we were following their steps
- The 11000 gallon LN2 tank has been plumbed with vacuum insulation piping into their lab, again a good reference for our planning



# 11000 gallon LN2 tank at Magnet Division

## ▸ LN2 plumbing on the 11000 gallon LN2 tank

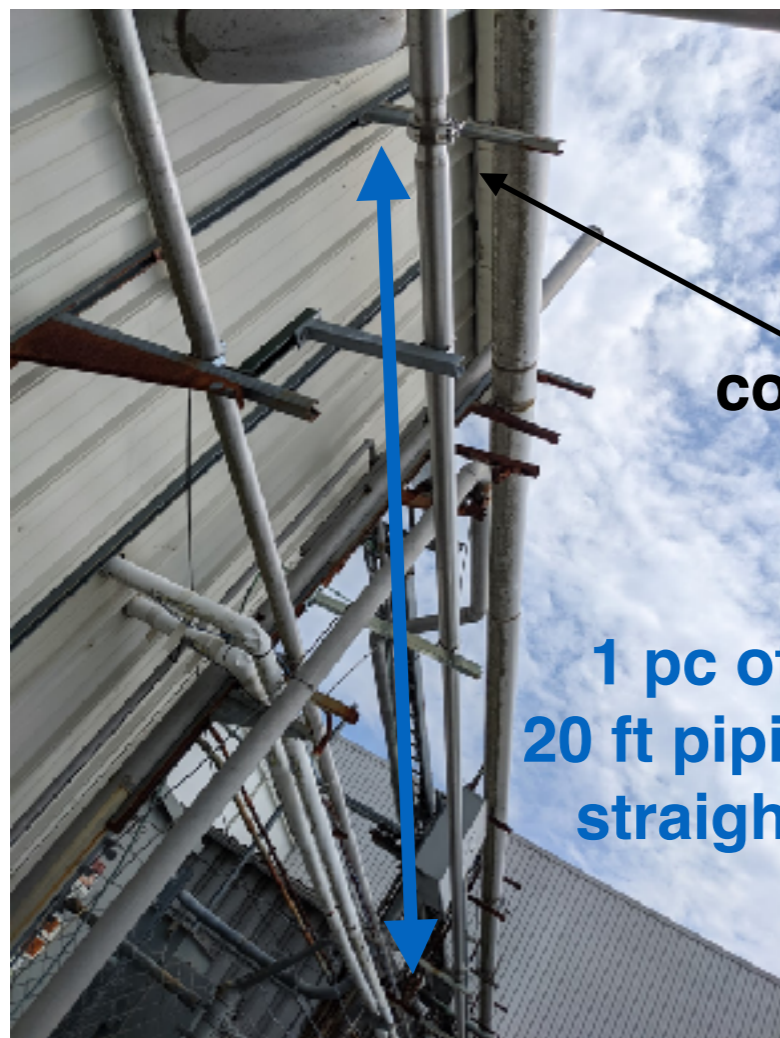
- The LN2 withdrawn from the bottom of the tank, similar location like our tank
- The plumbing runs ~150 ft from the tank to the indoor outlets
- The plumbing is constructed with super insulation piping ordered from Cryofab by sections with bayonet connectors Magnet Division did the piping installation by their own technician
- The piping sections fabricated at CryoFab were connected by clamps
- Most of the plumbing is rigid piping, only two sections with flexible hoses



# 11000 gallon LN2 tank at Magnet Division

## ▸ LN2 plumbing on the 11000 gallon LN2 tank

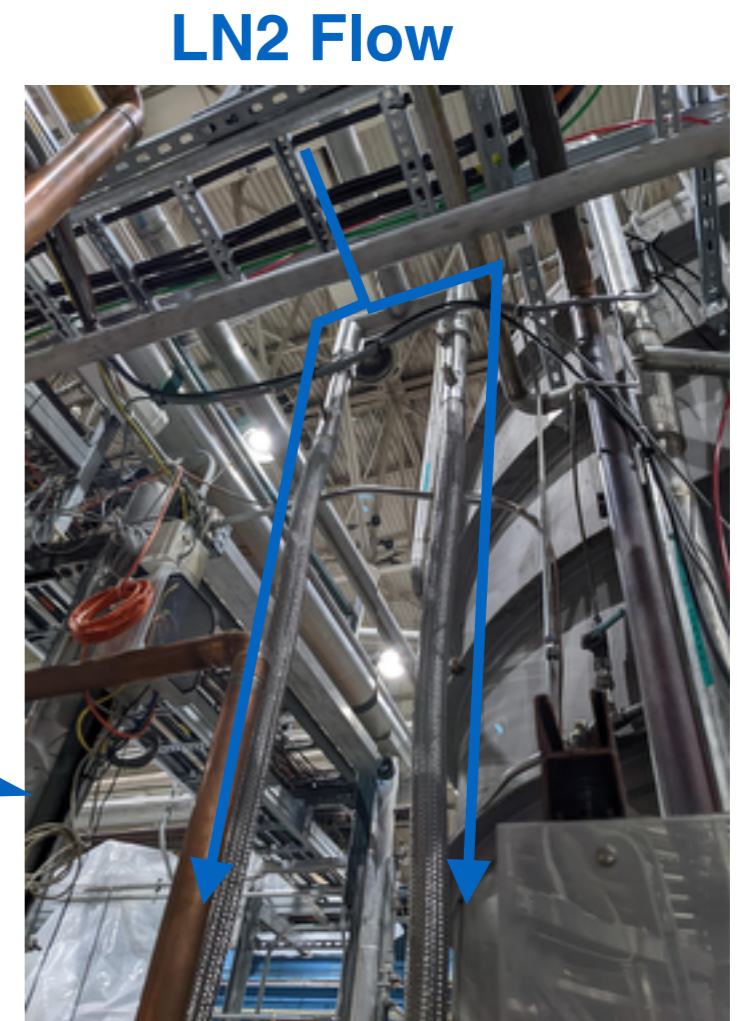
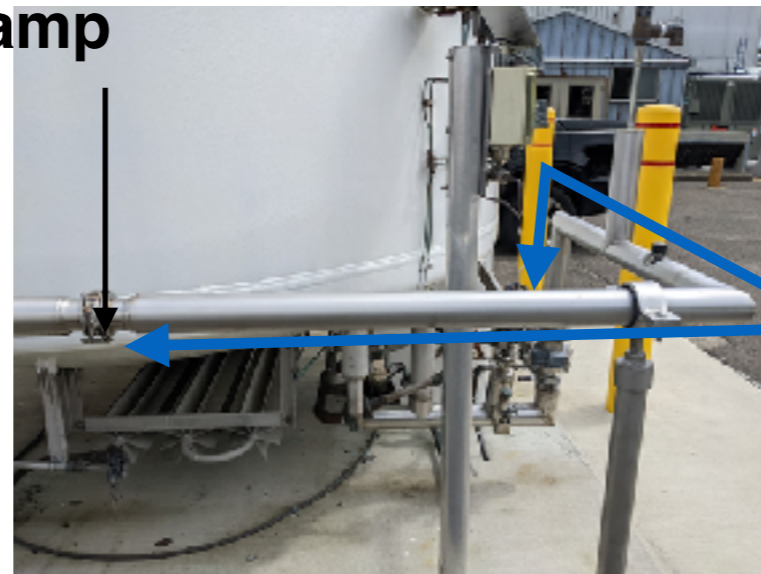
- The basic cryogenic piping parts fabricated by Cryofab is straight with 20 ft length
- Some others requires to be customized with specifications on the length and turning directions
- There are LN2 3 outlets in the building, 2 in pair in use, 1 spare
- A very rough cost estimation consulted with Cryofab for 150 ft rigid piping with 6 turns, 2 outlets:
  - 8 piping sections for the total length, ~30k, leading time ~ 3 months



1 pc of  
20 ft piping  
straight

connecting  
clamp

1 pc of piping  
with 2 turns



Indoor LN2 outlets

# 6000-gal LN2 tank implementation - Stage 2

## ▸ Sketch plumbing for 6000-gal LN2 tank

- It can start from the main valve at the front of the dewar
- Another option is the auxiliary valves at the back
- The plumbing requires sufficient overhead height
- The plumbing requires drilling on the wall
- Detailed engineering design needed
- ODH rating of the lab may be changed

