

# LAr R&D Progress Updates

## 03/03/26

Yichen

# Lab Safety and Space Management

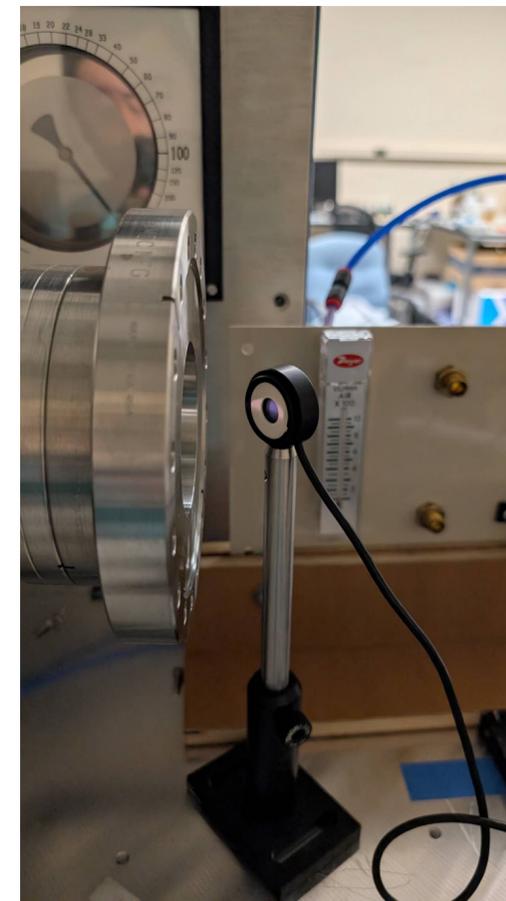
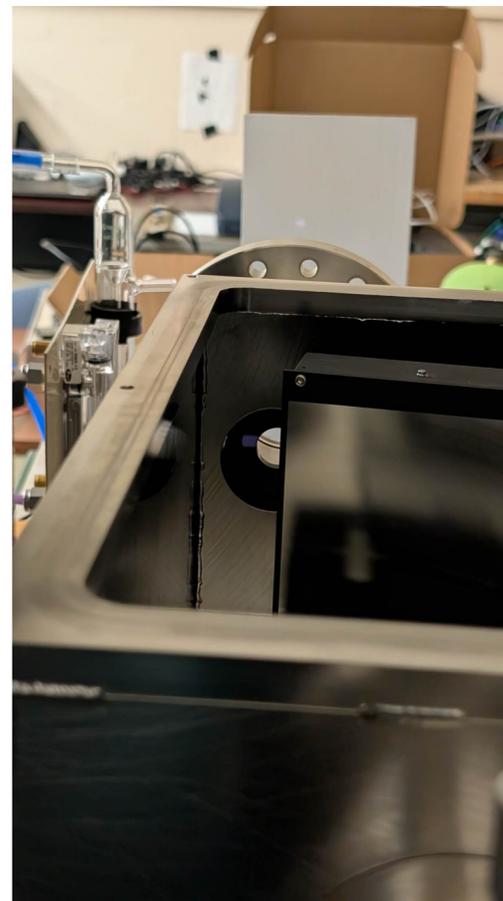
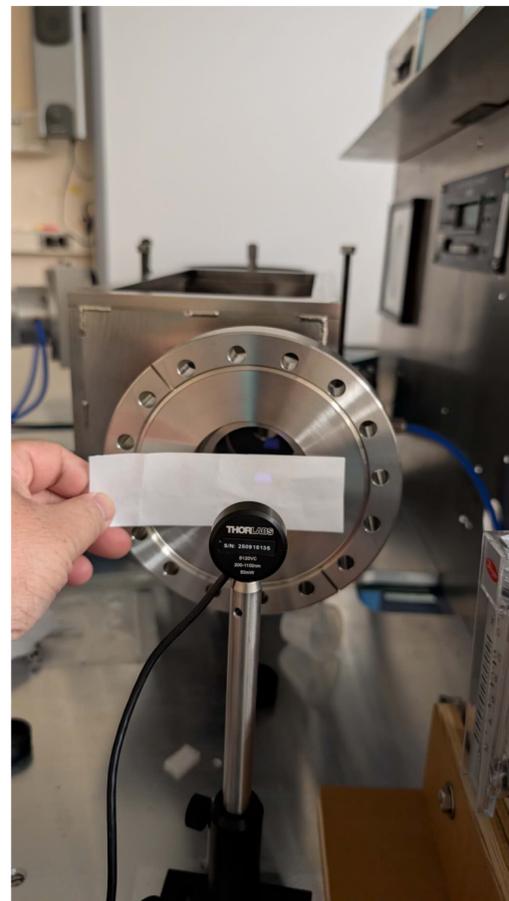
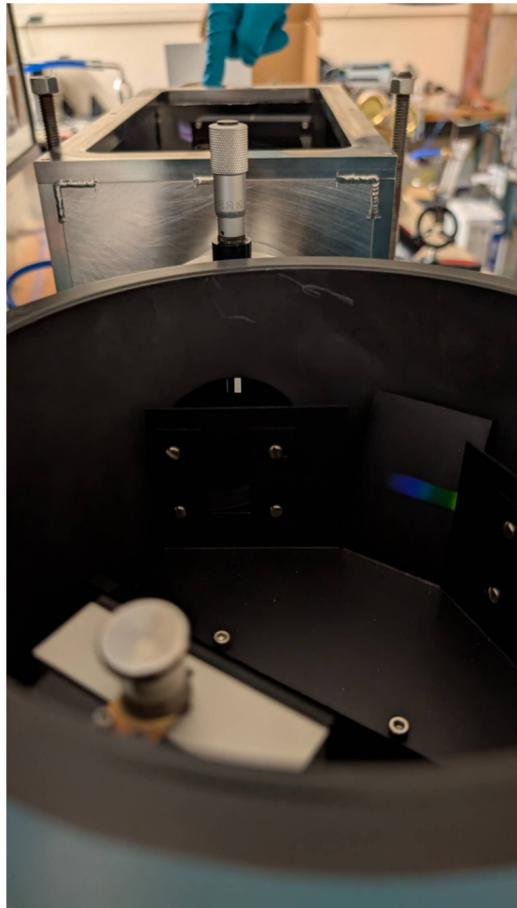
- Inclement weather onsite
  - Please be aware of the slippery conditions when walking around the lab
- Safety review for the Xenon collection system
  - The system design is complete validated by a mocking assembly (will discuss later)
  - Started the safety review process for Work Permit to operate

# Filter Testing at CIEMAT

- We are required to do a 0 value WebReq, i.e. Purchase Order with CIEMAT
  - New requirement by DOE starting 3 months ago
  - CIEMAT needs to be added as a vendor into BNL system
  - 3-4 forms to fill and our host Clara is helping to complete them
- Export control and Shipping memo in progress
  - Most of the parts are done
  - Need an End of User Statement to complete the export control and shipping memo
- CIEMAT proposed to delay the test by the week
  - Assembly 3/15-3/17
  - Starting booking the trip with refundable tickets

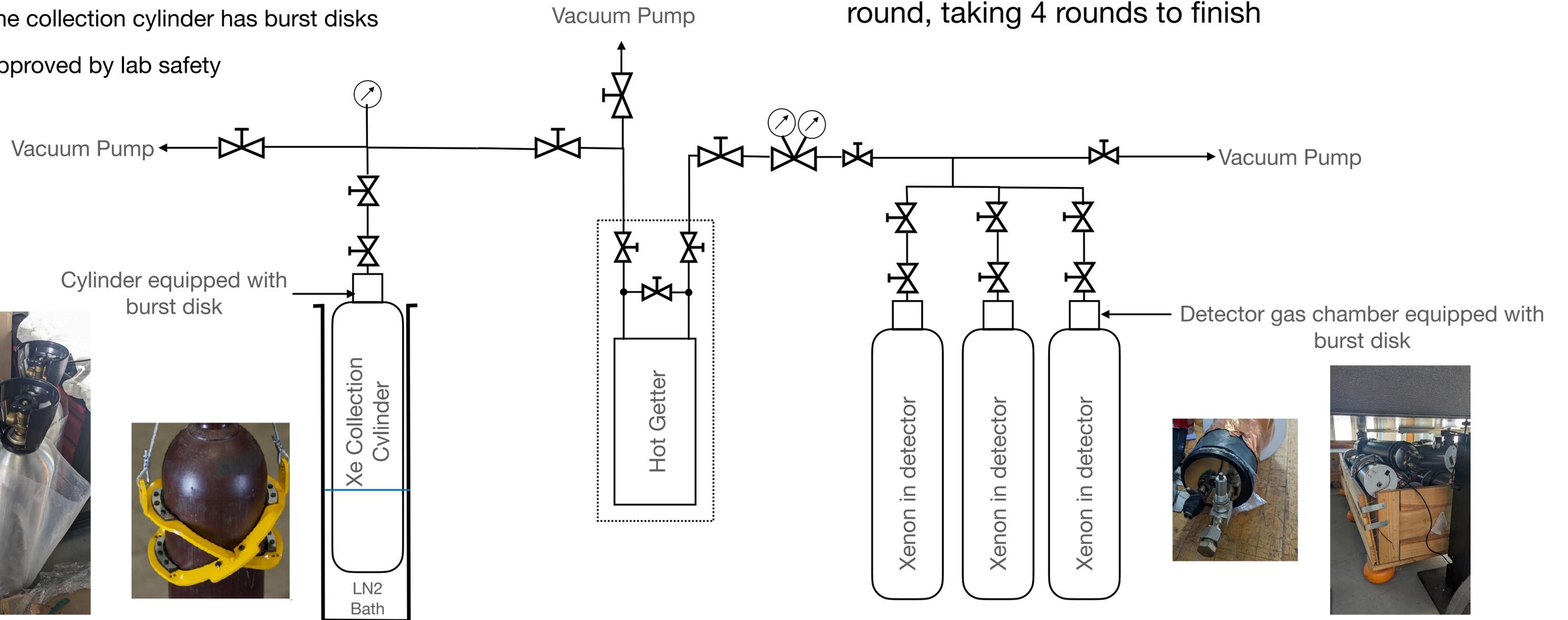
# Monochromator Focal Point Measurement

- Bob and I tried to conduct the measurement of focal point of the monochromator
- The exit slit of the monochromator was found malfunctioning again
  - With both translational and open/close problems
    - The slit has been opened to the maximum for the spectral measurement for a long time
    - The blades seem to be stuck again with partial moving
    - Asking Bill to rebuild it again( for the third time)
    - Need a new slit replacement, with a price of ~\$4000



# Xenon Collection System Full Design **OLD**

- Transfer driven by negative pressure produced by the LN2 bath condensing in the Xe collection cylinders
- All the fittings are designed with VCR fittings
- Gas goes through hot getter to remove residual H2 and H2O
- Safety Devices:
  - Detector Xe gas chamber has burst disks
  - The collection cylinder has burst disks
  - Approved by lab safety
- There are 13 detectors fully disassembled
- 3x Xenon detectors filling into 1 collection cylinder each round, taking 4 rounds to finish



# Xenon Collection System Cost Estimation **OLD**

Item Description	Part Number (Clickable)	Vendor	Unit Price (USD)	Qty	Line Total (USD)	Notes
316L SS High Purity Bellows Sealed Valve, 1/4 in. Male VCR	<a href="#">SS-BNVCR4</a>	Swagelok	378.78	10	3,787.80	High purity bellows sealed valve
316L VAR Welded VCR Female Cross, 1/4 in.	<a href="#">SS-4-VCR-CS</a>	Swagelok	67.21	2	134.42	Cross fitting
316 SS VCR Union Tee, 1/4 in., SC-01	<a href="#">SS-4-VCR-TP</a>	Swagelok	62.74	3	188.22	Tee fitting
316 SS Reducing Bushing 1/2 in. VCR × 1/4 in. Female VCR	<a href="#">SS-8-VCR-7-4VCRF</a>	Swagelok	46.66	3	139.98	Size reduction interface from detectors
316 SS VCR Female Nut, 1/4 in., SC-01	<a href="#">SS-4-VCR-1-03816</a>	Swagelok	16.16	25	404.00	SC-01 cleaned, double bagged
316L SS VCR Silver Plated Gasket, 1/4 in.	<a href="#">SS-4-VCR-2</a>	Swagelok	1.94	25	48.50	Non-retained style gasket
316L VAR VCR Long Tube Butt Weld Gland, 1/4 in.	<a href="#">6LV-4-VCR-3-4TB3P</a>	Swagelok	28.62	25	715.50	For custom welded tubing
Cylinder Connection 580 CGA × 1/4" Face Seal Male	<a href="#">CGA580SSFS</a>	ASG Equipment	260.00	1	260.00	Cylinder interface
Supporting Mechanics (Aluminum 2020 stud)	—	McMaster-Carr	500	1	500	Frame/support structure, gas panel
Stainless Steel Tubing (bulk)	—	Swagelok	—	—	500.00	Estimated material cost
Custom Welding (KeyHighVacuum, estimated)	—	KeyHighVacuum	—	—	3,000 – 4,000	EtimationBased on previous project

## Cost Summary:

**Hardware + Tubing + Supporting Mechanics Subtotal**

**\$6,678.42**

**Welding (Estimated Range)**

3,000 – \$4,000

**Subtotal Including Welding**

Low: \$9,678.42

High: \$10,678.42

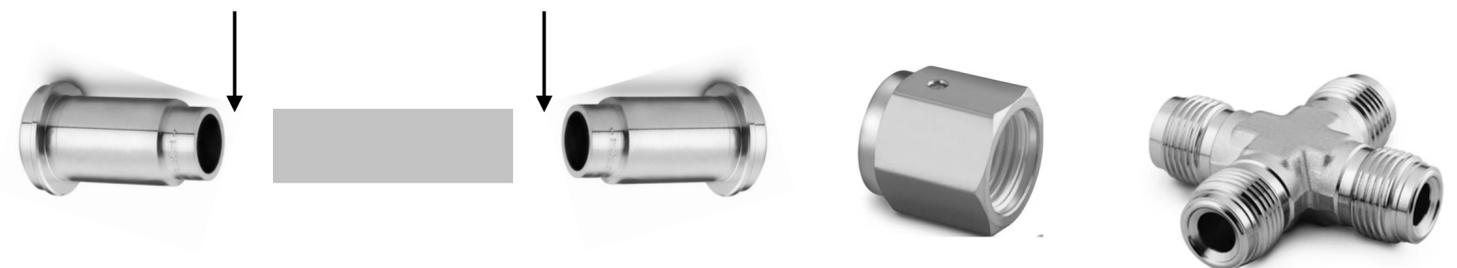
**With 10% Contingency**

**\$10,646.26-\$11,746.26**



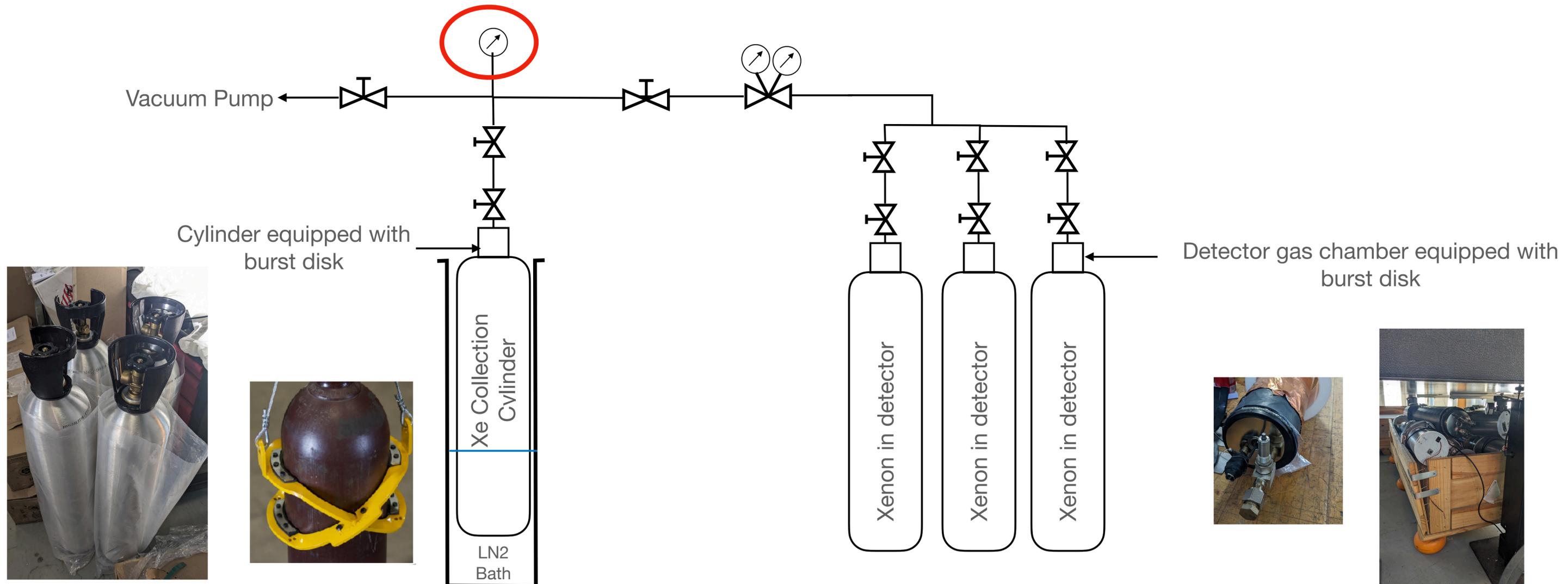
Swagelok

The tubing requires welding



# Xenon Collection System Design **REVISED**

- With the hot getter removed, the system is revised with reduced number of valves and fittings
- **Many thanks to Aleksey for providing the large inventory of valves and fittings**
- All VCR fittings configuration is maintained, except for the pumping port after the shutoff valve
- All hardware in need are located, excepted for one, a high pressure gauge to read the dewar pressure after transfer with a cost of < \$300
- The current cost is within the \$2000 bracket



# Xenon Collection System Mocking Assembly

- A mocking assembly conducted on the bench top with 3 detectors to 1 collection cylinder design with all VCR fittings(except for the pumping down port)
- The design and parts allocation are validated
  - Looks a bit messy due to different tubing sizes of the valves and redundant connectors found on the existing parts
  - Still can improve with reduction on the tubing length during installation



# Xenon Collection System Cost Estimation **UPDATED**

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Cylinder Connection 580 CGA x 1/4" Face Seal Male	<a href="#">CGA580SSFS</a>	ASG Equipment	260.00	1	260.00	Cylinder interface
Supporting Mechanics (Aluminum 2020 stud)	—	McMaster-Carr	500	1	500	Frame/support structure, gas panel
Stainless Steel Tubing (bulk)	—	Swagelok	—	—	500.00	Estimated material cost
Custom Welding (KeyHighVacuum, estimated)	—	KeyHighVacuum	—	—	3,000—4,000	EtimationBased on previous project
Pressure gauge reading the collection cylinder pressure	<a href="#">S122-300-PSI-VSF</a>	Swagelok	287.95	1	287.95	Need to customized order with Swagelok ,price found with Airgas

## Cost Summary:

**Hardware + Tubing + Supporting Mechanics Subtotal**

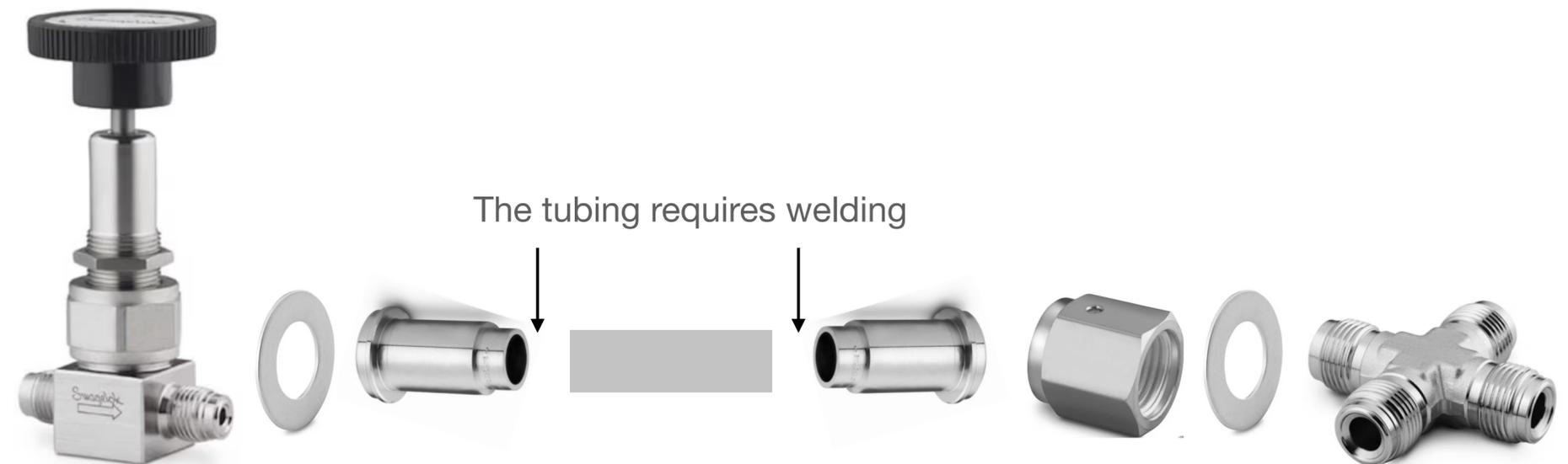
**\$787.95**

**Welding (Estimated Range)**

**\$0**

**With 10% Contingency**

**\$850**



# **LAr Teststand Operation**

- LAr delivered to us
- The old PC used from slow control is very instable, transferring the data and control program to the new PC

## **Optical filter JINST paper response**

- We had a discussion with Yimin for his input
- The comments are due by the end of tomorrow

## **260L system paper**

- First draft expected by 3/9, shooting for submission by 3/16

## **SiPM electronics**

- Electronics for SiPM received from John
- Besides 2x readout boards, he even provides a few SiPMs