

# COMMUNITY STANDARDS

## Welcome to Jefferson Lab!

Everyone at Jefferson Lab has a responsibility to foster an environment where all employees, users, students, guests, visitors, and subcontractors feel safe, welcomed and supported in advancing the Lab's mission.



**DIVERSE IN COMMUNITY**  
*United in Science*

While it is not possible to provide a complete list of the types of improper behavior below, prohibited conduct includes, but is not limited to:

- Offensive verbal comments
- Bullying or deliberate intimidation
- Stalking/following
- Repetitive photography of the same person(s)
- Gender-based insults
- Displaying or circulating sexually suggestive materials
- Inappropriate physical contact
- Unwelcome sexual attention or advances

Everyone is expected to embody the values of professionalism, respect, and diversity as well as cultivate a supportive and inclusive environment where the opinions of others are embraced. Behaviors not aligned with the lab's values will not be tolerated. Failure to adhere to this Community Standard may result in being barred from further lab events, suspension of site access including housing at the SURA Residence Facility, and/or removal from the site.

If you or someone else feels uncomfortable in the workplace or believe you are subjected to a hostile or harassing environment, or have any other related concerns, please contact the Jefferson Lab Ethics Officer, Rhonda Barbosa, immediately at [rbarbosa@jlab.org](mailto:rbarbosa@jlab.org) or via the Lab's Ethics Hotline at <http://www.jsaecp.ethicspoint.com>. Alternately, you may contact your sponsor or the DEIA Program Manager at [dei@jlab.org](mailto:dei@jlab.org).

# Hall A Status

January 2025 Winter Hall A Collaboration Meeting



Mark Jones  
Hall A/C Group Leader

Bob Michaels  
Hall A/C Deputy Group Leader

Jan 2025

# Hall A status

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- On the Scheduled Accelerator Maintenance calendar, the Physics start date is Feb 28<sup>th</sup>.
- At this point , the physics schedule end date is sliding.
- Reminder, only running 25 physics weeks. Still in CR, so Lab does not have a budget.
- GEp deinstallation/MOLLER installation to starts after GEp running.
  - Talks on Wed morning and Thursday afternoon on MOLLER status
- Wed afternoon
  - Talks will be given on GEp status.
- Thursday morning:
  - Talks on the SBS completed experiments: GMn, nTPE, GEN-II and GEN-RP
- Thursday afternoon:
  - Talks on SoLID

## Goals

- Scheduled goal: 900 kW at 1060 MeV/linac through the summer
- Stretch goal: Demonstrate 1100 kW by increasing current to Hall C fourth pass while A is at fifth pass. Ops has to sustain 1100 kW before Physics will push for intermediate heat exchanger upgrade to allow perhaps 1500 kW total.

## Injector

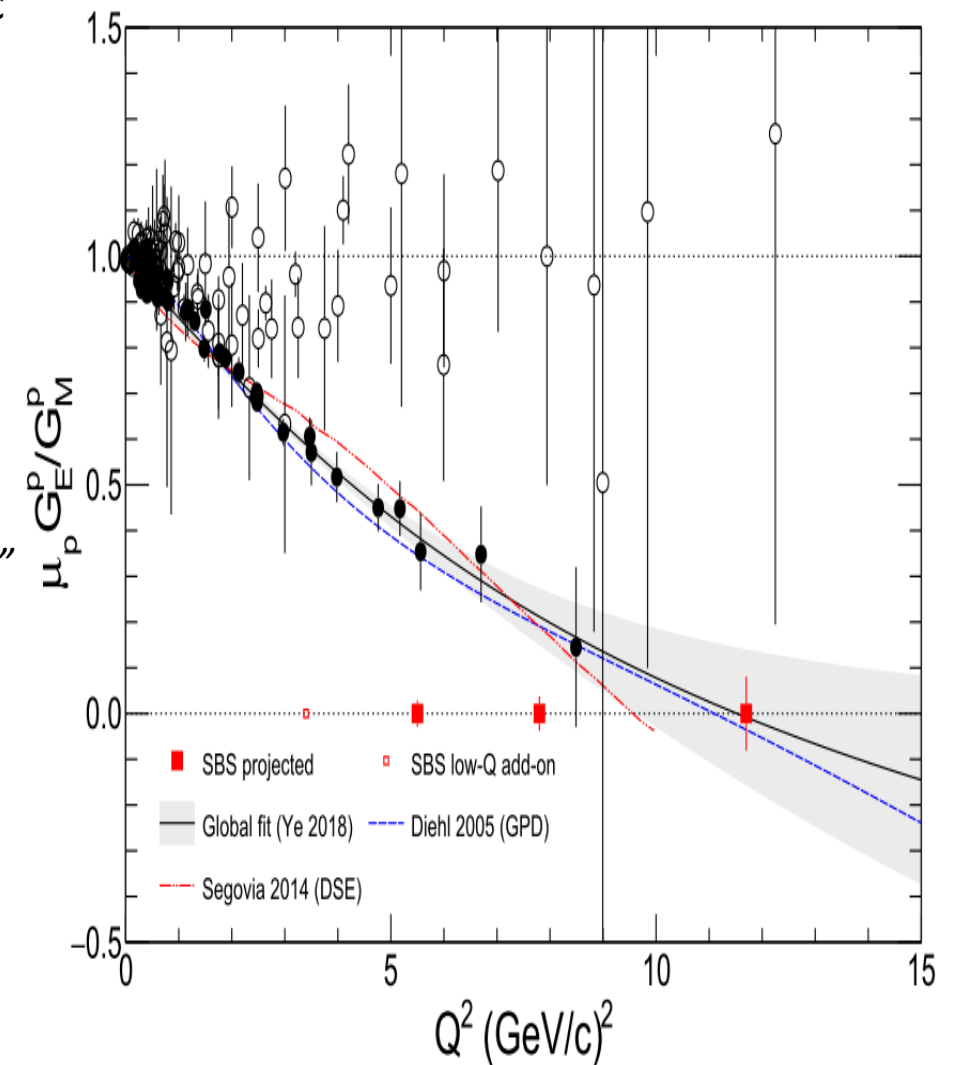
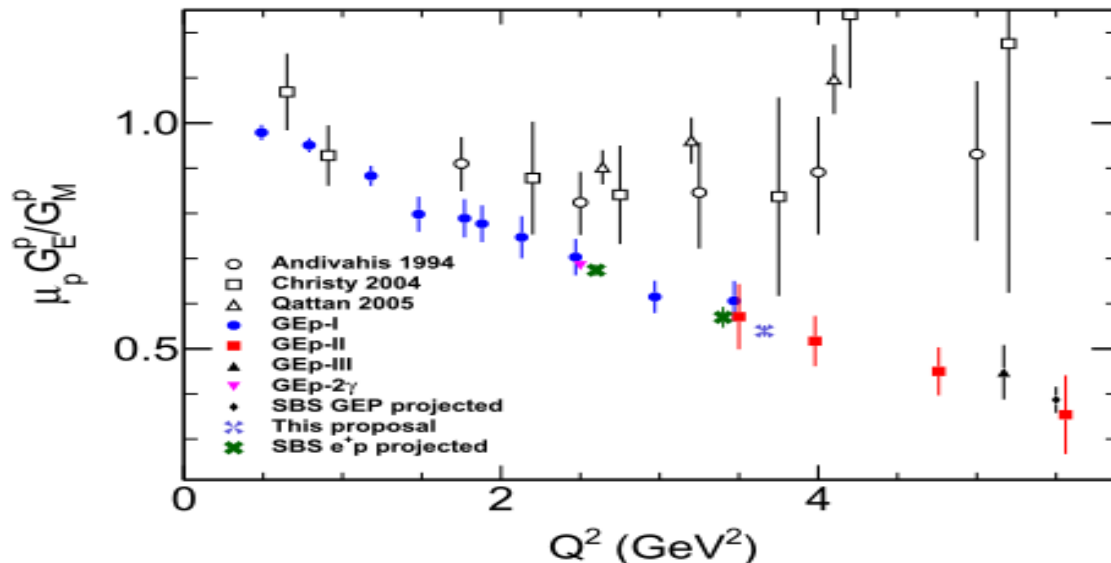
- Injector is essentially new
- Rebuilt 200 kV source
- Rebuilt focusing solenoids
- Degrader installed. LDRD to simulate large emittance positron beam.
- Several weeks of commissioning and testing planned in parallel with linac RF/SRF work
- Three days of dedicated MOLLER tests planned.

# Schedule Status

- Critical path is through SRF commissioning and RF recovery of 30+ other cavities.
- Personnel with transferable skills are being brought in from other groups to get back on track.
- Three refurbished modules need to be commissioned: 1L22, 2L05, 1L09
- Present schedule has 1L09 commissioning ending 13 February.
- Useful CEBAF recovery start will depend on the other 30+ cavities.
- Accelerator Division is working with ES&H to ensure 24-7 on-call support.

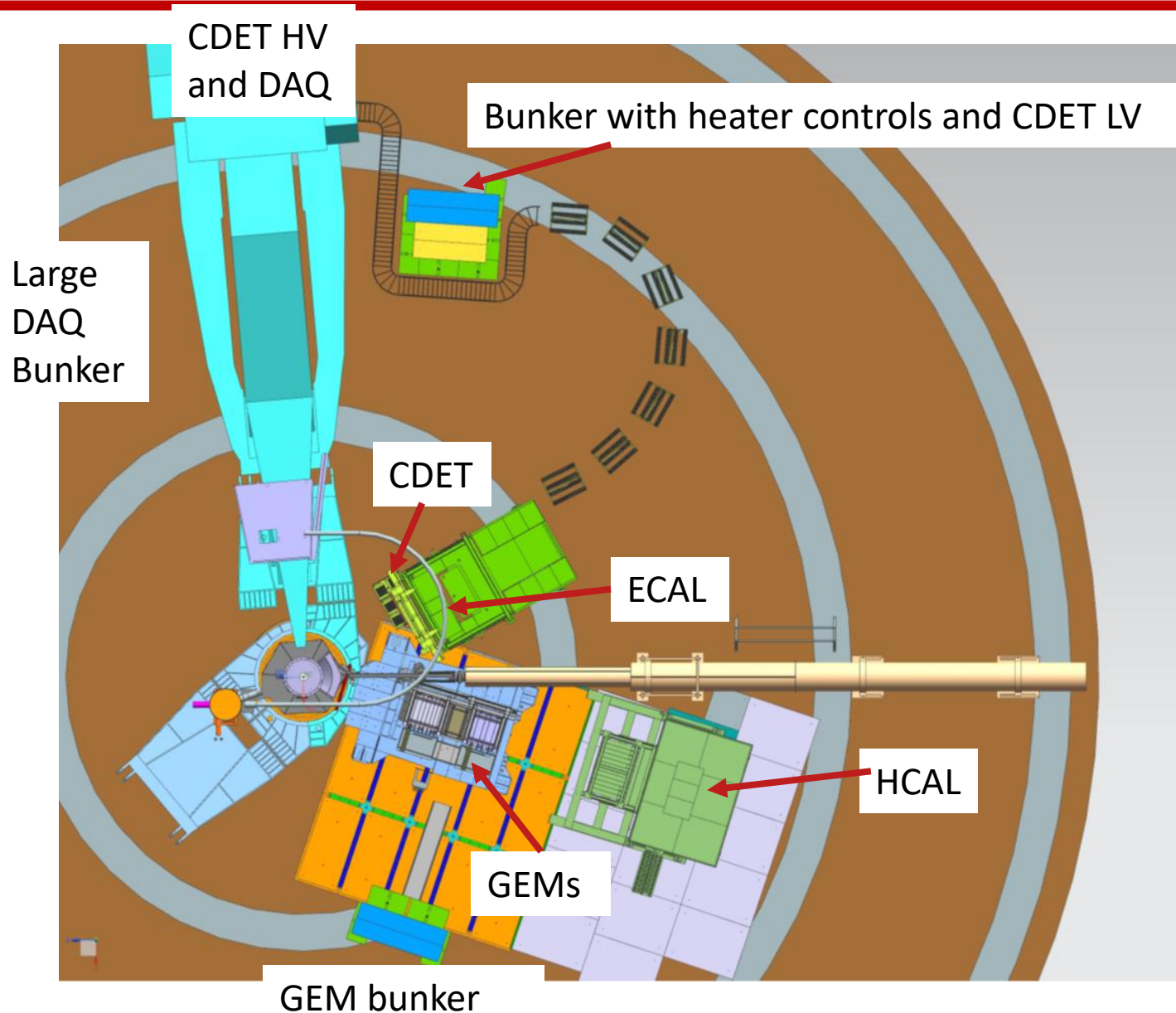
# GEP: Ratio of proton electric to magnetic form factor

- Last experiment in series of neutron and proton elastic electric and magnetic form factor experiments.
- Six graduate students on the experiment.
- E12-07-109 Measure proton electric form factor to  $Q^2 = 12$
- E12-24-010 High-precision measurement of proton form factor ratio with Polarization Transfer,
  - Spokespeople: A. Puckett\*, J. Bernauer and A. Schmidt
  - Measure proton  $G_E/G_M$  to 1% statistical precision at  $Q^2 = 3.8$
  - “The primary motivation for this request is to improve the precision of the polarization data at this  $Q^2$  in anticipation of the comparison to a future measurement using positrons, described in a previous LOI to PAC51 (LOI12-23-008).”



Figures by Andrew Puckett from E12-24-010 proposal

# Overview of detectors: Layout for $Q^2=12$ kinematic point



## Electron Detection

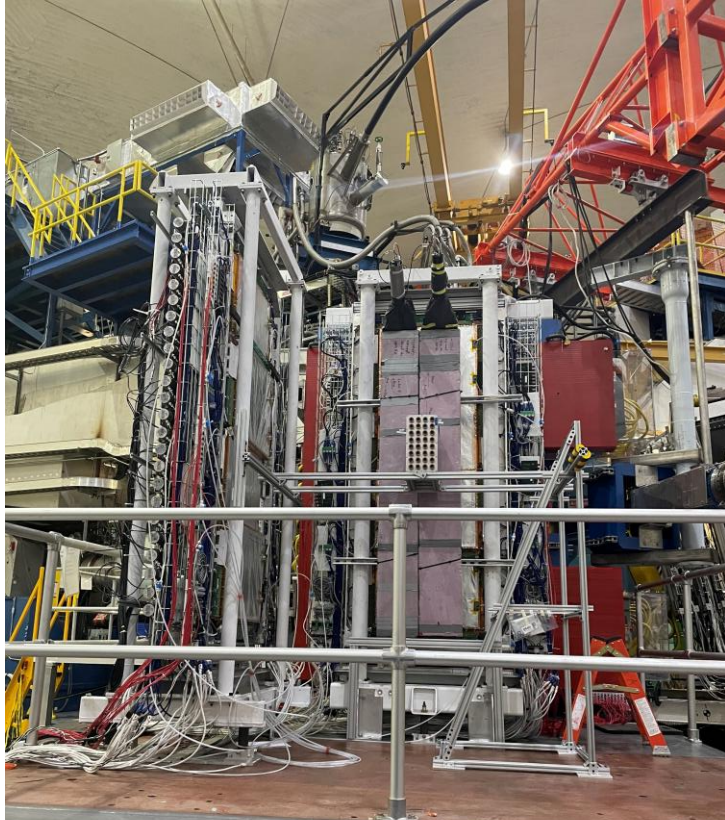
- Electron Calorimeter (ECAL)
  - 1656 Lead glass blocks
  - Trigger formed in FADC from clusters
  - Need good energy calibration at FADC
  - Tight cut on elastic to reduce accidentals
  - Measure angle and energy
- Coordinate Detector (CDET)
  - 2352 scintillator bars
  - Measures vertical angle
  - Aids track finding in front GEMs
  - Reduce the photon background

## Proton Detection

- GEMS Front and rear tracker
  - Each 8 layers of GEMs
  - Measure momentum, z-target, angles
  - Plastic analyzer for rescattering protons
  - Measure the recoil polarization of protons
- Hadron Calorimeter (HCAL)
  - 288 iron/scintillator blocks
  - Trigger formed in FADC from clusters
  - Aids track finding in rear trackers



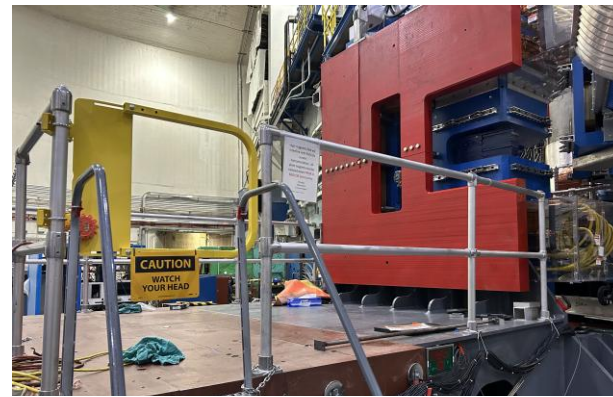
# Hall A: Deinstalling BigBite and SBS GEN-RP



GEN-RP SBS detectors before experiment started. The large scintillators used for cosmics were removed.



GEN-RP SBS GEM detectors moved off SBS

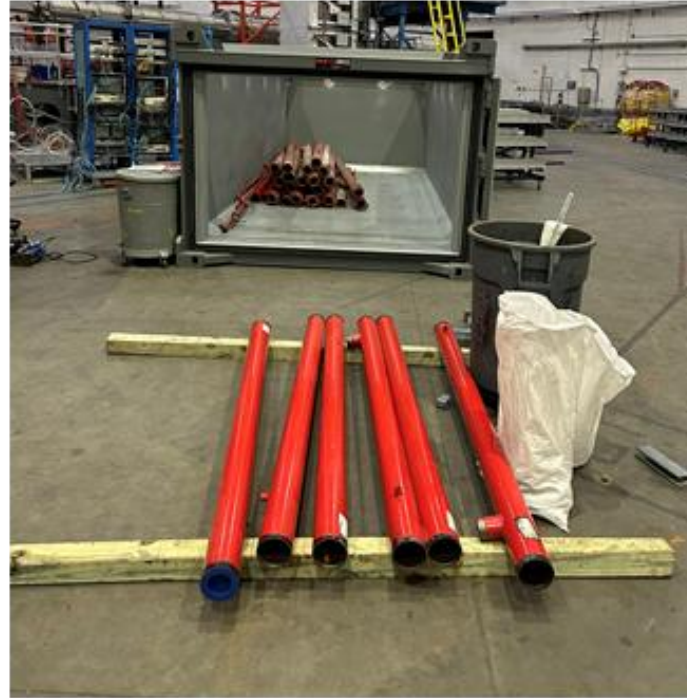


SBS counterweight is cleared off



BigBite magnet stored in the TestLab

# Hall A Fire Suppression replacement and MOLLER Switchgear

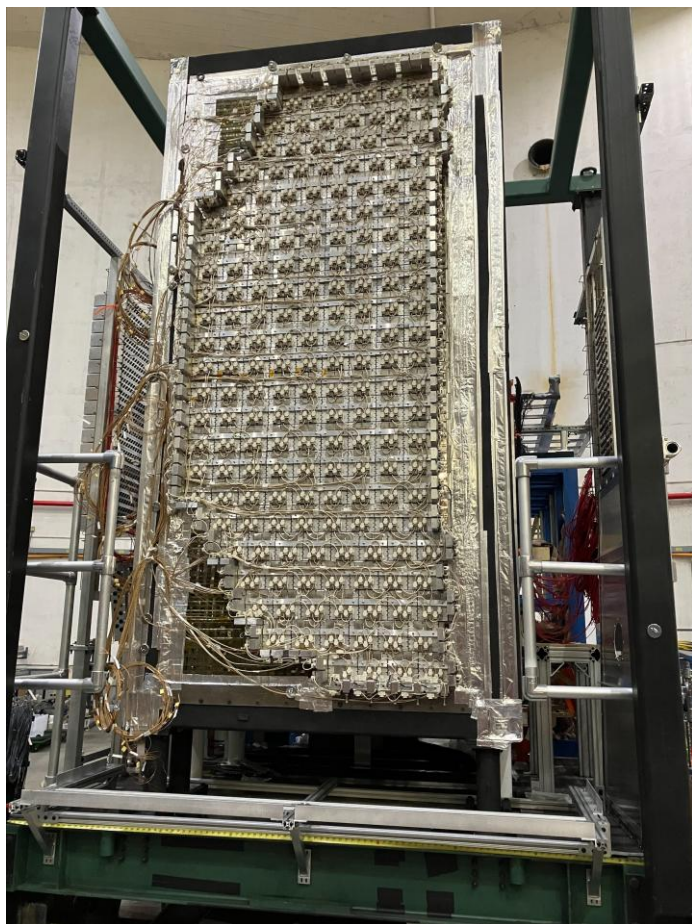


## Fire Suppression replacement

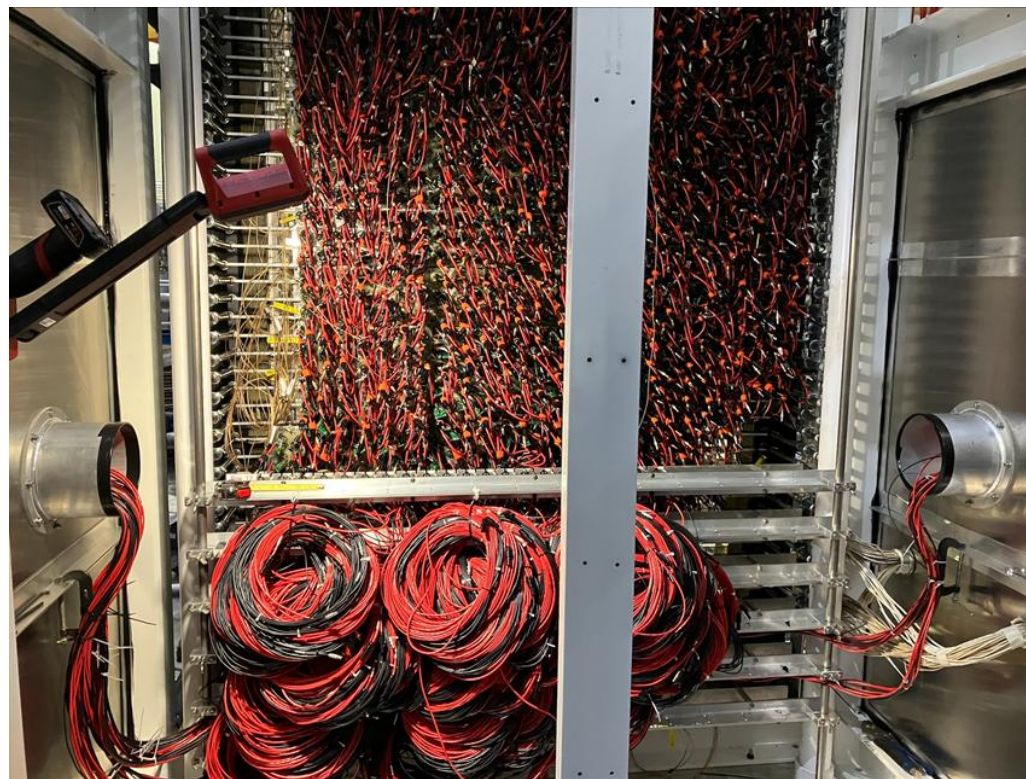
Fire suppression work is complete in both Hall A and C

Switch gears for MOLLER Power supplies  
All installation work is complete.

# ECAL installation



After the heaters installed



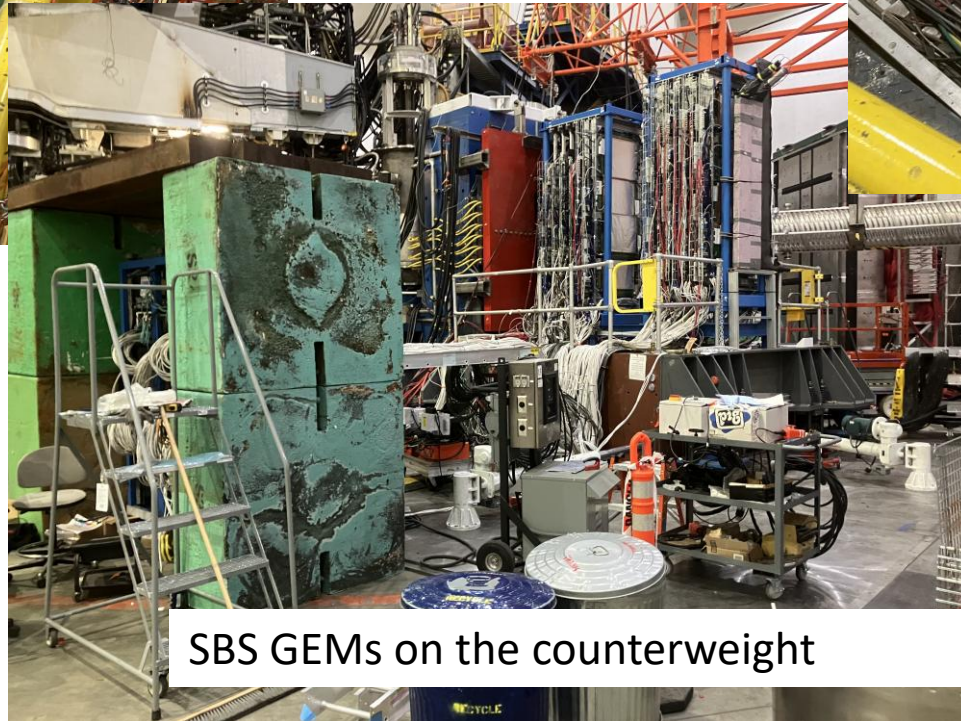
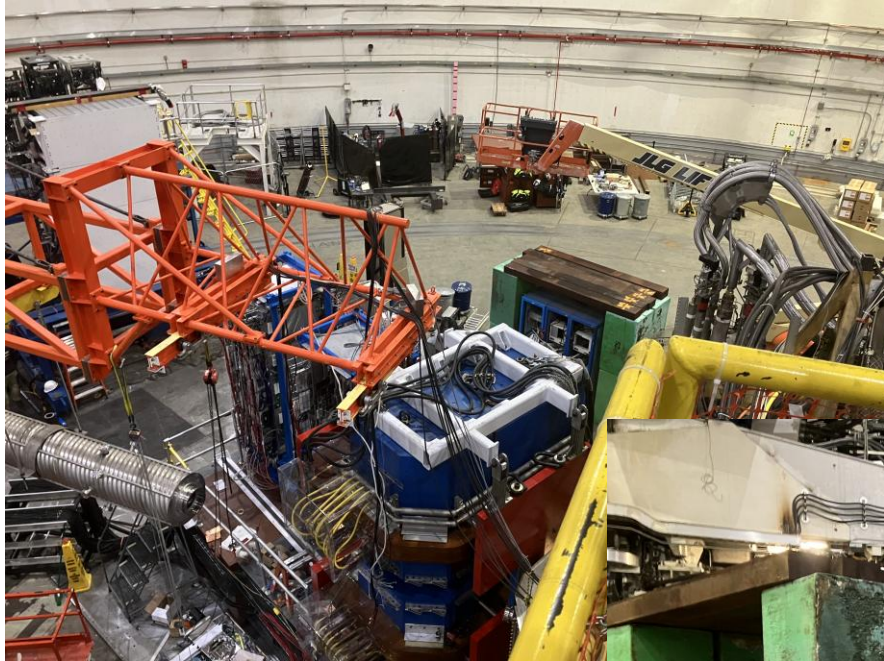
The ECAL PMT and dividers installed. Rear enclosure and cooling system installed. Picture at the beginning of the cable installation.



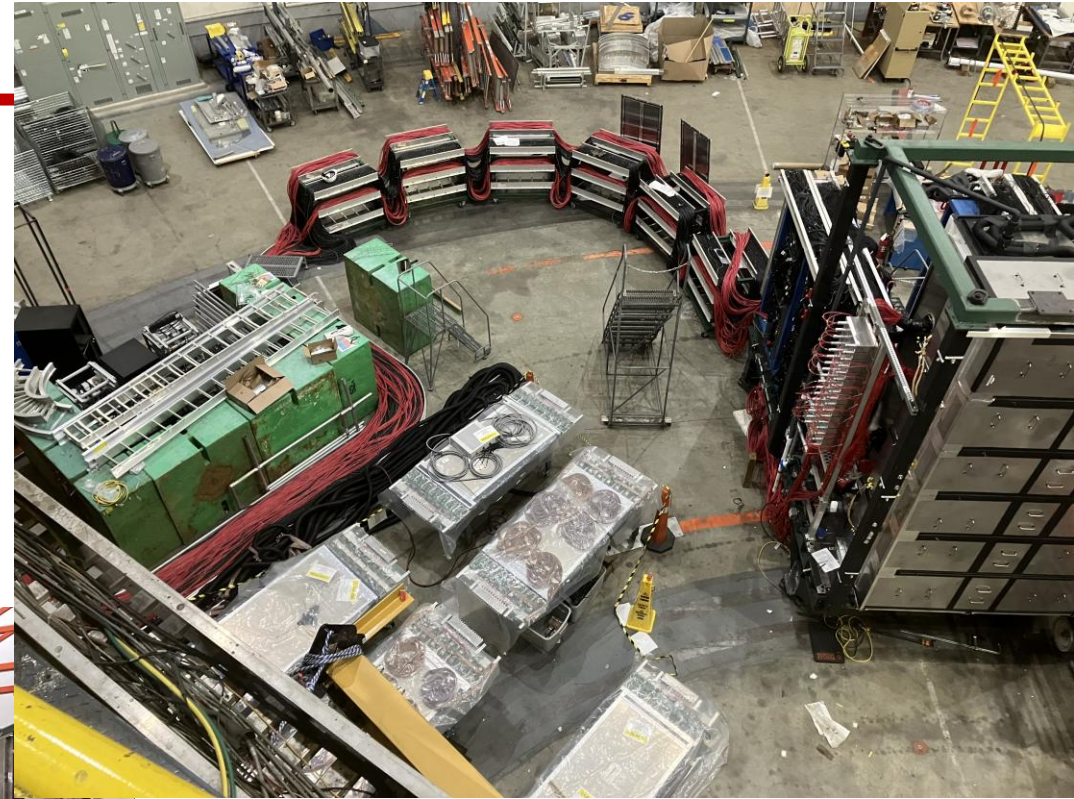
The DAQ electronics in the SBS bunker.

# Ecal installation

Overview of SBS magnet and GEMs with HCAL.

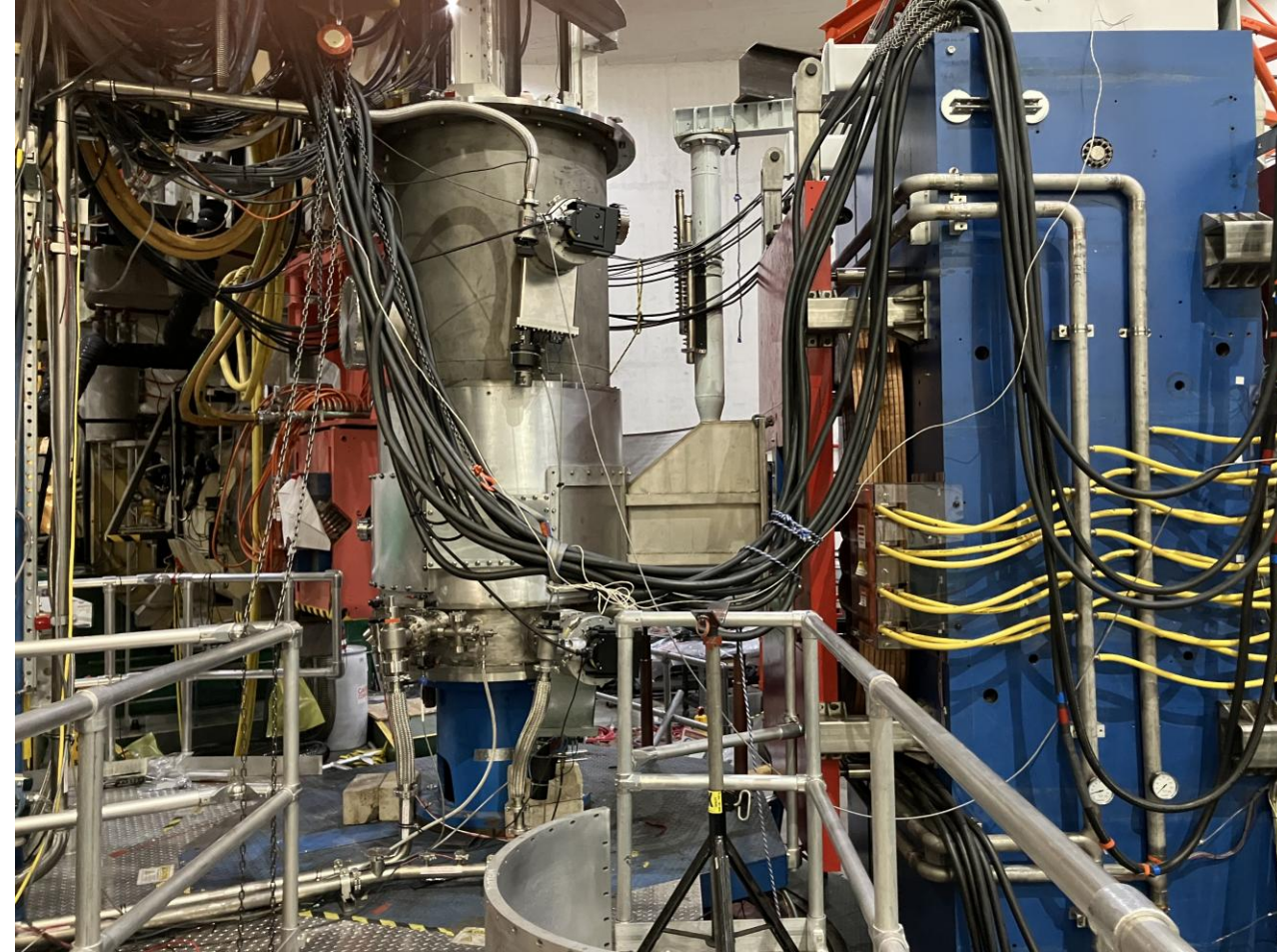
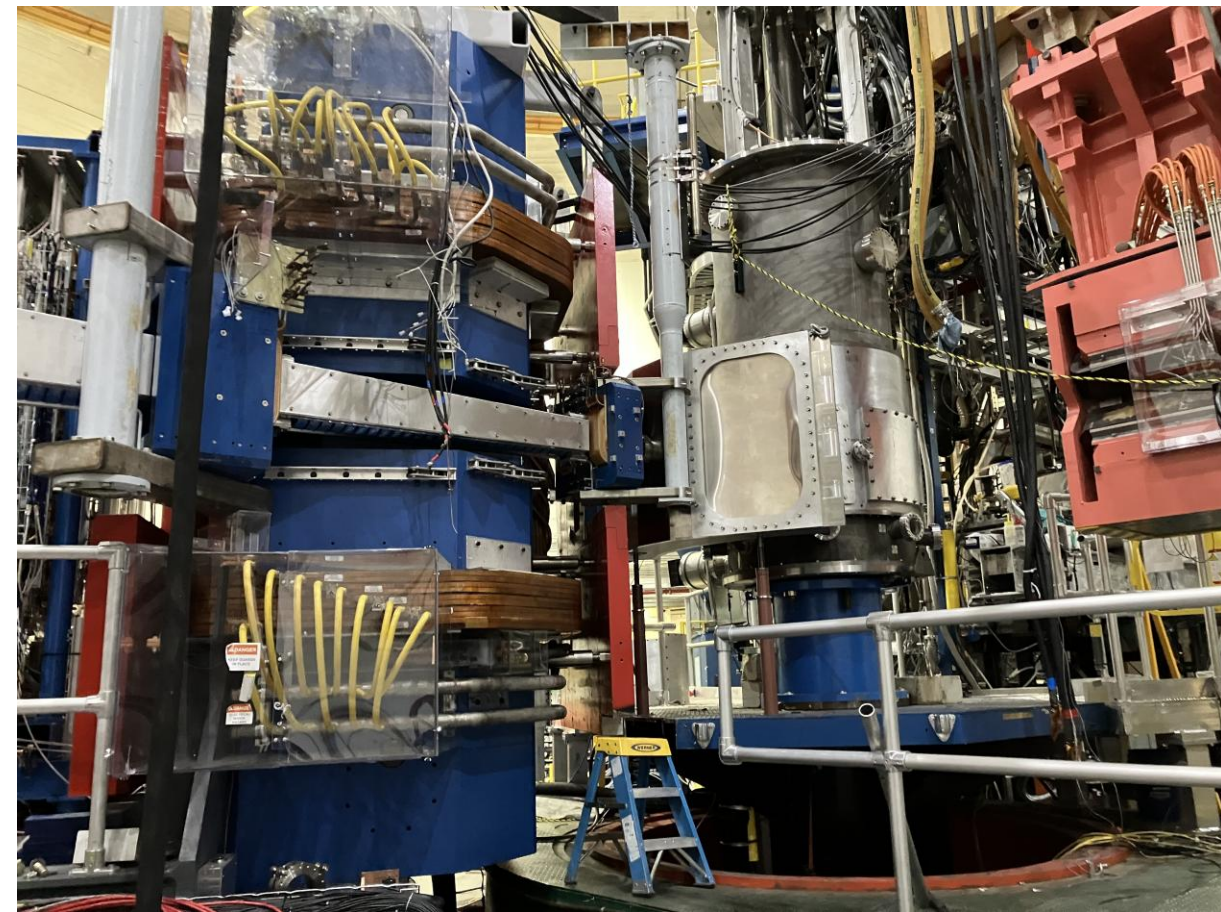


SBS GEMs on the counterweight



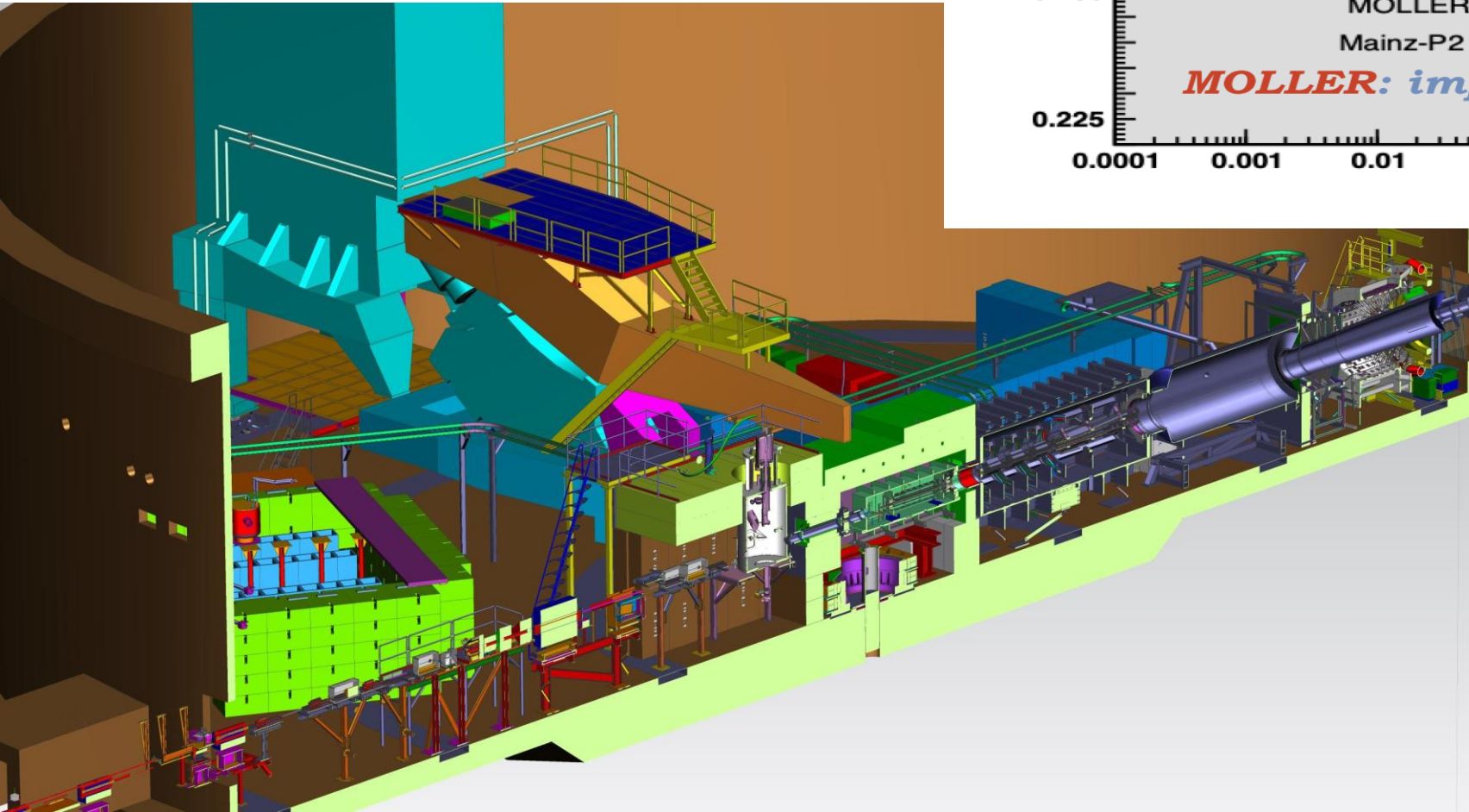
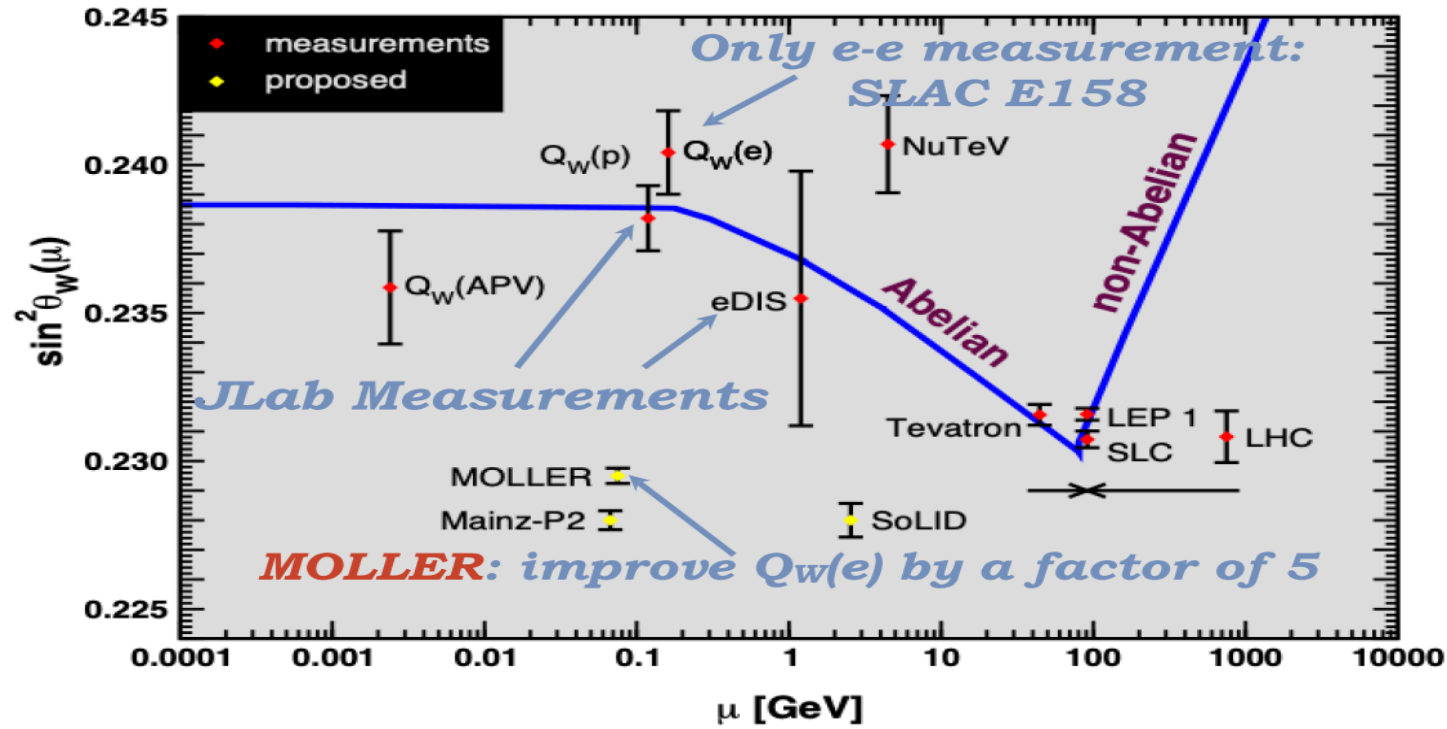
Top view of CDET planes and ECAL

# Target and beamline installation



# MOLLER Project

- ESAAB Approval: MOLLER Project CD-2/3
- Installation starts after GEp running
- 3 years of running.



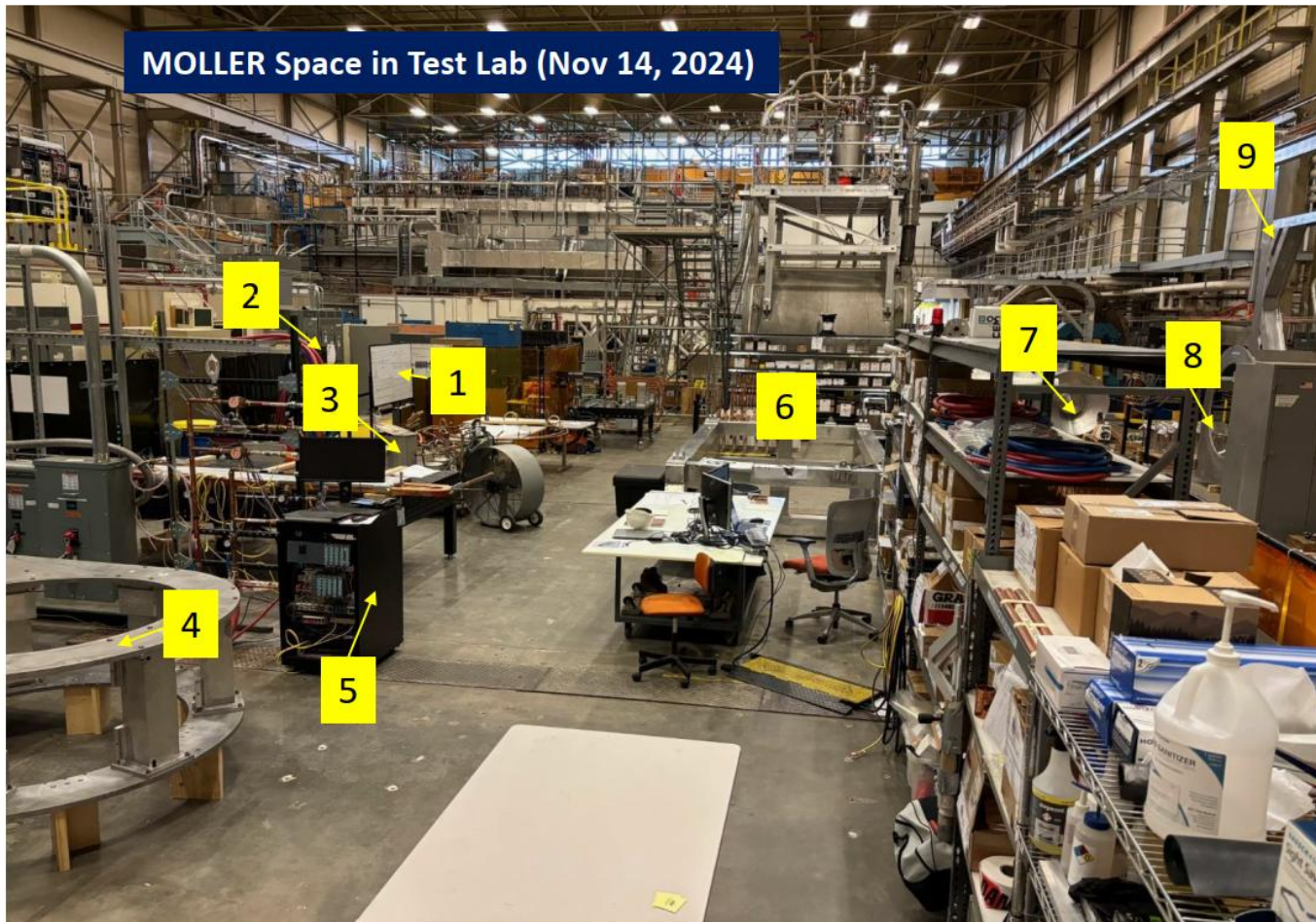
# MOLLER updates

November 19<sup>th</sup>, 2024

Jefferson Lab **MAGNET GROUP**

MOLLER

Magnet Group – General



MOLLER Space in Test Lab (Nov 14, 2024)



New Power Source

- ❑ Big Bertha secured (thanks to Hall D)
- ❑ Provides - 120V, 208V 3-Ph, 480V 3-Ph



Water Header

- ❑ Help from - Acc/Engg
- ❑ Setting up the water header
- ❑ Purpose is to remove flux prior to leak testing
- ❑ Requires 208V 3phase

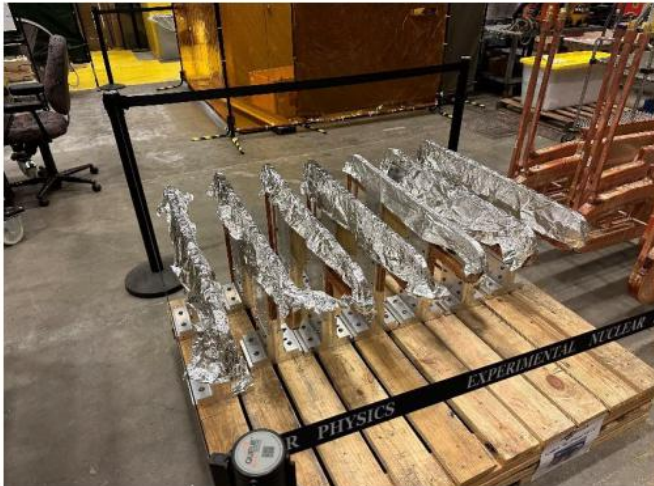
- 1. White board meeting area
- 2. Big Bertha Power source
- 3. Water Header (Flushing)
- 4. TM2 space/support frame
- 5. I&C rack for test lab

- 6. Drift pipe support
- 7. Detector pipe
- 8. TM4 support frame
- 9. Detector pipe support frame

# MOLLER updates

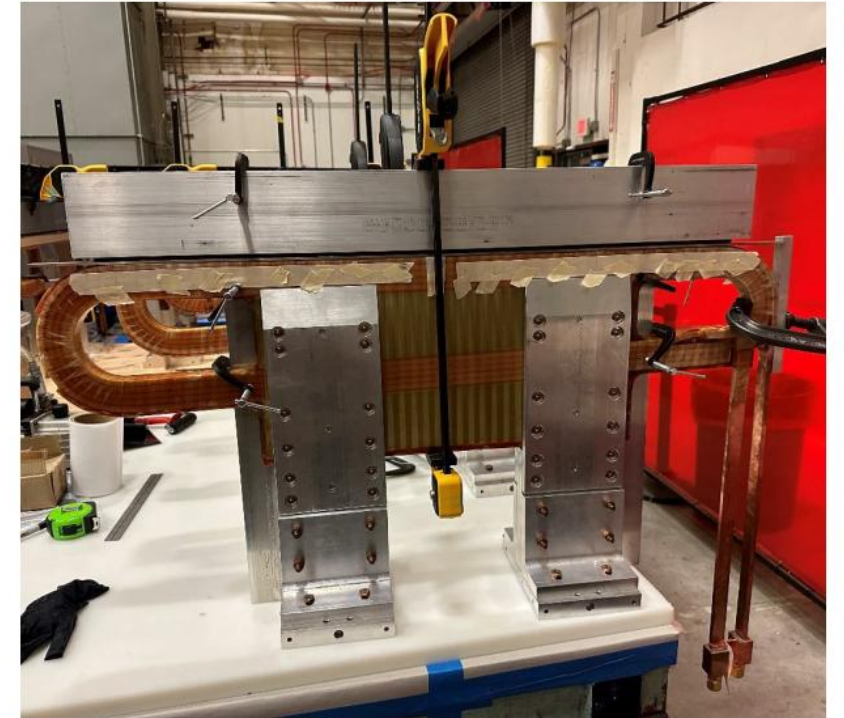
## MOLLER

SC1 coils – Fully clamped and sanded, 7 of 7 High potted w/o Belly plates



## Magnet Group and team – General

SC2 Coils - Fully clamped and sanded, Belly plates positioned with spacer wires, 7 of 7 hi-potted



✓ Hi-pot – Test completed, and all passed the test up to 1.5 kV (leakage current test,  $<0.3 \mu\text{A}$ ) – THANKS to Morgan Cook (Hall-B)

Ready to Hi-pot and then epoxy on Belly plate (BP) and Tooling balls (TB)  
Note - Z stop, Tape holding wires, Foam putting even pressure on BP, TB not installed here.

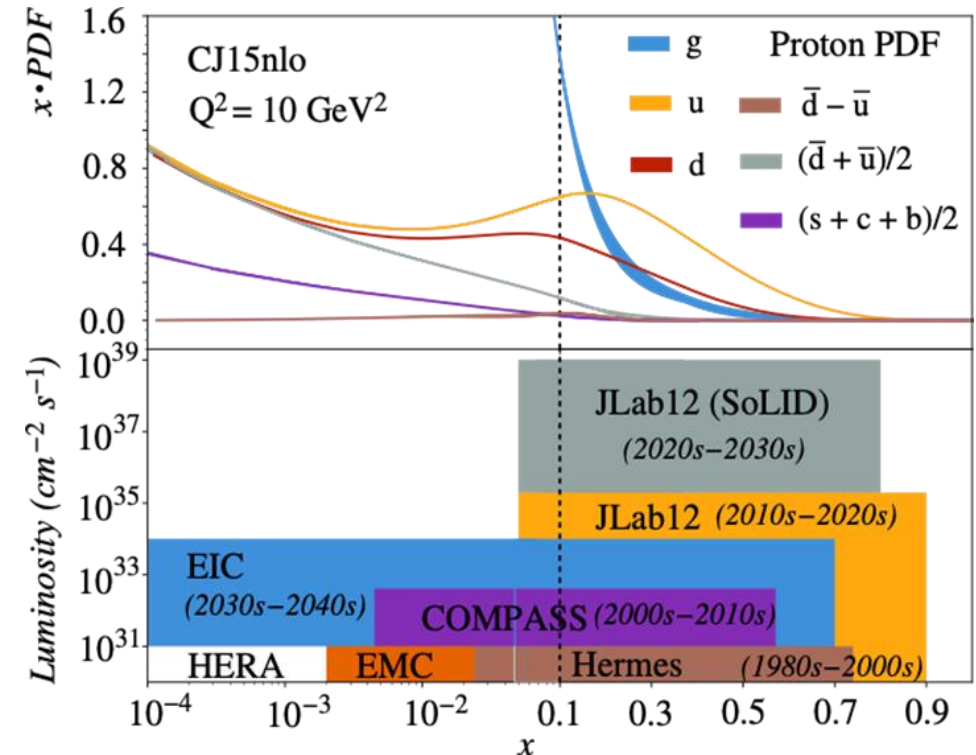
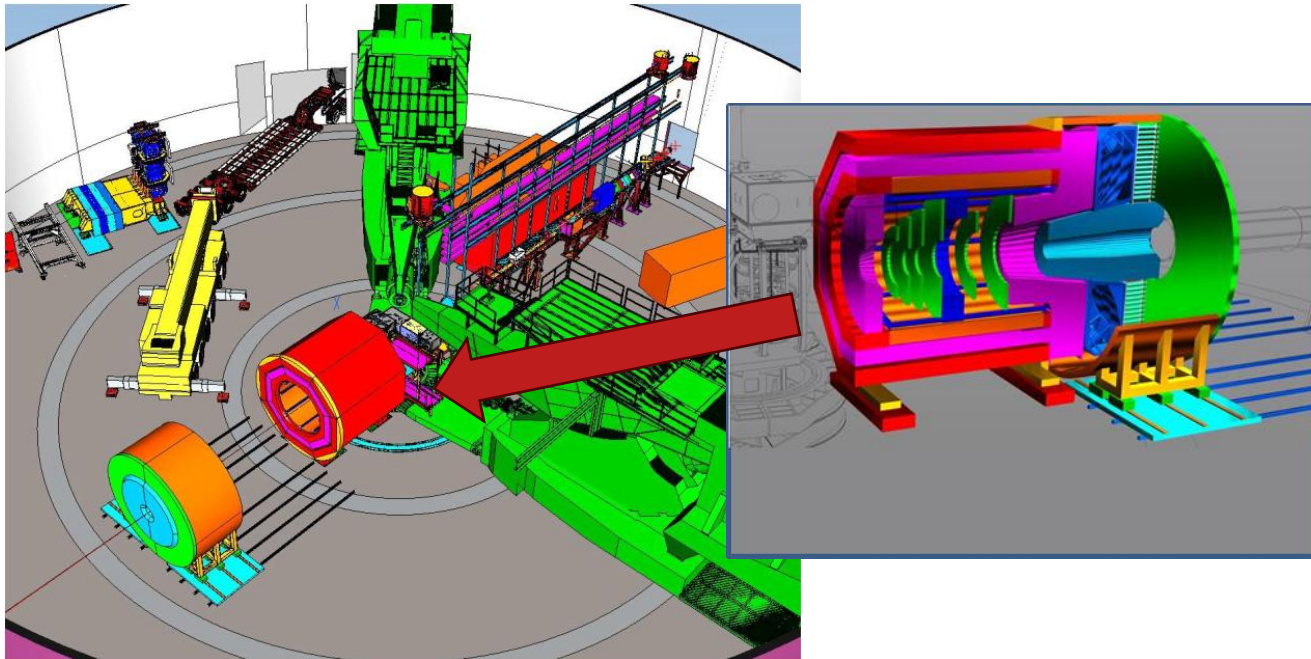


# MOLLER Major Components Highlights



# SoLID : Solenoidal Large Intensity Device

- A series of SIDIS experiments will probe the confined motions (3-D imaging) of partons inside protons and neutrons including orbital motion, and uncover the rich QCD dynamics such as spin-orbital correlations.
- Parity Violating Deep Inelastic Scattering (PVDIS) to search for new interactions beyond the Standard Model.
- $J/\psi$  production near threshold will provide information on the pure gluonic component of QCD



- SoLID in recommendation #4 of the NSAC Long Range Plan  
 “We recommend capitalizing on the unique ways in which nuclear physics can advance discovery science and applications for society by investing in additional projects and new strategic opportunities”... which include “the Solenoidal Large Intensity Device (SoLID) at Jefferson Lab”.

## ***Efforts to move SoLID to CD0***

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- SoLID leadership had a meeting with new Lab Director Kimberly Sawyer, Paul Souder made presentation.
- Associate Director of Science for Nuclear Physics, Linda Horton, visited JLab in Nov:
  - Haiyan Gao made a presentation about SoLID
- In December, Haiyan Gao made presentation on SoLID to the JSA S&T Mission Committee meeting.
- Lab leadership plans to present the cost sharing plan at the LMBB in March/April 2025
  - Lab Capitol account would be used for a GEM project and a LGC project
  - Lab OPS account would be used for magnet testing to full current.
  - From 2023-2025 Lab Capitol used for Generic DAQ that can be used for SoLID.
- Planned DAQ test
- Support plans for an additional beam test of SoLID detectors during the FY26 running.
- Jlab support efforts to obtain new pre R&D funds for GEM readout and tracking options, MCP-PMT

# Summary

- Session with updates on the SBS form factor experiments:
  - Measurement of neutron magnet form factor (GMn) to  $Q^2 = 13.5$
  - Search for two-exchange effects in elastic neutron scattering (nTPE).
  - Neutron electron form factor measured by beam-target asymmetries with polarized  $^3\text{He}$  target to  $Q^2 = 10$
  - Neutron electron form factor measured by (n,p) and (n,n) recoil polarization at  $Q^2 = 4.5$ 
    - Compare to recoil polarization techniques and compare to beam-target asymmetry method
    - Charge exchange (n,p) could be used in future experiments to extend  $Q^2$  range.
- Long installation of GEp nearly complete. Status updates will be given.
  - BigBite deinstallation, ECAL, CDET, SBS GEMs, SBS magnet and beamline reconfiguration, HCAL and target
- MOLLER spectrometer, infrastructure, target and detector procurements and construction underway