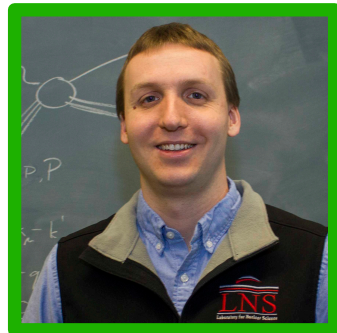


The LAD Experiment: Status and Preparation

Florian Hauenstein
HallC Meeting
February 18, 2022

Eager to get LAD ready

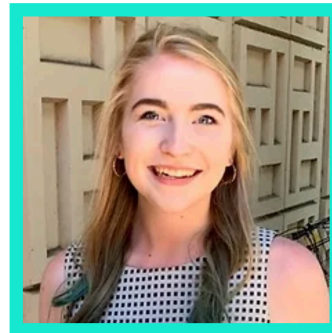
Axel Schmidt
(Faculty)



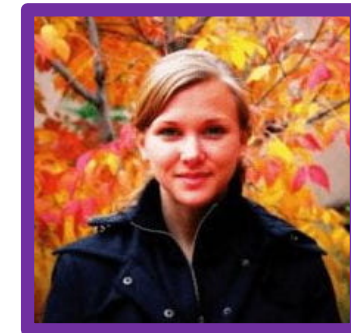
Tyler Kutz
(Postdoc)



Natalie Wright
(Grad student)



Holly Szumila-Vance
(Staff)



Sara Ratliff
(Grad student)



Jason Phelan
(Grad student)



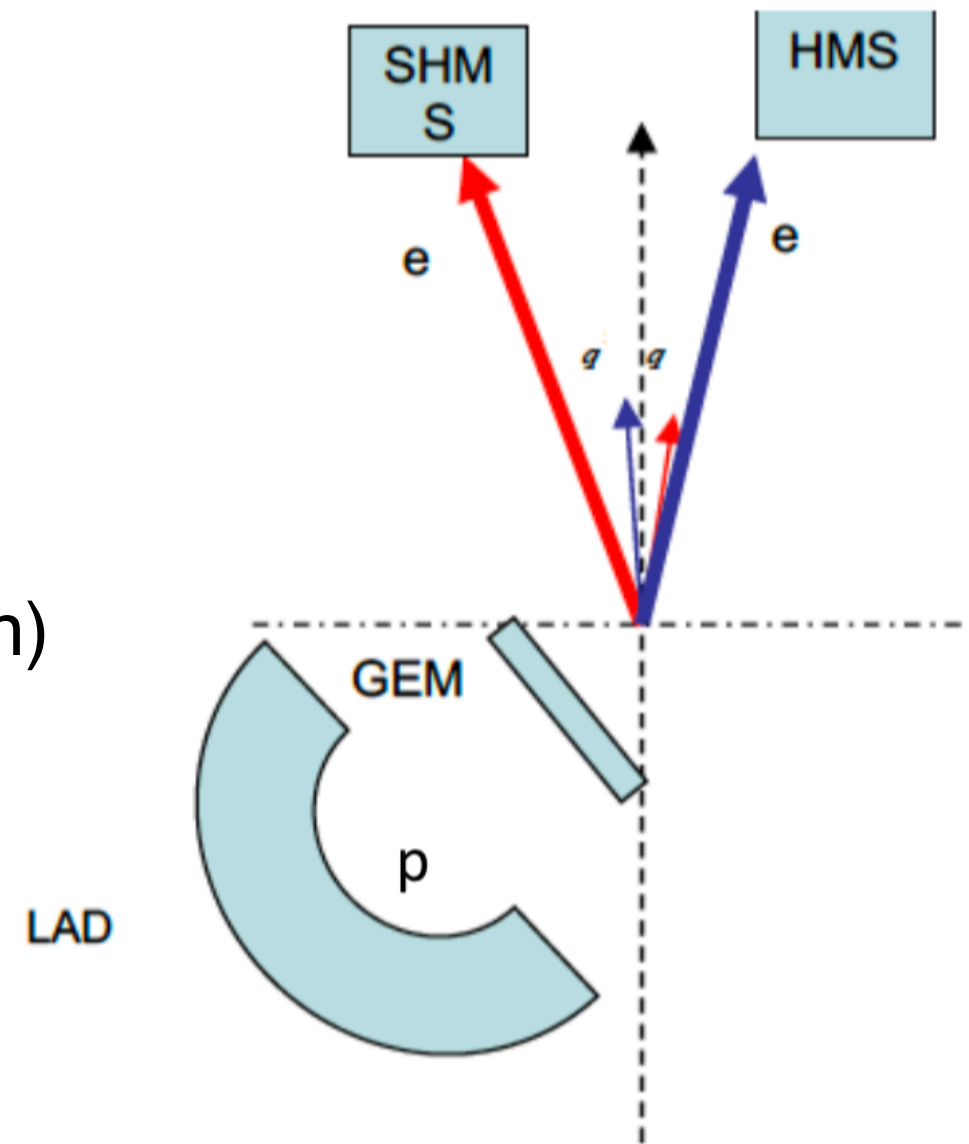
Dien Nguyen
(Isgur Postdoc)

plus: Or Hen, Douglas Higinbotham, Eli Piassetzky, Larry Weinstein, and me



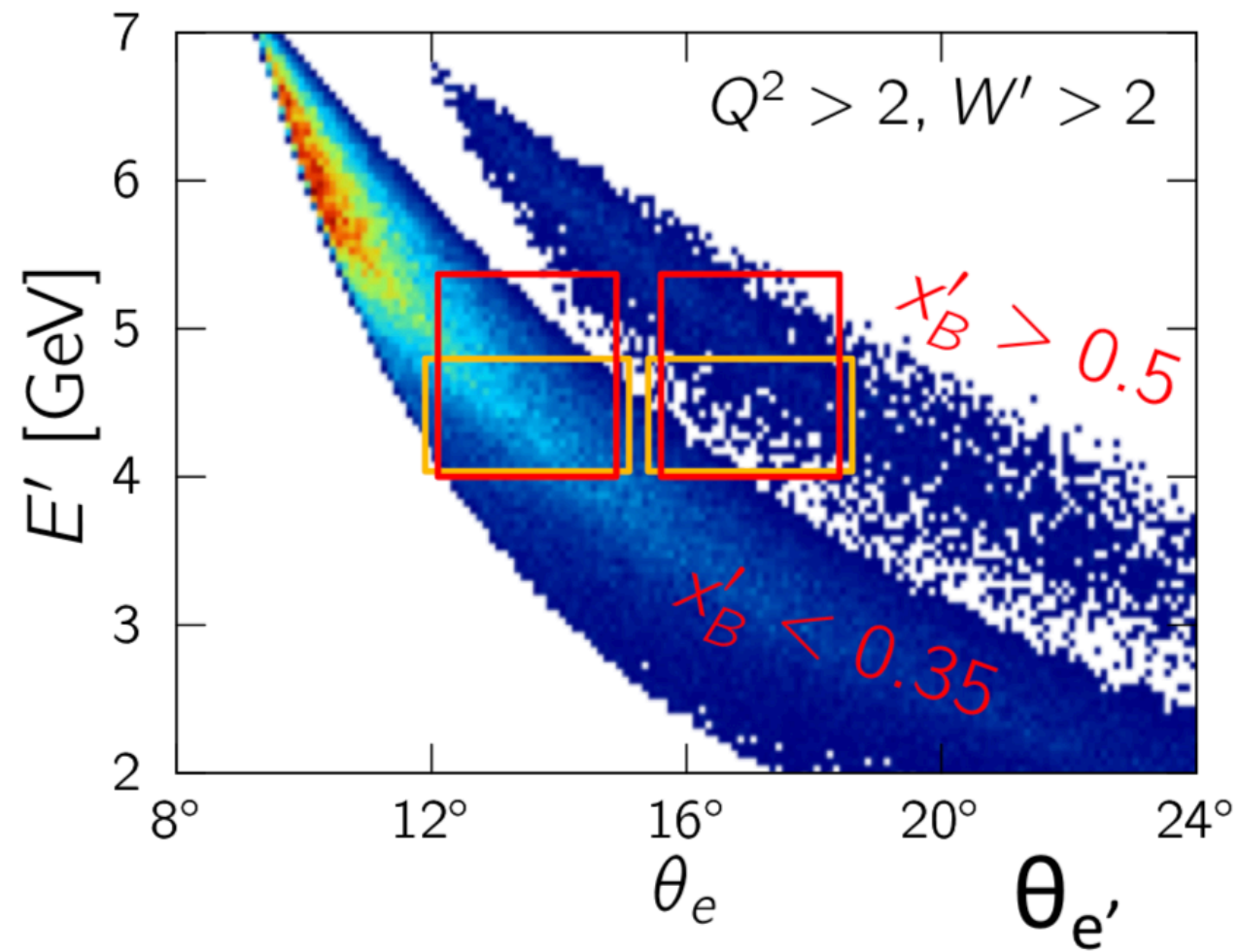
LAD Experimental Settings

- Beam energy 11 GeV and 6.6 GeV (calibration)
- Beam currents $\sim 1\text{-}2\mu\text{A}$
- Standard HMS for electrons
 - Momentum: 4.4 GeV
 - Angles: 13.5° , 17° and 21.7° (calibration)
- Standard SHMS for electrons
 - Momentum: 4.4 GeV and 5.1 GeV (calibration)
 - Angles: 13.5° and 17°
- LAD detector for recoil protons
- PRAD GEMs for tracking

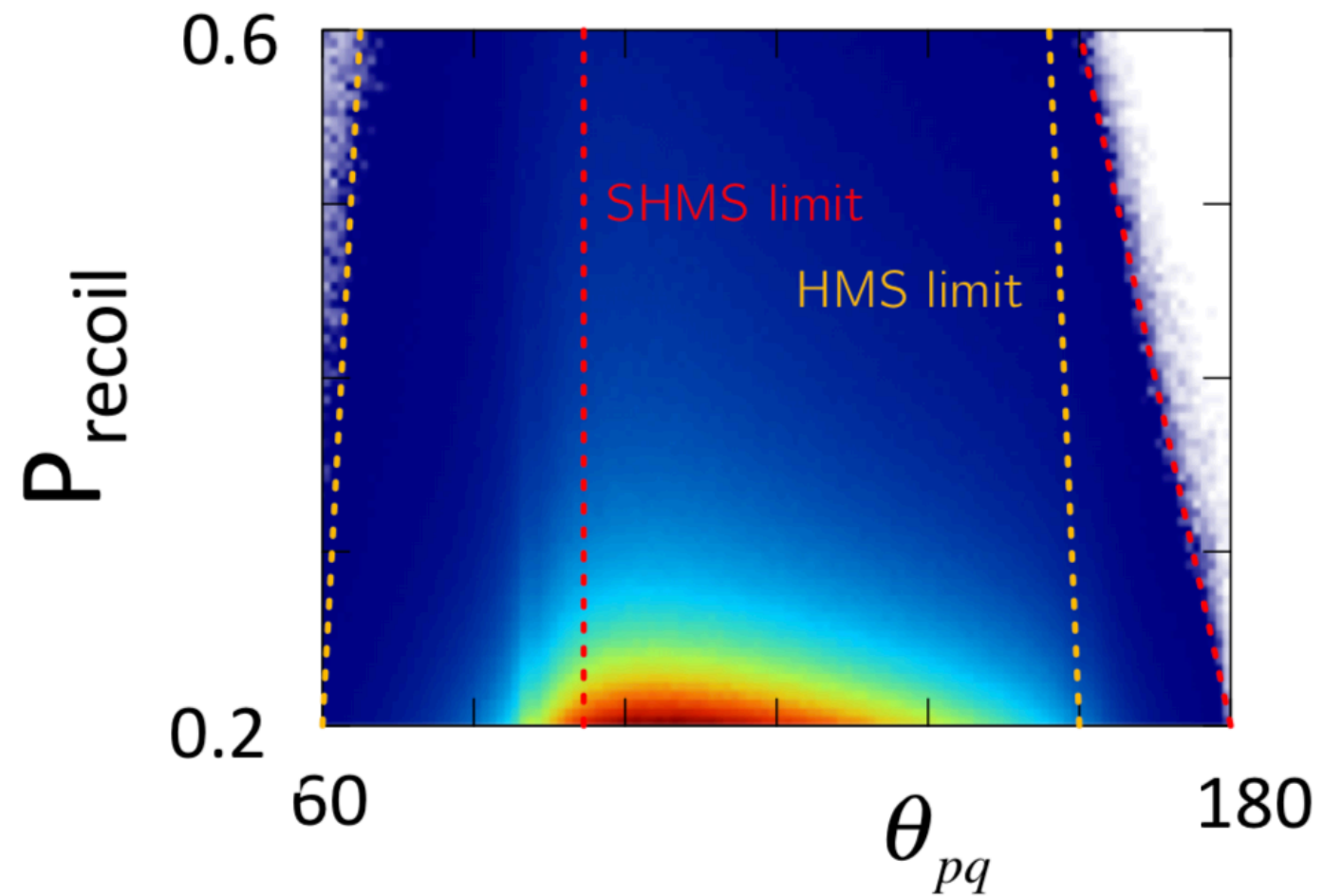


Kinematic Coverage

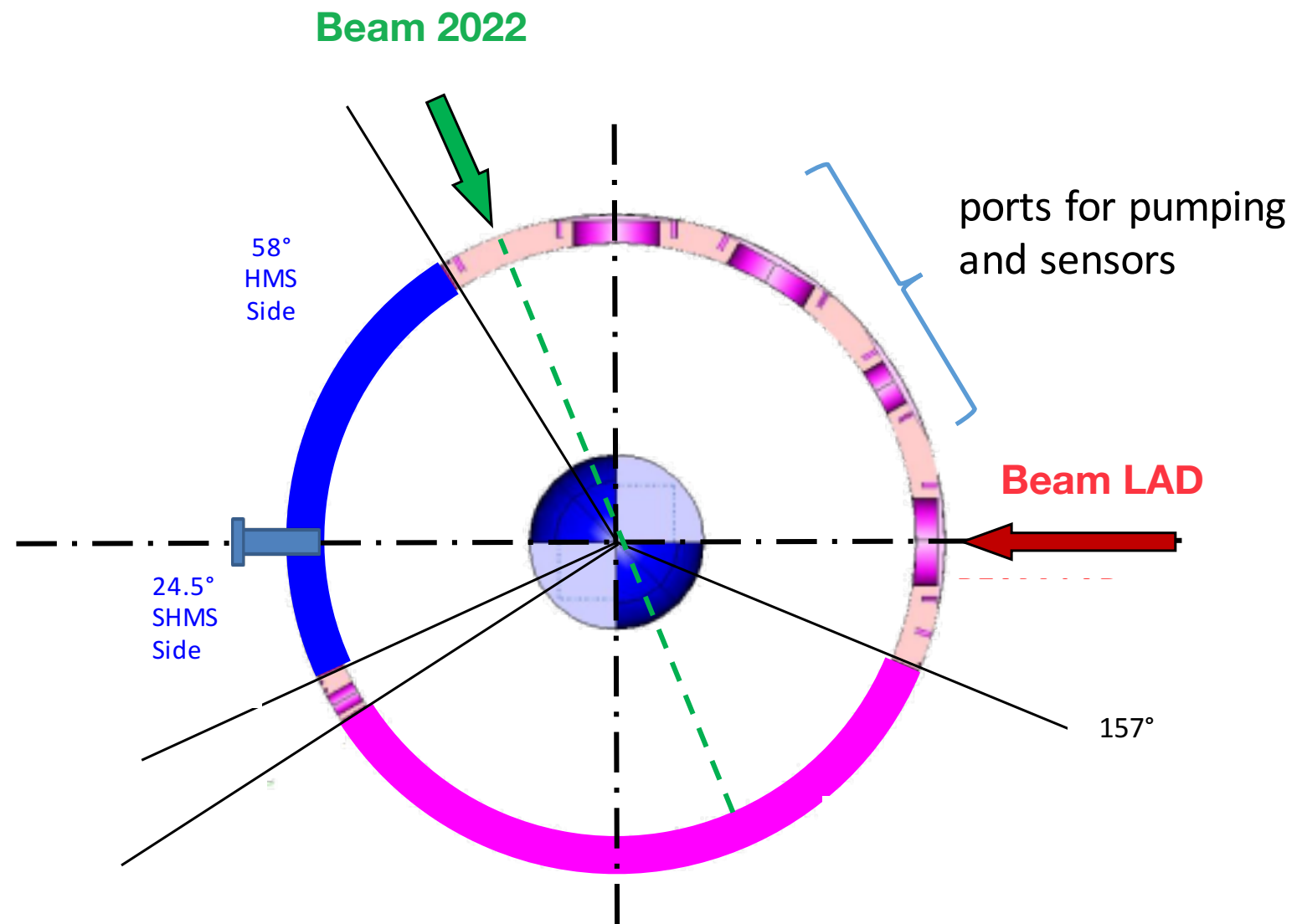
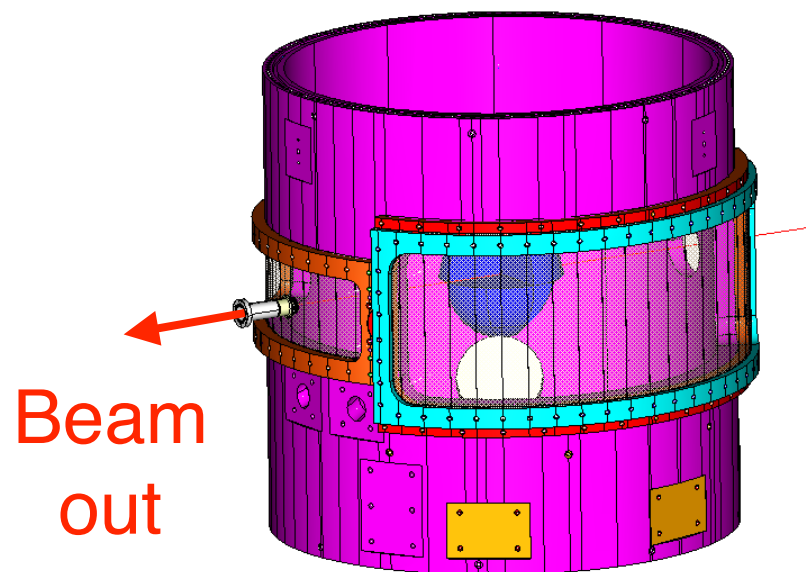
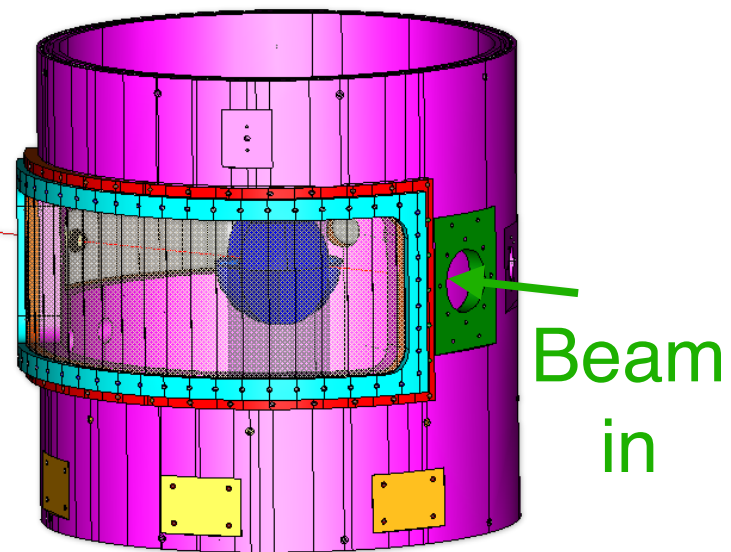
Electrons



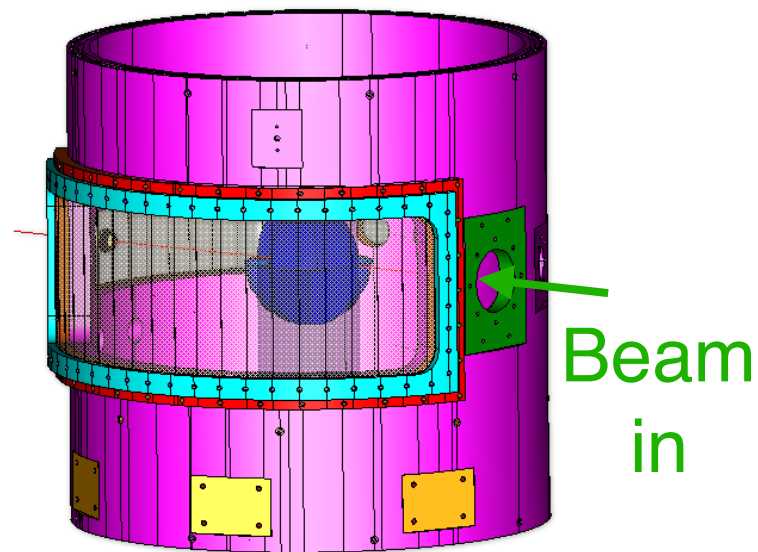
Recoils



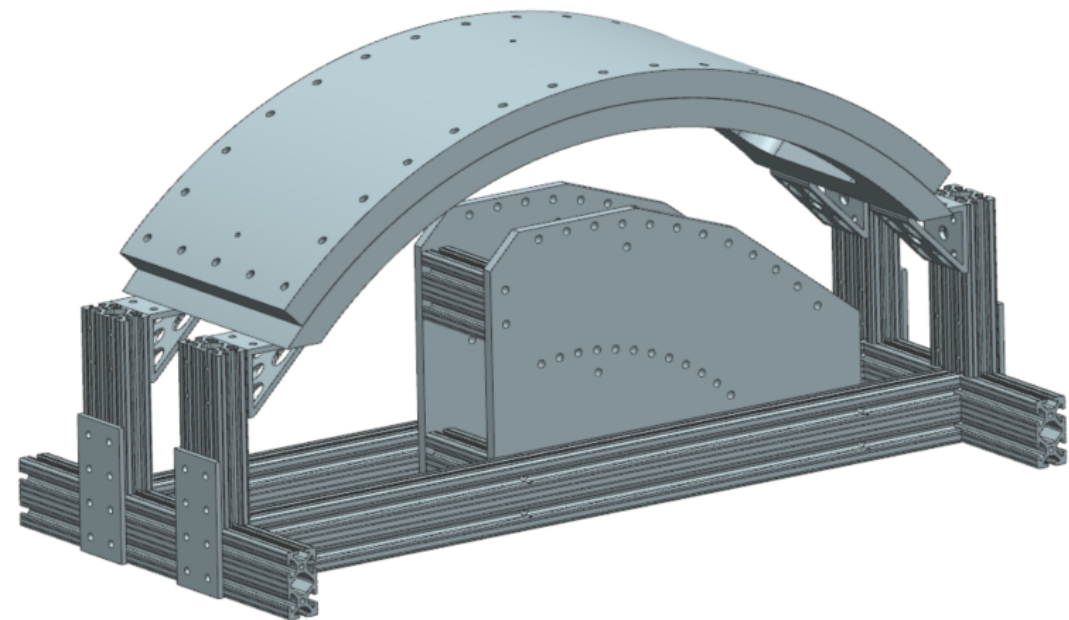
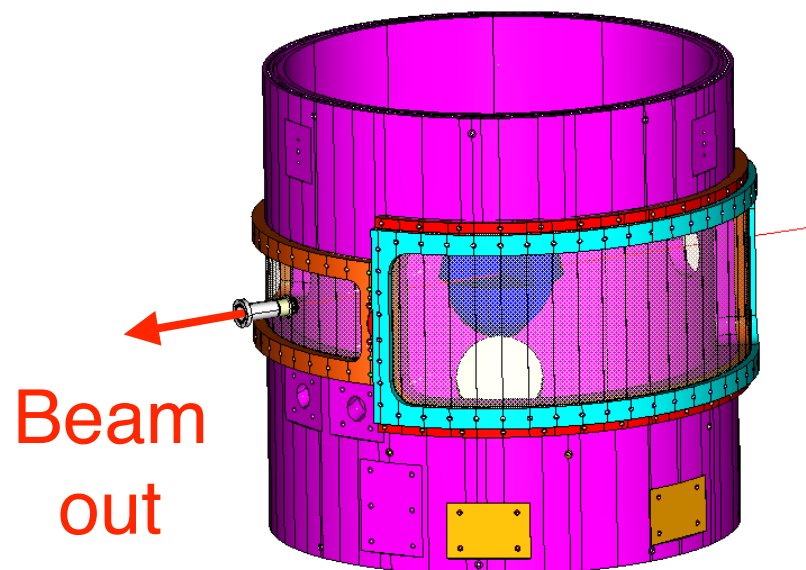
Rotated Scattering Chamber



Rotated Scattering Chamber

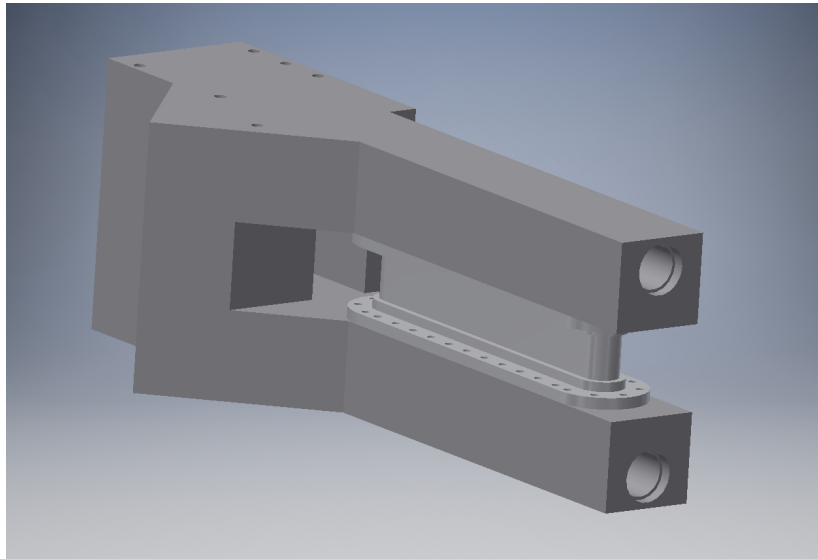


- Designs complete for new exit window, beam ports and window fixtures
—> read for fabrication

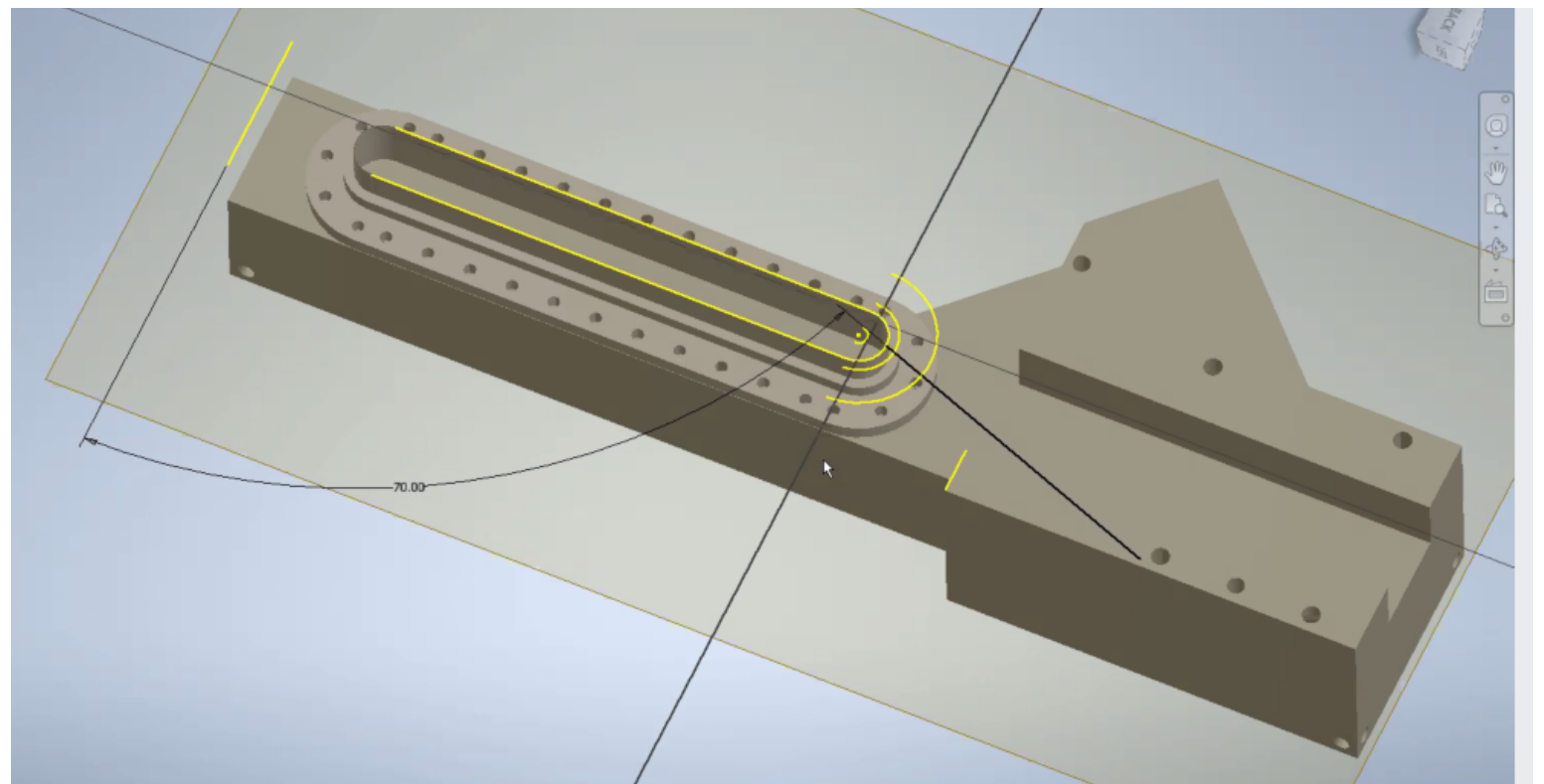
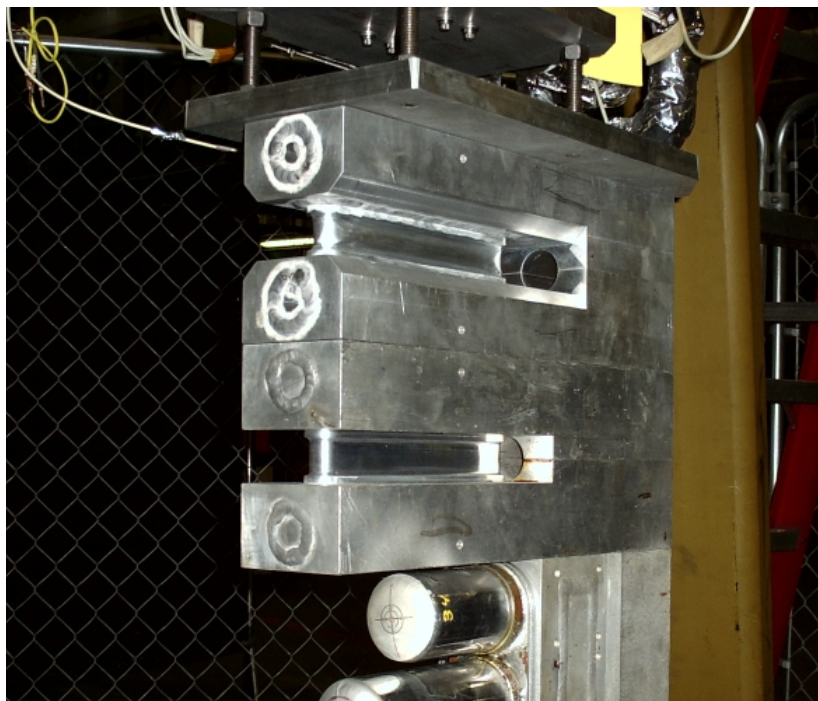


New window fixtures (S. Gopinath)

Target

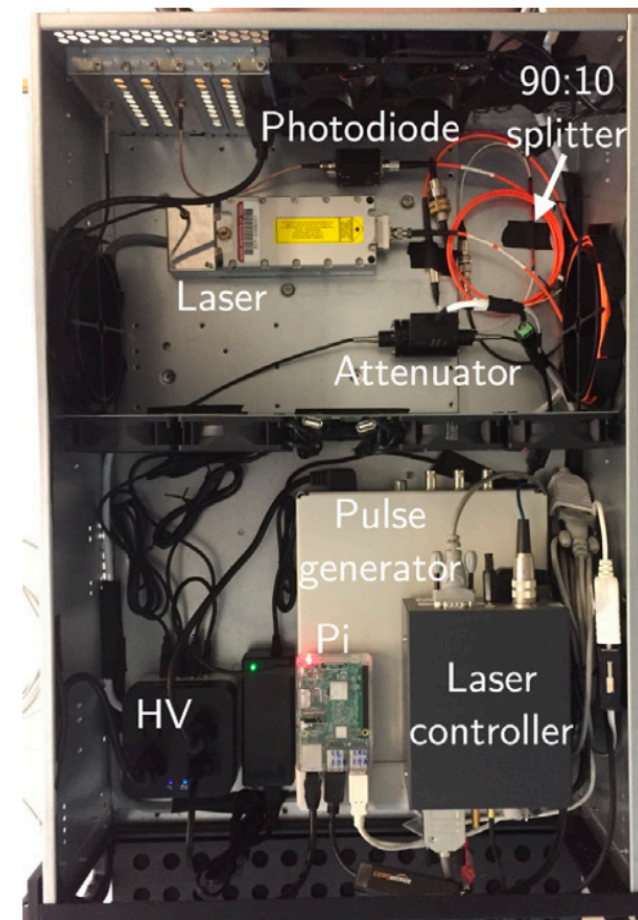
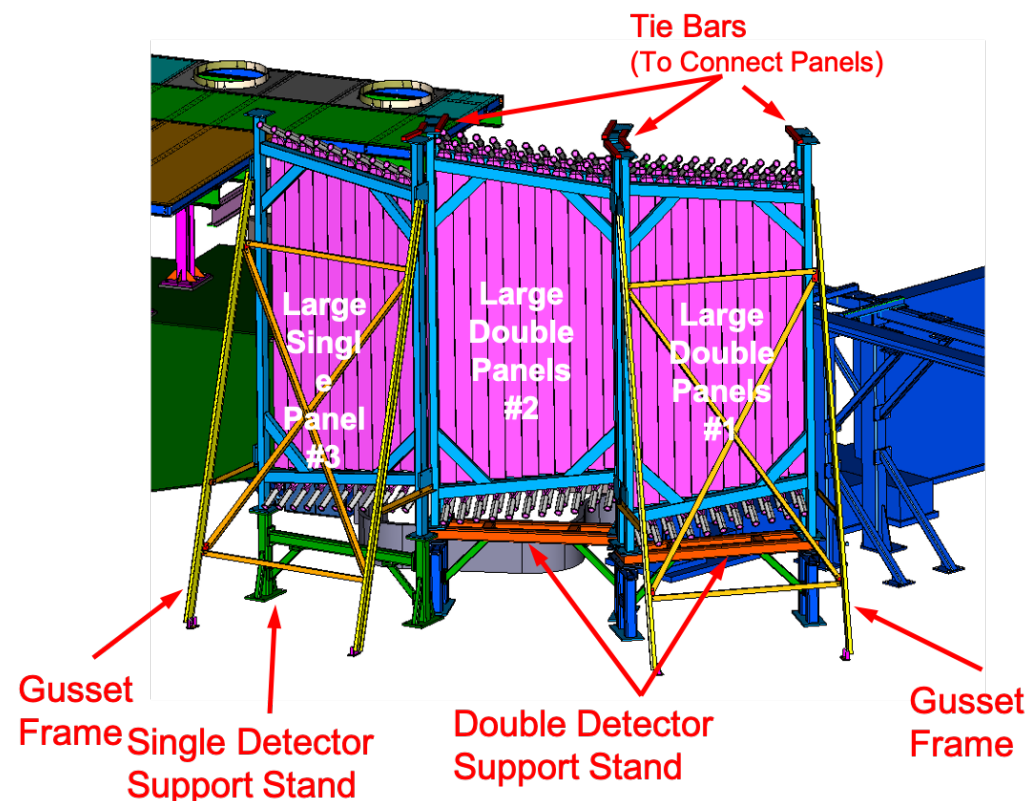
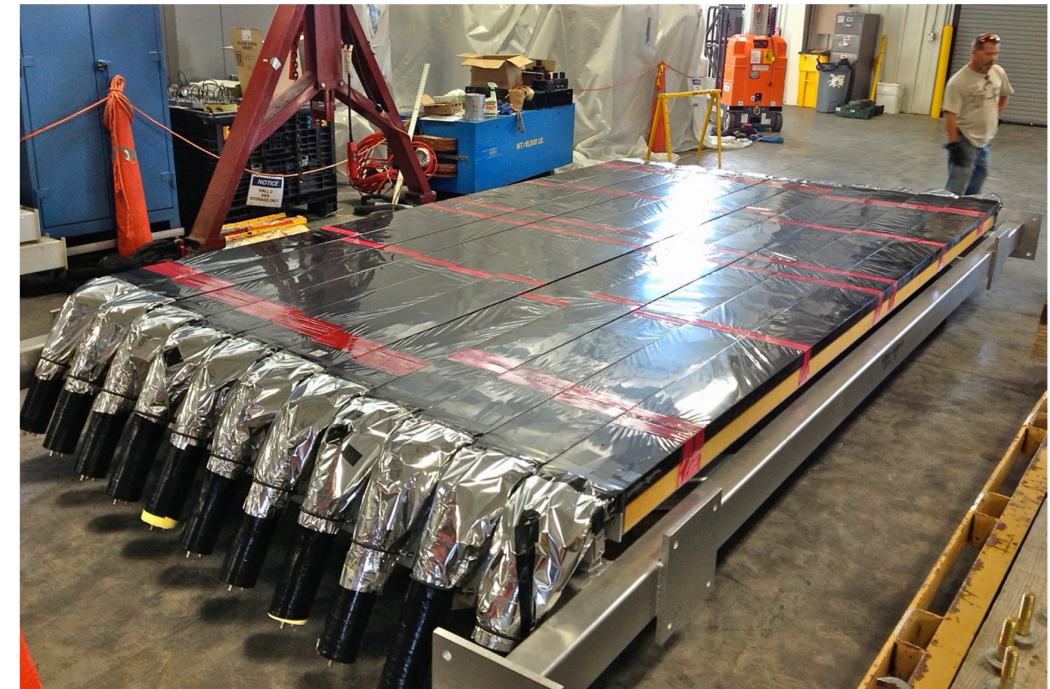


- Modified HAPPEX cell to accommodate LAD acceptance
 - 20 cm length
 - 2 cm width
 - 2 cm height
- Fabrication by JLab target group

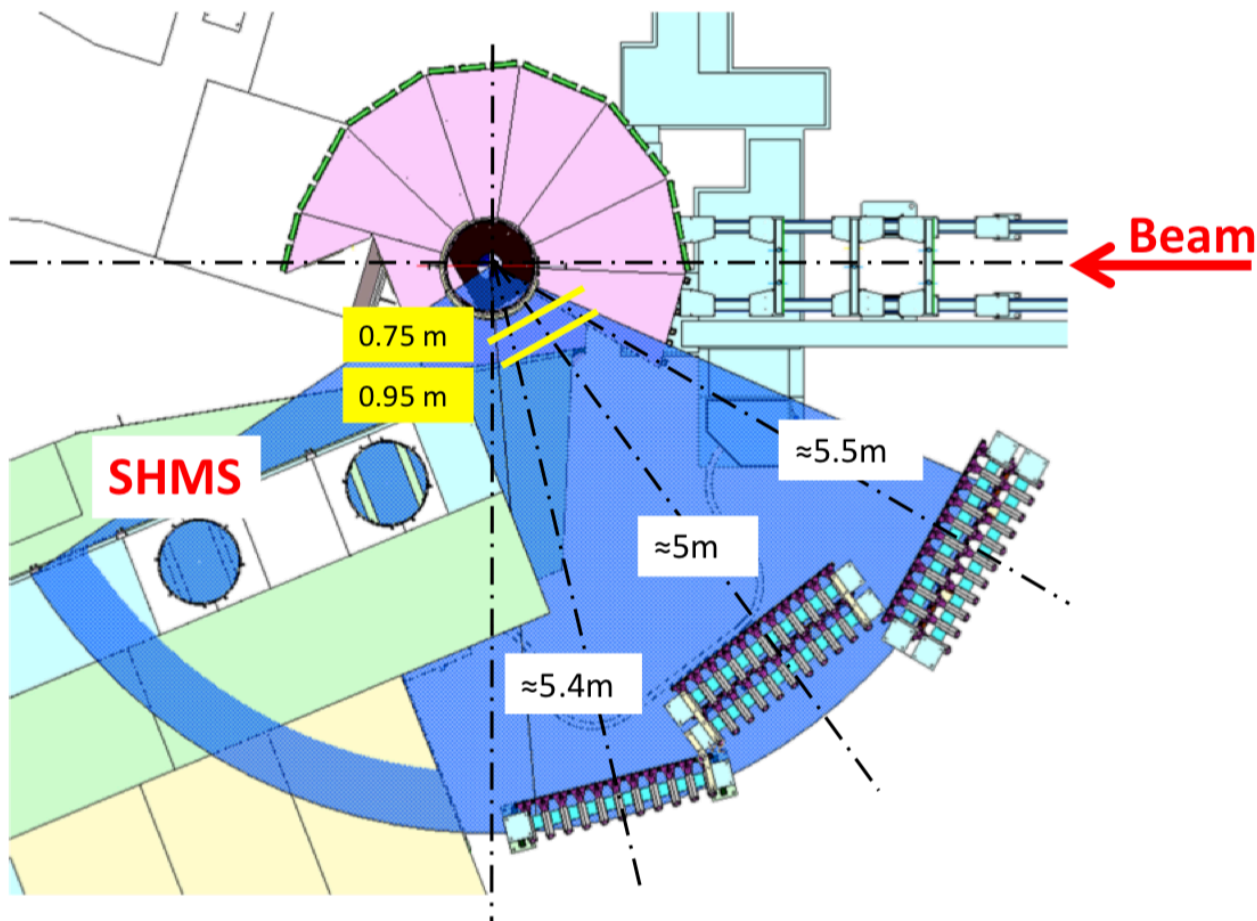


LAD Detector

- CLAS TOF scintillators refurbished at ODU
 - install/purchase ~50 new 3-inch PMTS
 - stored in ESB
 - stands designed and ready for fabrication
- Laser calibration system
 - tested system from BAND (HallB)
 - fibers need to be installed
- DAQ/electronics in SHMS hut (110 channels)
 - 7 FADCs
 - 1 TDC



LAD Position

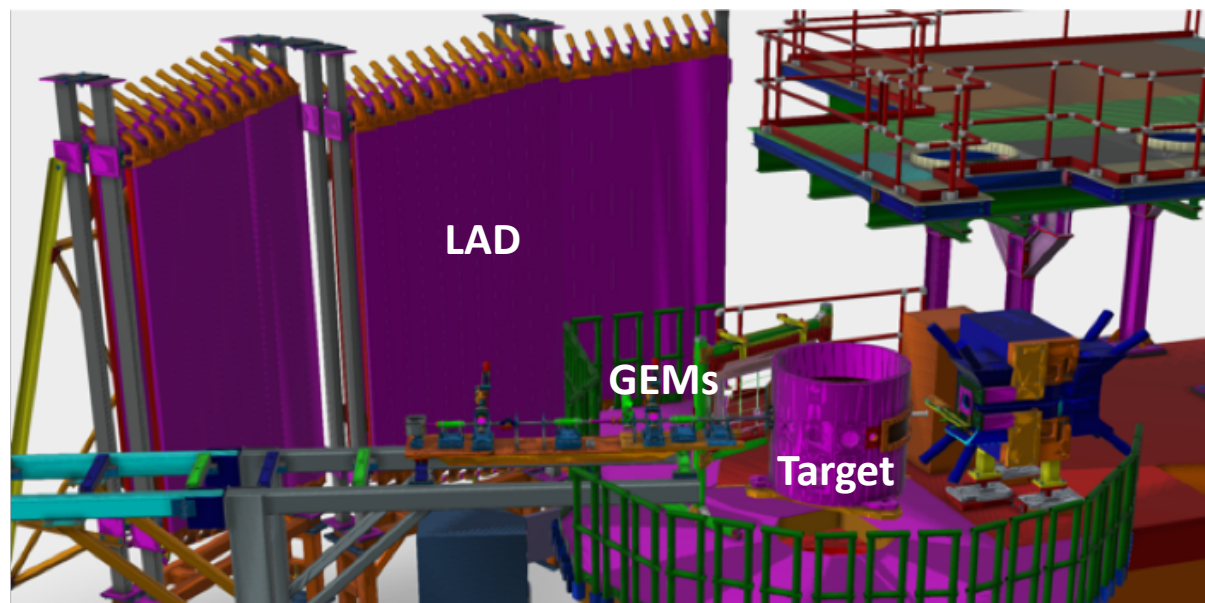
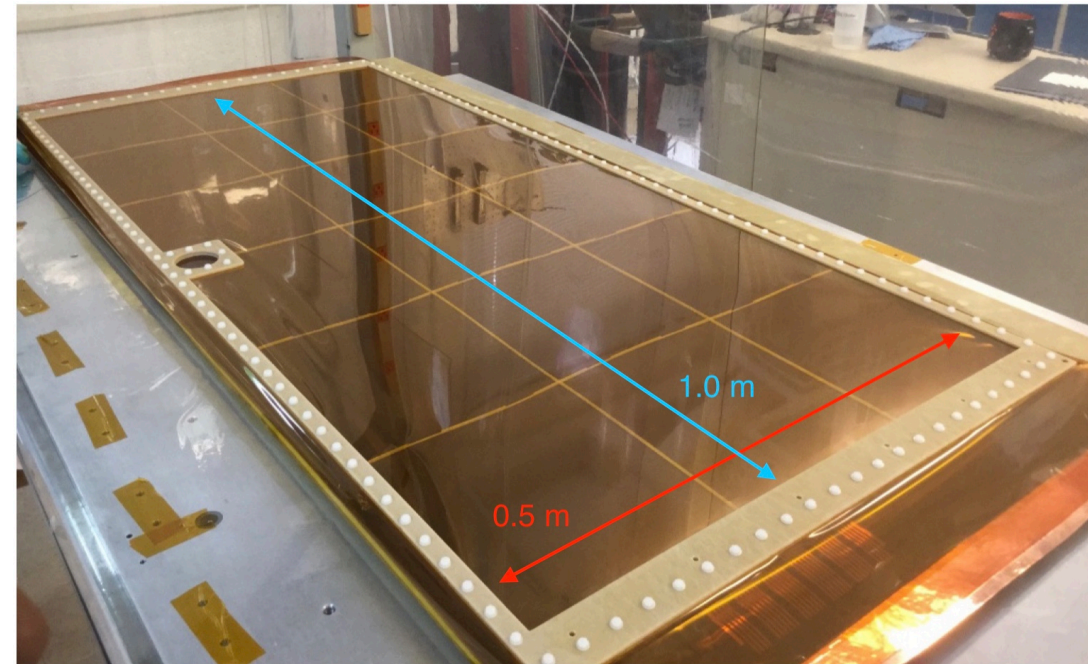


- 5-6 m away from target
- In-plane coverage $90^\circ - 157^\circ$
- Out-of-plane coverage $\pm 17^\circ$
- SHMS cable tray needs modification
 - plan developed
 - ~1 week work (3 people)

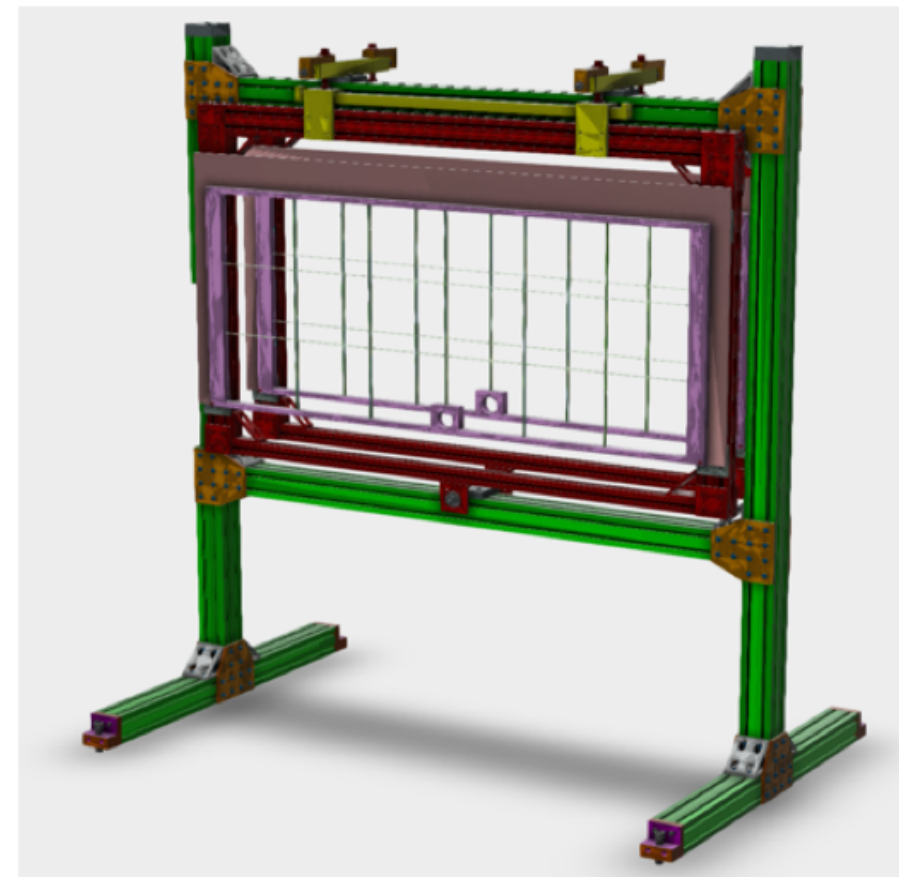


GEMs

- Two refurbished 120 x 55 cm² PRAD GEMS
- Next to target chamber (<1m away from target)
- Readout:
 - MPD readout
 - experience from SBS
- Support stand designed
—> ready for fabrication



(courtesy Holly)



GEM Commissioning



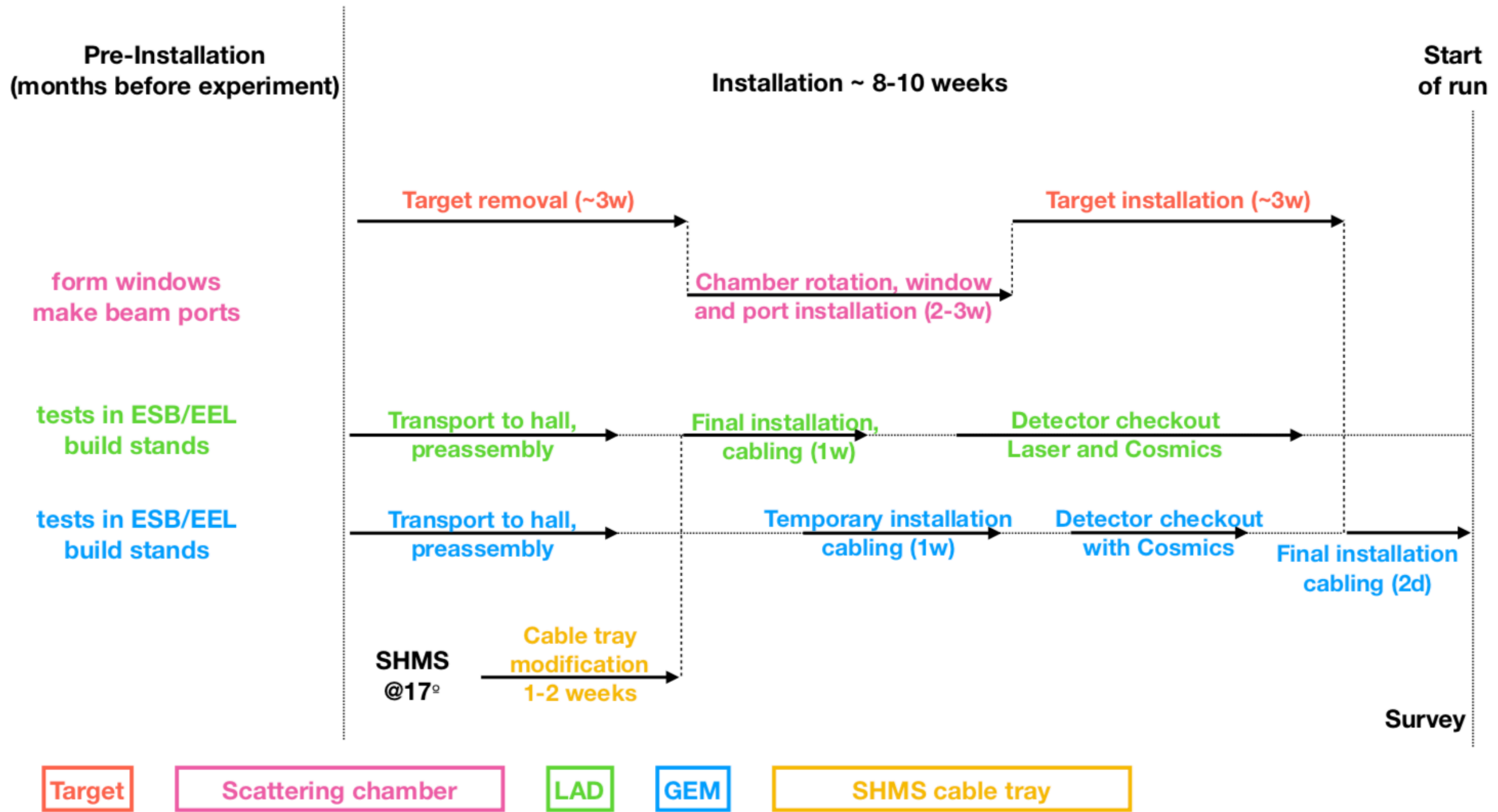
PRAD GEMs in test lab

**Test lab emptied in April-May,
ready for PRAD GEM testing**



(courtesy Holly)

Preparation and Installation Plans Ready



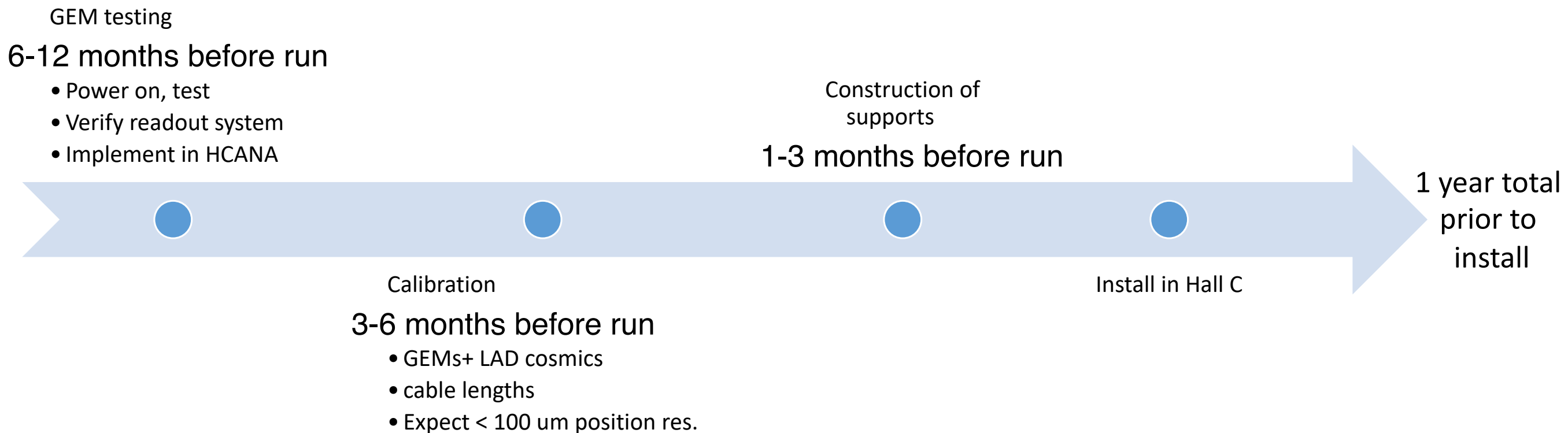
Summary

- Large group of students, postdocs, staff and PIs to get LAD ready and take data
- All components will be ready by next summer
 - No showstoppers for individual components
 - Designs signed off for stands, ports etc.
- Plans for preparation, installation and beam time exists in detail

We are ready to run LAD next year!

BACKUP

GEM Timeline



- General 1-year timeline achievable
- To be done ASAP for GEMs (this summer):
 - Install aluminized mylar
 - Produce faraday cage shielding
 - Flow nitrogen through detectors

(courtesy Holly)