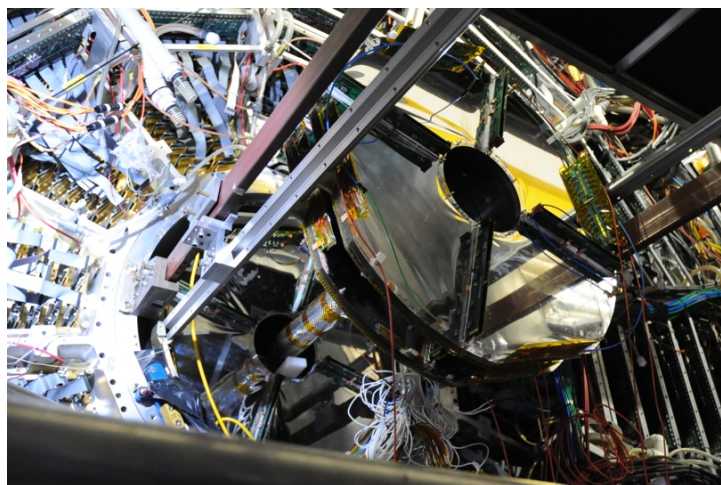


# Remarks on MPGD Gas System

## STAR FGT Experience

Bernd Sorrow

[\(sorrow@temple.edu\)](mailto:sorrow@temple.edu)



DOE NP contract: DE-SC0013405

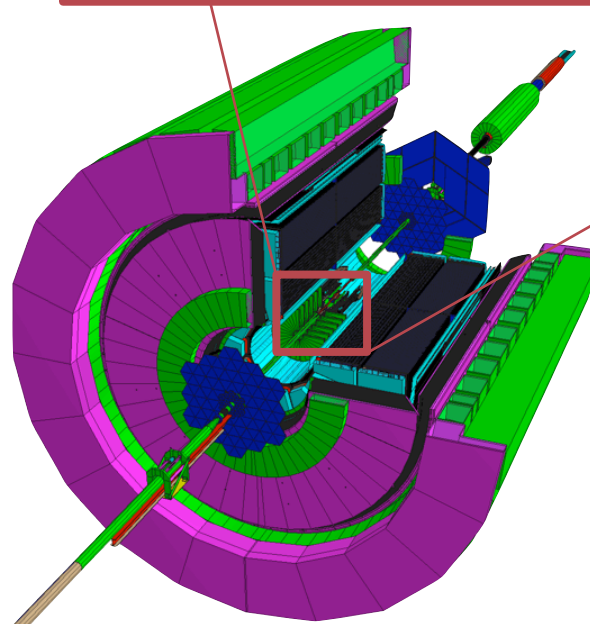
Bernd Sorrow

# Outline

□ Overview of FGT design

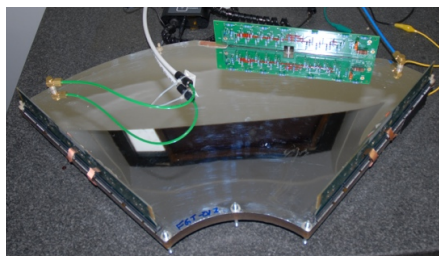
□ Gas system design

□ Gas system implementation

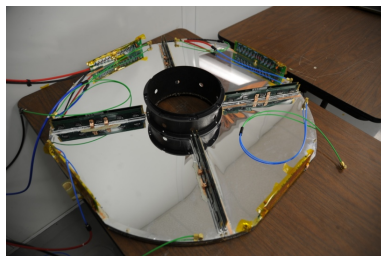


# Overview of FGT Design

## Forward GEM Tracker - Layout



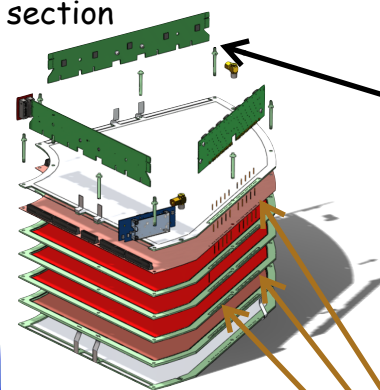
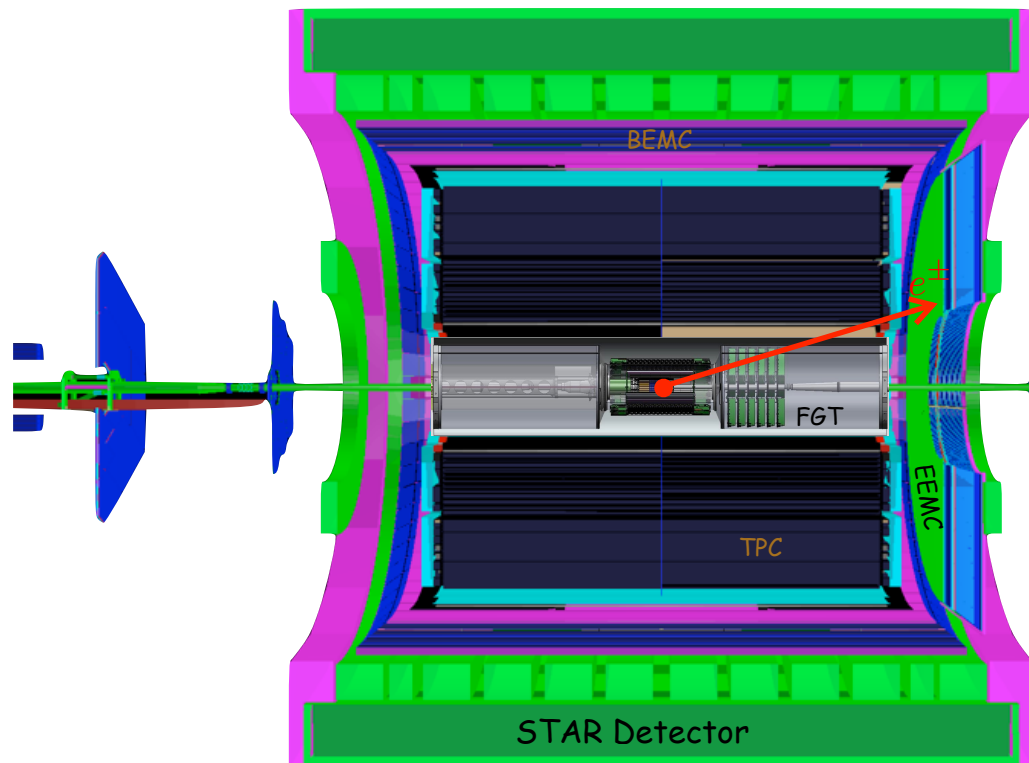
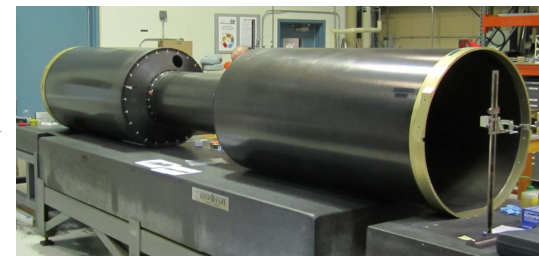
Quarter section



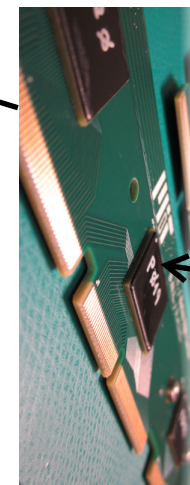
Disk



Quarter section



FGT GEM foil



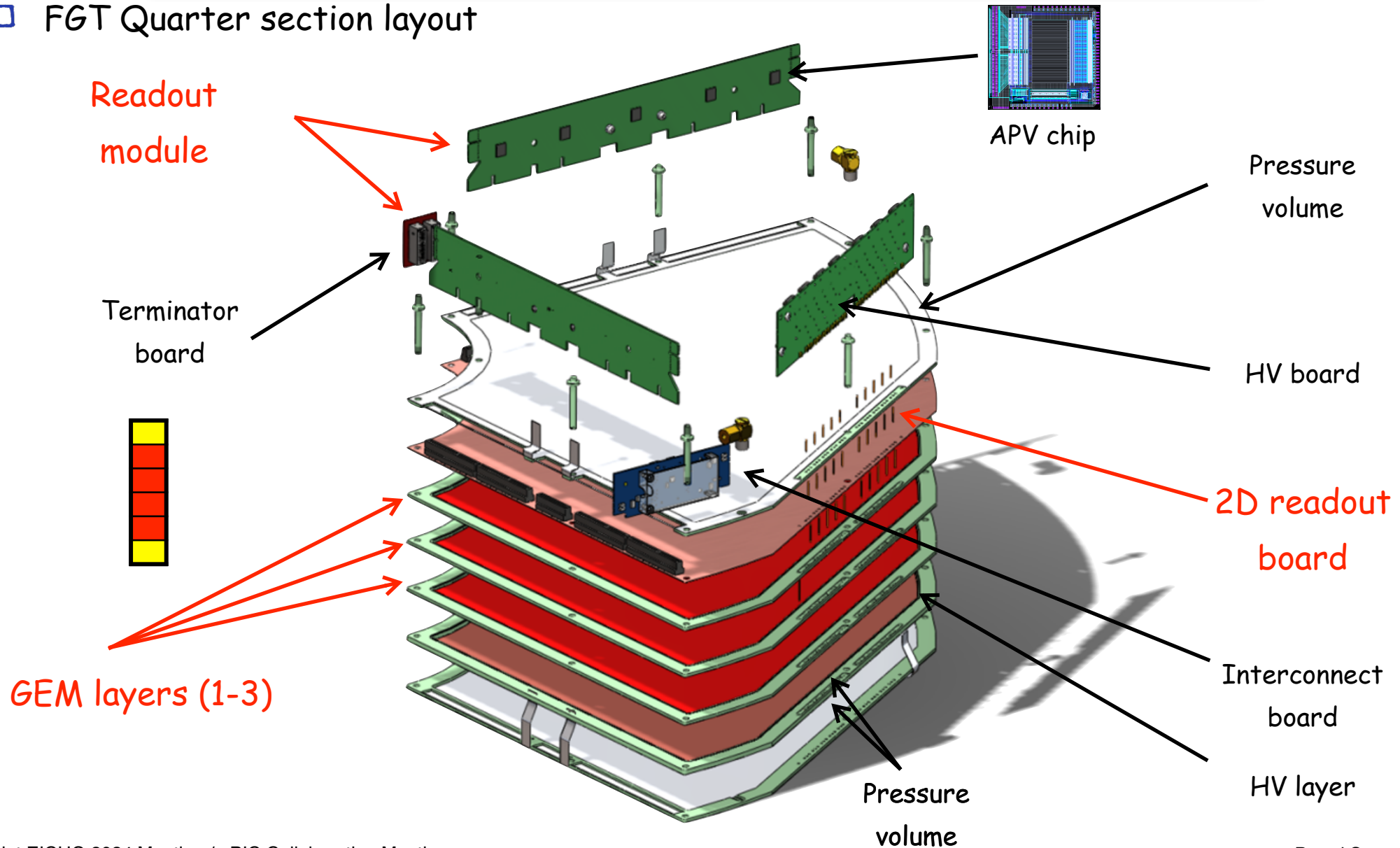
APV module

Packaged APV chip



# Overview of FGT Design

## FGT Quarter section layout

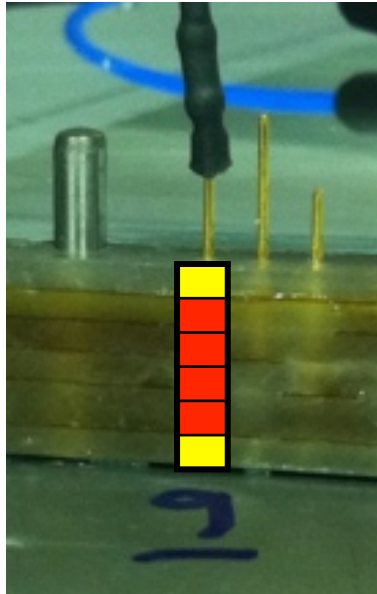


# Overview of FGT Design

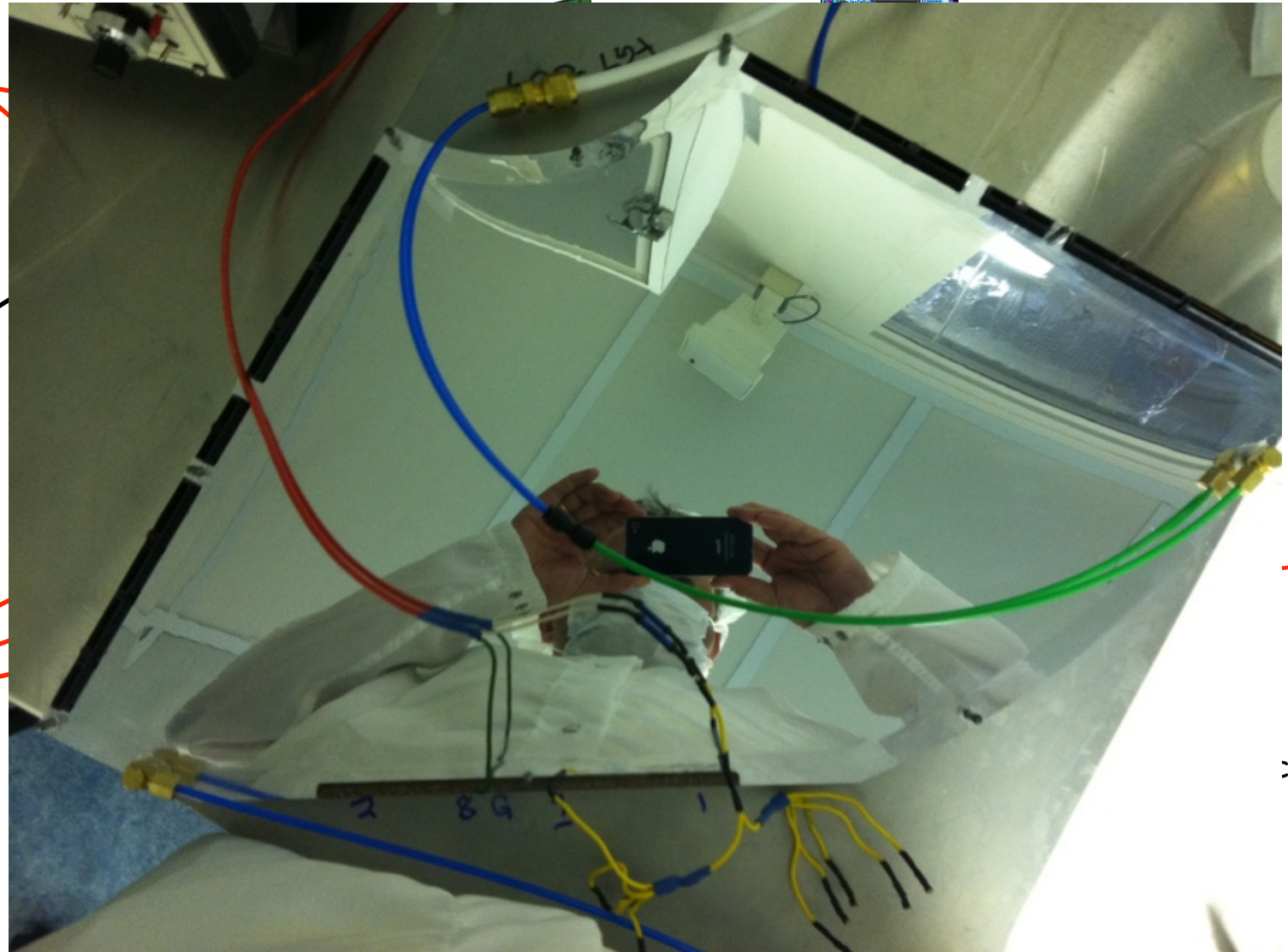
## FGT Quarter section layout



Readout module



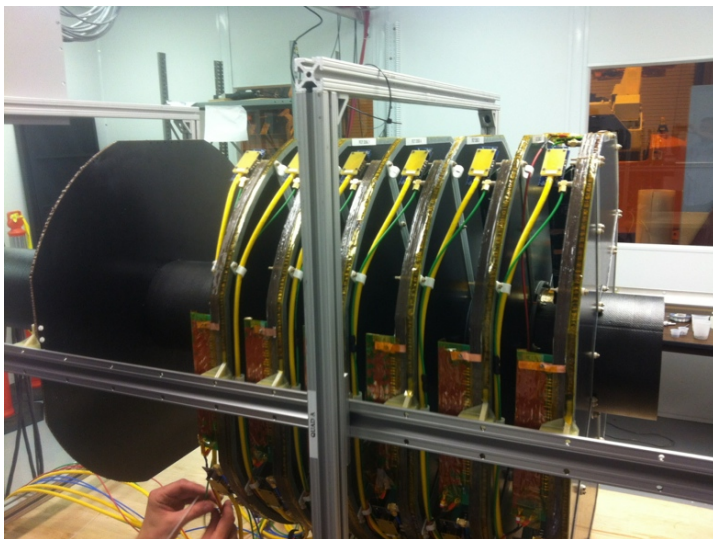
GEM layers (1-3)



volume

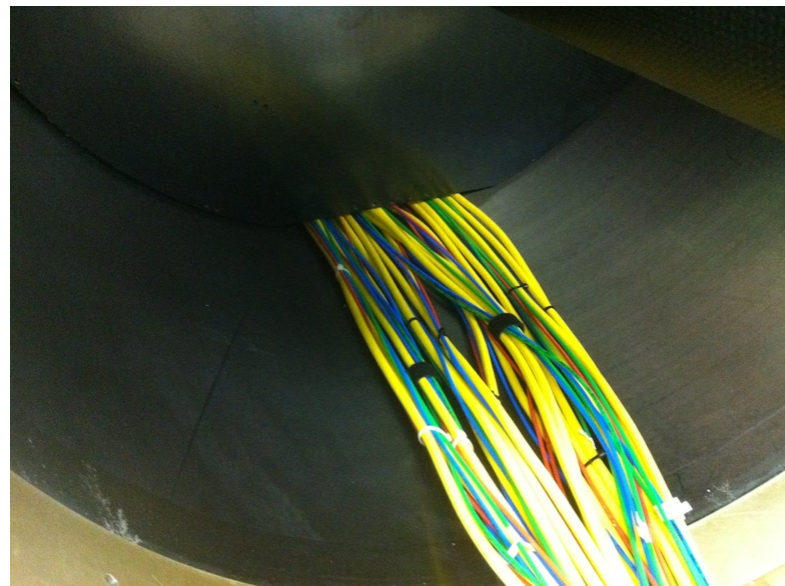
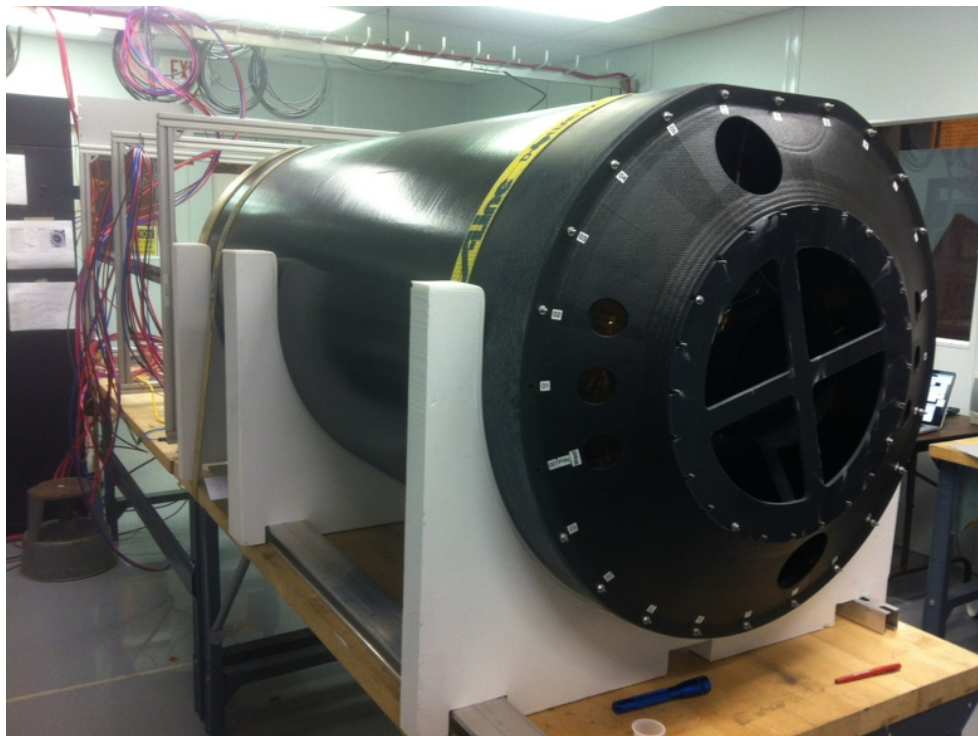
# Overview of FGT Design

- Photo album - Quarter section assembly (1)



# Overview of FGT Design

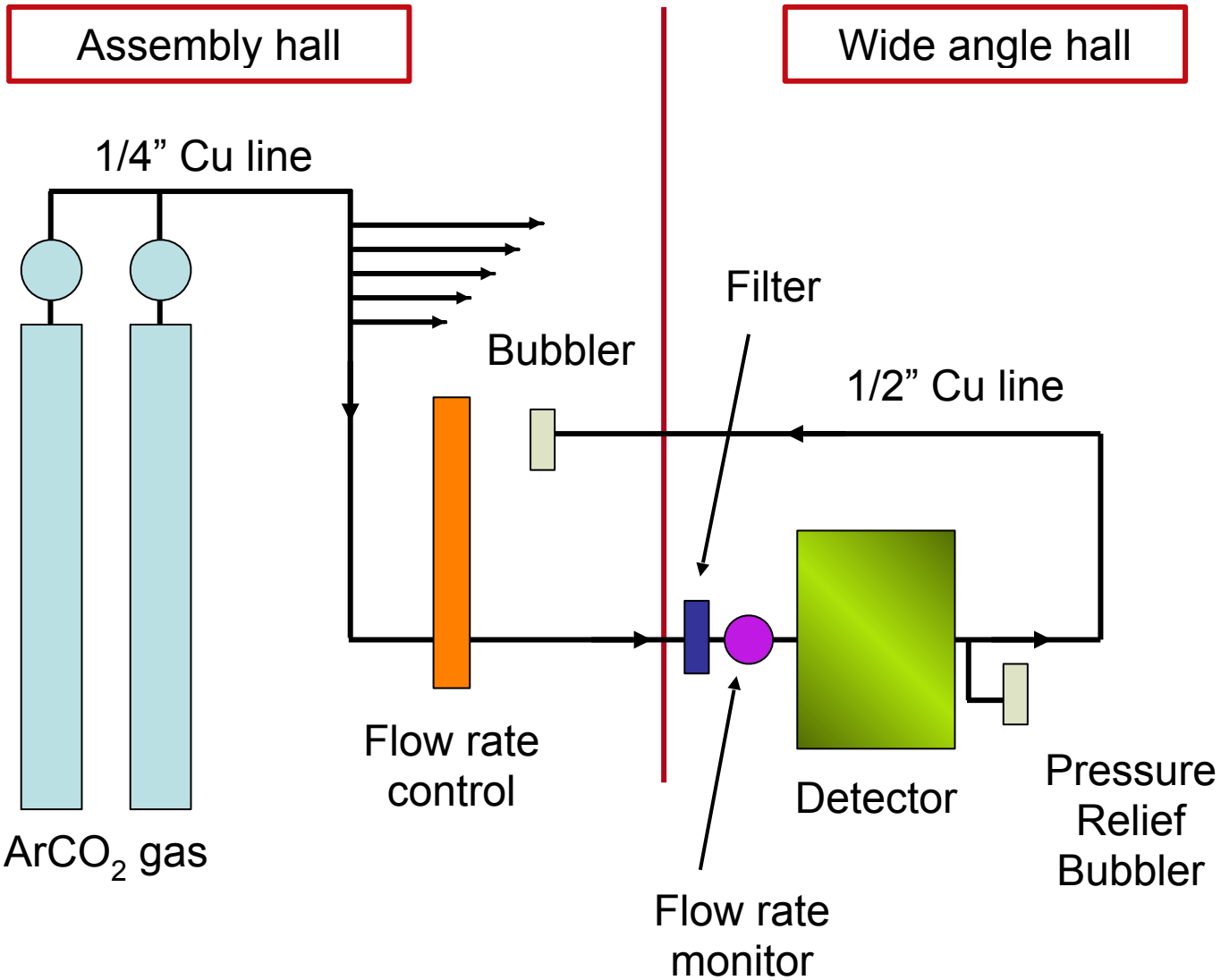
## □ Photo album - Quarter section assembly (2)





# Gas system design

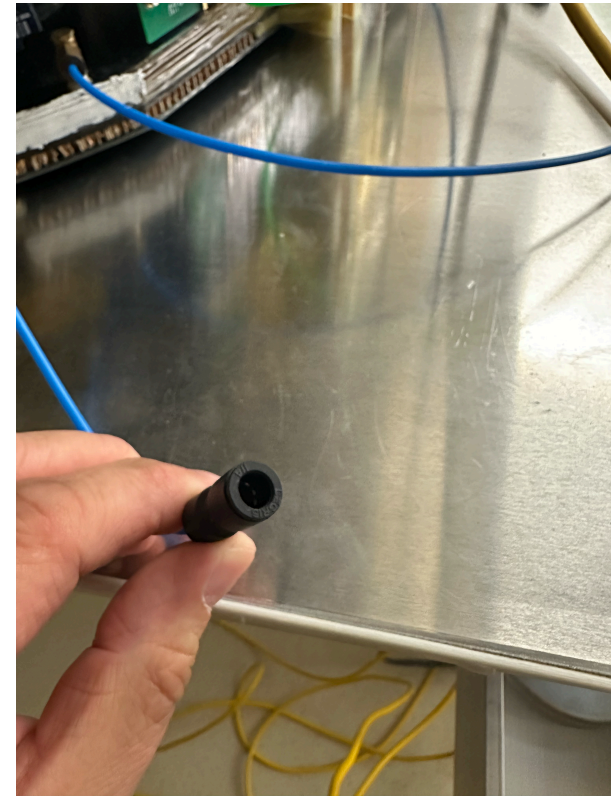
## Overview





# Gas system design

## □ Photo album (1)



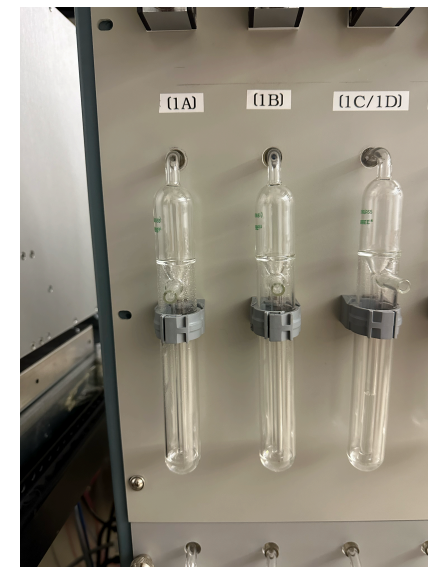
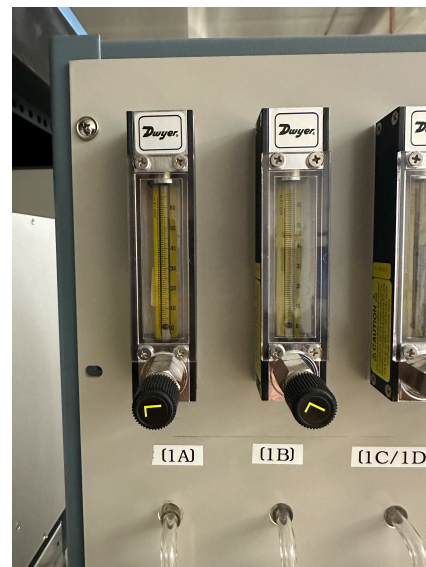
# Gas system design

## □ Photo album (2)



# Gas system design

## Photo album (3)

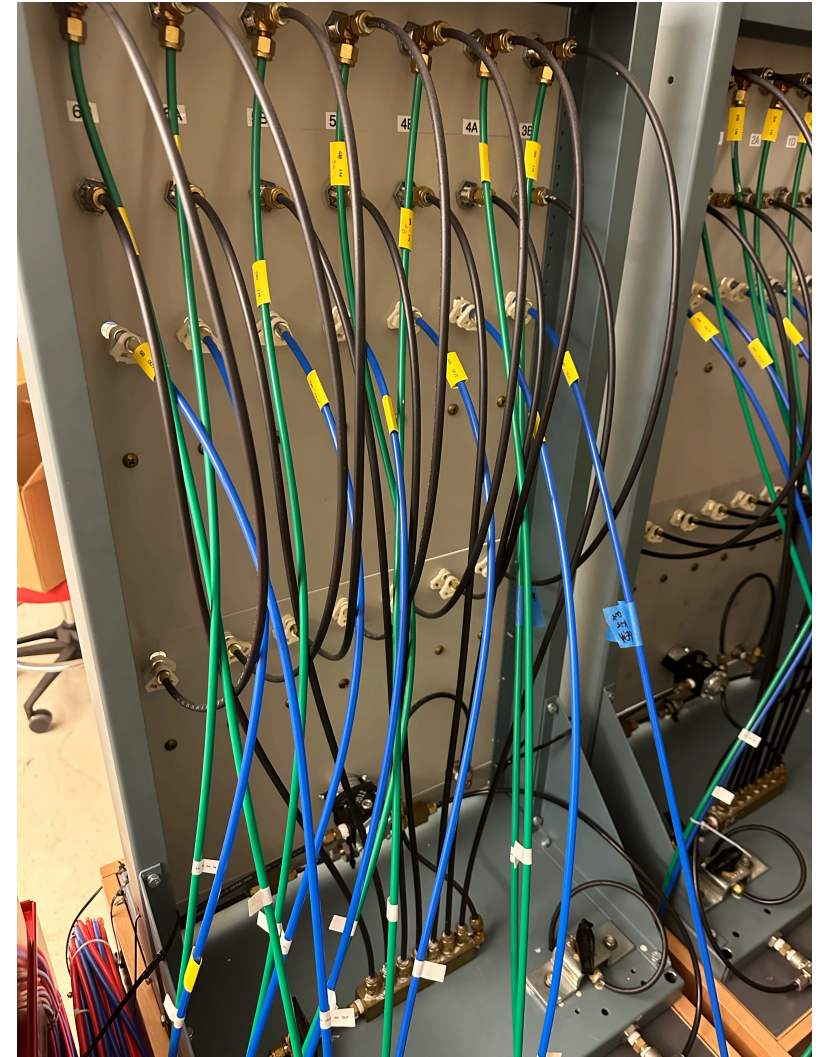


# Gas system design

## □ Photo album (4)

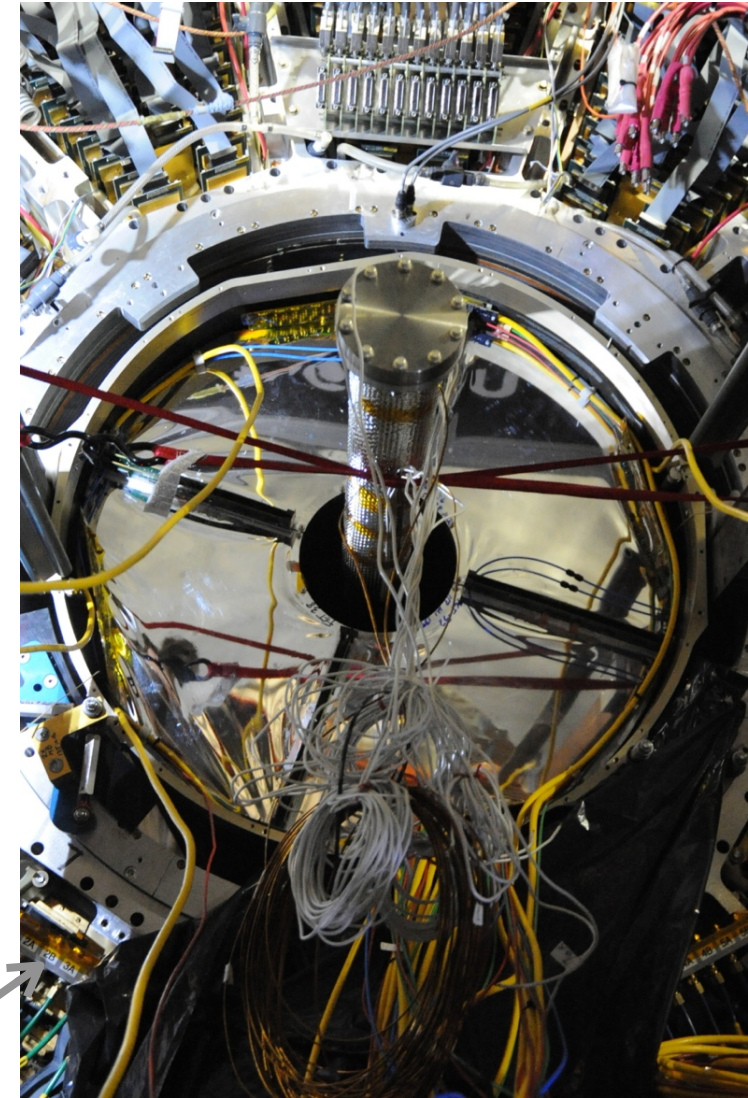
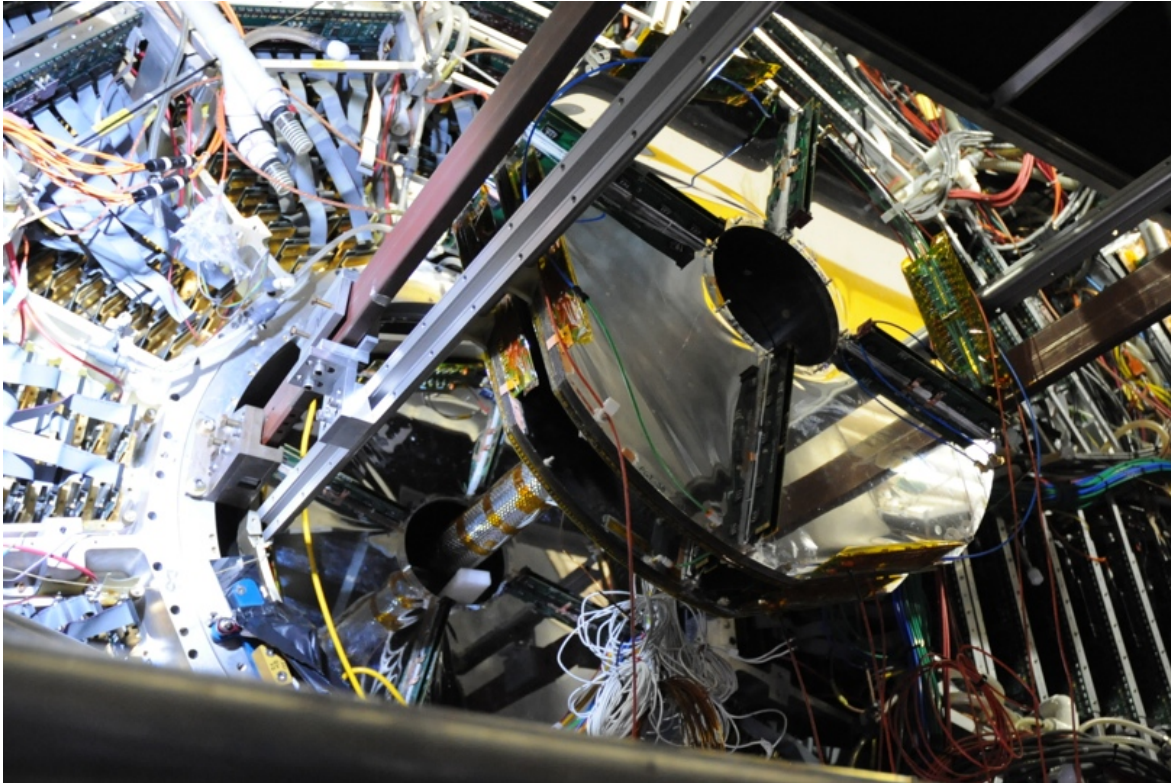


Backside!



# Gas system design

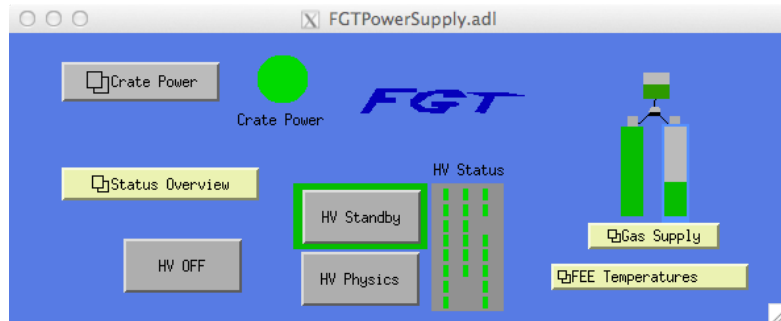
## □ Photo album (5)



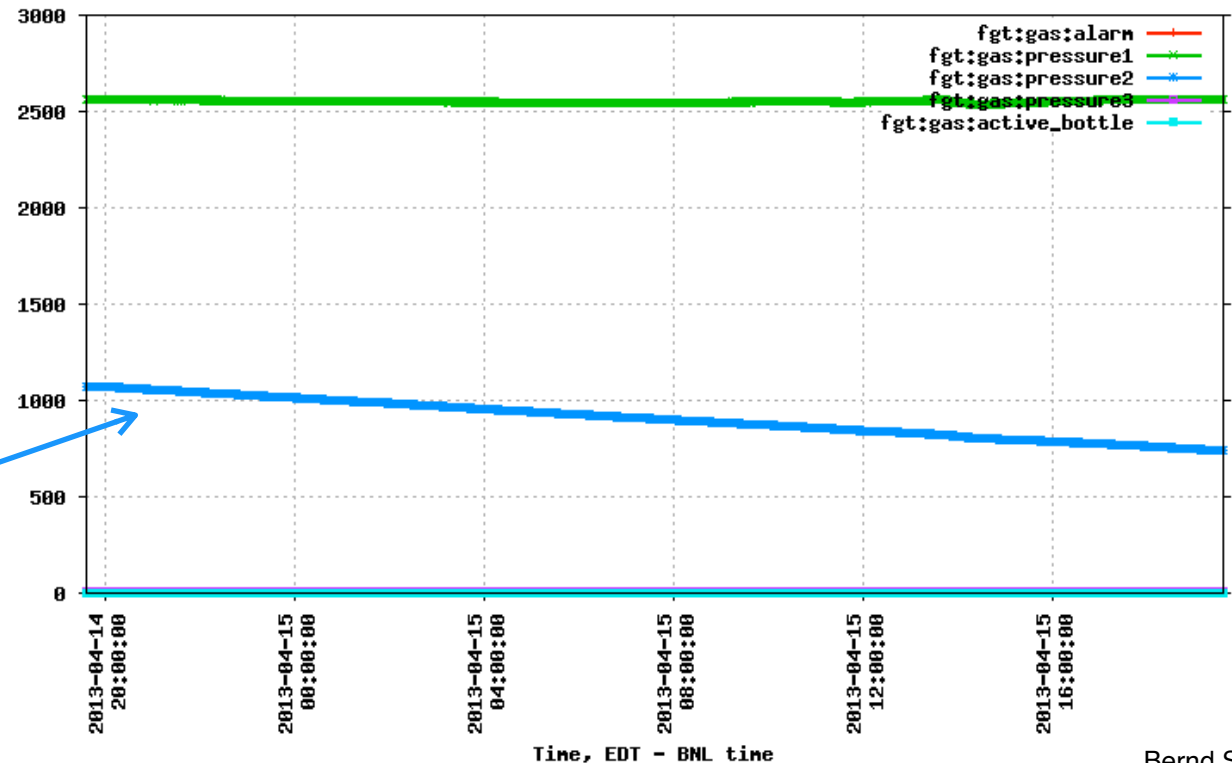
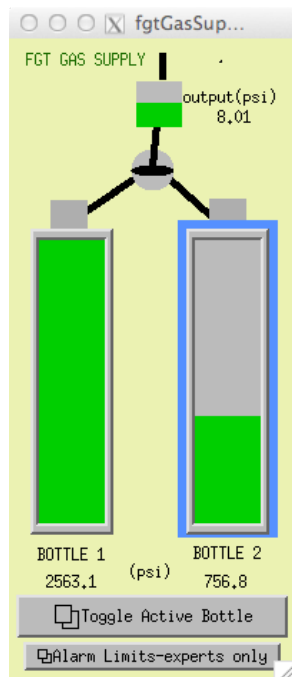
Patchpanel

# Gas system design Performance

## □ Status



- Smooth performance
- Two ArCO<sub>2</sub> (90/10) gas bottles connected to gas system  
(Gas consumption: ~350psi / day ⇒ 1 bottle / week)
- No issues!



# Summary

- **FGT gas system** was based on a **pre-mixed gas system of ArCO<sub>2</sub>** without oxygen or water content monitoring.
- The gas system was a **standalone gas system**, i.e. it was not part of another gas detector system. The pre-mixed gas bottles were located for simplicity outside the STAR gas room.
- **Remote monitoring of pressure** was included and was part of the slow-control system.
- Generally, the gas system was very **robust and simple**. It did not cause any issues!
- The full gas system is now at Temple Univeristy in our lab.

