

# A Merry Christmas at EHN1

Sabrina Sacerdoti, for the PDS installation team

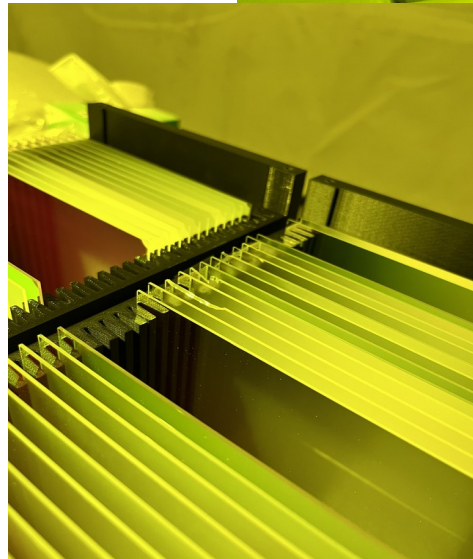
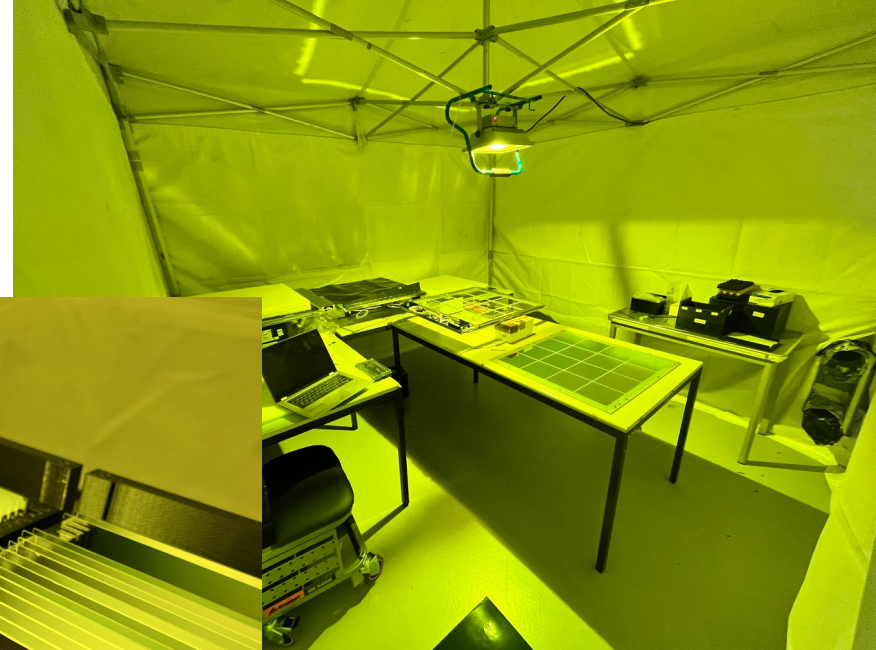
APC - 10/01/2024

# The Module 1 installation

- Mostly during December 2024
- Rushed and crazy as usual due to multiple situations: lost items and delays in shipments, a few malfunctions, a few unforeseen situations
  - List of “lessons learned” to be made
- Great team of experts on site: fortunately many PDSers were there and tasks could be split and carried out in parallel
  - Thanks a lot to all those who participated + to the support from outside sending last minute equipment!
- Good experience for improving the test and installation procedures
- Today: short presentation just to show what is installed and where

# Module testing

- Modules arrived fully assembled to CERN except for
  - The SoF electronics which were shipped directly to CERN
  - Dichroic filters
- No damages in module shipment, but some delays
- Some dichroic filters arrived with corners chipped
- Filters were added after cold testing
  - clean room was setup for this



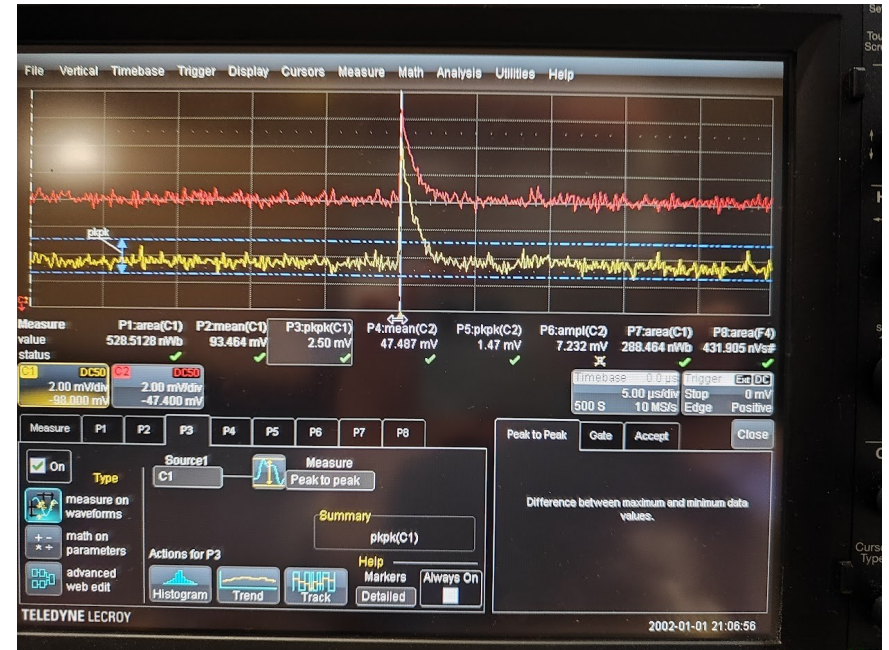
# Module testing

- The PDS test stand is equipped for testing the modules in warm and LAr
  - Warm check in the dark to ensure things are working/check for light leakage prior to cooling



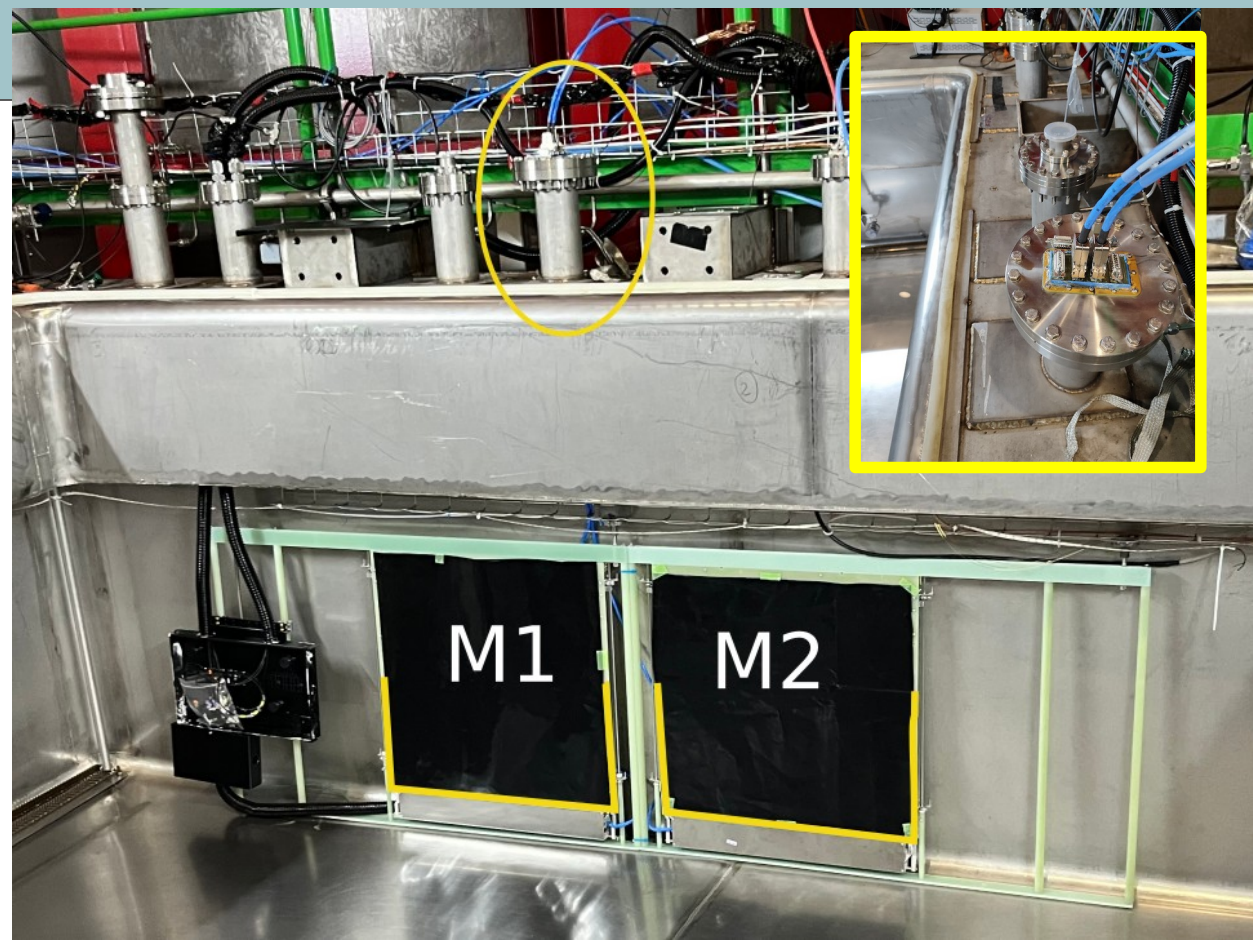
# Module testing

- In the test of the first module the baseline was very noisy → due to light leakage from PoF escaping through the many holes of the electronics box
- Efforts in potting and fiber covering were not enough → the box had to be fully sealed off
- Eventually light blocking was successful and data was acquired to characterize the modules for SNR, FFT... using an LED inside the cryostat



# The wall modules

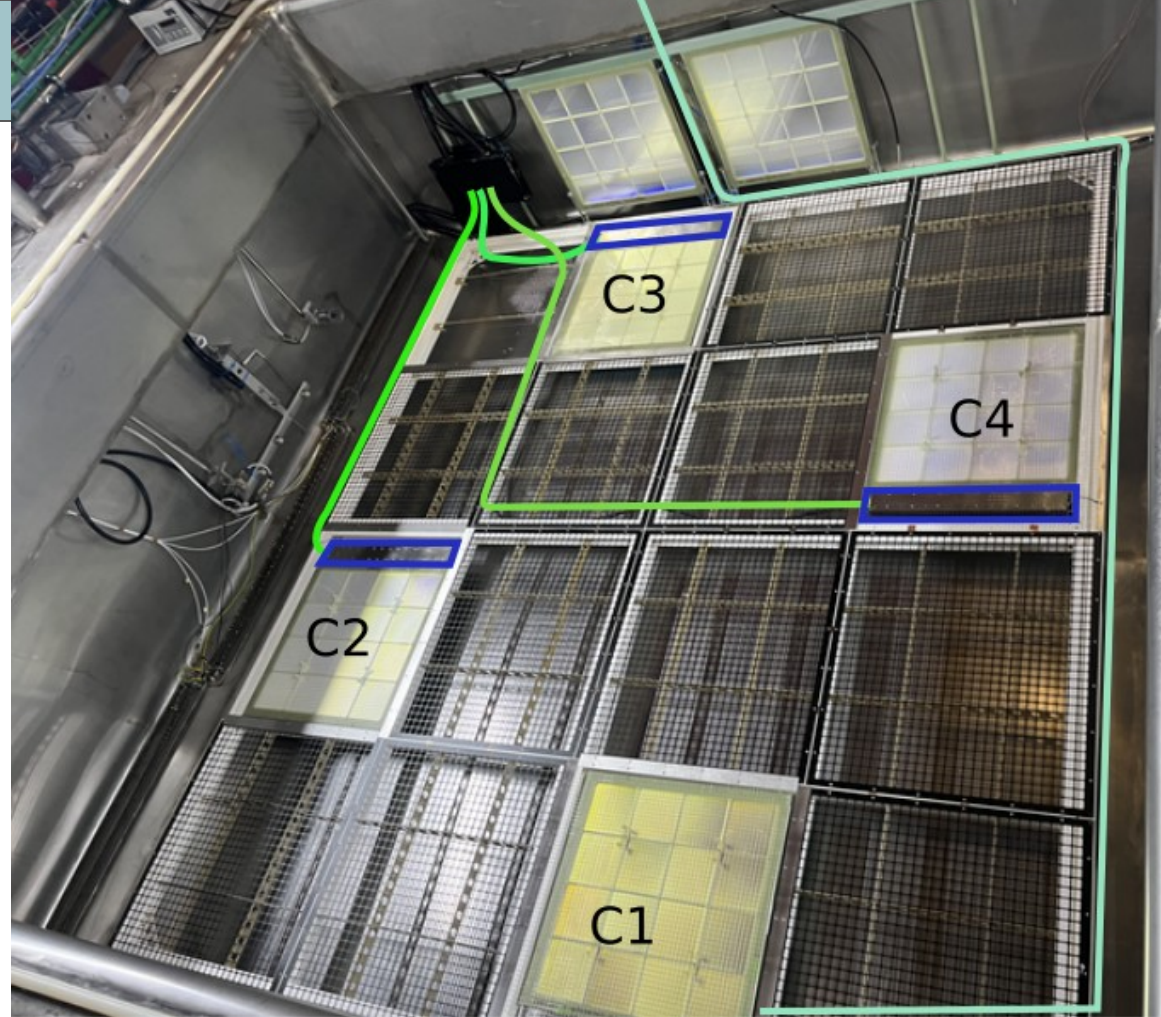
- Flange has 4 D15 connectors
- “half” xArapucas (both NIU):
  - M1=DVDM/VD-style readout
  - M2=DMEM/HD-style readout
  - Data taking:
    - First with CAEN/scope
    - DAPHNE later
  - 4 FBK flexes each  
(32V bias in cold)
- Support structure in G10 designed by Jay
  - No contact between modules and coldbox
  - Same fixations as in M0
  - Can support additional hardware (fiber FCFC connector boxes)



Installation was done in November

# Cathode modules

- Cathode was refitted with resistive/transparent mesh according to new module positions
- Electronic boxes were sealed for light leakage
- SoF electronics are the same in all modules
- 2 OPCs per board
- Differences in configurations:
  - Bikuiti on backplane
  - WLS type
  - SiPMs
  - Fiber feedthrough



# Cathode Modules summary

- C1 (NIU)
  - FBK SiPMs → 32.3V DCDC
  - WLS 40mg/kg
  - No bikuiti on bp
  - New potted feedthrough, 40m fiber
- C4 (NIU)
  - HPK SiPMs from Module 0, 46.9V
  - WLS 24mg/kg
  - Backplane w/bikuiti
  - Fibers from CB (5m?), re terminated
- C2 (CIEMAT)
  - HPK SiPMs, 47V
  - WLS 24mg/kg
  - Backplane w/bikuiti
  - Fibers from CB (4m?), re terminated
- C3 (CIEMAT)
  - HPK SiPMs, 47V
  - WLS?
  - No bikuiti on bp
  - Fibers from CB (5m?), re terminated



# Conclusion

- Great job everyone!
- Module 1 is almost ready to take data
- Further details on Module 1 installation and xArapuca module configurations can be found [in this document](#) (begin updated)
  
- PoF lasers were received this week,
  - Setup is finished
  
- SoF warm side:
  - Koherons/CAEN setup to be used first
  - ArgonRec/DAPHNE next week
- Coldbox will finish filling tomorrow morning

