Module 2 Assembly & Run

ND-LAr Consortium

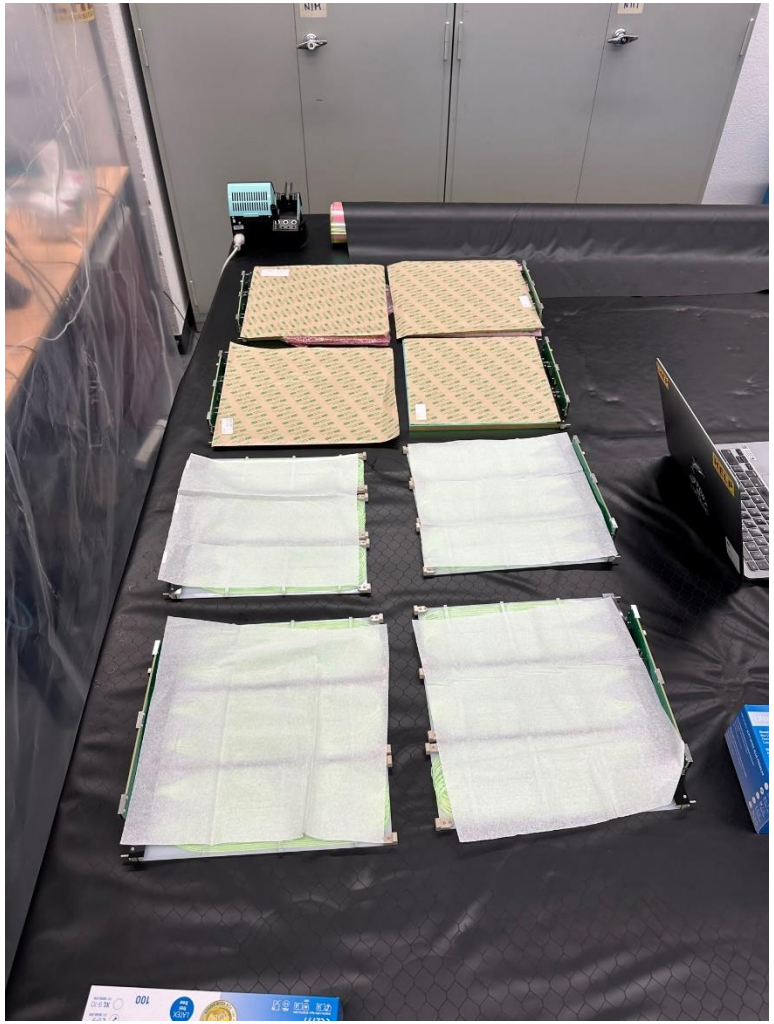
Useful Info

- Slides posted to today's Indico
- Also posted to Slack channel: # nd-lar-run
- Module 2 build photos uploaded to Consortium Google Drive

Wednesday, November 2nd

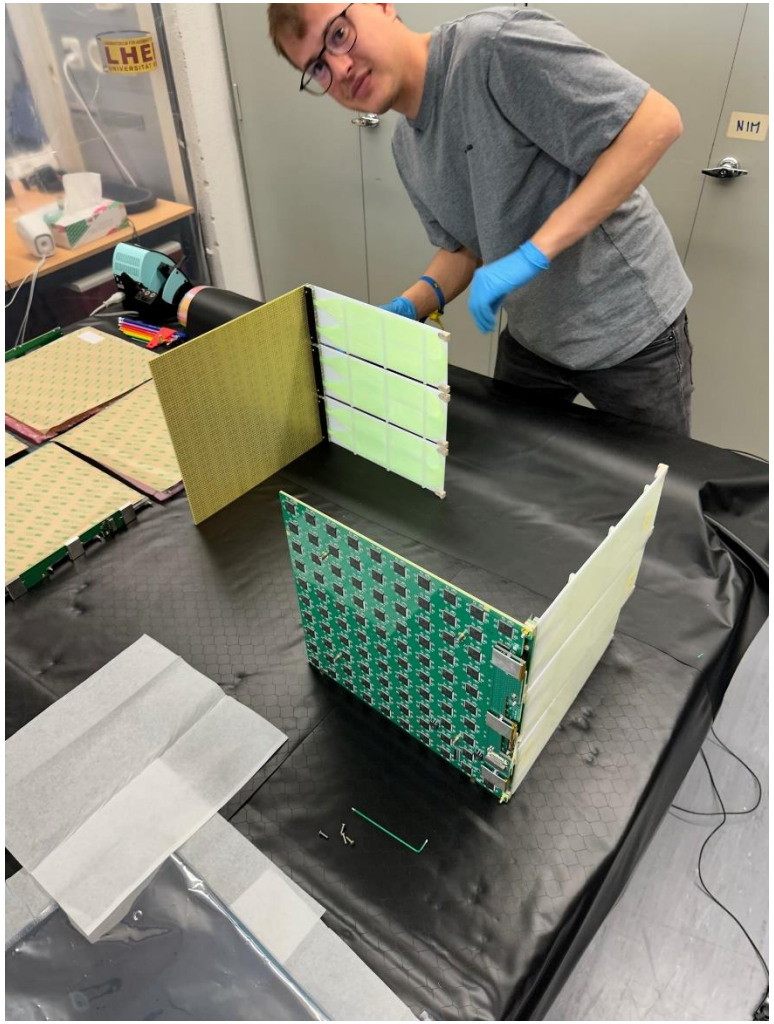
- Completed the anode assembly for TPC 1 of Module 2
- Inserted anode assembly of TPC 1 into the field shell
- Prepared pixel tiles in warm test enclosure for TPC 2 of Module 2
- Pictures follow

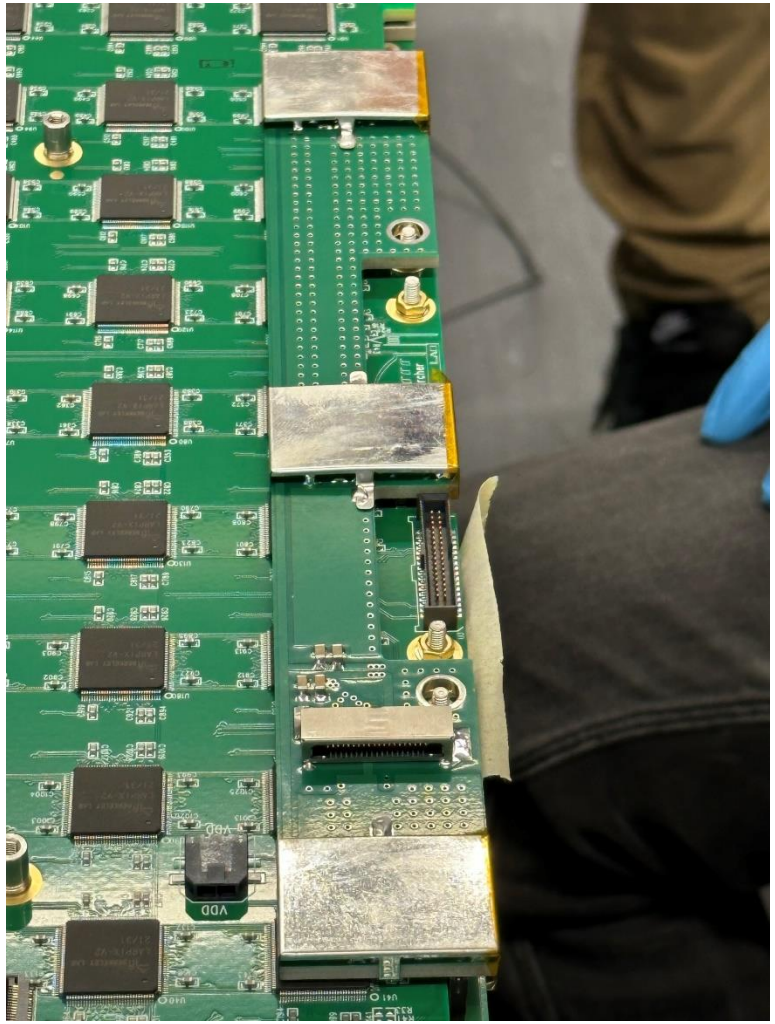
4 ArCLight Tiles and 4 LCM Tiles



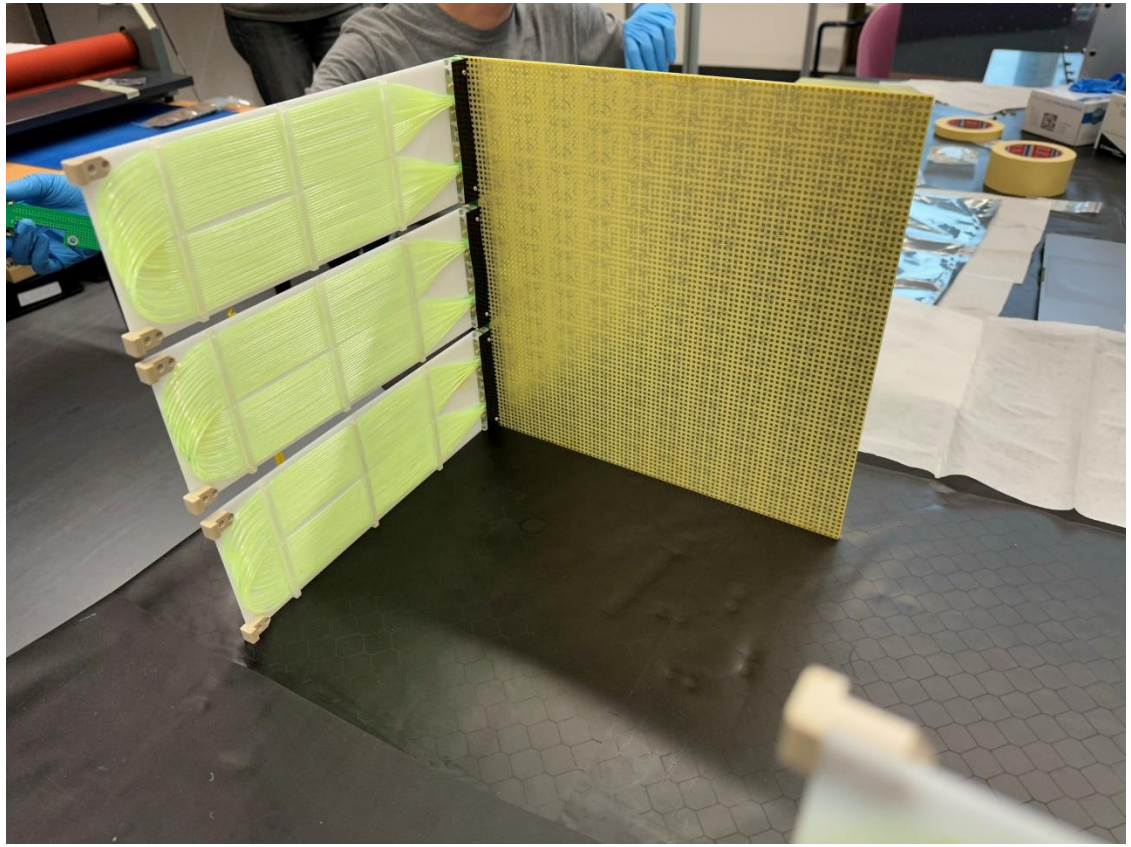
Livio

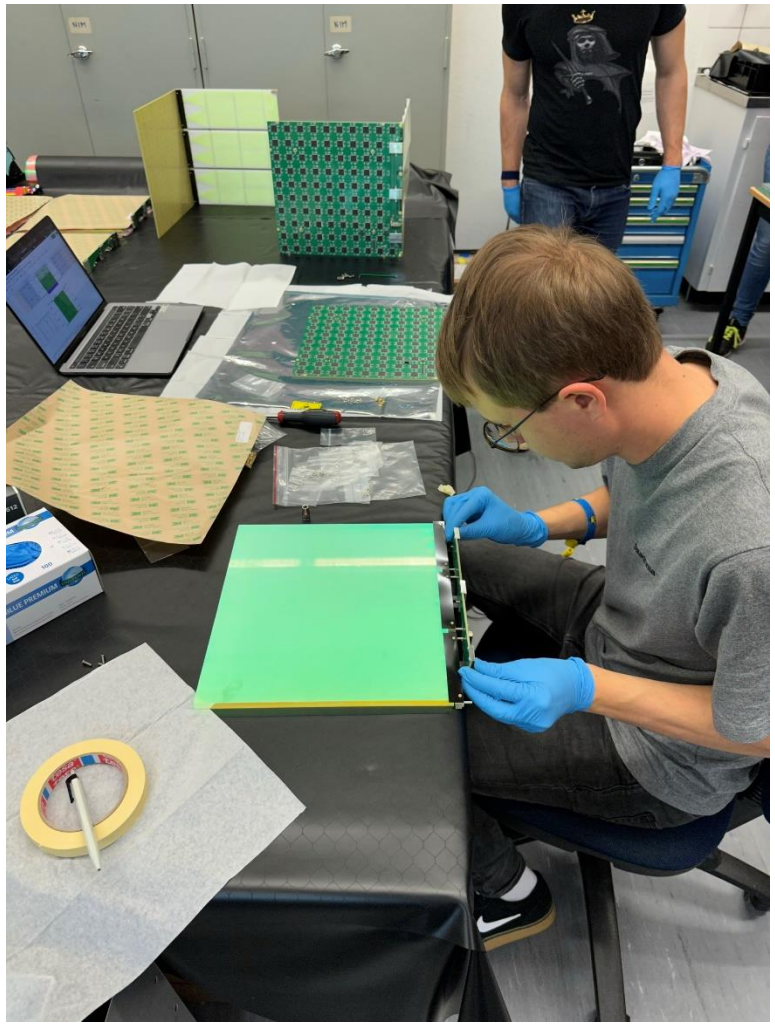
First assembly of each readout system, E-board on the right



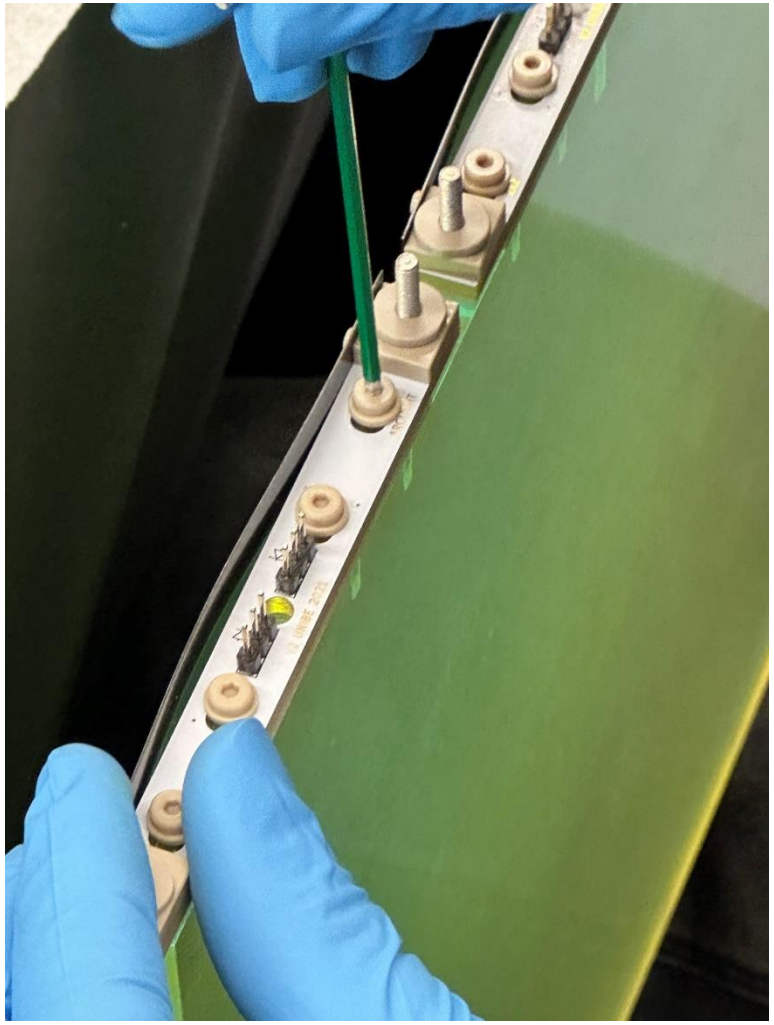


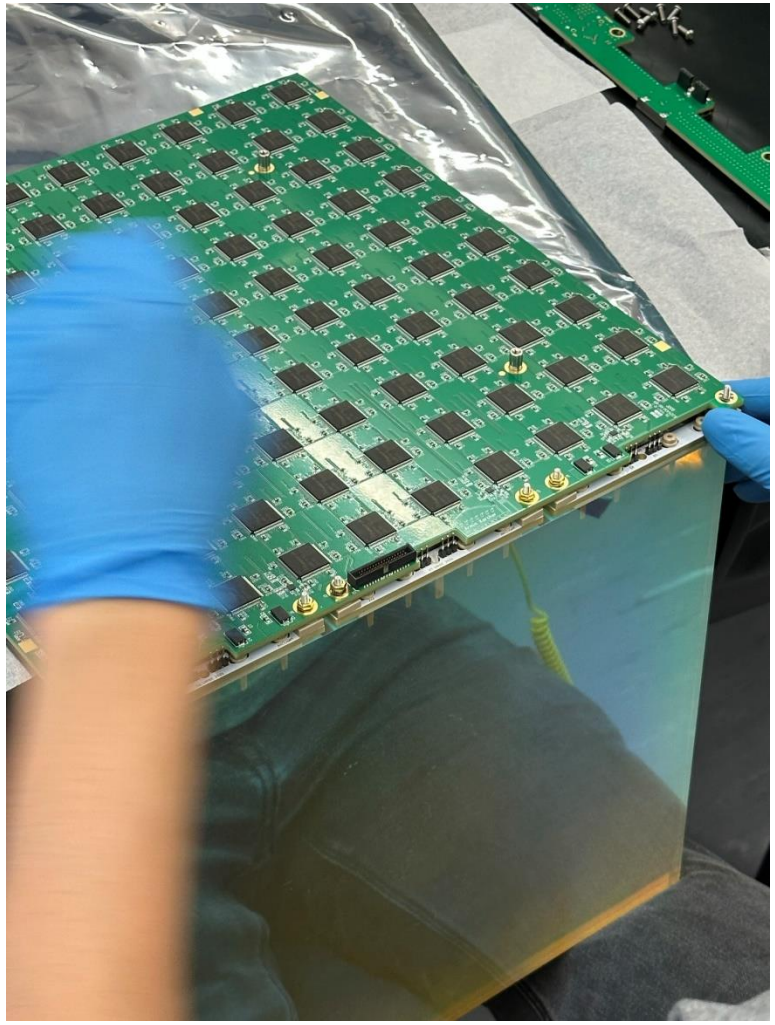
Pixel tile with LCM (left) and installation of ArCLight (right)



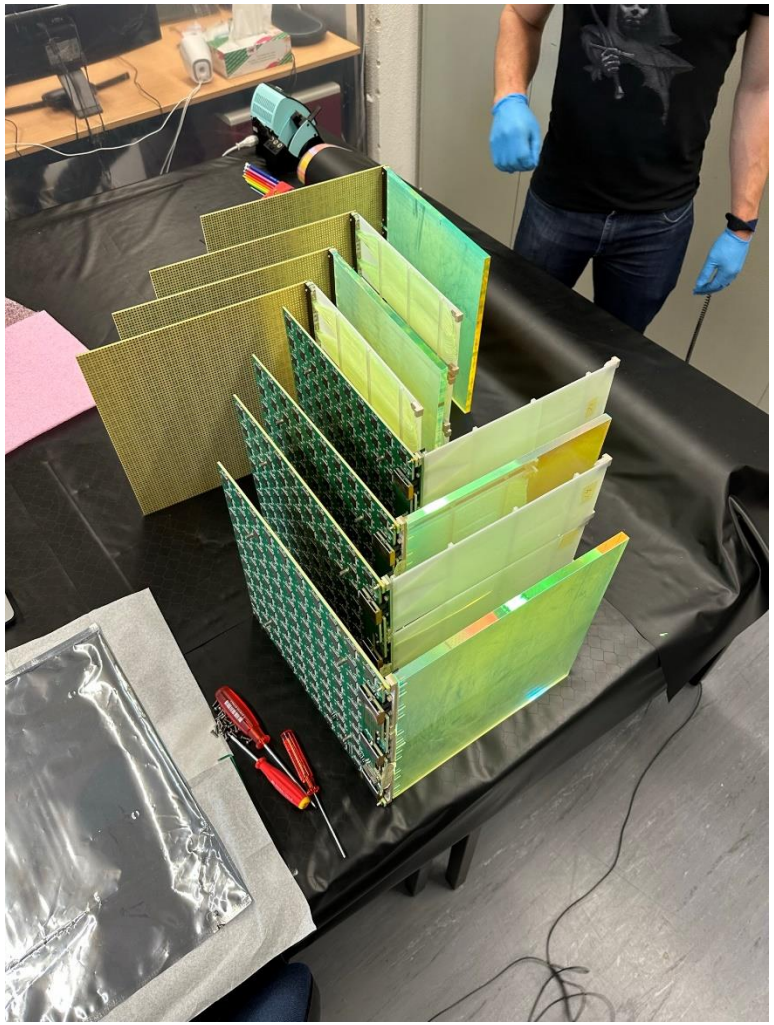


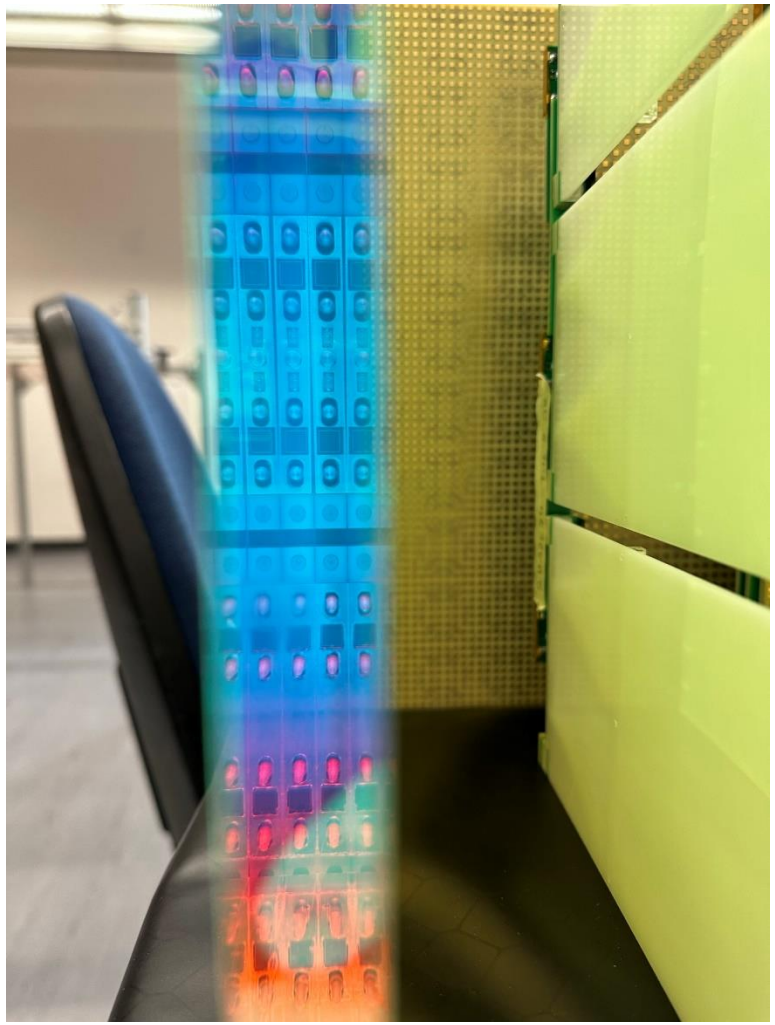
Adjustment of screws to get everything to fit (left), ArCLight installed (right)



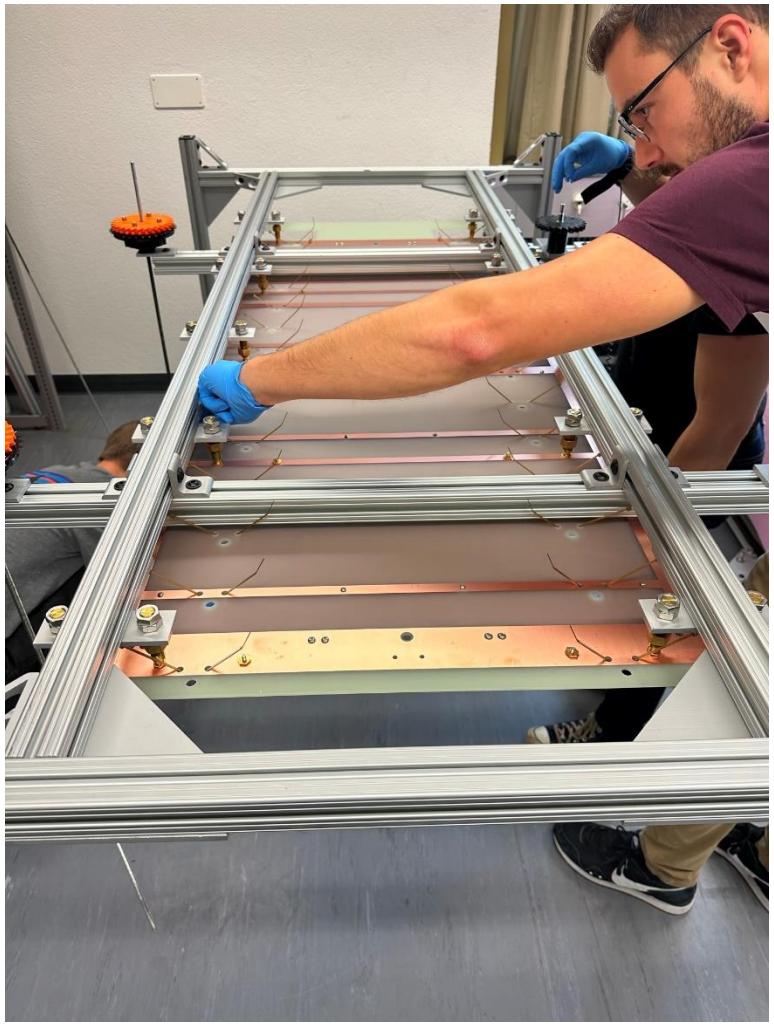


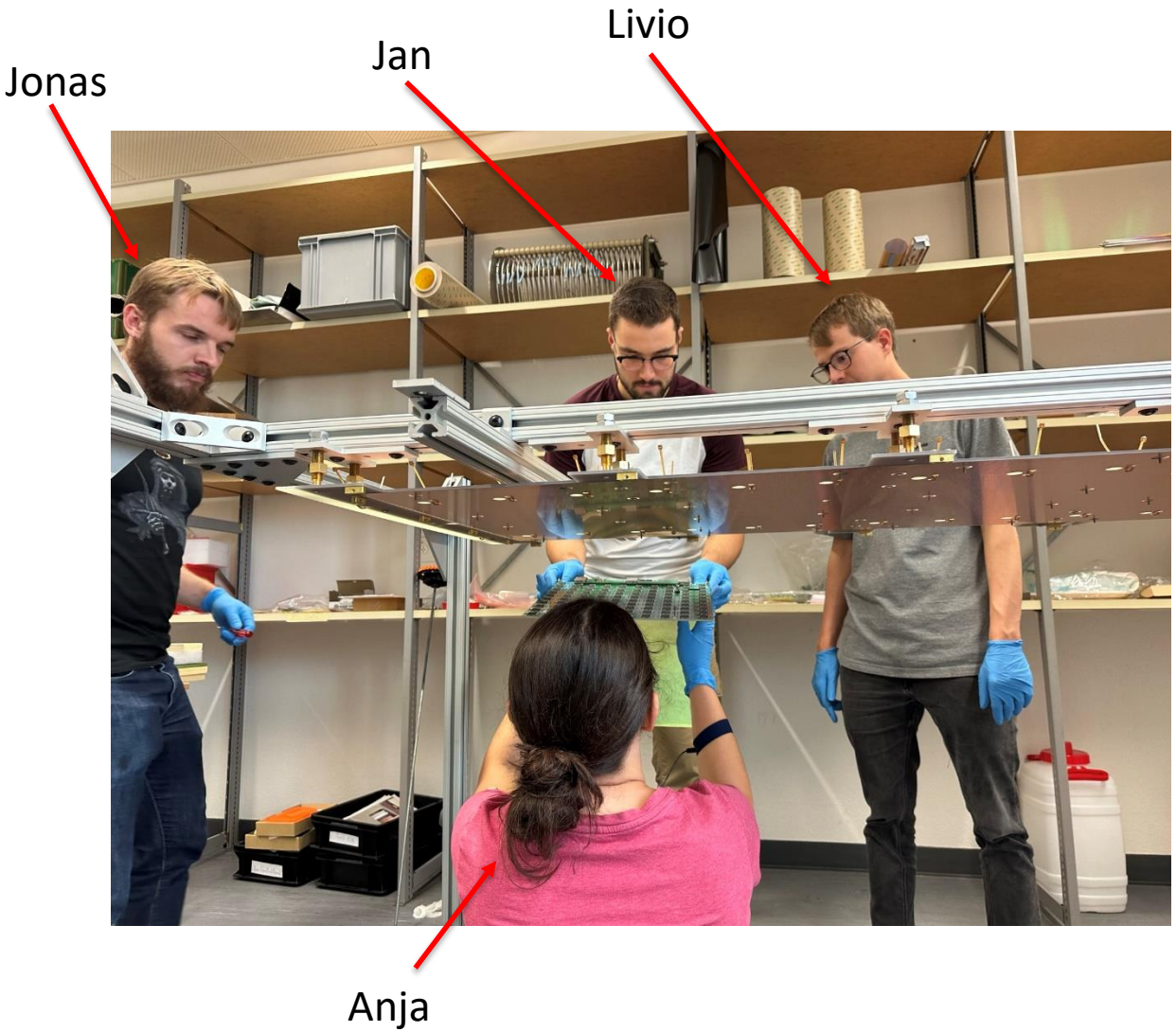
All tiles assembled and ready (left), and picture of SiPMs (right), there is only one but ArCLight coating reflects image



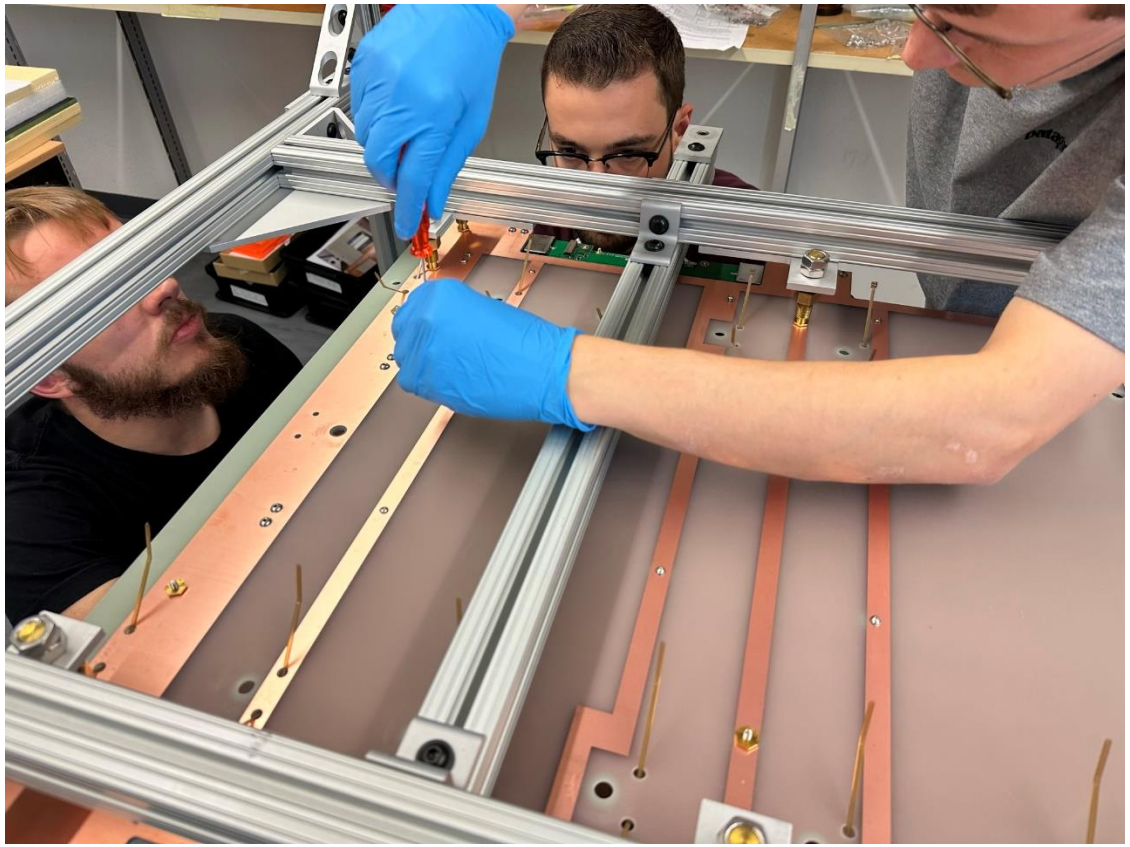


Preparing the Anode Panel (left) and installation of first pixel tile assembly (right)

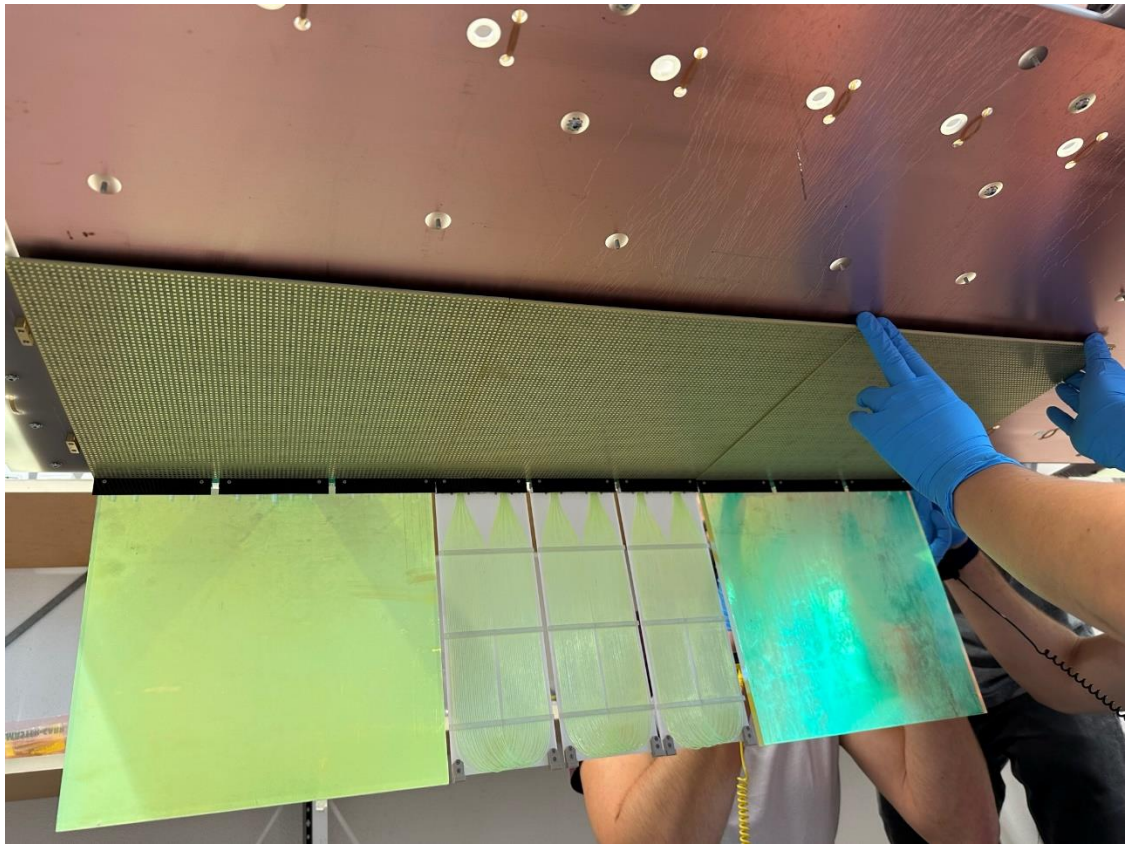




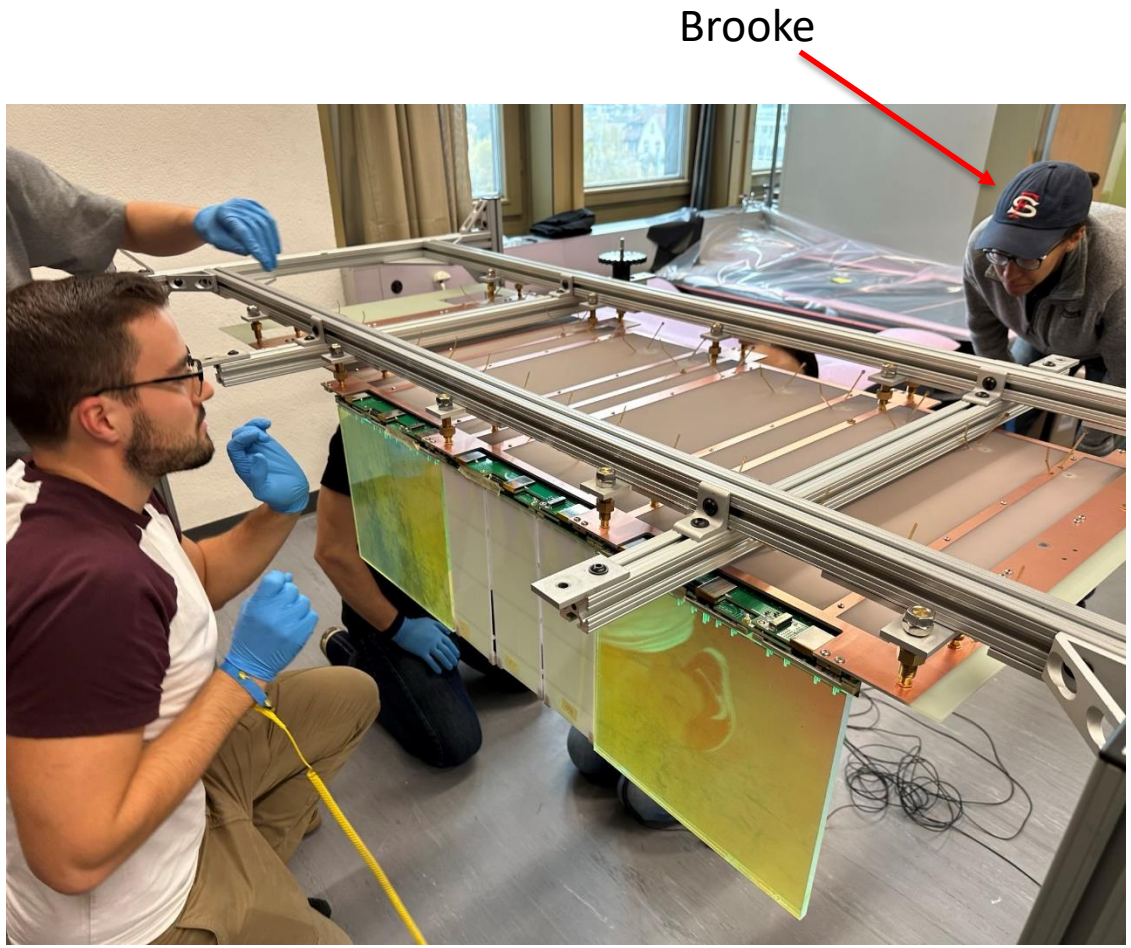
Pixel tile is held underneath (left) and fasteners are installed from the top (right)

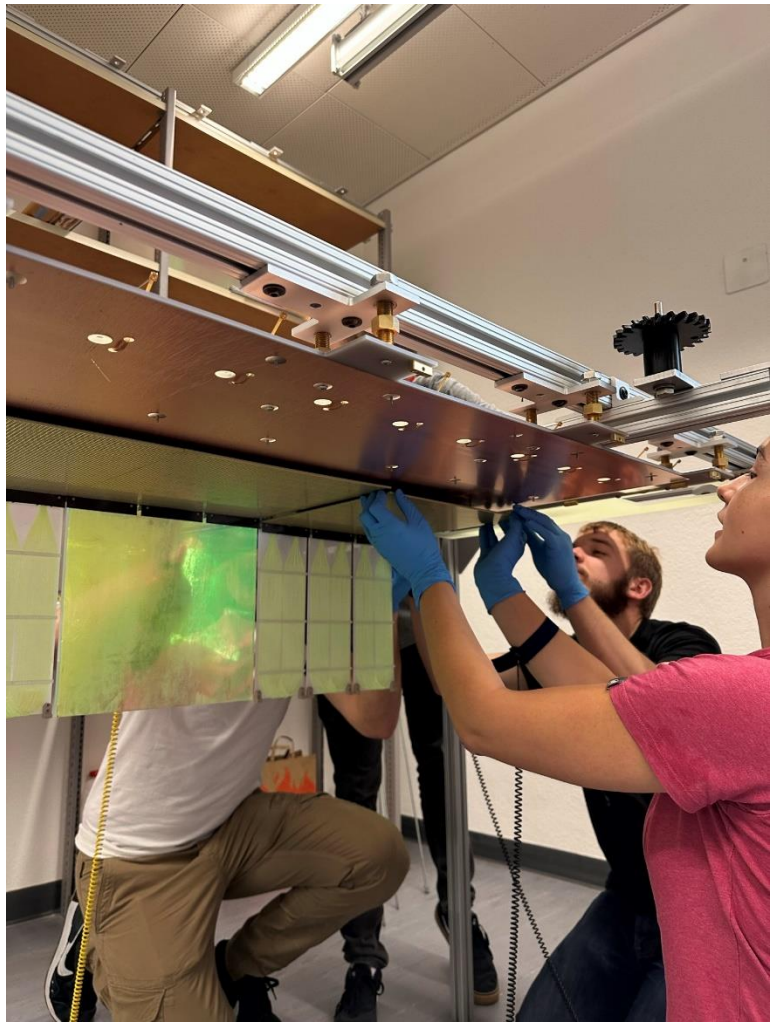


2nd tile assembly is installed (left) and 3rd is installed (right). Notice that ArCLight and LCM alternate

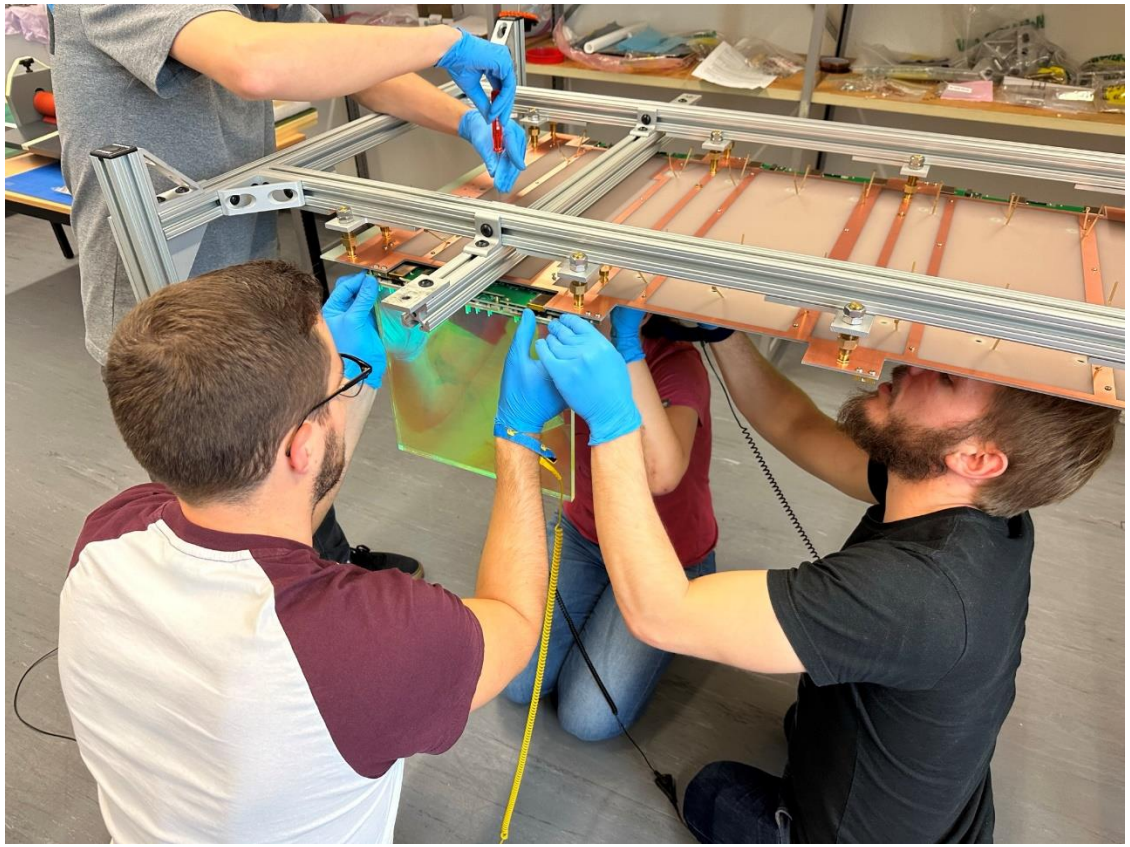


Installation of 4th tile assembly (right)

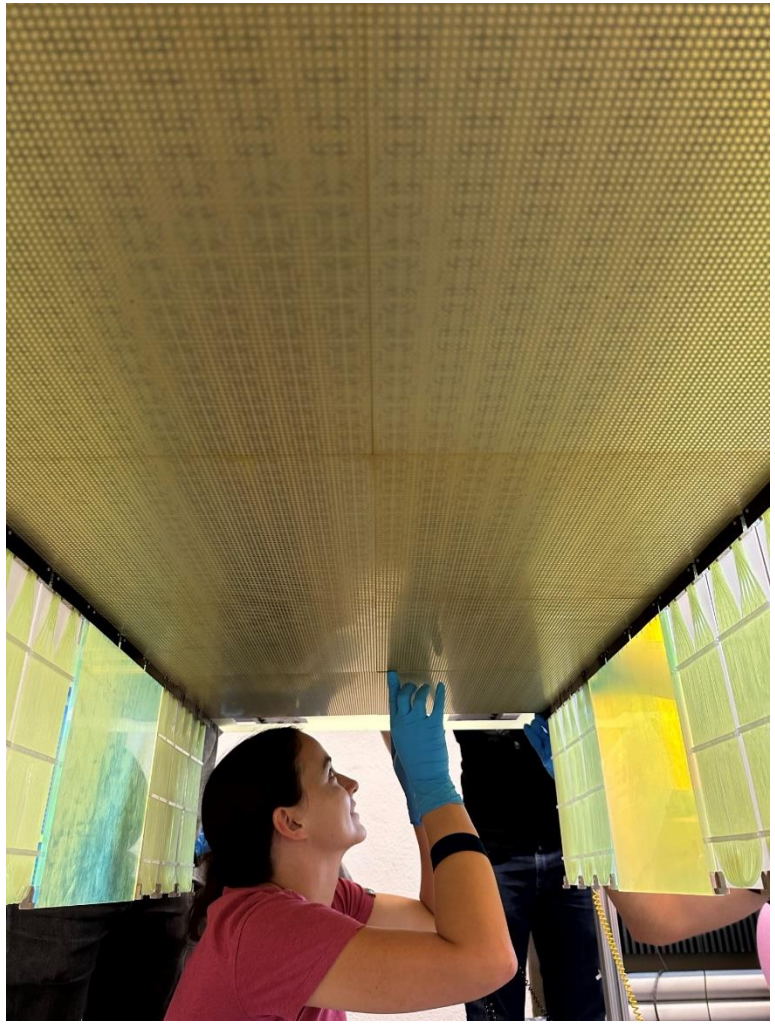




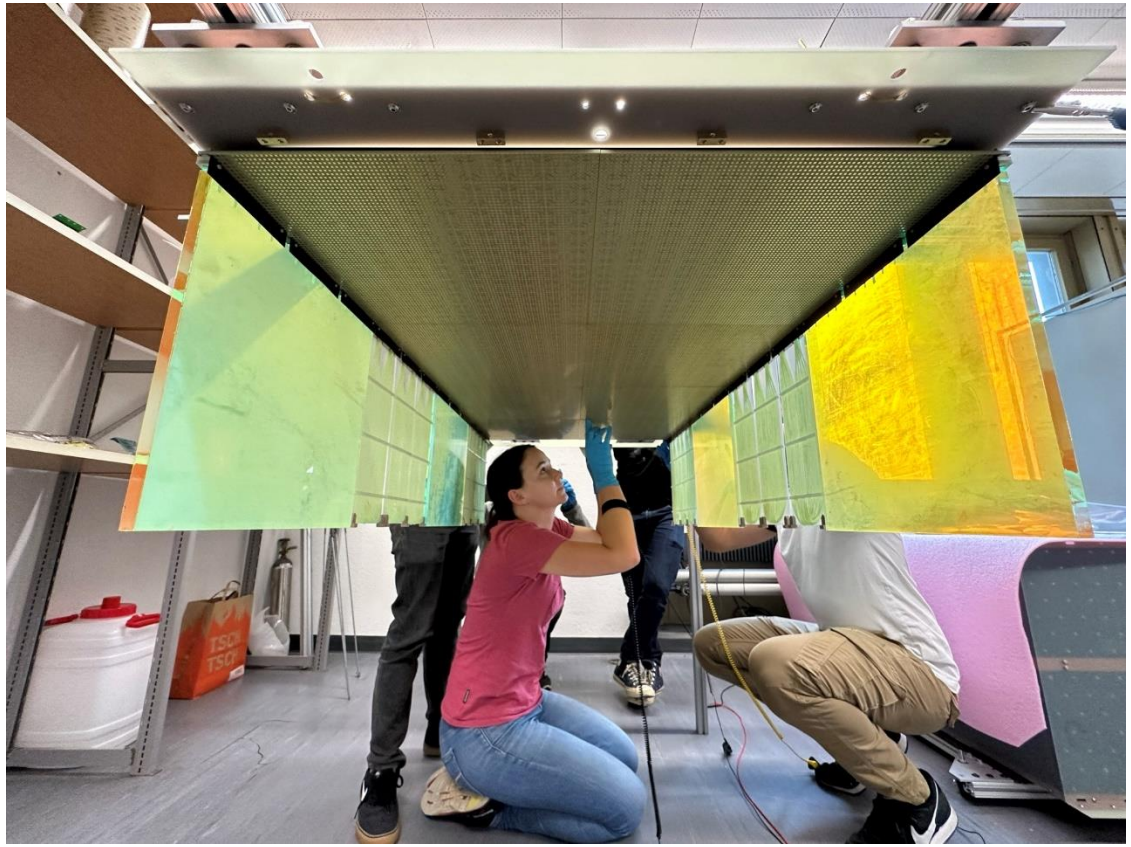
Installation of 4th tile assembly (left) and 5th tile assembly (right)

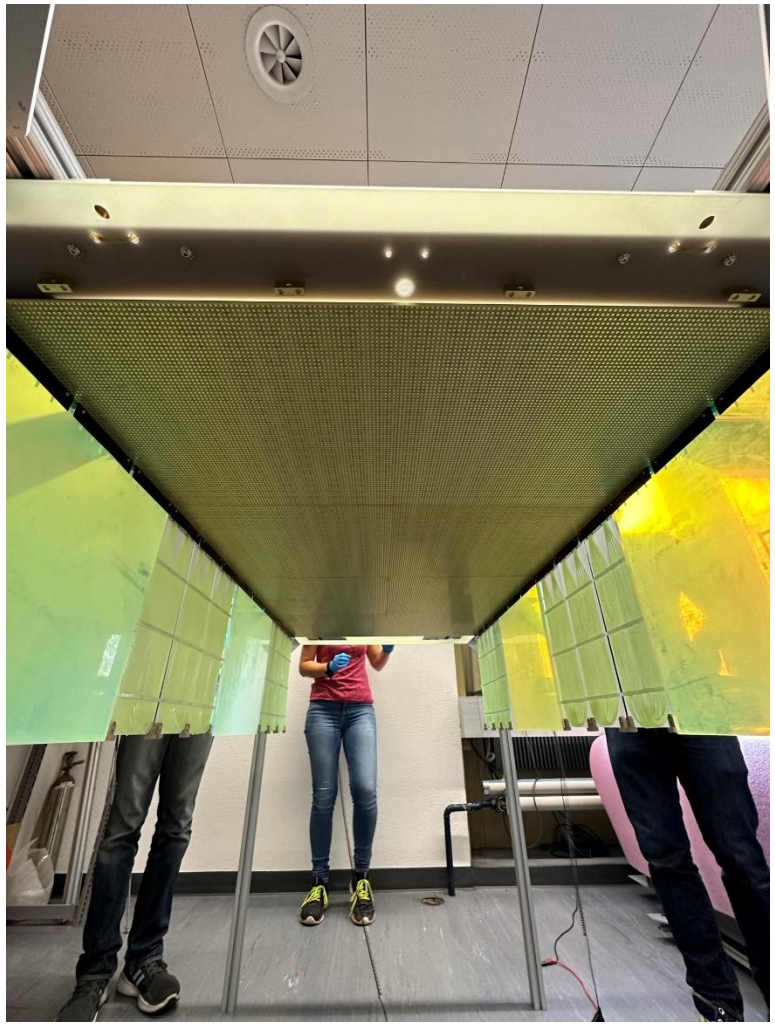


6th tile assembly installed (left) and 8th (final) tile assembly installed (right)

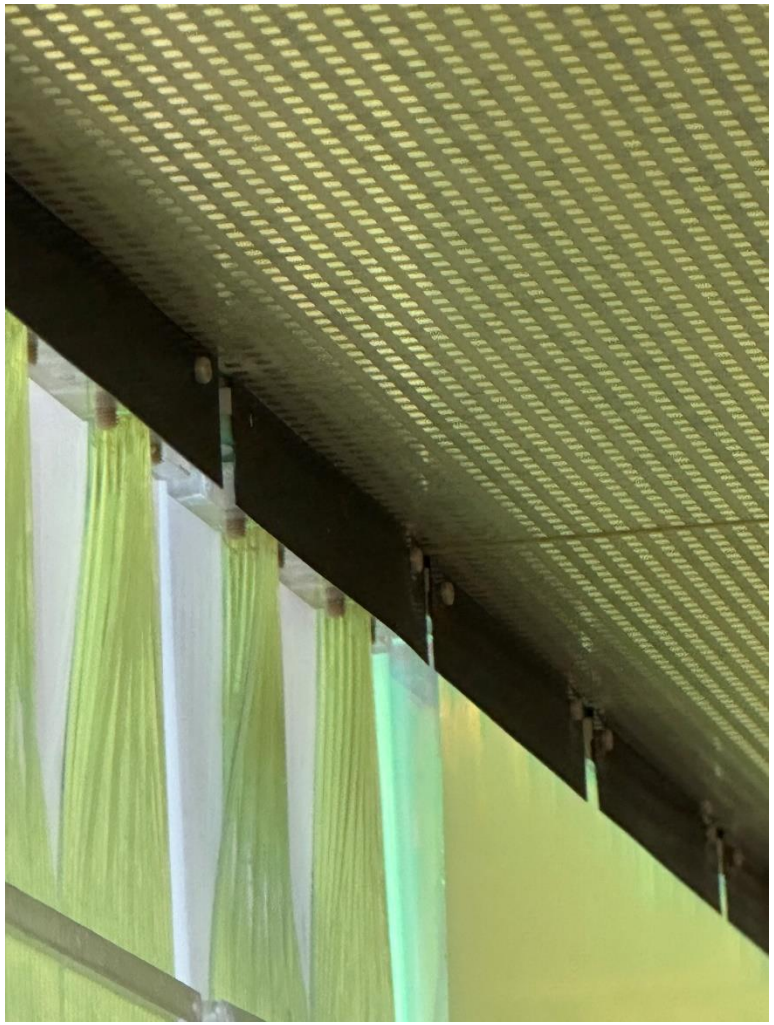


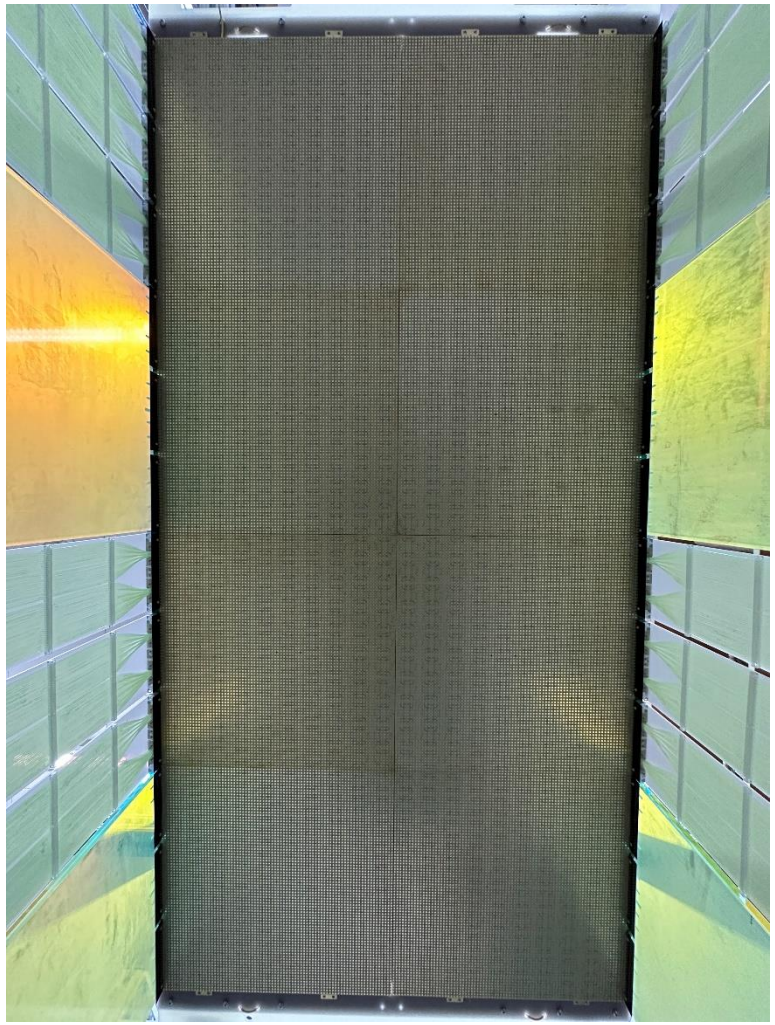
Full pixel tile and light readout installed to the anode (left & right)



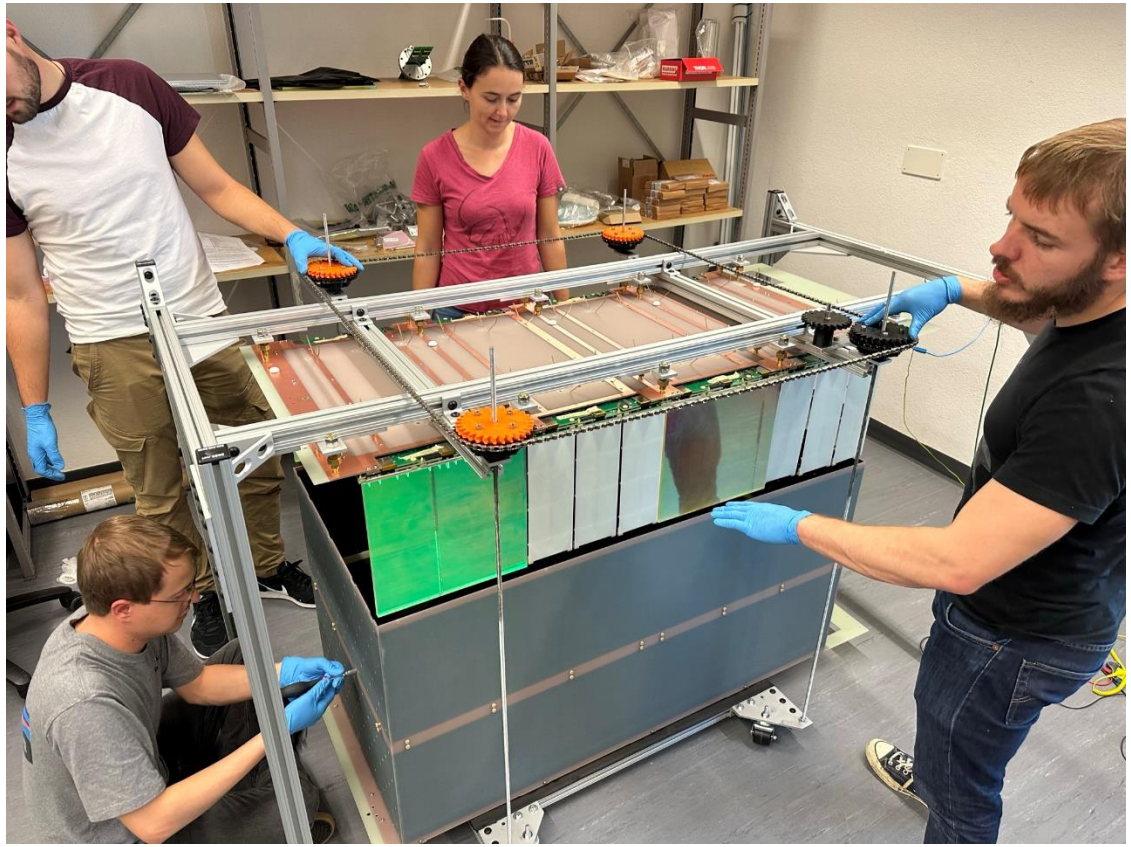


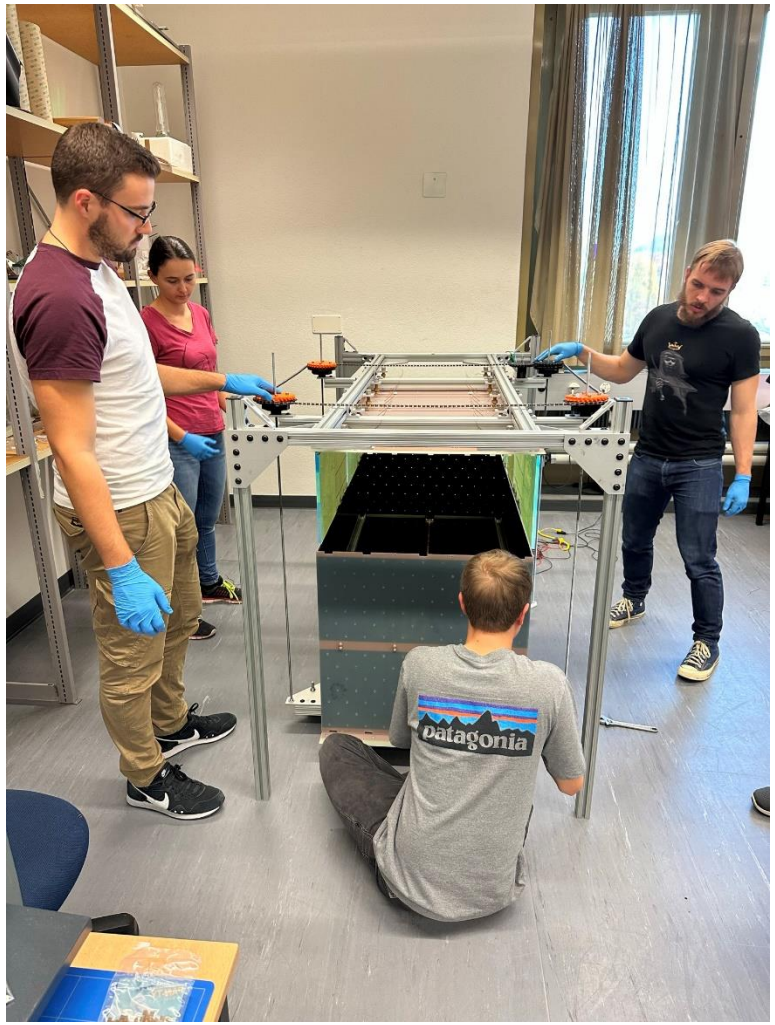
Zoom in on pixels + LCM/ArCLight (left) and full anode photo from below (right); tiles are not fully tightened down until all installed -> alignment of tiles



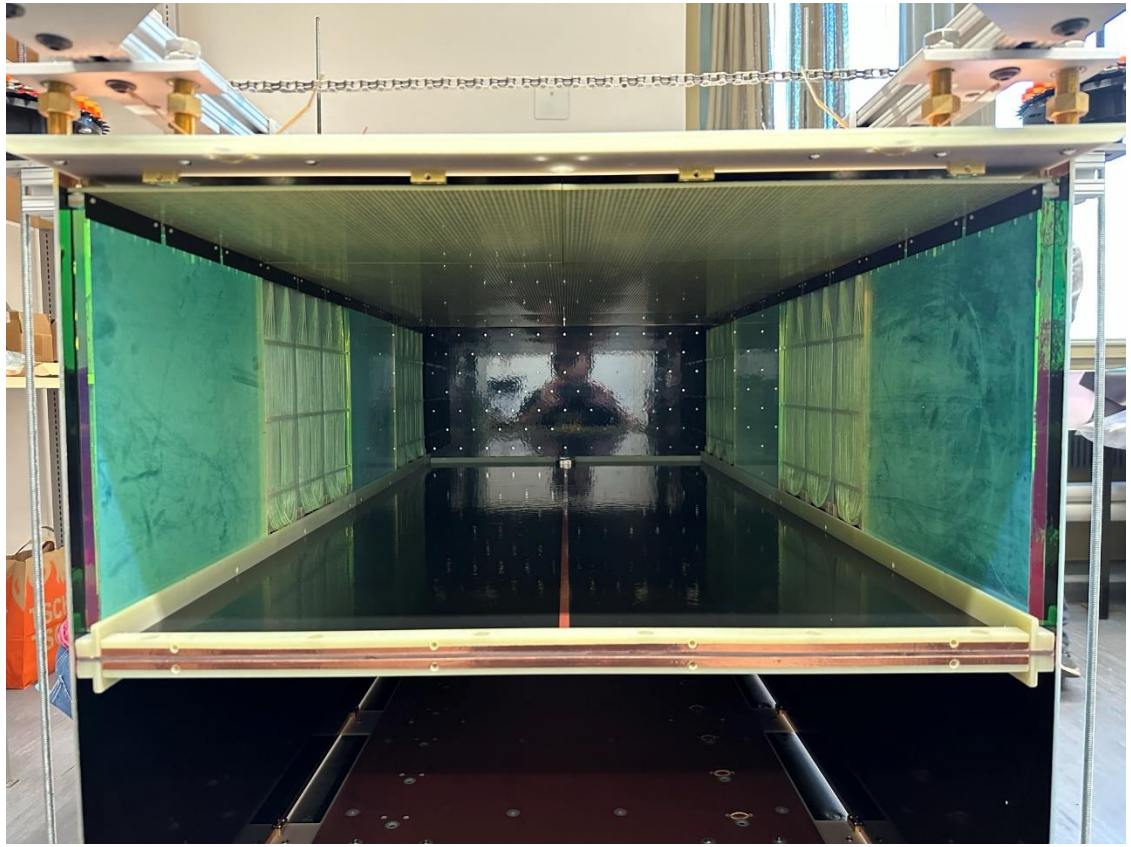


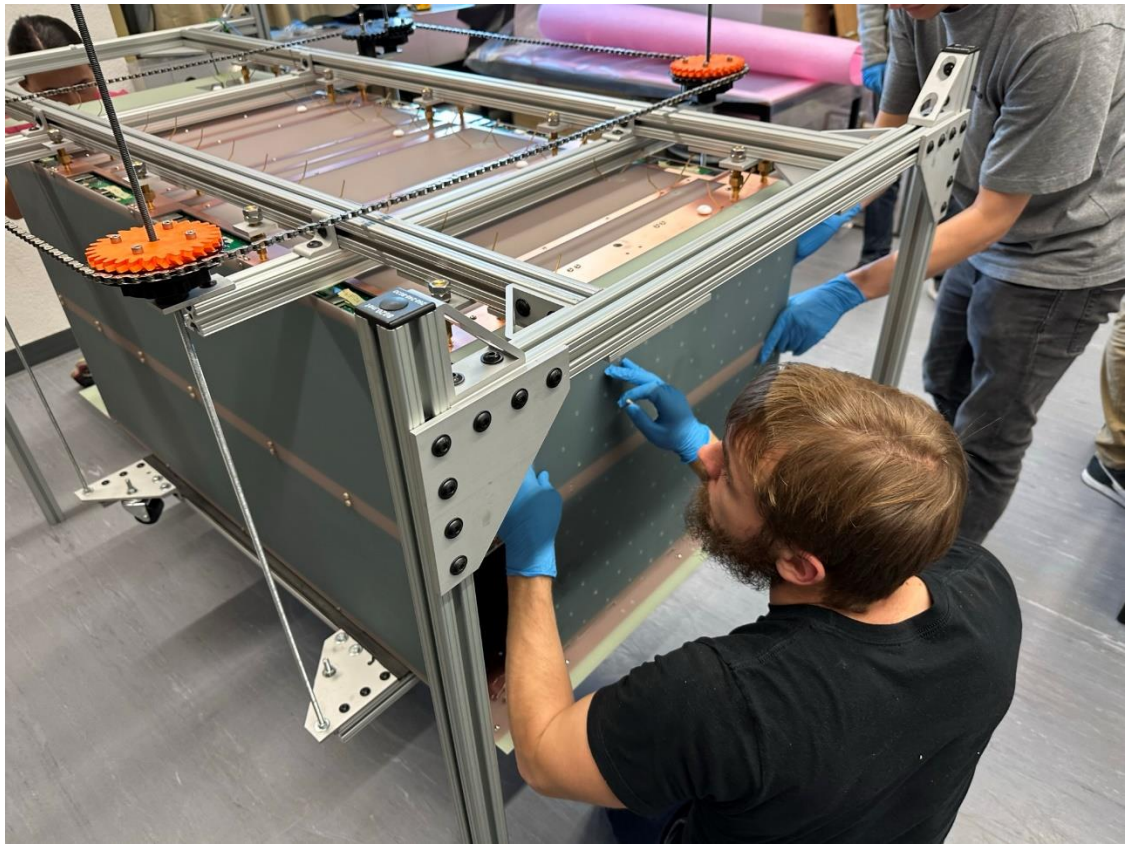
Installation of anode panel assembly into the field shell using installation fixture



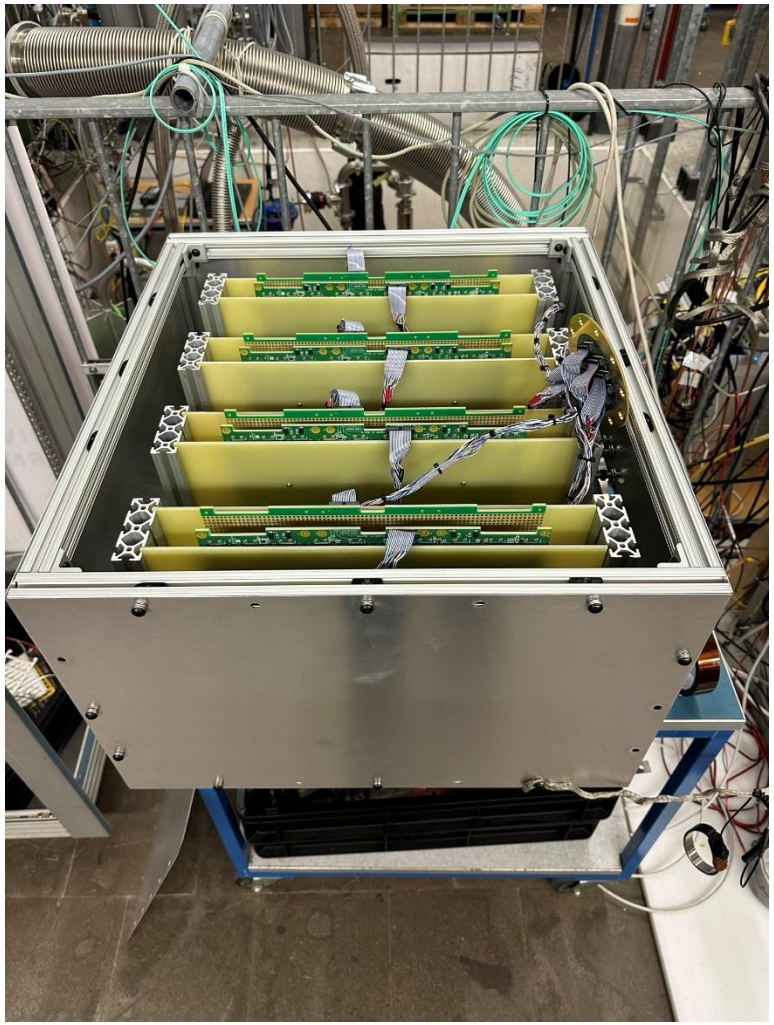


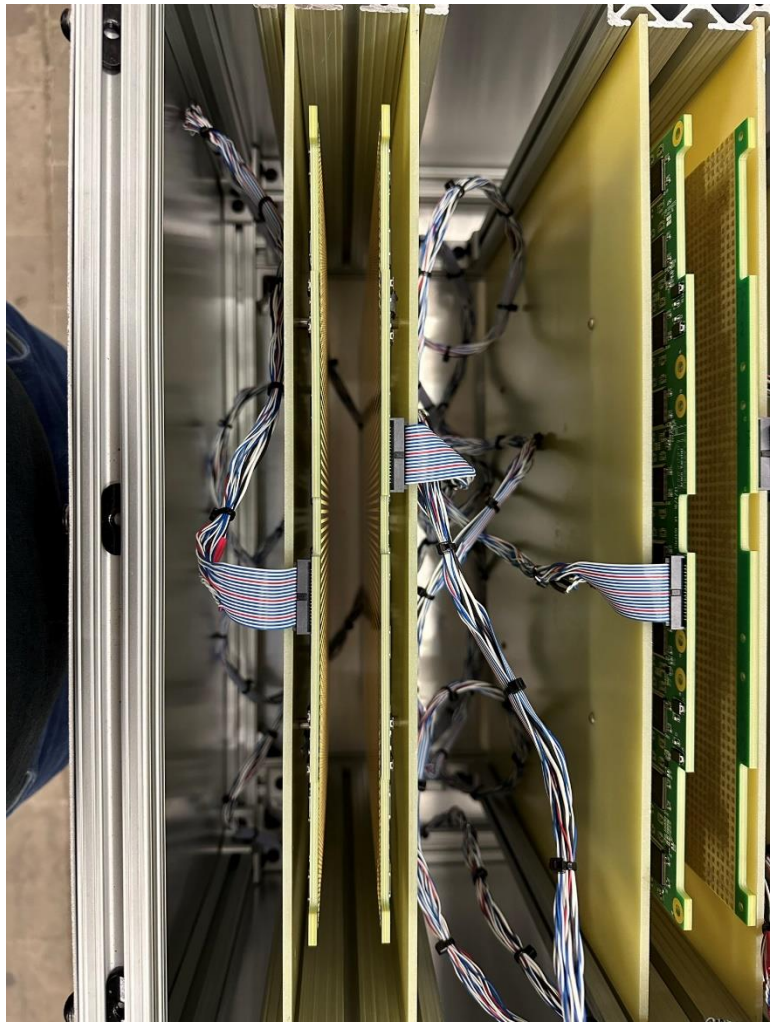
Anode panel assembly installed to the field shell (left) and re-installation of bottom field shell panel (right)



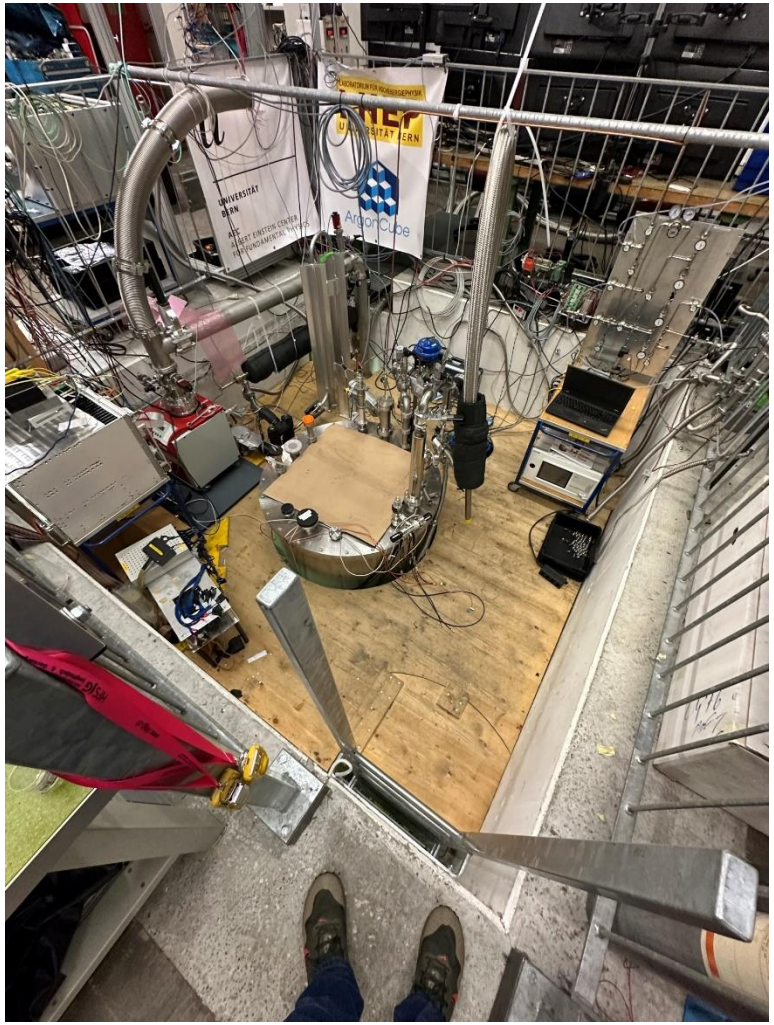


2nd TPC tiles installed to warm testing enclosure, testing will commence tomorrow morning and these tiles will then go through identical installation procedure





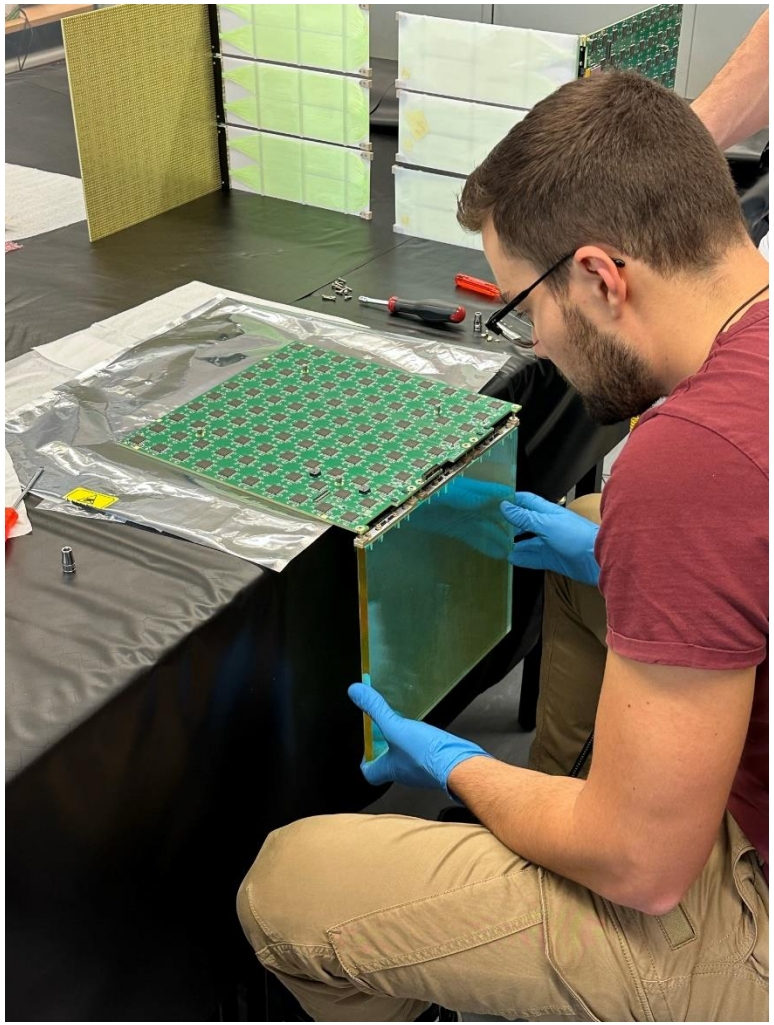
Module lid with feedthroughs (left), picture of cryostat in pit (middle), slow control and DAQ station (right)



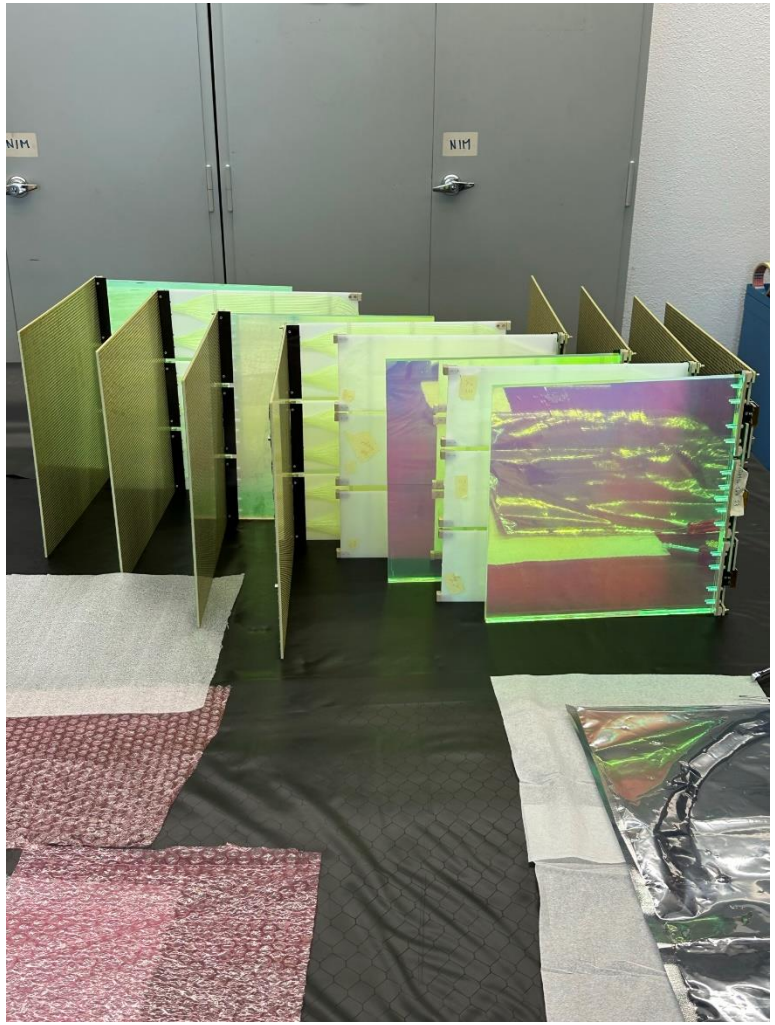
Thursday, November 3rd

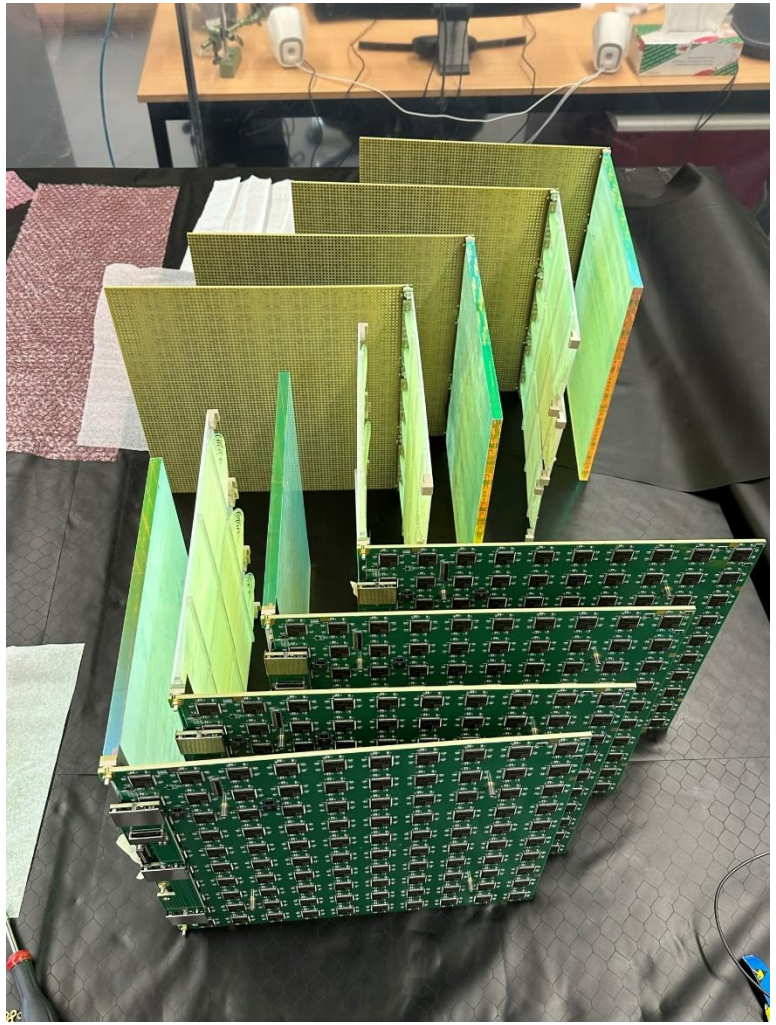
- Completed the anode assembly for TPC 2 of Module 2
- Inserted anode assembly of TPC 2 into the field shell
- Transported Module 2 to Grosslabor and Installed Top Flange
- Pictures follow

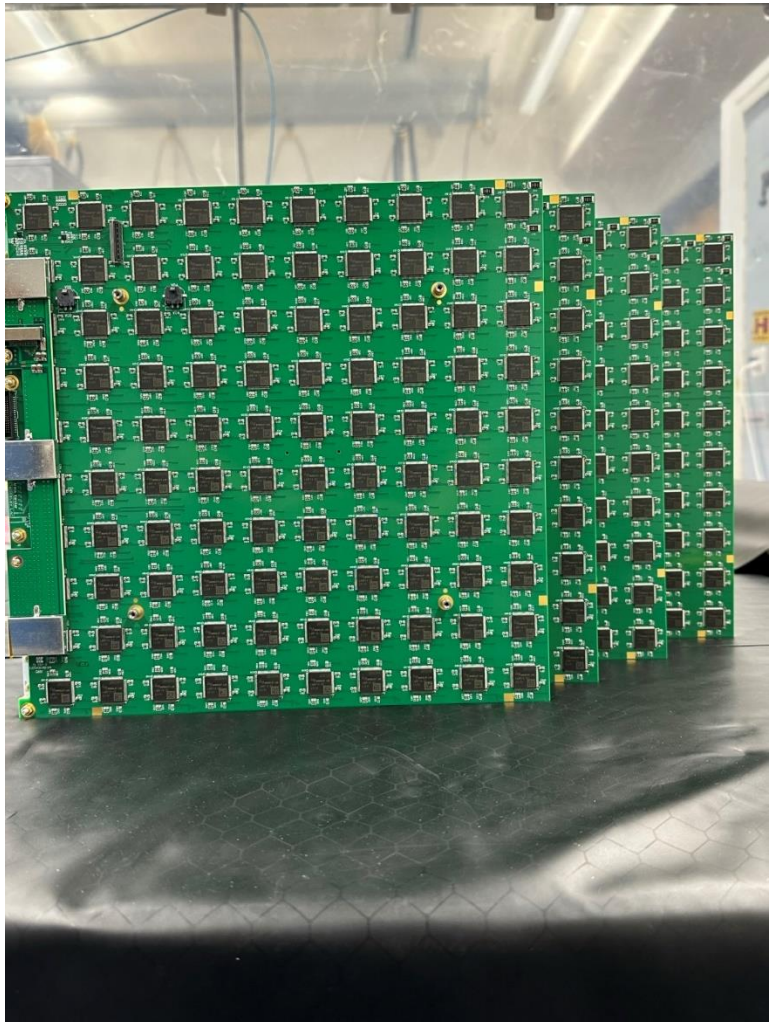
Assembly of pixel and light readout tiles for TPC-2



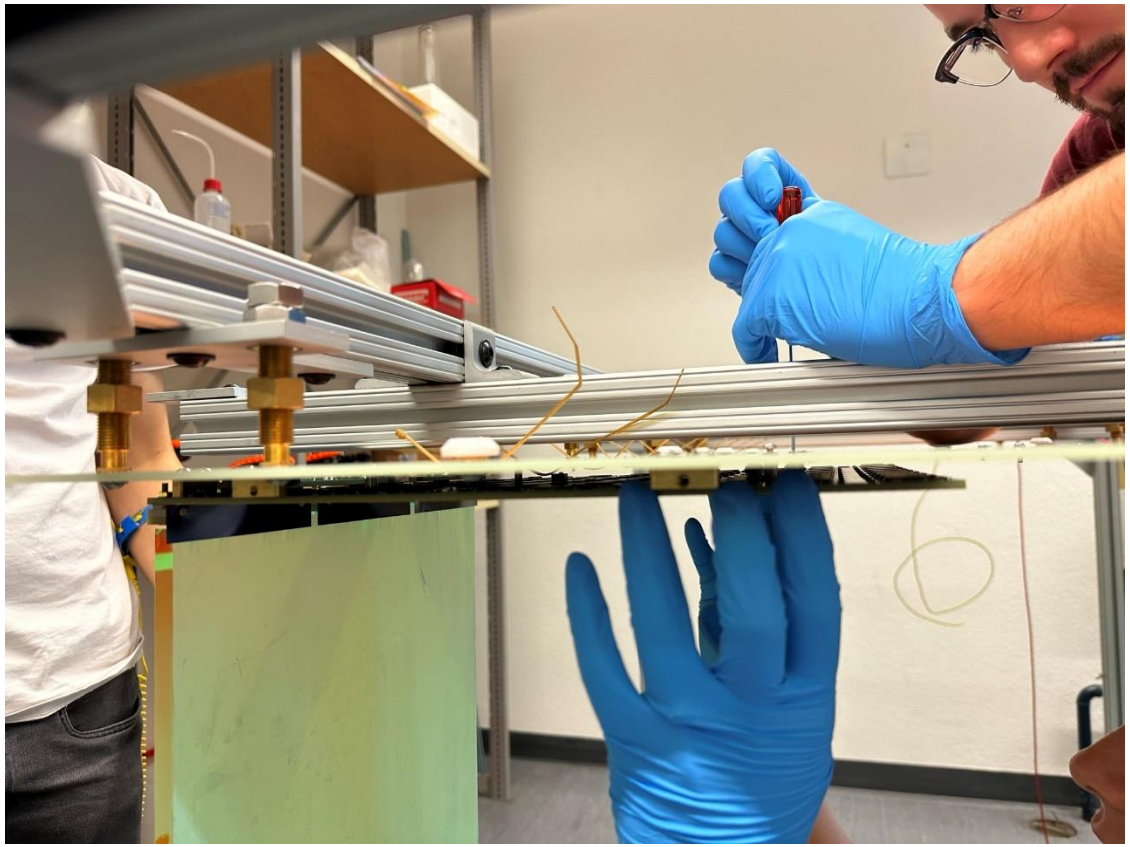
All tiles assembled for TPC-2 (4X with ArCLight, 4X with LCM)



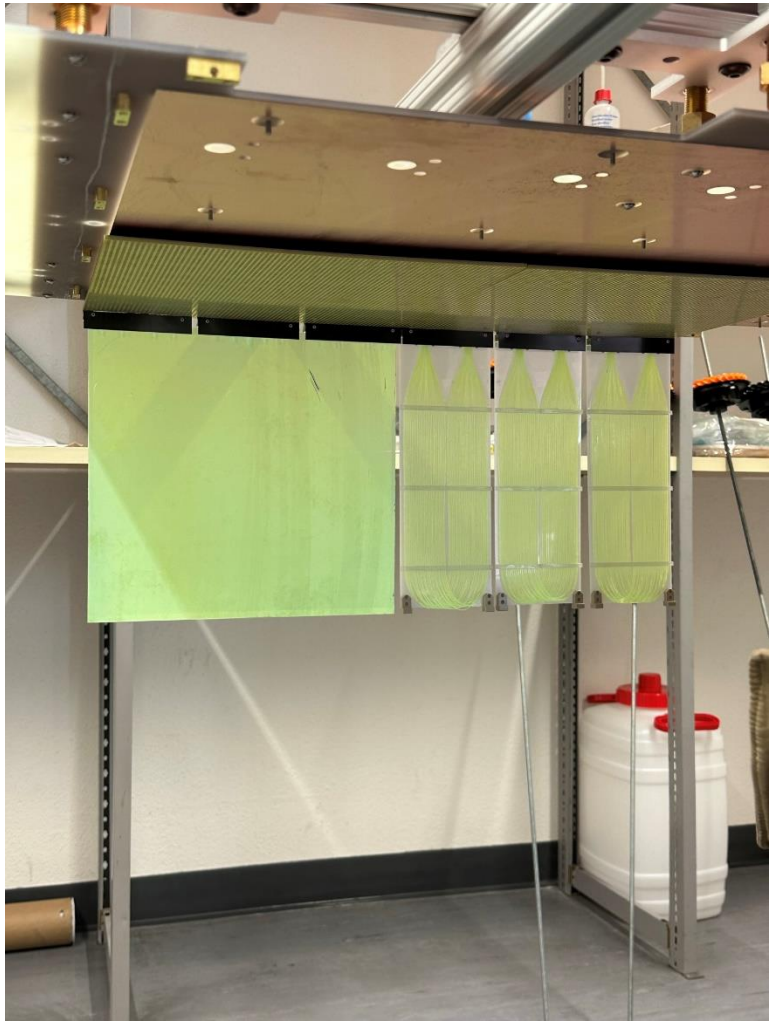




Installation to anode of first tile assembly for TPC-2

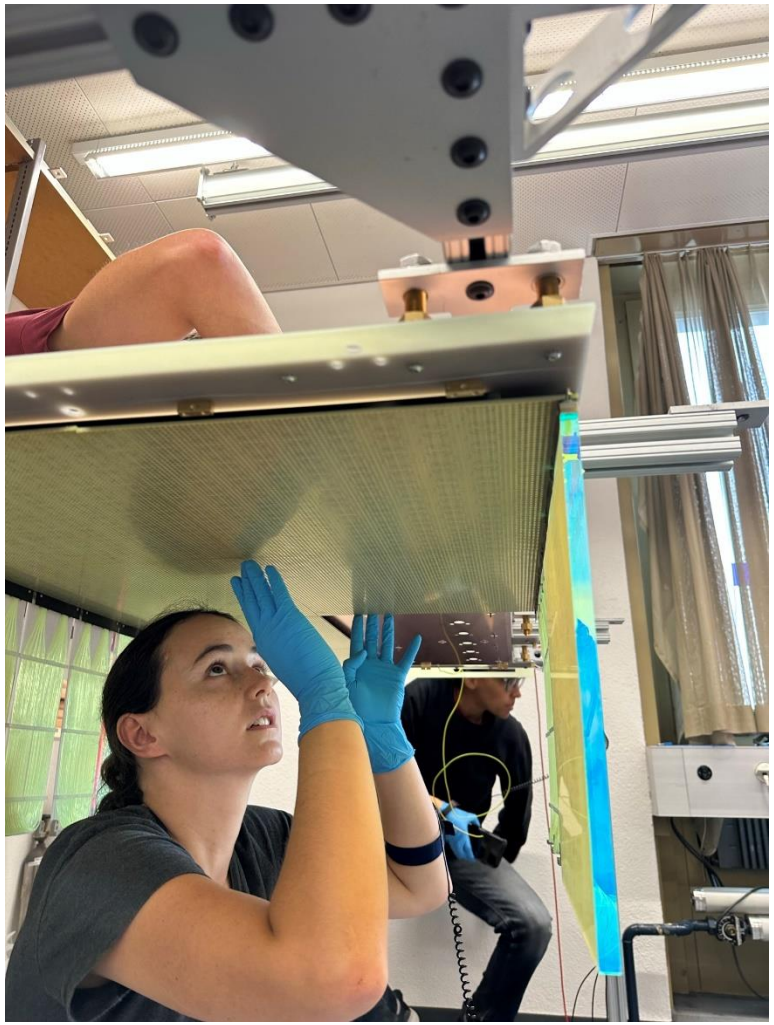


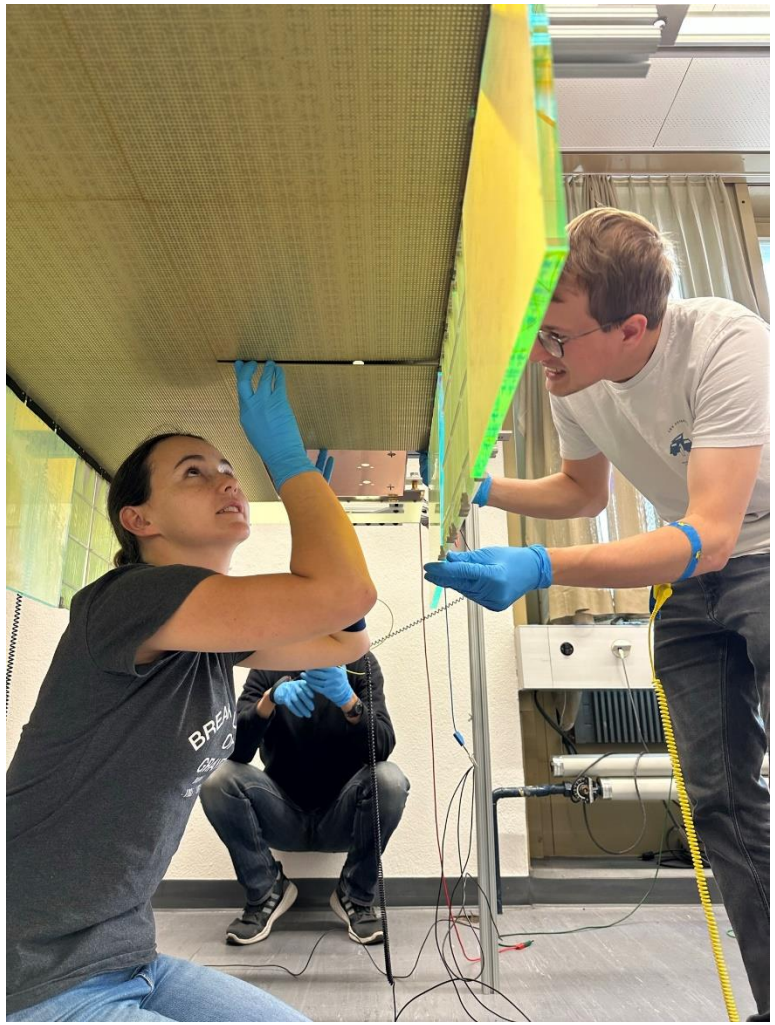
Tile assembly 2 and 3 installed to anode panel



Tile assembly 4 and 5 installed to the anode

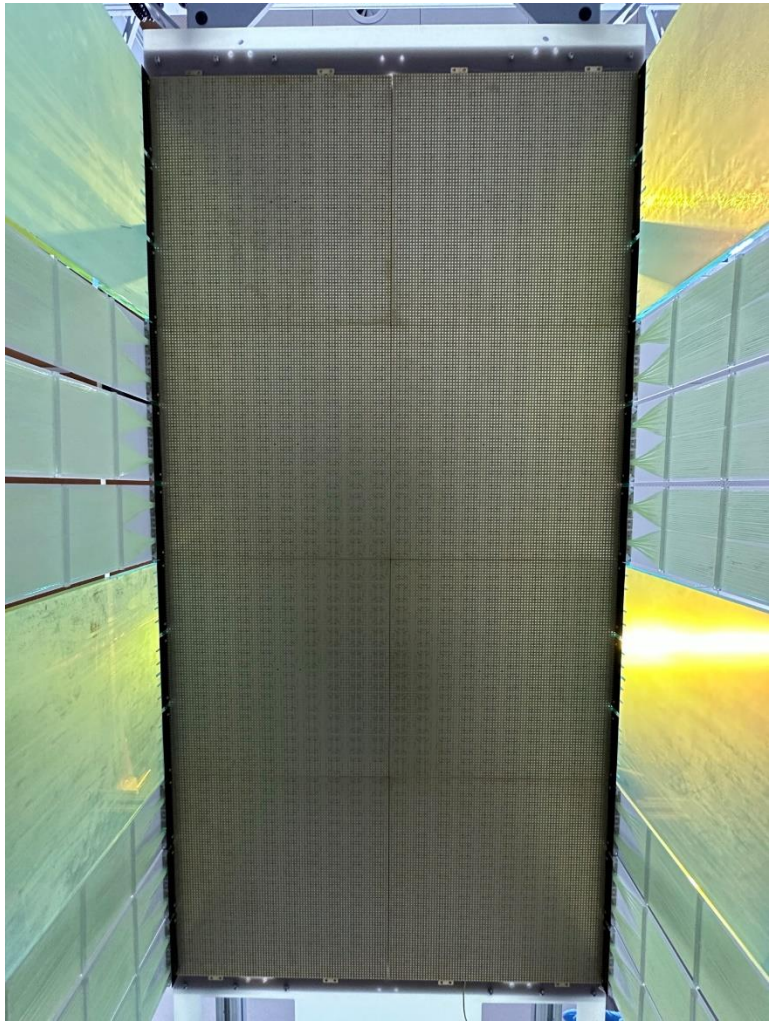
Tile assembly 6 and 7 installed to anode panel

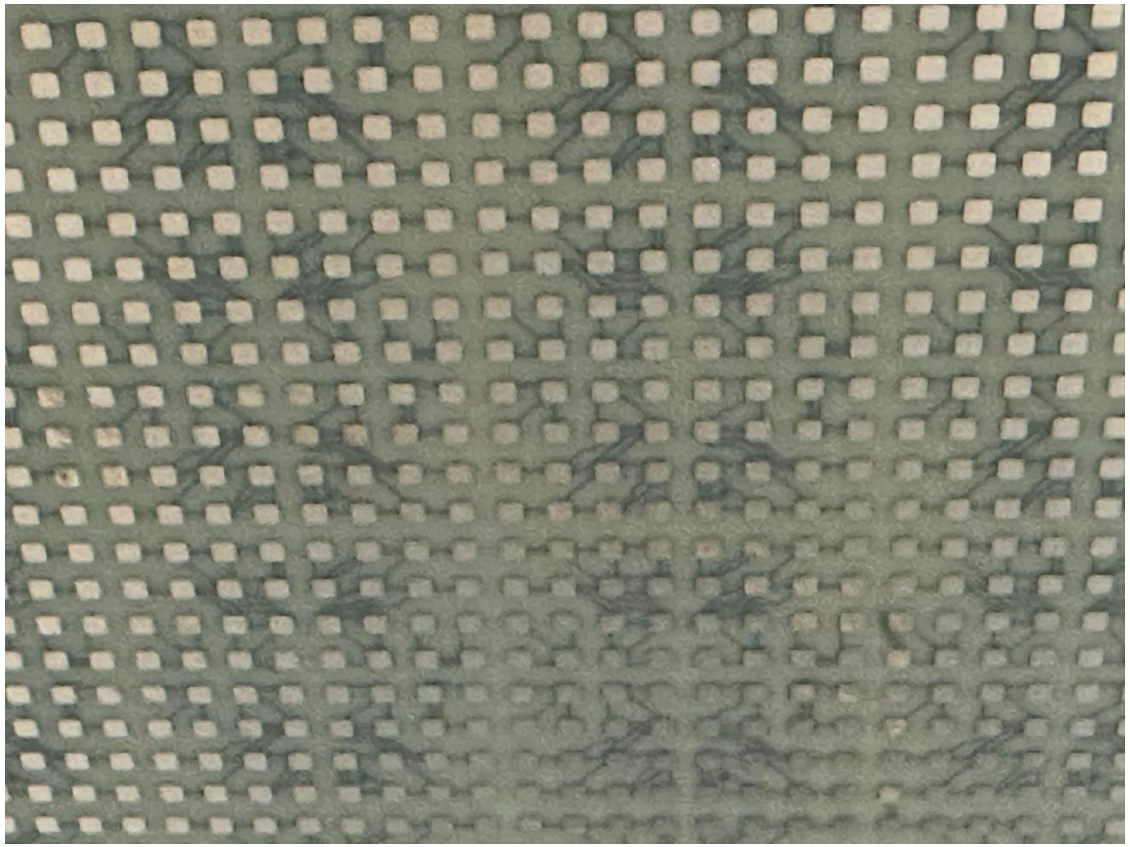




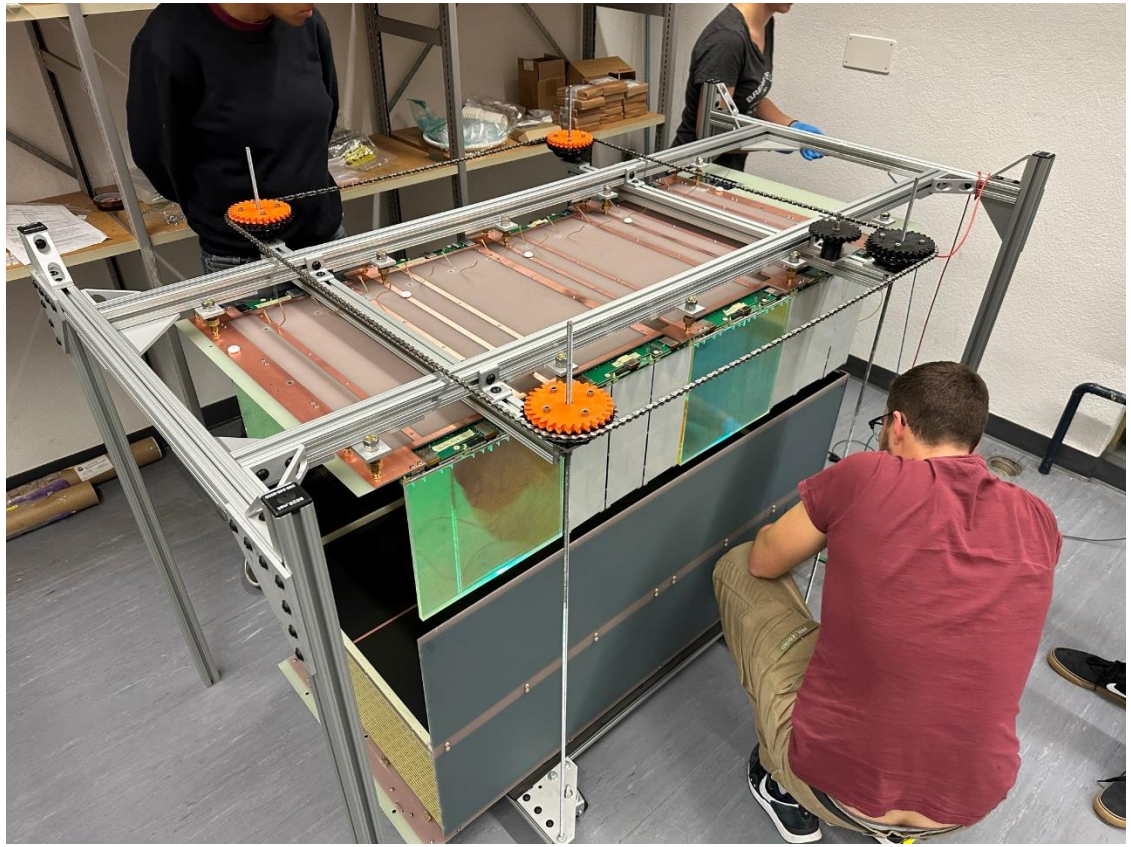
Tile assembly 8 installed, followed by alignment of tiles

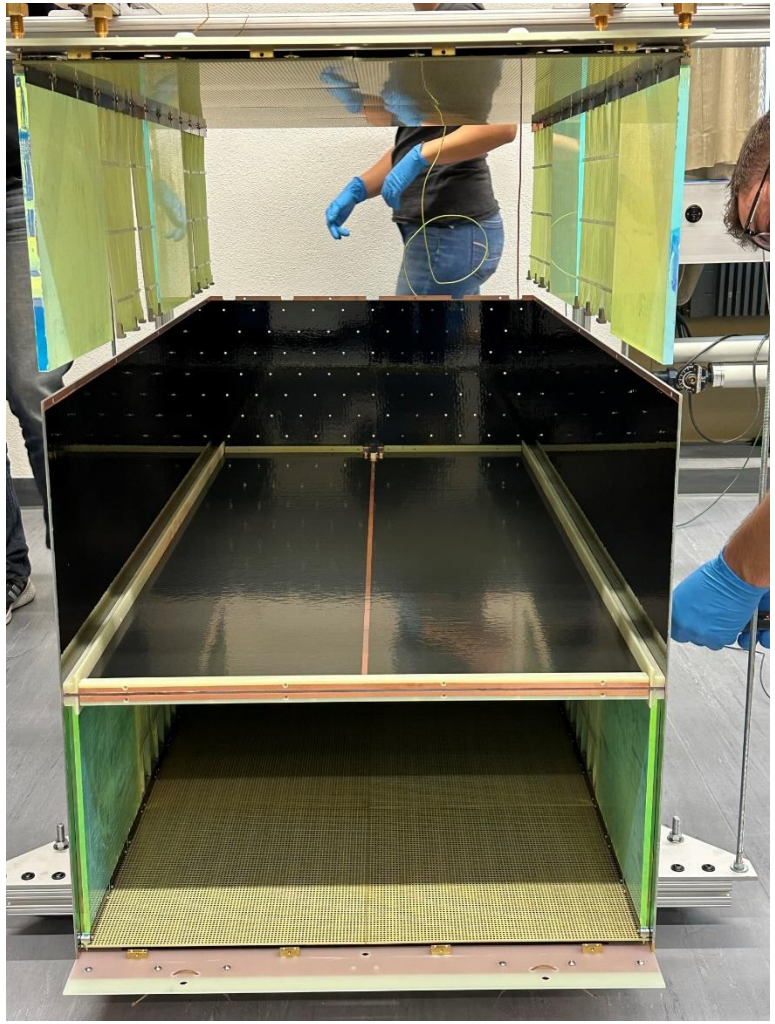
Anode assembly completed (left), close up of new pixel layout (right)



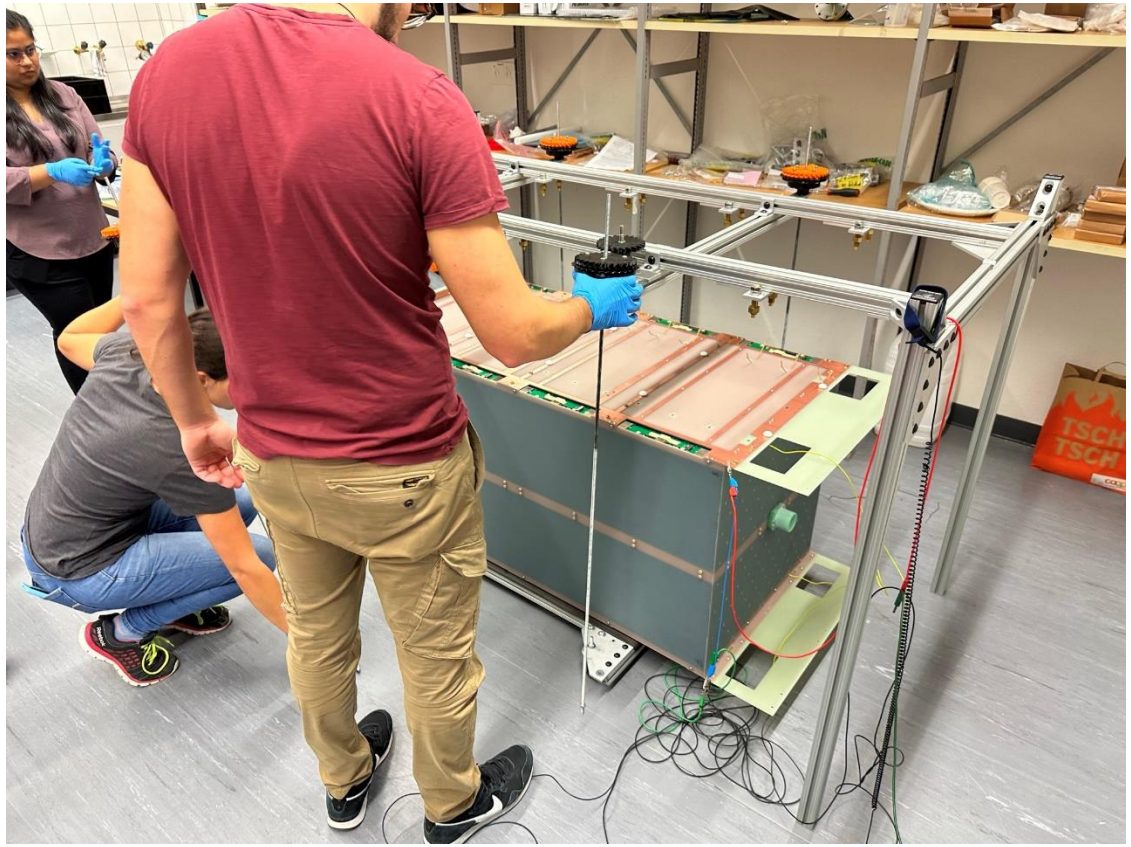


Installation of 2nd anode & LRO to field shell, 1st anode & LRO is visible

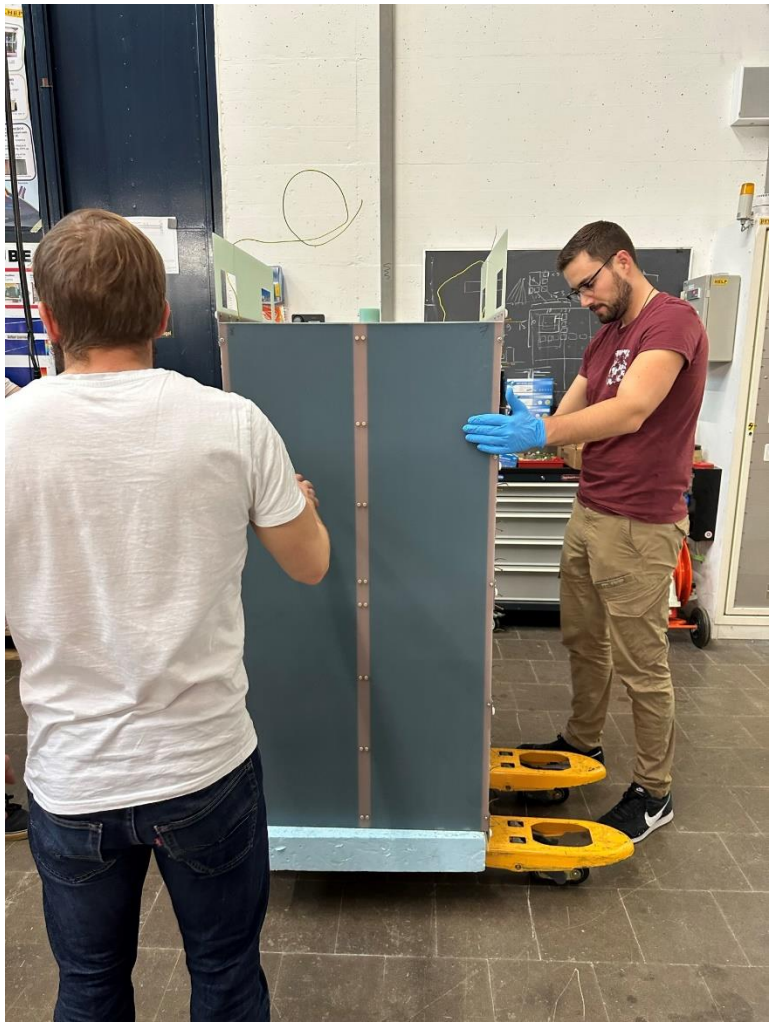




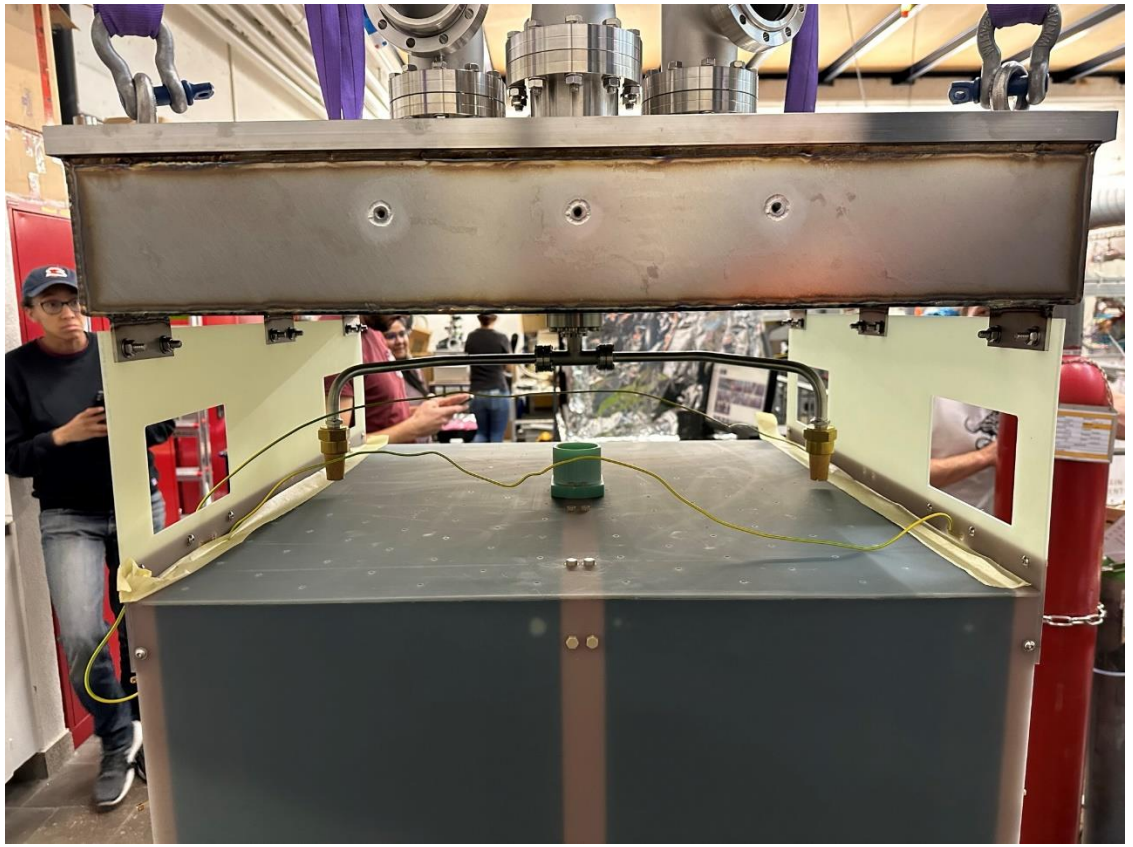
2nd anode and LRO installed without issue, module rotated upright and transported to Grosslabor



Module positioned for top flange installation in Grosslabor (left) and top flange is installed to module (right)



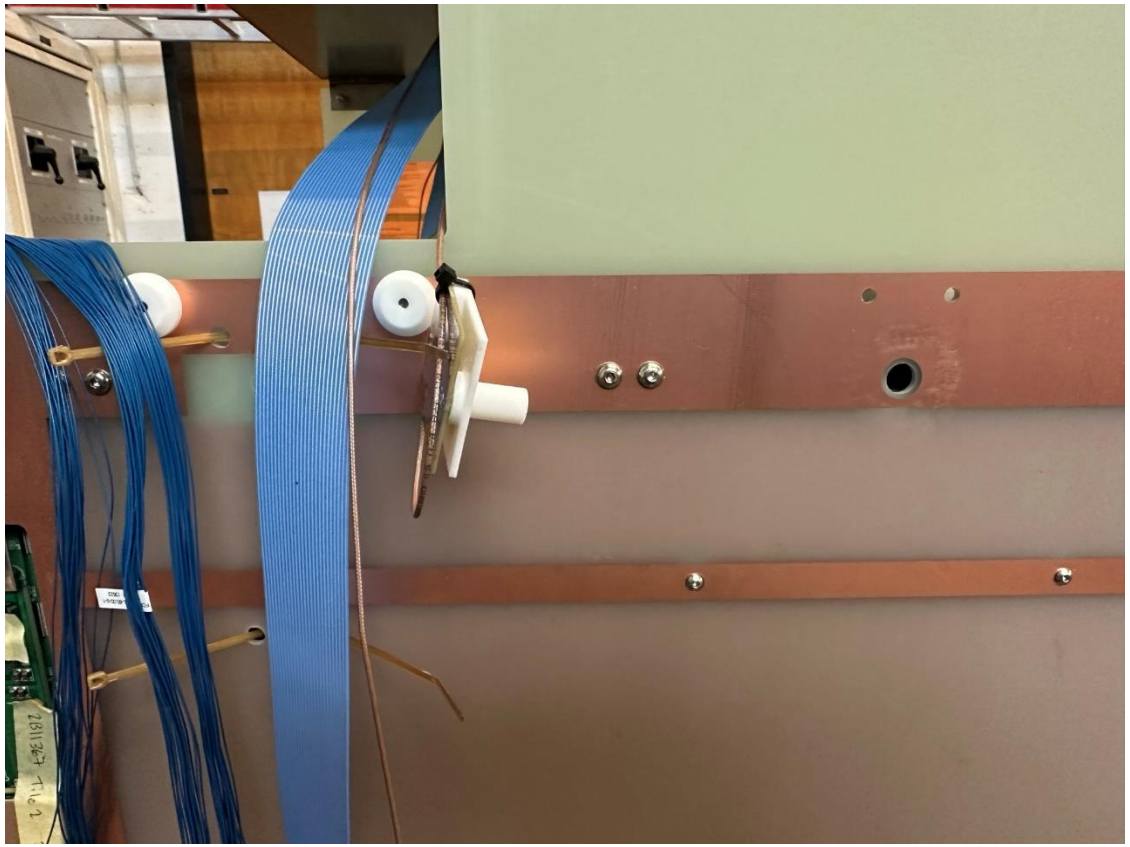
Top flange installed to module, no cabling installed yet (left), can see top flange & LAr sprayers (right)



Friday, November 4th

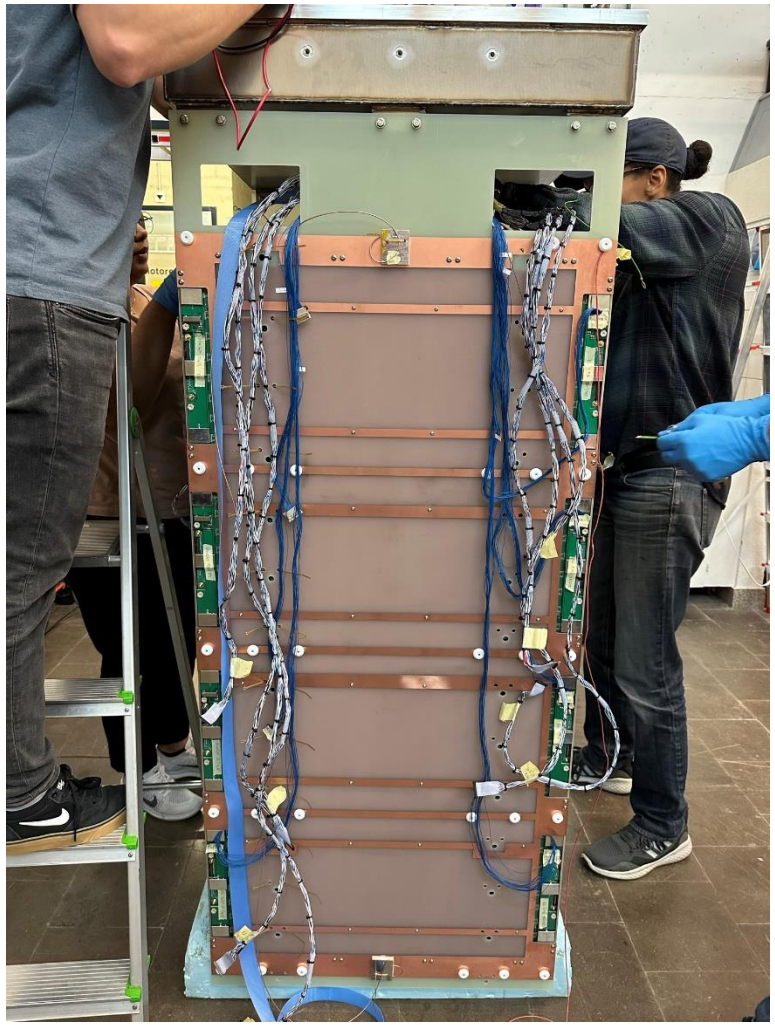
- Routed light and charge readout cabling
- Installed slow control cabling
- Installed light system calibration source
- Completed feedthrough assembly for one TPC
- Pictures follow

Light readout cables installed to e-boards (left), slow control and light readout calibration (right)



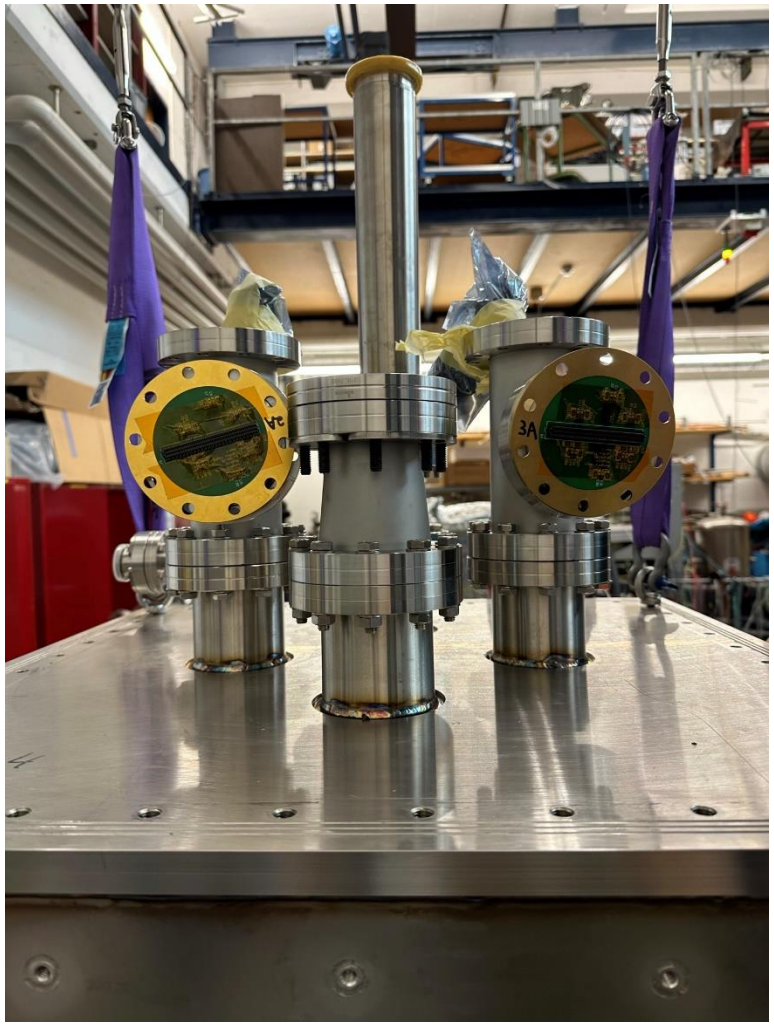
Slow control and light system calibration wire routed (left), light system calibration source (right)

Charge cable routing (left & right)



Charge readout feedthrough (left), top flange preparation (right)

Charge readout feedthroughs (left), charge readout + light readout + slow control feedthroughs (right)



Assembly team photo

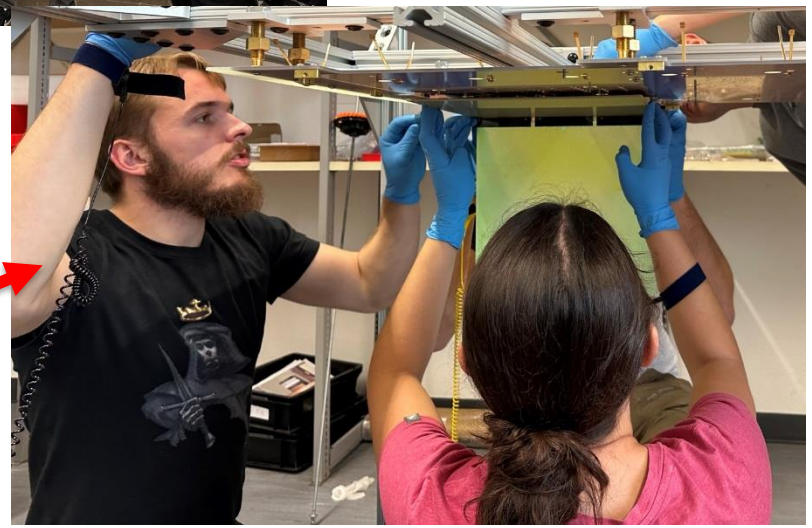
Anja Jan Brooke

Livio

Faiza

Nikolay

Jonas



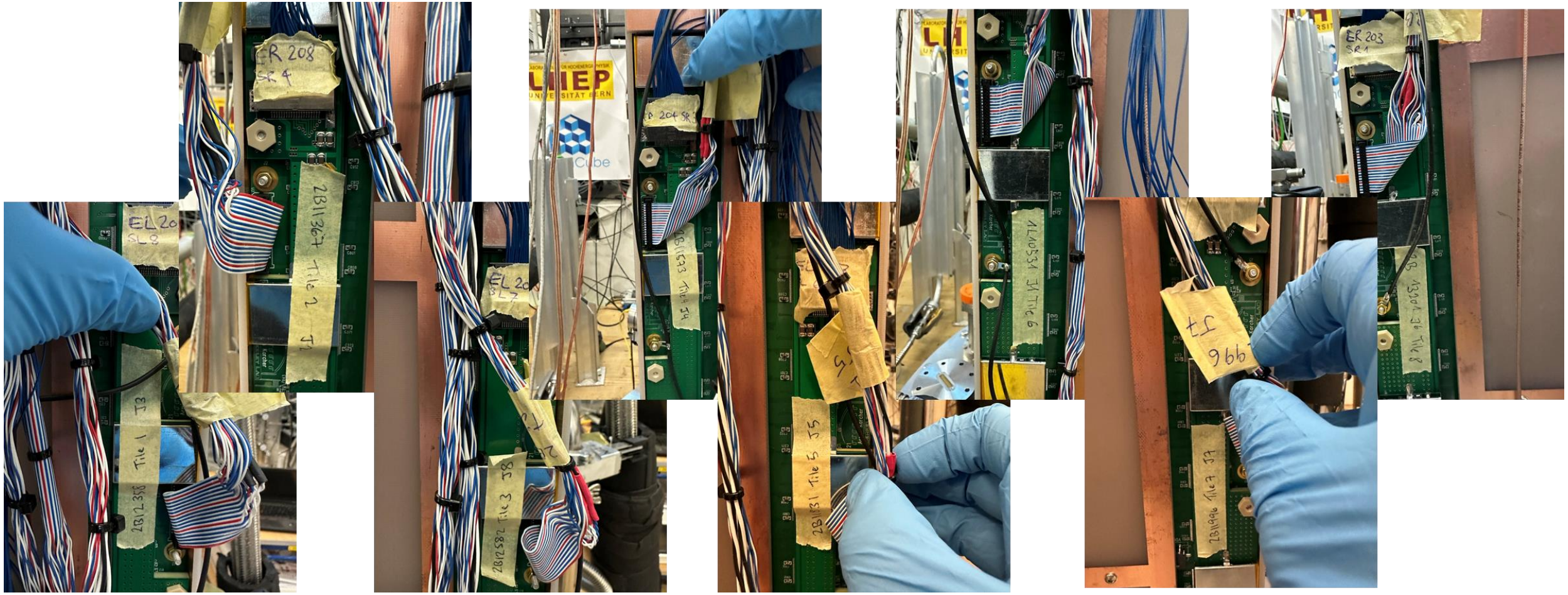
Monday, November 7th

- Warm tests in cryostat over weekend
- Installation to sleeve and re-installation to cryostat
- Continuing warm tests in cryostat
  - Charge System
  - Light System

Cryostat inserted to cryostat for warm tests (pre-sleeve insertion)

Warm checks on both charge and light system (pre-sleeve insertion)

All pixels and e-boards numbered with identifying serial numbers / ID numbers; recorded and checked prior to insertion to sleeve

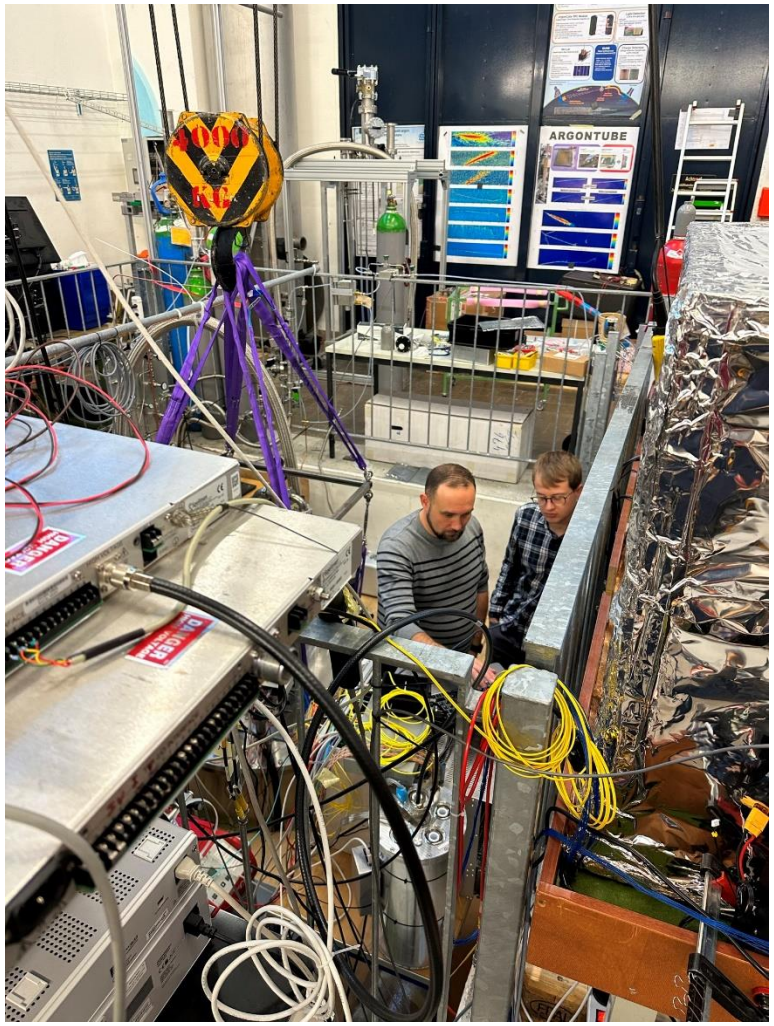


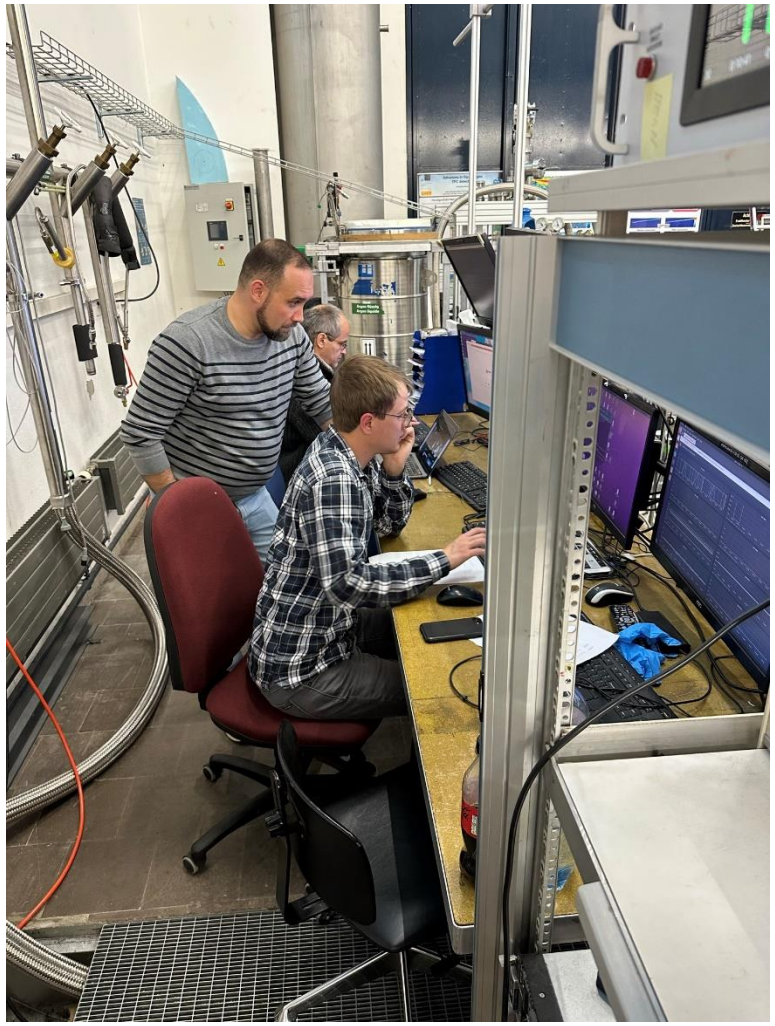
Module insertion to sleeve a slow and careful process, assembly team monitors for interferences and safety. Once in sleeve module is re-installed to cryostat.

Tuesday, November 8th

- Continuing Light and charge system warm testing in cryostat
- Initial pumpdown and leak check
- Overnight pumpdown

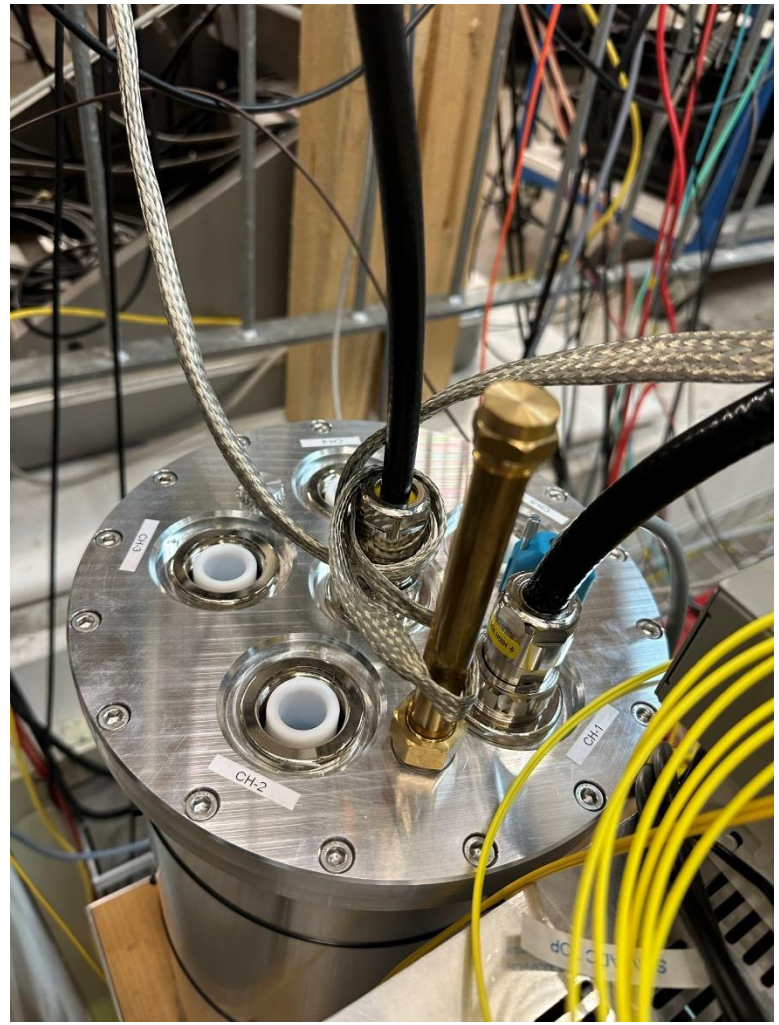
Light Readout system testing (left & right)



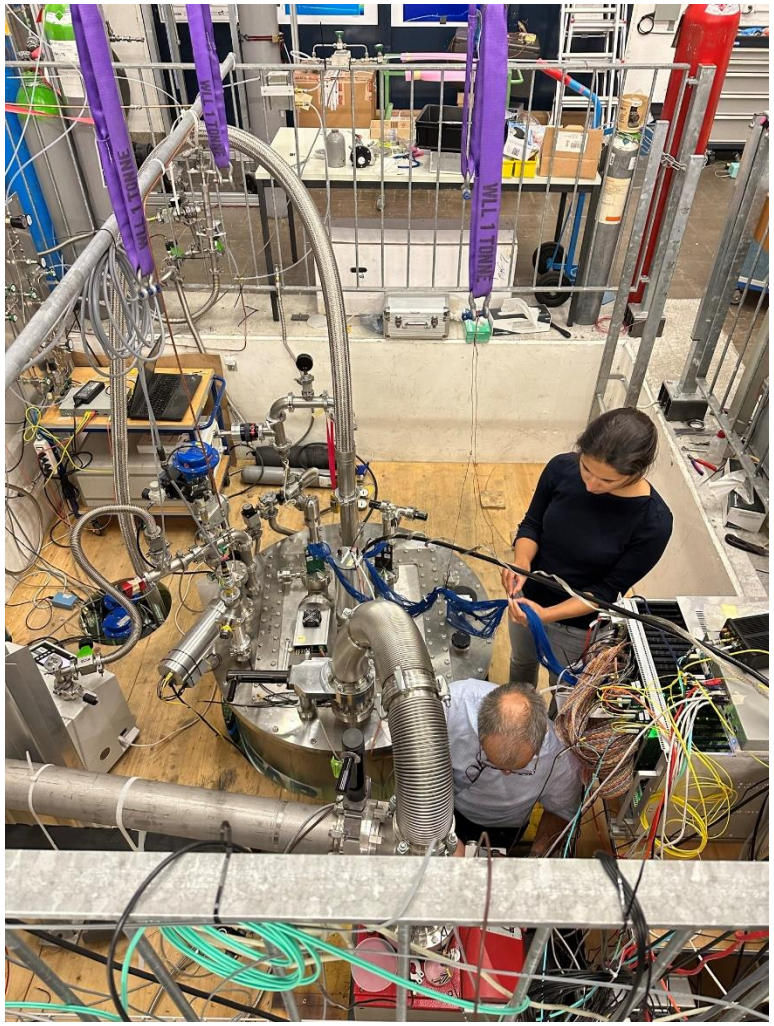


Module top flange with all services

HV cable insertion (left & middle) and PFD-5 HV filter (right)



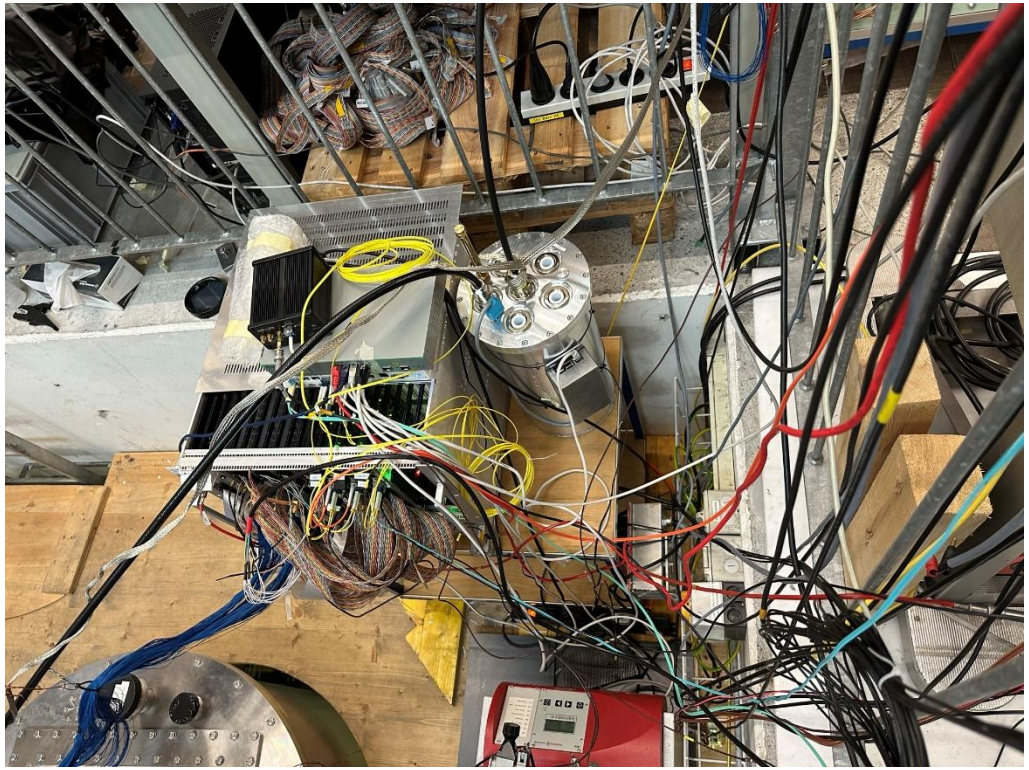
Initial pumpdown and leak check, found a few leaks and repaired, overnight pumpdown

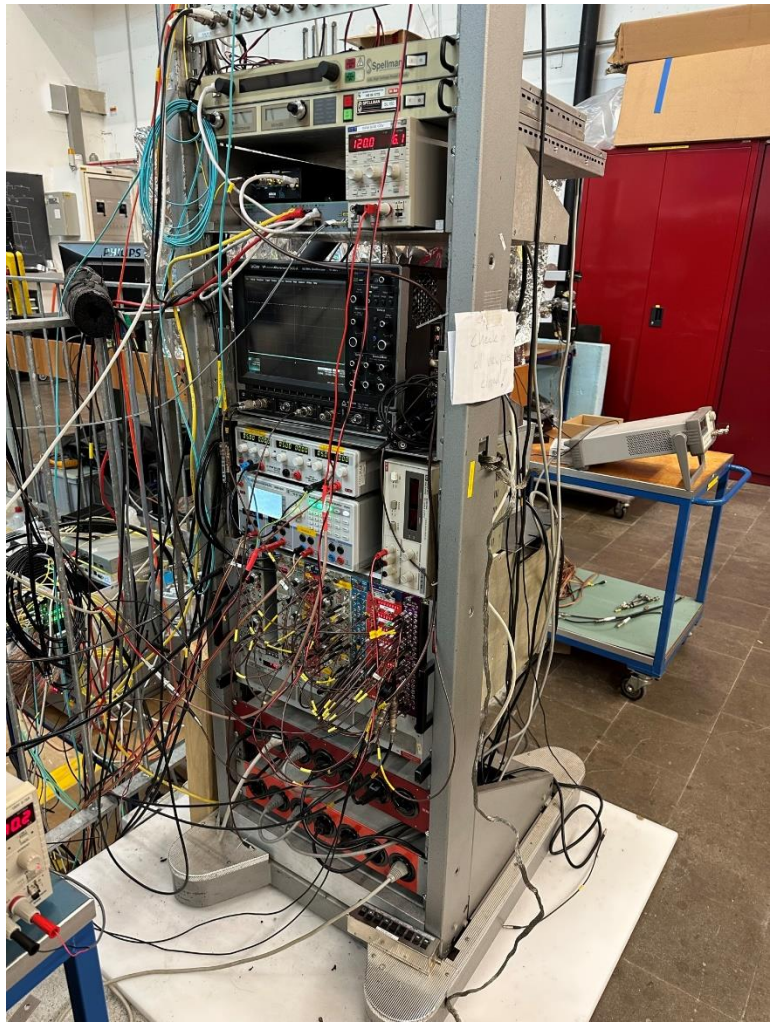


Wednesday, November 9th

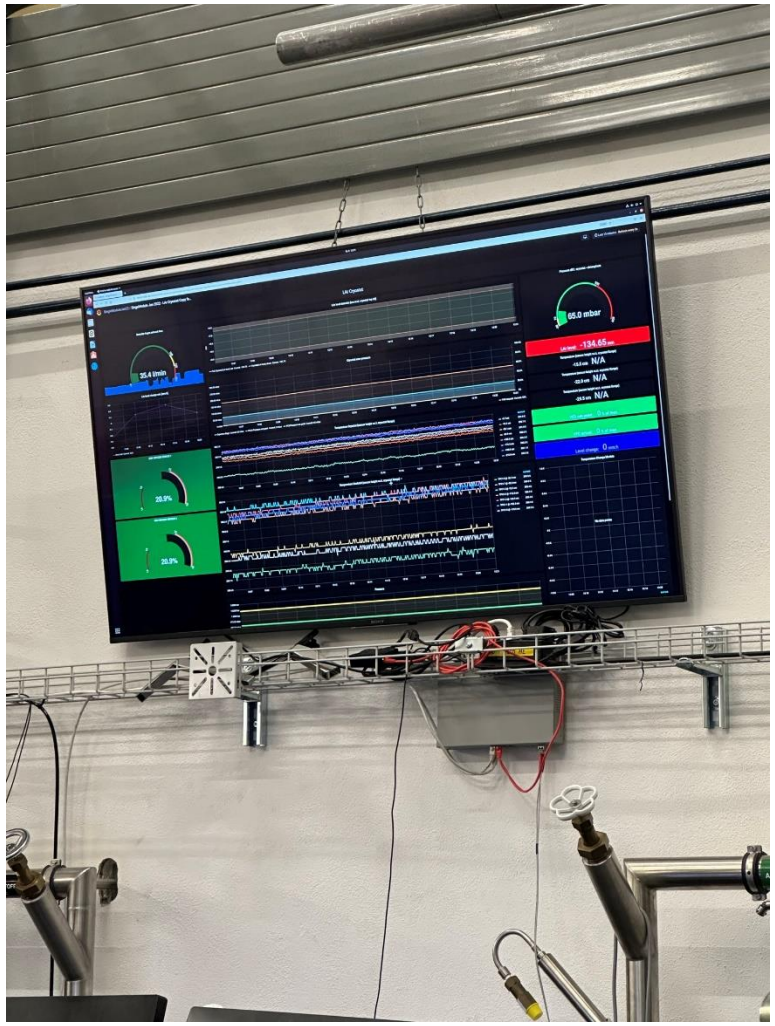
- GAr backfill
- Light and charge system testing

Light readout and PFD-5 HV filter (left) and power supply rack (right)





Slow control and monitoring station (left & right)



Thursday, November 10th

- Waiting for liquid argon delivery, scheduled for Monday November 14th
- System is pumping down again, will continue with further leak checking today and tomorrow (Nov. 11th)
- Run Plan – Igor Kreslo