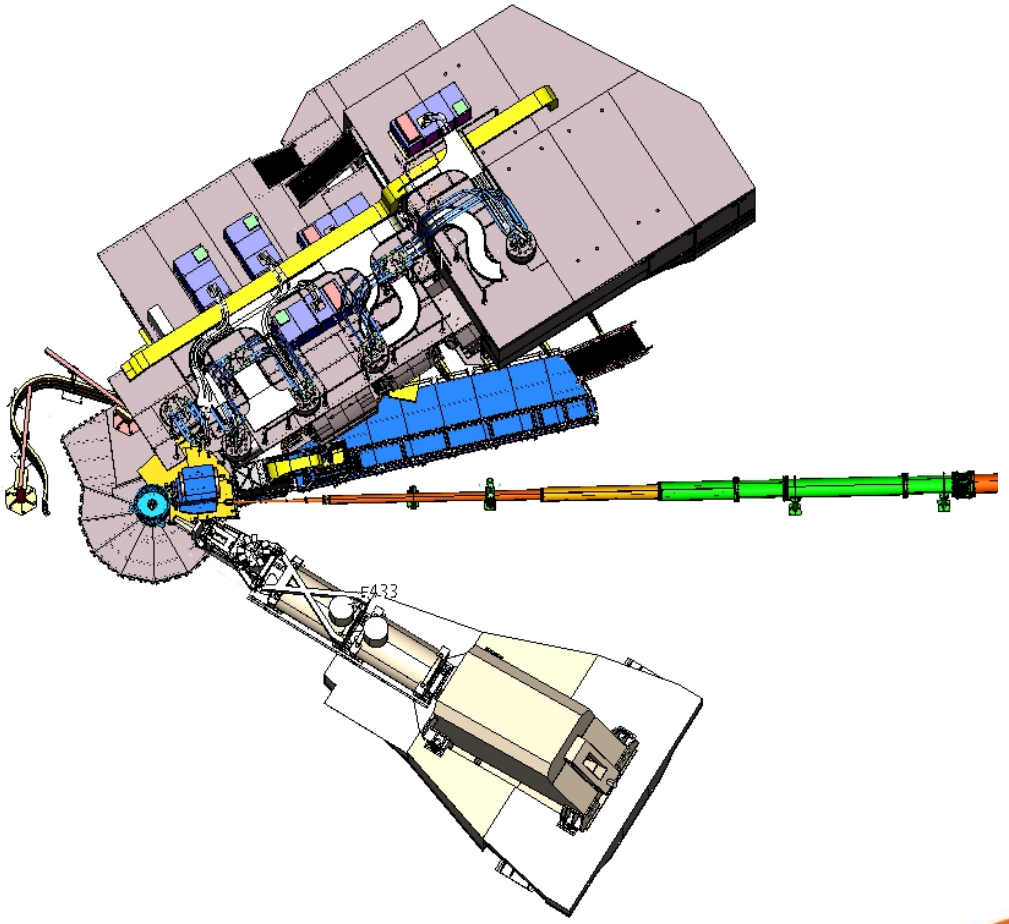
Status of the NPS calorimeter



Carlos Muñoz Camacho (IJCLab)

NPS Collaboration Meeting
JLab, Feb 2-3 (2023)

As of last week…

Cabling inside the NPS box completed:

- Signal, HV & LV and optical fibers (gain monitoring)
- Temperature sensors on crystals (front & back)
- Cosmic PMTs in place (after checking dividers)
- Cooling water circuit tested
- Fans and heat exchangers tested
- Inlet/outlets for dry air available (front & back)

Dry air flow (source, pumps, etc.):
who is responsible?

Side views: PMT dividers to distribution boards

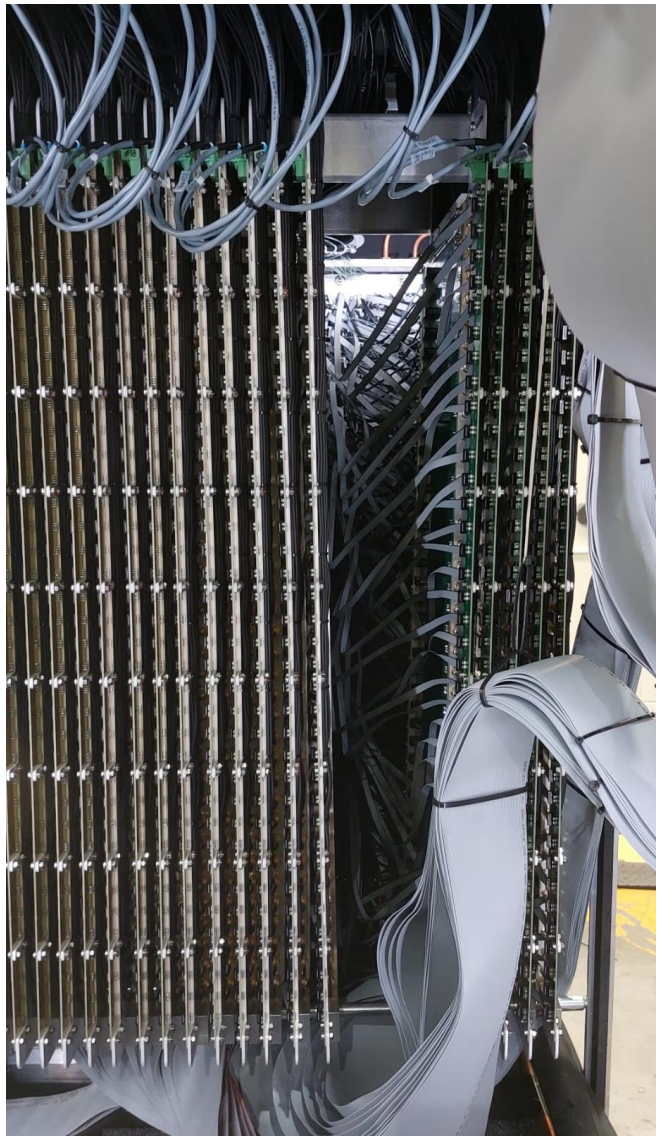
As expected:

- Significant cable density between PMTs and distribution boards
- Limited air flow

Left (looking upstream):

Right:

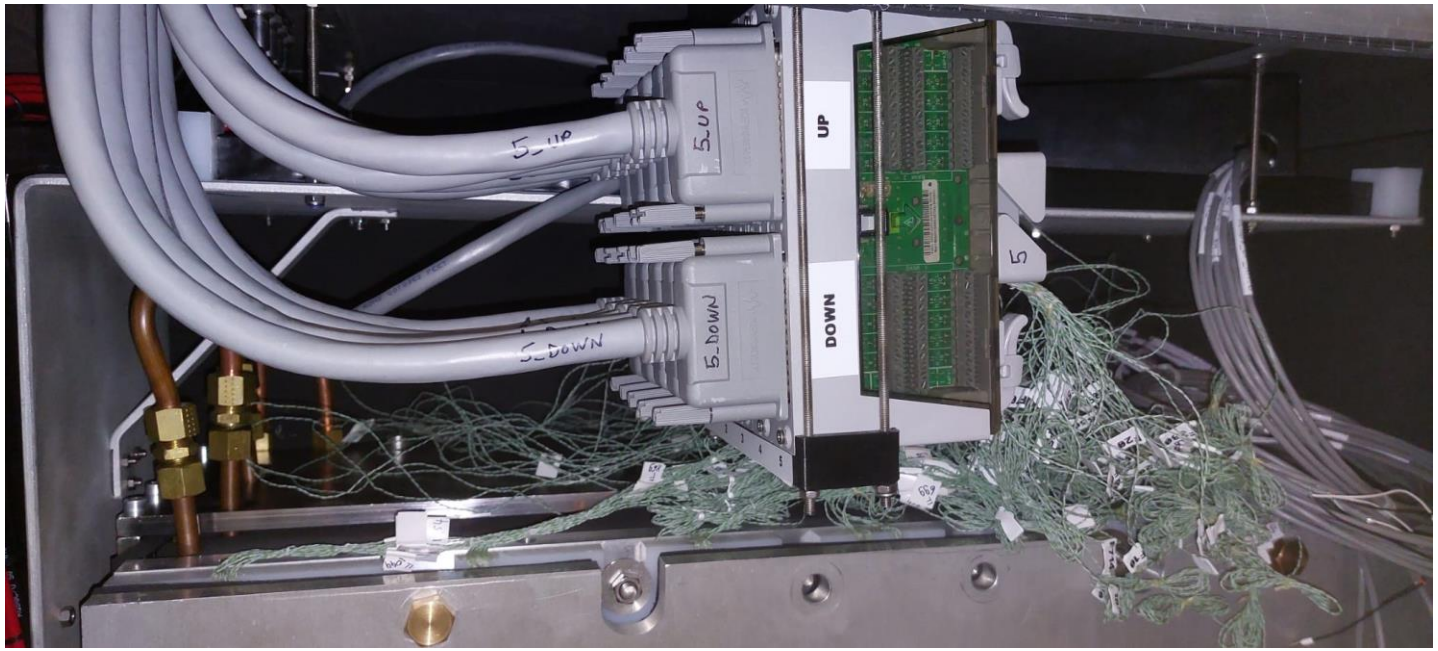
PMT maintenance

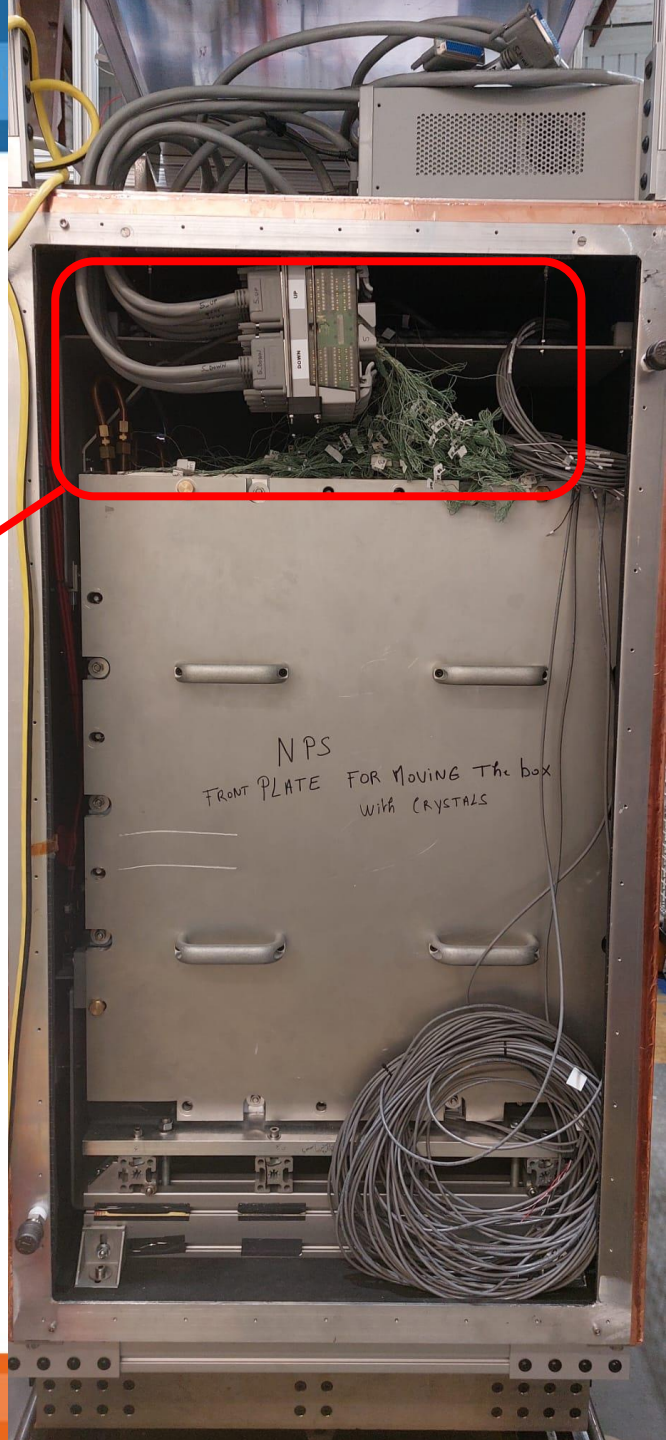


- Enough space between boards to access individual PMTs
- Test performed after full assembly was completed
- 2-3 h operation (including overhead); additional 1-2h if we want to open the front and check optical contact
- Changing a crystal is also possible (even though it's probably not required)

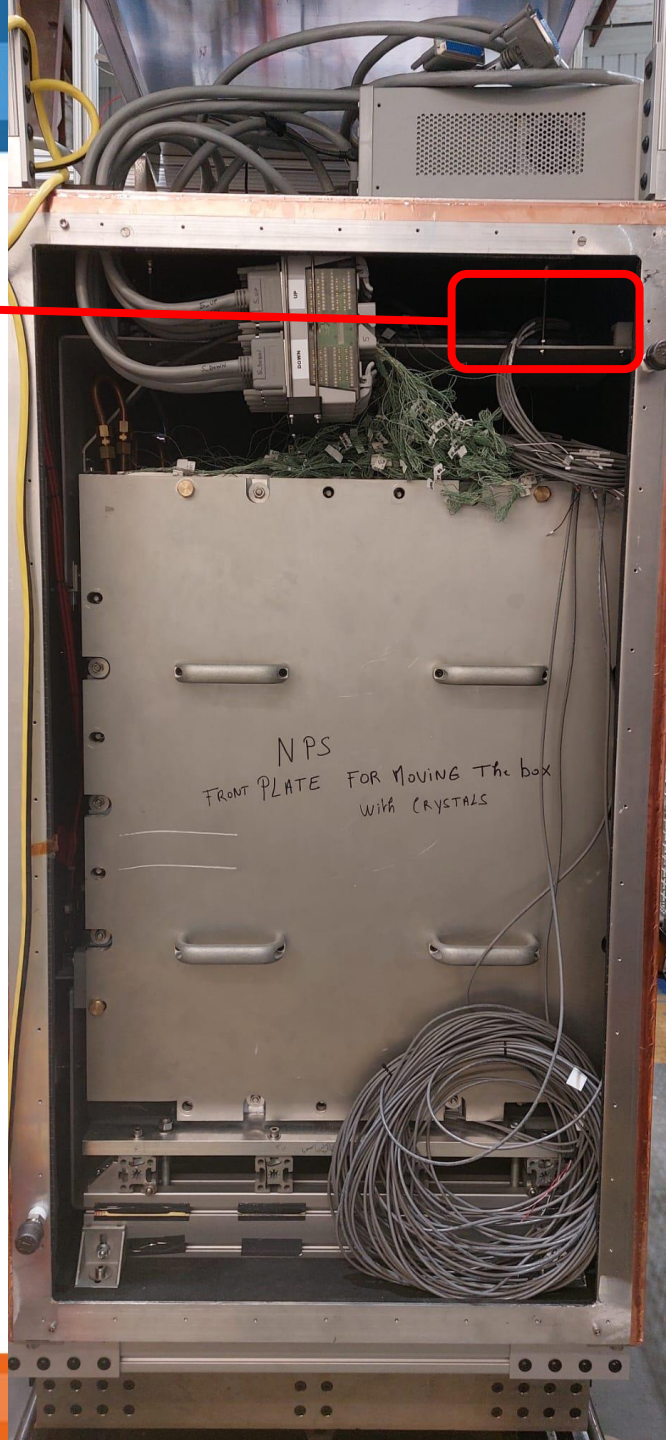
Crystal temperature sensors

- Temperature sensors at the front and back of 53 evenly distributed crystals
- When accessing the front face of crystals, front sensors come together with the removeable plastic front plate, and together with 2 (out of the 5) multiplexer units
- Back sensors remain in place at all times





Box temperature & humidity sensors



- Additional sensors provided by DSG
- 4 humidity & 4 temperature sensors in the front and back of the crystal area: a total of 16 additional sensors
- Cables from back sensors routed to the front (where the multiplexer units are placed)
- Cable from multiplexer unit to DAQ unit routed through the top plate of the NPS box
- **TODO (front panel of the box needs to be removed):**
  - **cable sensors into the multiplexer units**
  - **attach both front and back sensors to the box**

Boxed closed and shielded

(Part of the) group

+ others…

Status summary

- Cabling inside completed (modulo box temp. & humidity sensors)
- Full-scale tests can begin as soon as outside cabling is completed (some tests can be even before)
- Most of servicing can be done through the back door (easy access)
- Some servicing require front panel to be removed (cabling of remaining sensors, check optical contact, etc)
- Side panel don't need to be removed unless need to service cosmic PMTs or cooling system.

Some tests to be perfomed

- LED system (pulsed – channel check; continuous mode – curing; stability with time)
- Cooling system

  (leak checks done; maybe needs to be redone in front of Steve)
- Temperature regulation/stabilization: power all channels + cooling system – record temperature as a function of time
- Cosmic runs: channel check; gain matching
- DAQ, VTP trigger, etc…

Cabling at the top of the box