# Status of MUV and CHOD

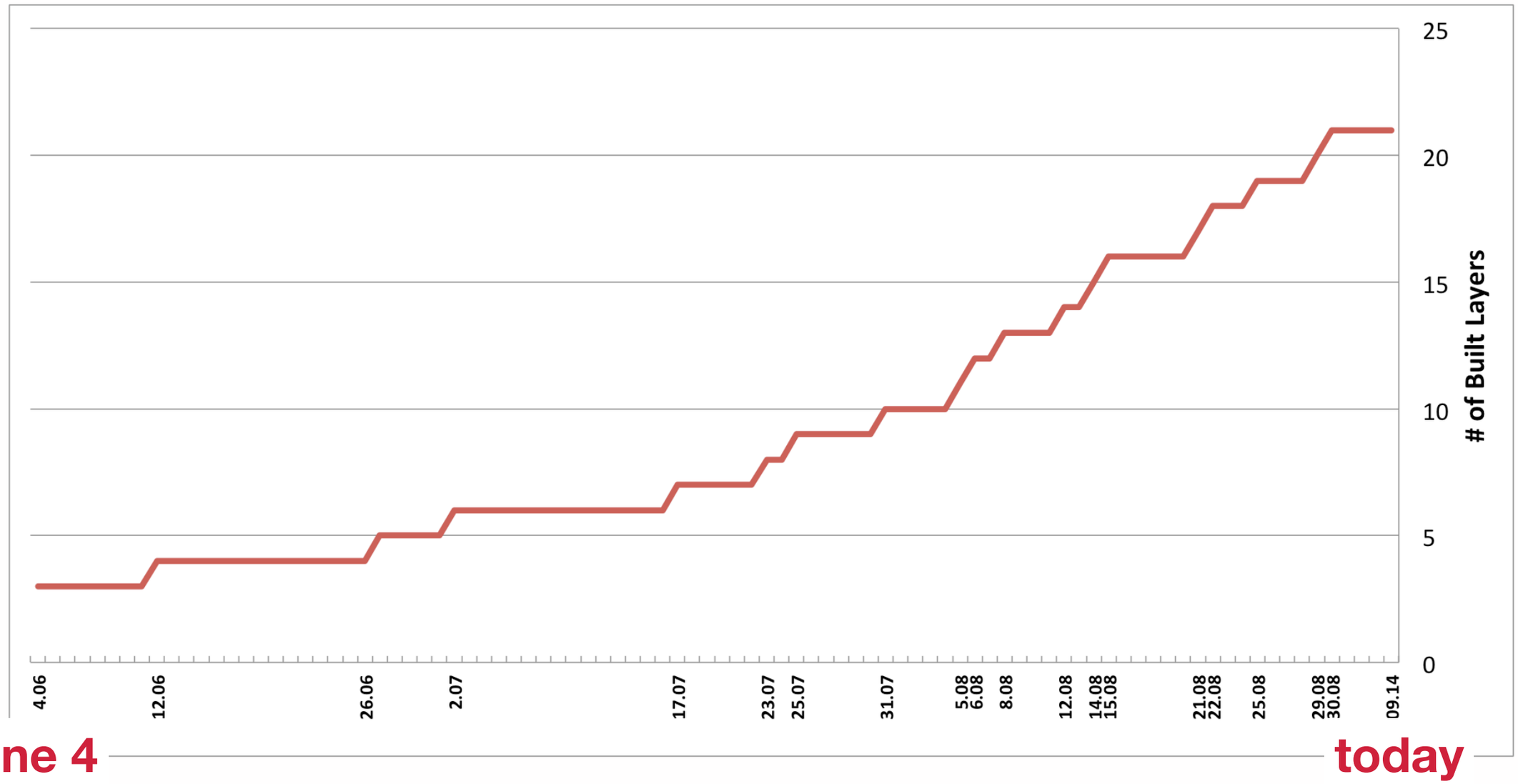
Rainer Wanke

NA62 Collaboration Meeting
Ferrara, Sep 4th, 2014

# Status of MUV1

Gia Khoriauli & Mainz group

- Practically all scintillators ready, equipped with fibers, tested, and wrapped.
- 21 layers built, just 2 remaining.



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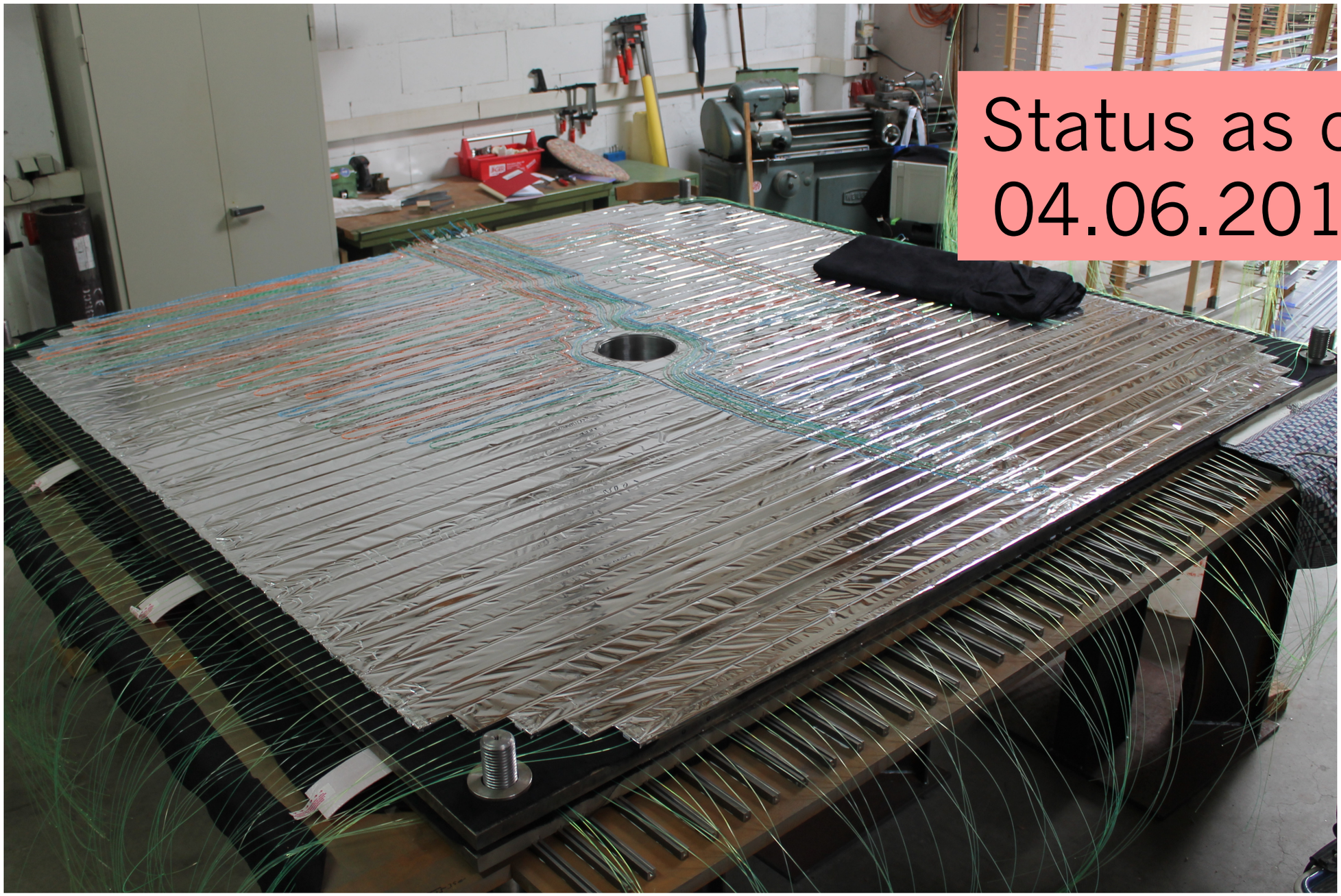


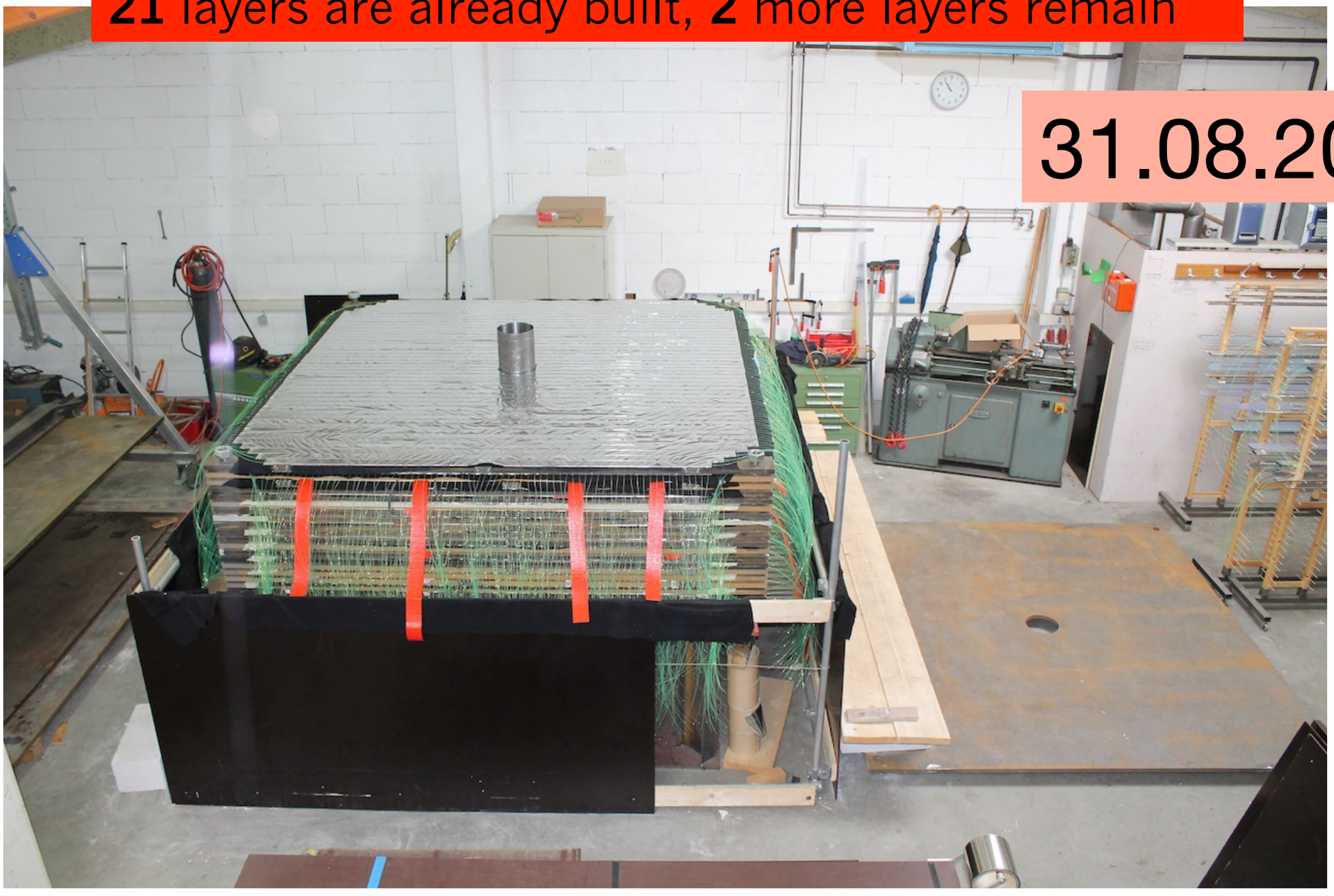
Status as of
04.06.2014

# Status of MUV1

22.08.2014

# Status of MUV1

**21** layers are already built, **2** more layers remain



31.08.2014

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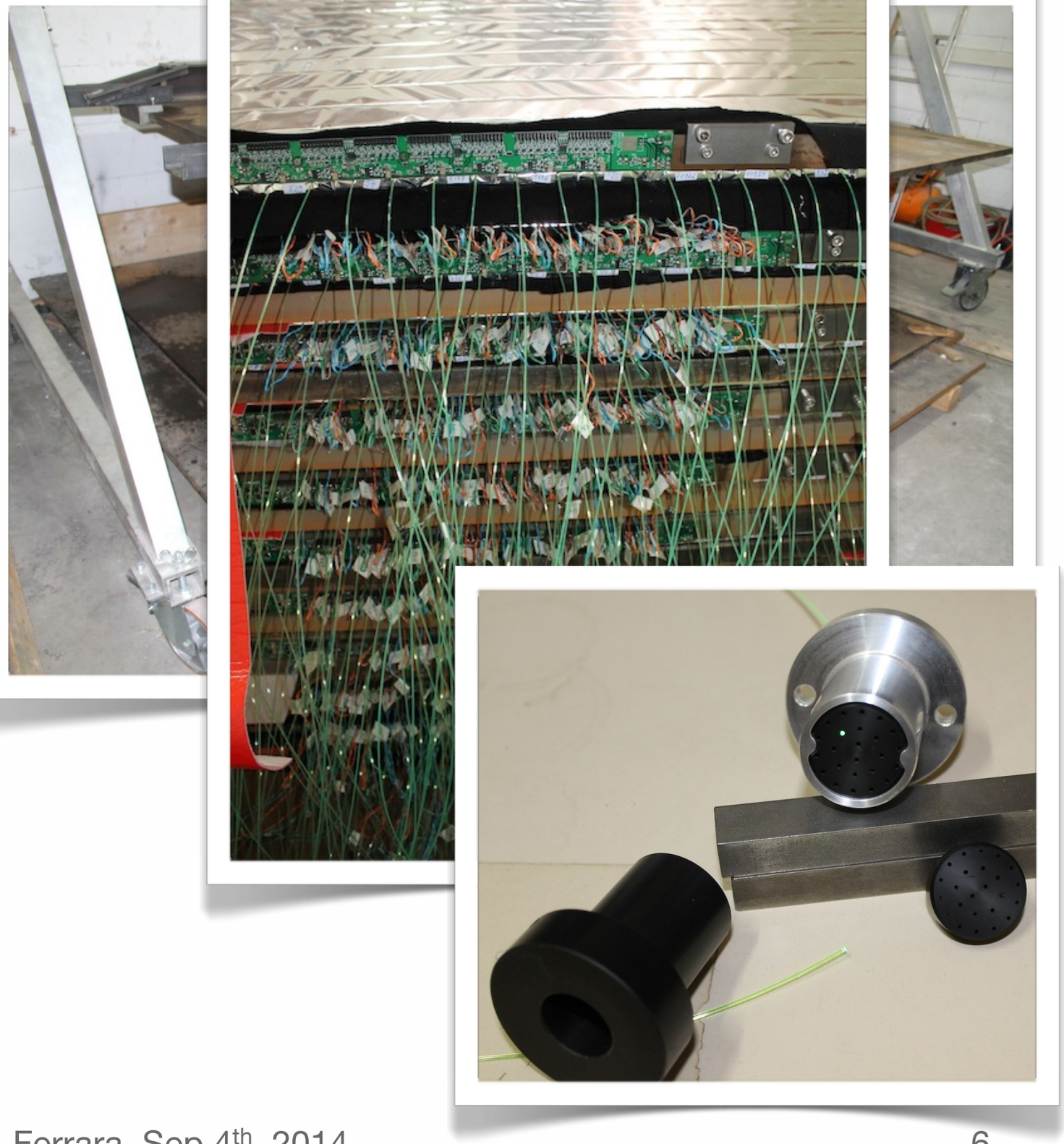

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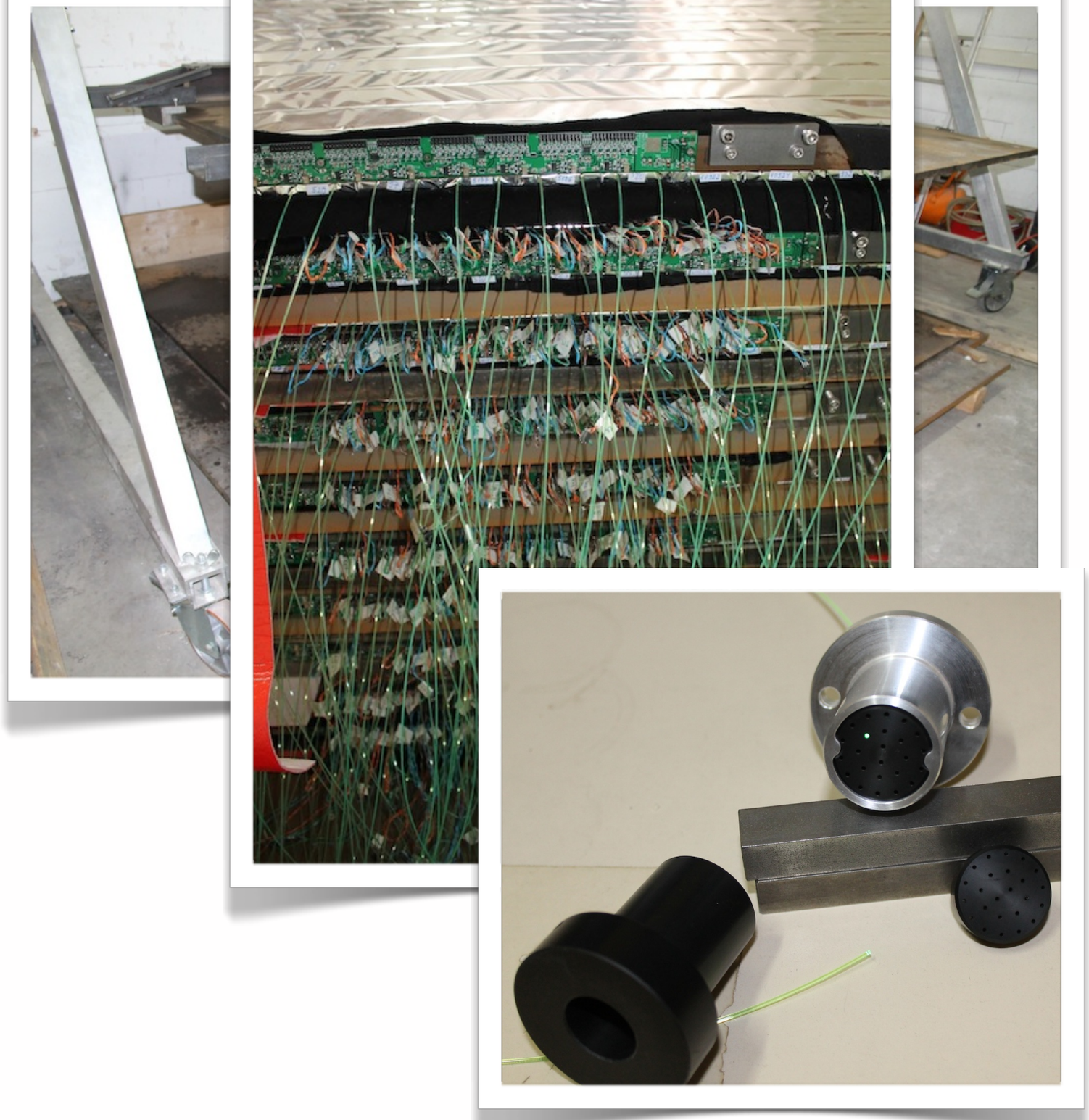

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➜ ***Very optimistically:***
***Shipment by end of September.***

# MUV1 in 2014

**Options for MUV1:**

- **A: Try to go for the run 2014**
  - If possible, shipment to CERN and installation just in time one week before the run. Then cabling, tests, and calibration.
  - End of construction in a hurry, no thorough tests possible. Probably only ready for second part of run.
- **B: Same as A, but keep MUV1 uninstalled (horizontally) in ECN3**
  - No hurried installation and cabling necessary.
  - Tests can be done with cosmics.
  - MUV2 not covered by MUV1.
- **C: MUV1 in Mainz until end of run (or ship to different CERN hall)**
  - Tests is Mainz more easily possible because of accessibility.
  - Only one HV crate available for both MUV1 and MUV2.
  - Shipment in winter may be problematic.

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***Decision taken***

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# MUV2 Readout

Rainer Wanke & Mainz group

- **In 2012 run: MUV2 readout with LAV-FEE modules**
  - Problems with the length of the pulses in the TEL62 (could in principle be solved).
  - Time-over-threshold does not give optimum pulse height resolution for MUV1/2.

- **Beginning of this year: Test of CREAM readout** for MUV pulses:
  - MUV1/2 pulses much shorter than LKr pulses (~40 ns/~80 ns)
    ➜ old **NA48 HAC shaper modules** needed.
  - Otherwise tests were fine.
    For high-rate MUV1 channels probably oversampling needed.

# MUV2 Readout with CREAMs in 2014

Rainer Wanke & Mainz group

- **CREAM boards** (32 ch. each):
  - **MUV2** (88 ch.) → **3 CREAMs**
  - LKr will have O(10) spares + 5 usable prototypes ✔
- **NA48 HAC shapers** (16 ch. each):
  - ≥15 boards + 1 prototype available, but need to be tested. (✔)
  - Schematics still available for future further production.
  - Two NIM crates for shapers available. ✔
- **TTC interface, VME bridge:** Electronic pool. (✔)
- **Switch** to connect CREAM boards: to be bought. (✔)
- **Cables & Connectors:** To be bought and assembled. (✔)

***MUV2 will use CREAM readout in 2014***

# New MUV3/CHOD CFDs

- First prototype built in June (at that time still with the wrong FTDI chip) with 4 input channels, each with both potentiometers and DACs. After testing and adjustments potentiometers replaced by fixed resistors and DACs.
- Tests done by Riccardo A. after electrical test & FTDI replacement:
  - Writing and reading to and from the DACs for voltage settings.
  - Using generated pulses (according to MUV3 measurements) to follow the signal pulses through the single CFDs and measure the output and the timings.
    ➜ adjustments of potentiometers for optimum thresholds and time resolution.
  - Due to the little time: No test of coincidence outputs and no tests of all channels and for different input pulses.
- After the tests replacement of evaluation board with own FTDI chip but no thorough tests possible any more.

# MUV3 CFD Prototype Test at CERN

**Tests of the prototype at CERN completely unsuccessful:**

- Not able to make it work at all: ☹
  - **Electrical problems** (despite of corresponding tests in Mainz).
  - **No connection to the FTDI chip** possible.

➜ **Board brought back to Mainz.**

**Conclusions for the 2014 run:**

- Will use again the **old AKL CFDs.**
- Needs additional work to fix oscillating channels,
  also not enough CFDs for all MUV3 channels.
- **Apologies to the MUV3 experts and helper (Luigi, Italo, Jonas)!**

# Towards the final MUV3/CHOD CFDs

- **Prototype board** needs again to be fixed, evaluated, and thoroughly tested (including studies of the time resolution).
- Meanwhile the **layout of the final CFD boards** will be finalized (only few parts are still missing in the layout).
- Submit a **full prototype** ***after*** complete testing of existing prototype (optimistically not before 3 weeks from now).
- **Test of full prototype** in Mainz and possibly at CERN.
- If everything goes well:
  Going for operation in the second part of the run (mid November) with non-connected MUV3 channels.

# Old CHOD/NHOD

Slava Duk & Perugia group

**HV:** CAEN SY403 old system

- CHOD: frames, modules and cables installed and tested
- NHOD: frame installed, cables to be installed and tested

**DCS:**

- PC & connectors bought. Preliminary tests with CHOD done.

**DAQ:**

- Standard Wiener crate, 1 TEL62, 3 TDCBs.
- Ingredients ready. Mounting in September.

**CHOD L0 Trigger:**

- Hardware trigger in September. Firmware tests in progress.

**Software:**

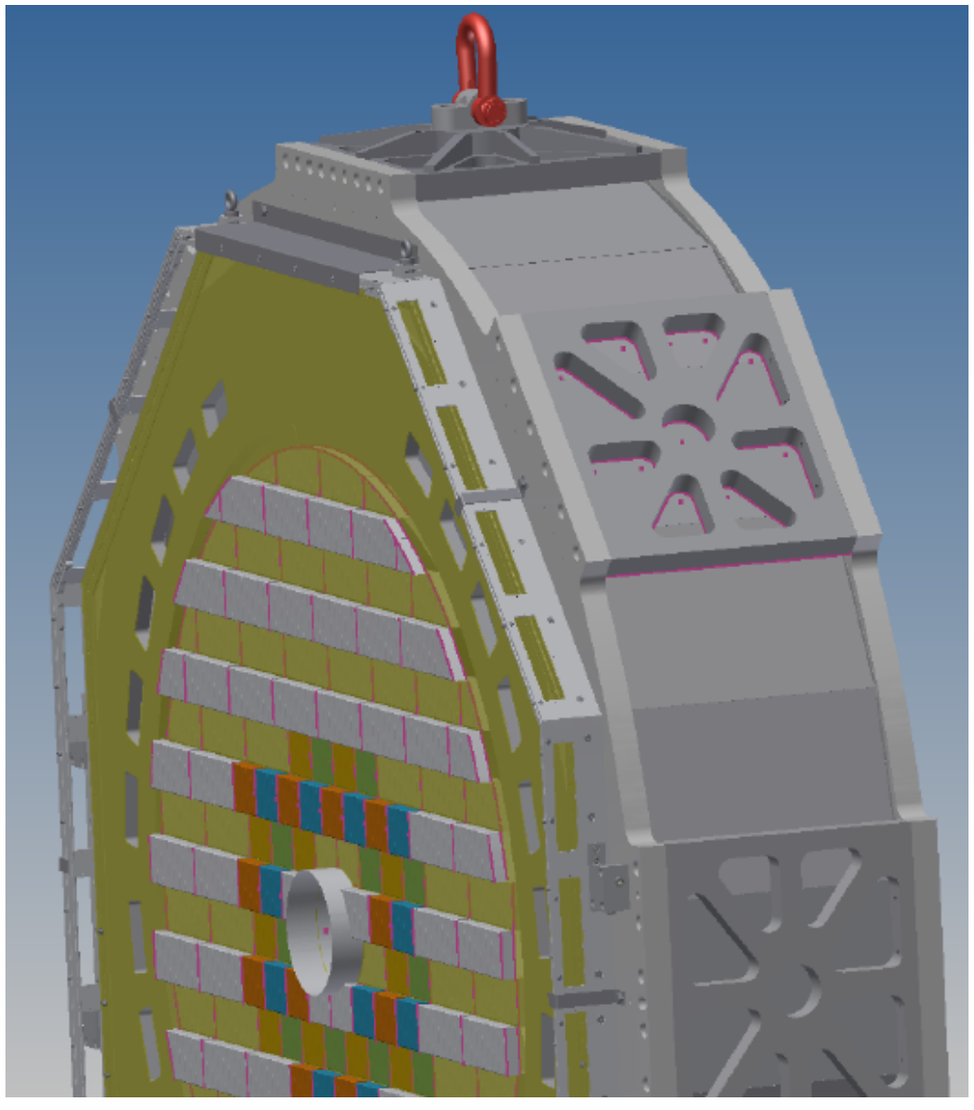
- Reconstruction ready. Monitor to be implemented in September.

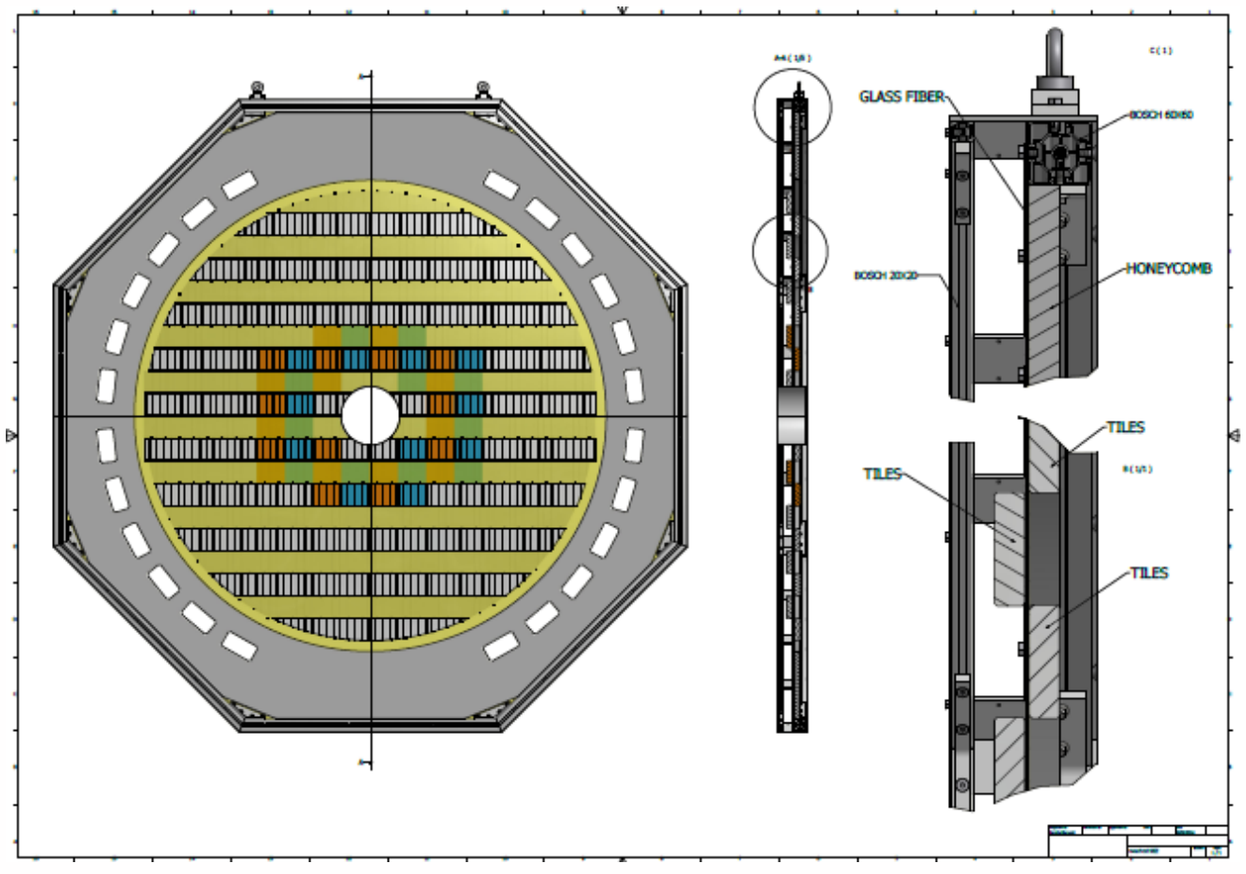
***CHOD/NHOD are in a good shape***

# Status of New CHOD

Italo Mannelli & Protvino group

## Reminder: New CHOD geometry:





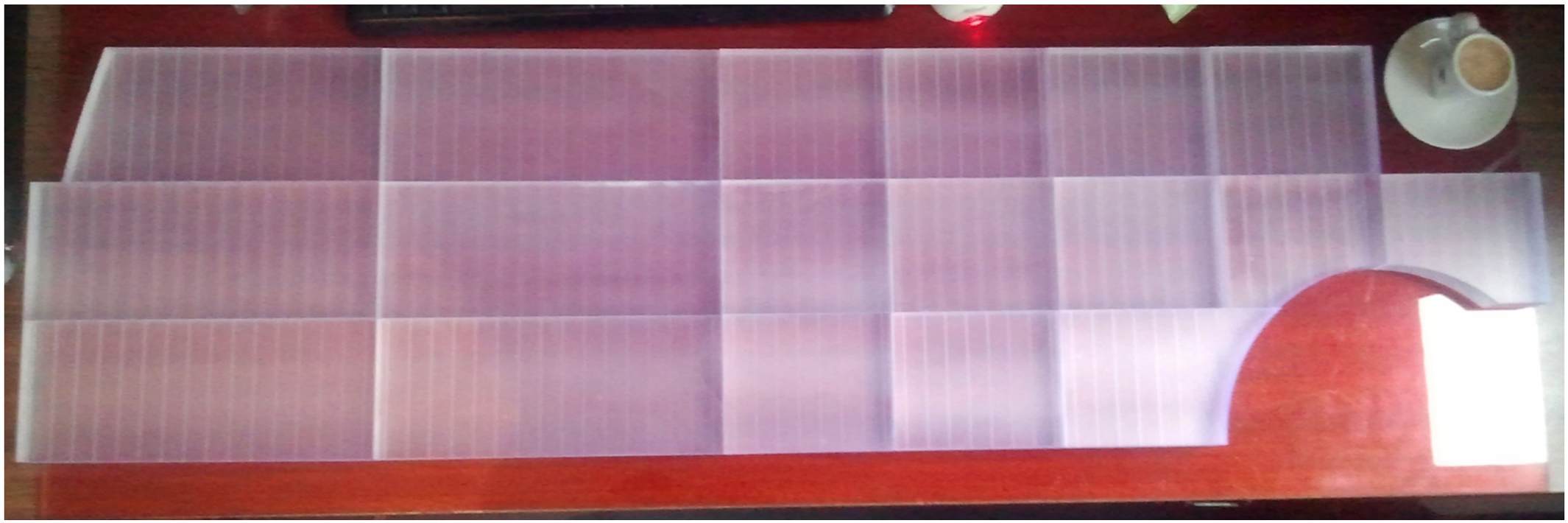
# Status of New CHOD

**Prototype:** 18 scintillator counters

**Dimensions:** 5 counters: 20 mm x 108 mm x 268 mm
9 counters: 20 mm x 108 mm x 134 mm
+ 4 with special dimensions (around the beam + corner)

**Readout:** 16 Bicron WLS fibers (⌀1 mm) for big counters, 8 for small

**Photosensors:** two pairs of 3x3 $mm^2$ SensL SiPM per one big counter, two SiPM's per small counter.



# Status of New CHOD

**Status:**

- 18 counters are manufactured, Tyvek envelopes in preparation.
- 64 SensL SiPM are bought and tested.
- 64 amplifier channels are manufactured and tested.
- Production of 4 mother and 32 SiPM boards, 32 Black heads in progress.
- 1mm Bicron fibers are at CERN.

**Plans:**

| | |
|---|---|
| Mechanics at CERN | **middle of September** |
| Counters at CERN | **middle of September** |
| Electronics at CERN | **middle of October** |
| Mechanics, fibers preparation and gluing | **September-October** |
| Counters mounting | **September-October** |
| Tests during NA62 run | **November** |