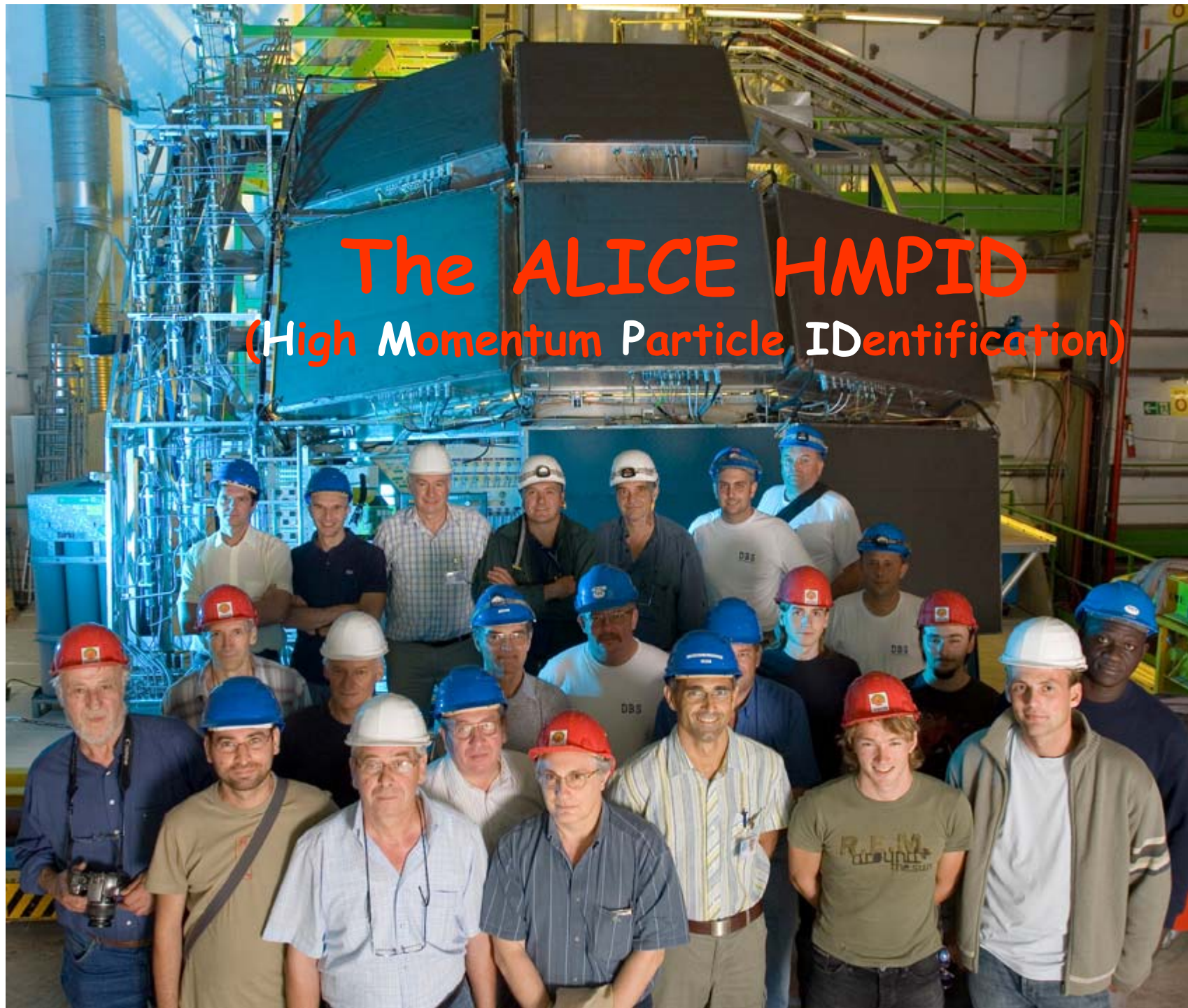
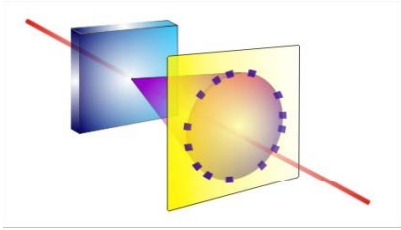


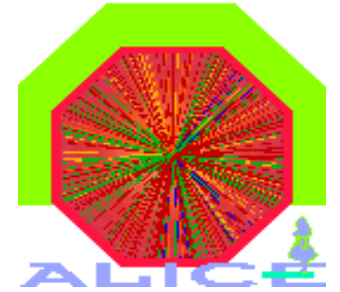
The ALICE HMPID

(High Momentum Particle IDentification)



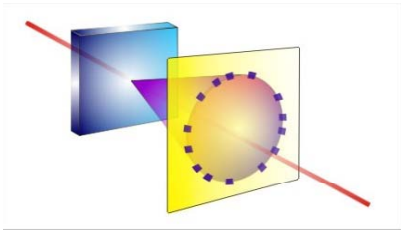


HMPID INSTITUTES

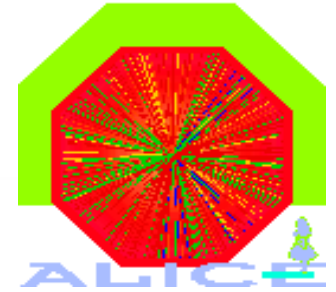


- **CERN** (AIT-HM, AIT-PT, AIP, TA1, TA2, MIC +WORKSHOPS)
 - **INFN** **BARI**
 - **INR** **MOSCOW**
 - **IST** **LISBON**
 - **RBI** **ZAGREB**
 - **RMKI** **BUDAPEST** (since ~2 years)
- ~ 40 people, including students and technicians





THE HMPID DETECTOR



Operating principle

Radiator:

15 mm C_6F_{14} - $n=1.3$ @ 170 nm

Photon detector:

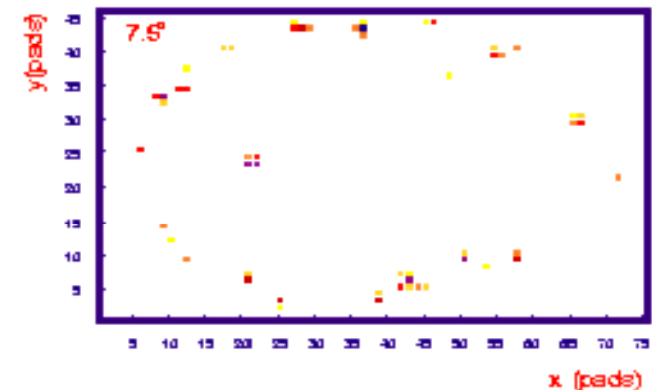
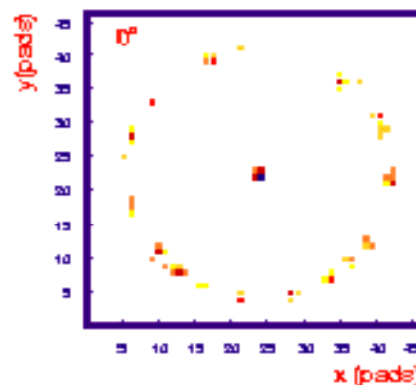
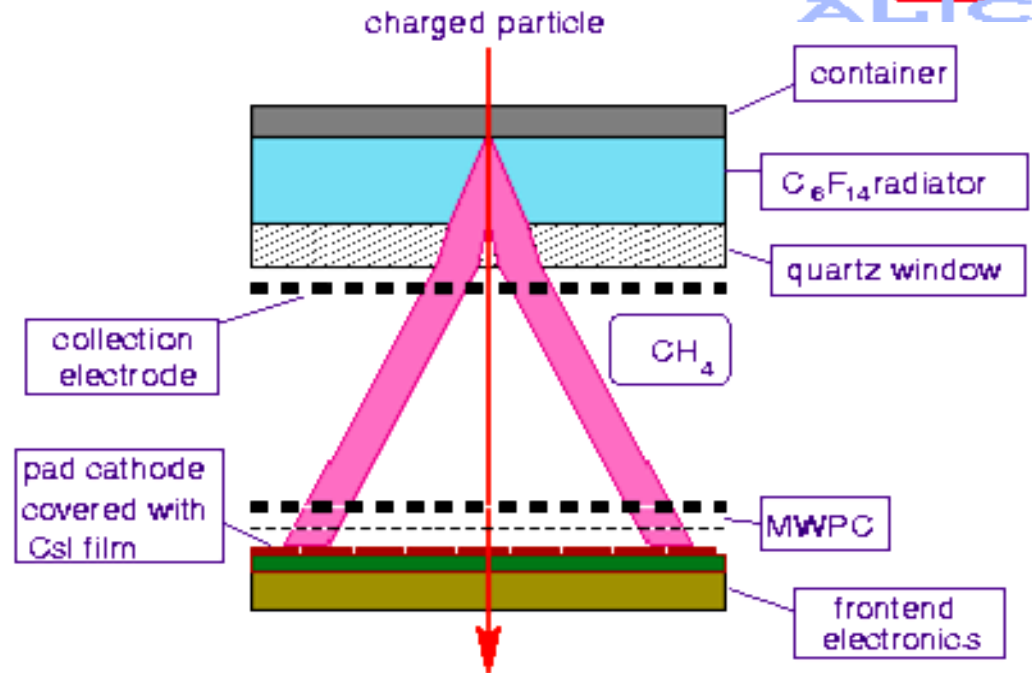
- MWPC with CH_4 at atmospheric pressure (4 mm sensitive gap)
- analogue pad readout

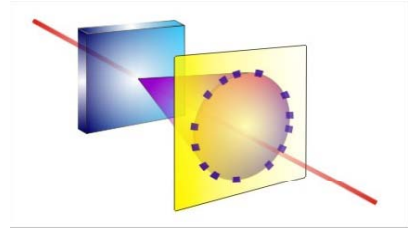
Photon converter:

Reflective layer of CsI (QE= 23% @ 170 nm)

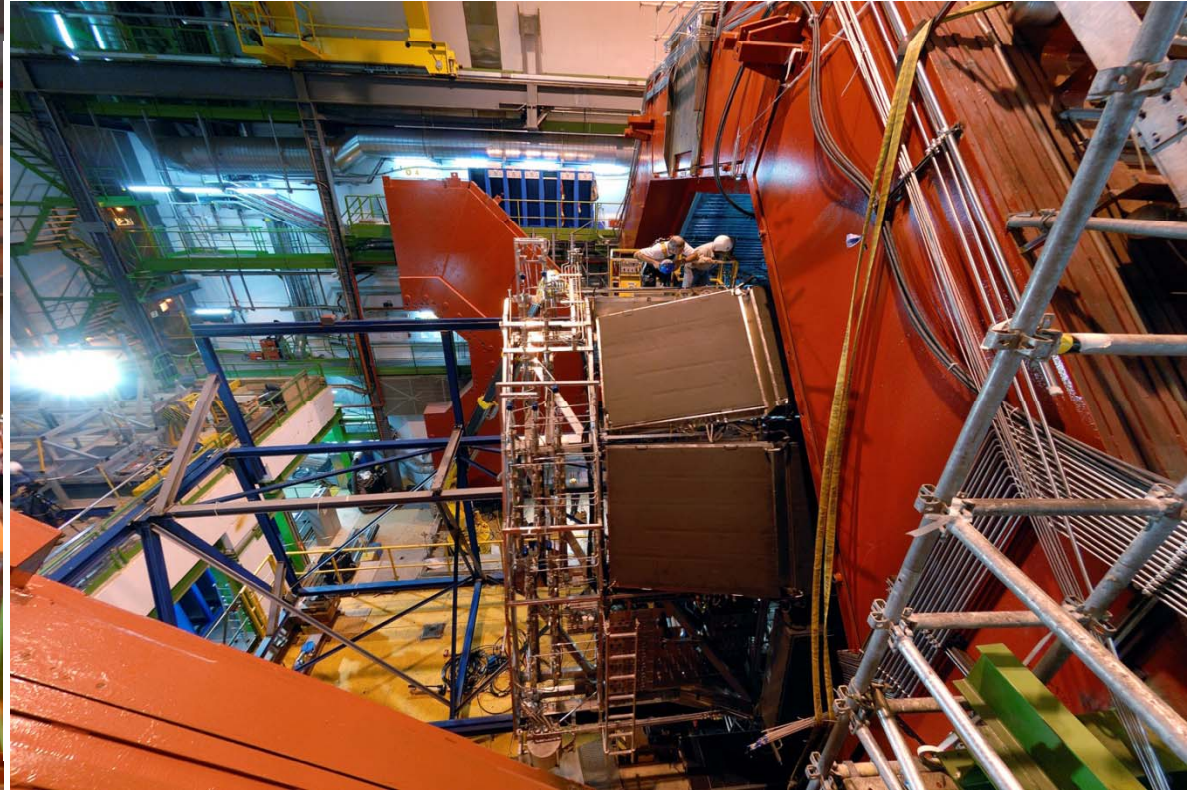
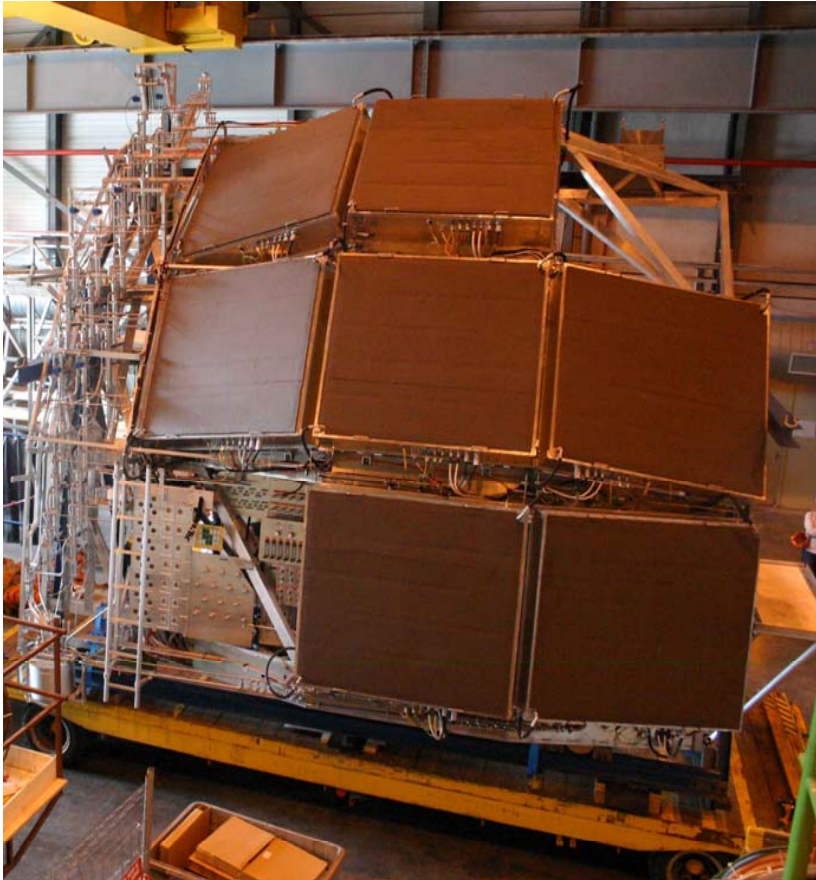
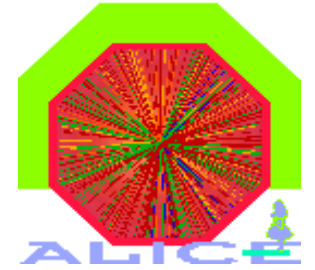
PID range:

- $1 < p < 3$ GeV/c π K
- $2 < p < 5$ GeV/c p

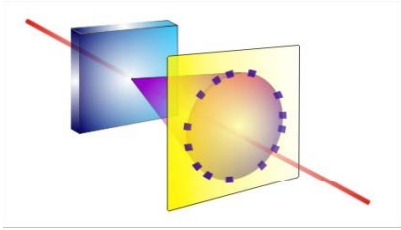




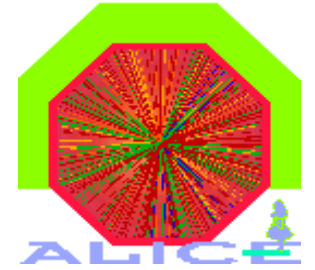
Detector Layout



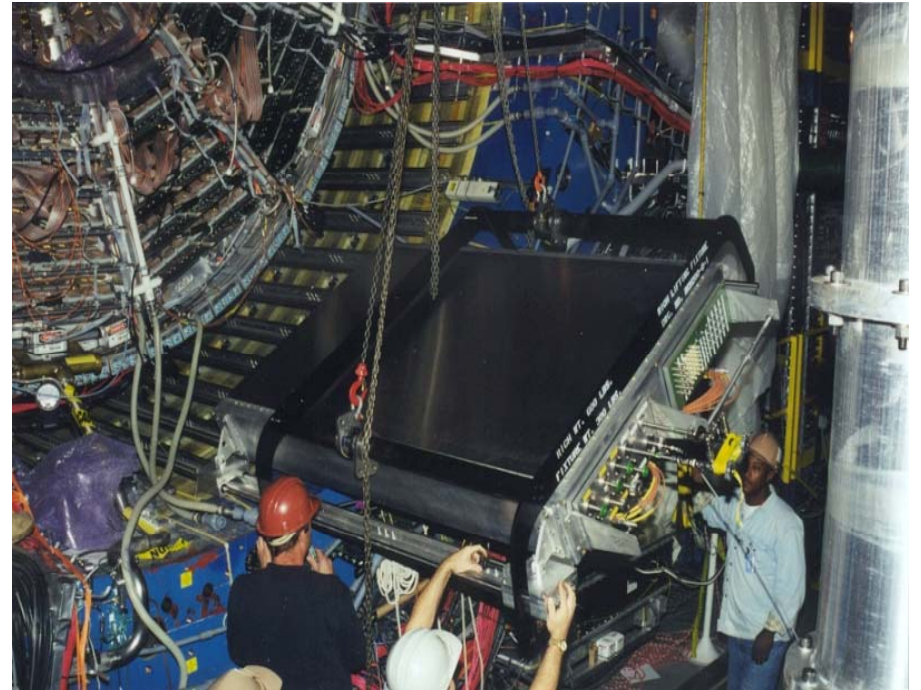
7 modules, each $\sim 1.5 \times 1.5 \text{ m}^2$
3 radiator trays, 6 photo-cathodes, 23'040 pads
Total CsI area $\sim 11 \text{ m}^2$



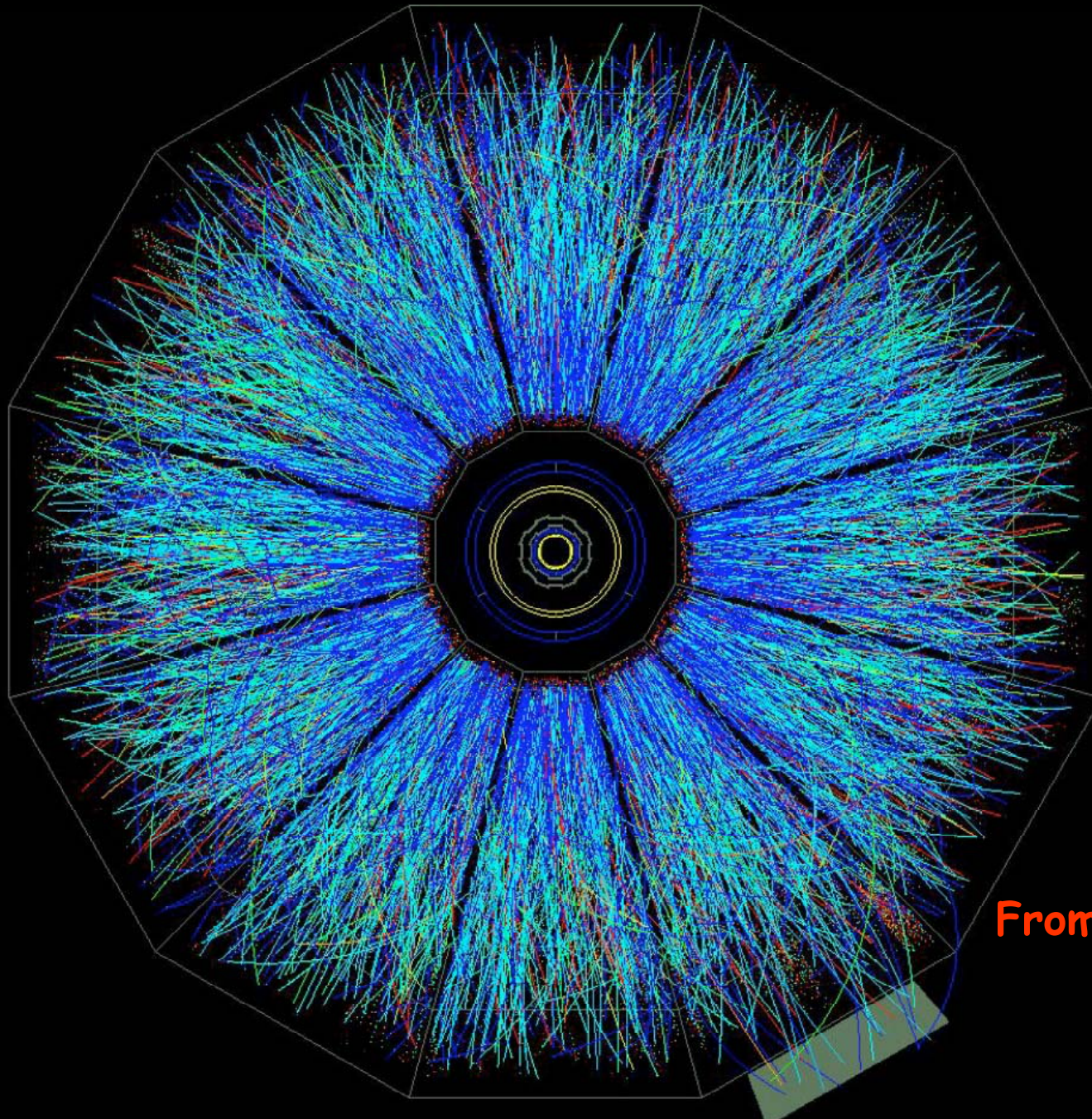
R&D ACTIVITIES



- CsI based photo-cathodes (PC)
(RD26)
- Detector prototypes :
Proto-1
Proto-2 → STAR-RICH @ BNL
Proto-3
- Front-End electronics
 - A lot of work done also on the radiator, the C_6F_{14} circulation system etc.

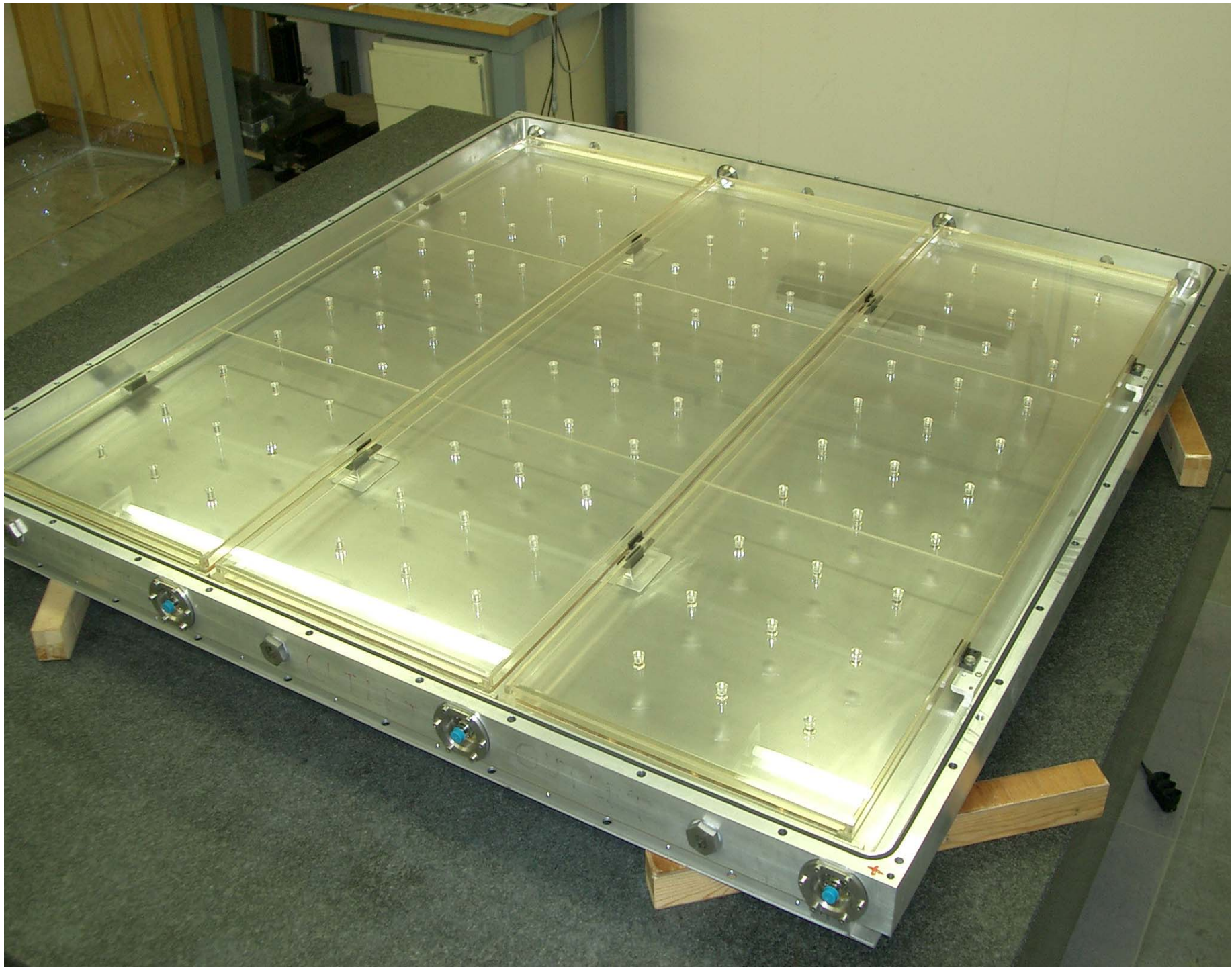


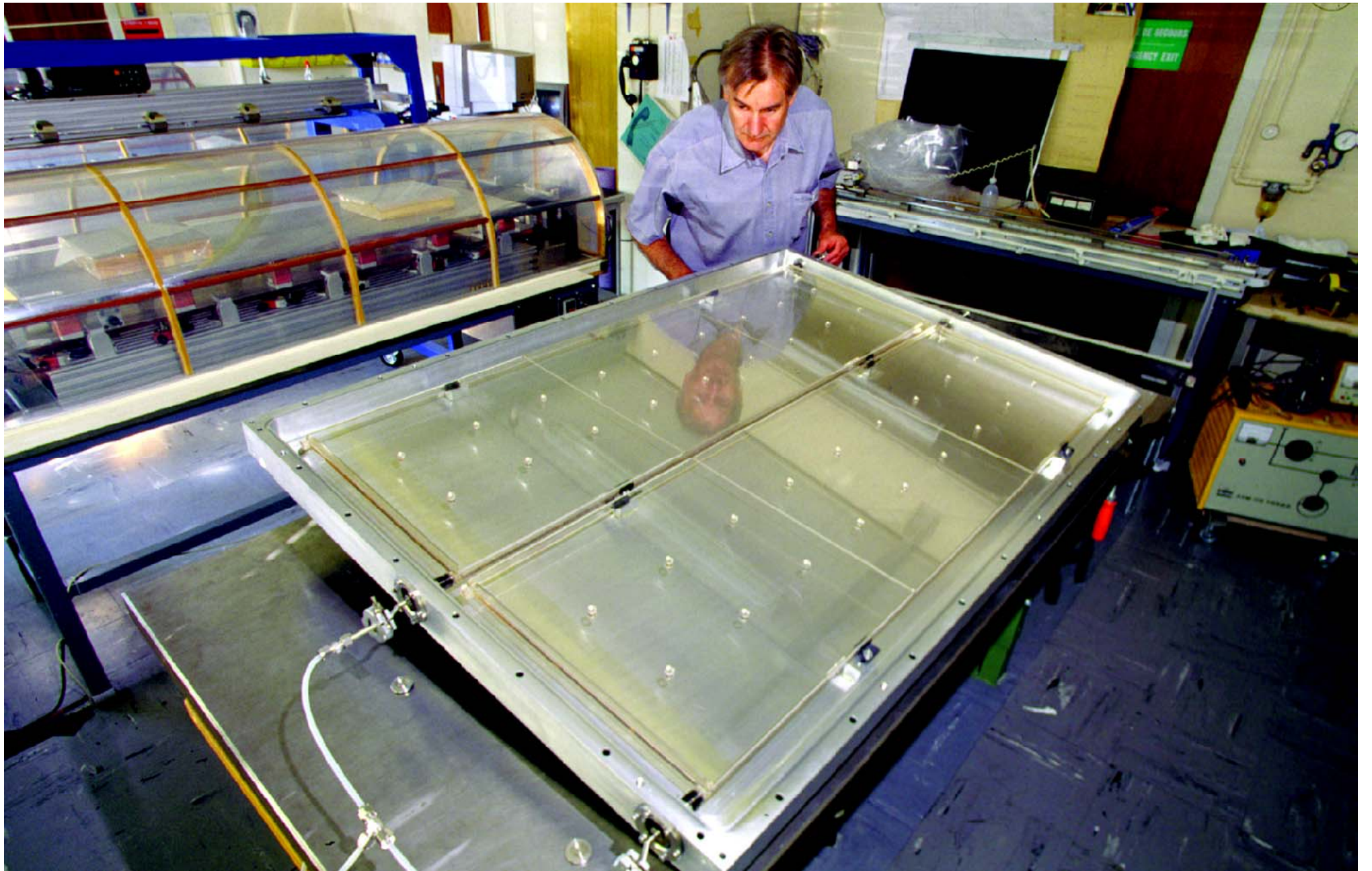




From Franck Wilczek's
Nobel lecture

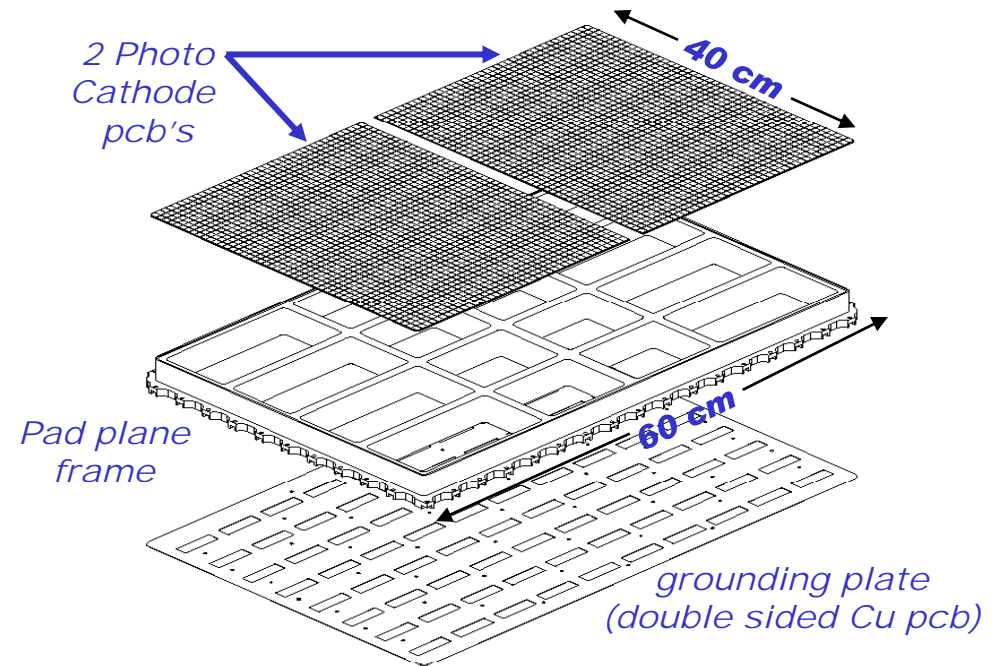
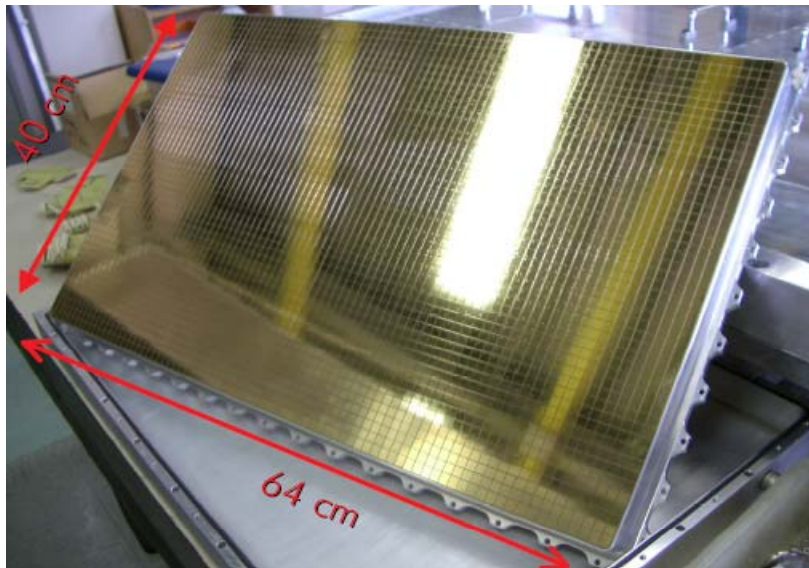
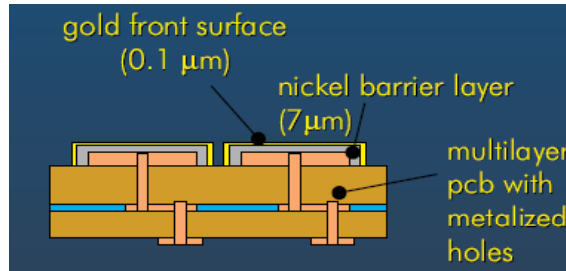


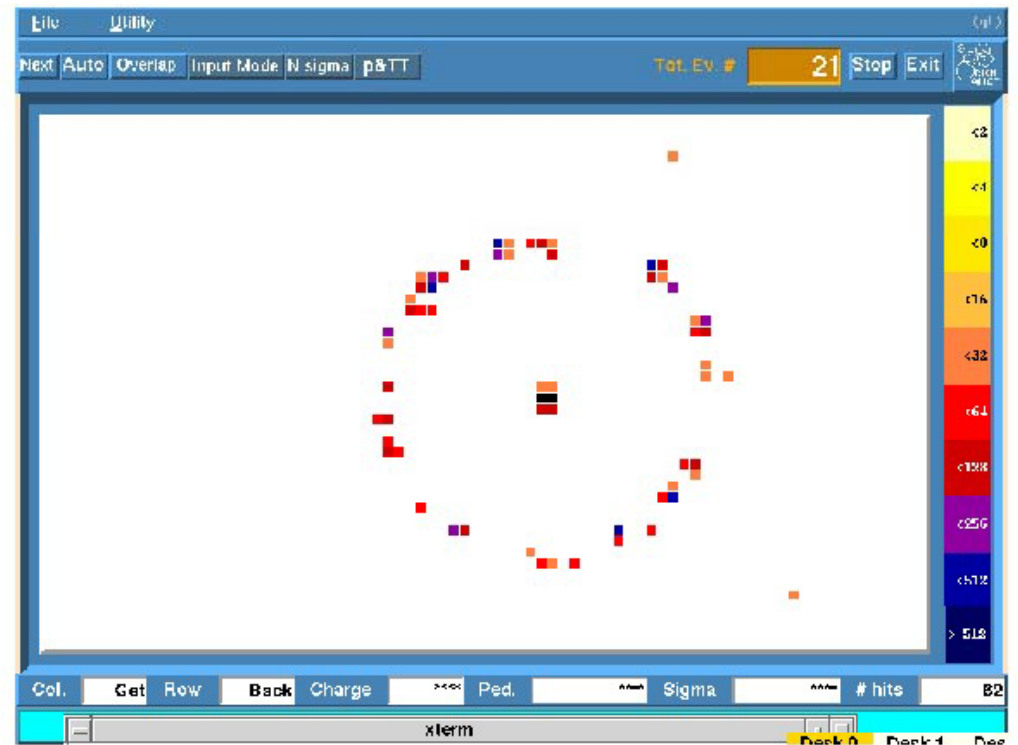
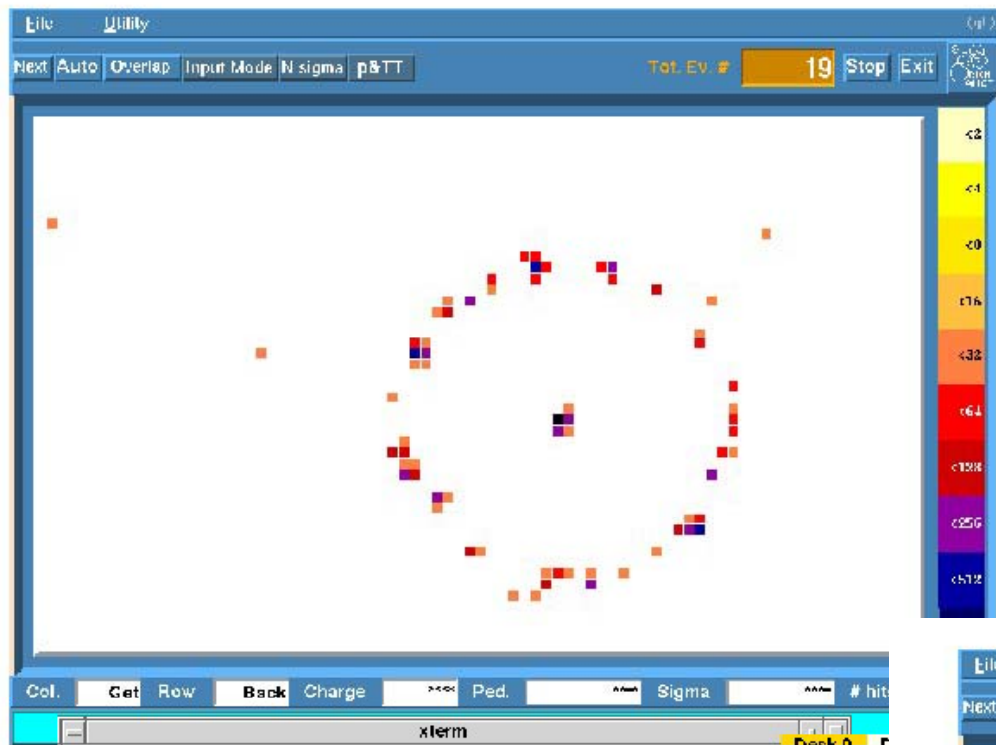


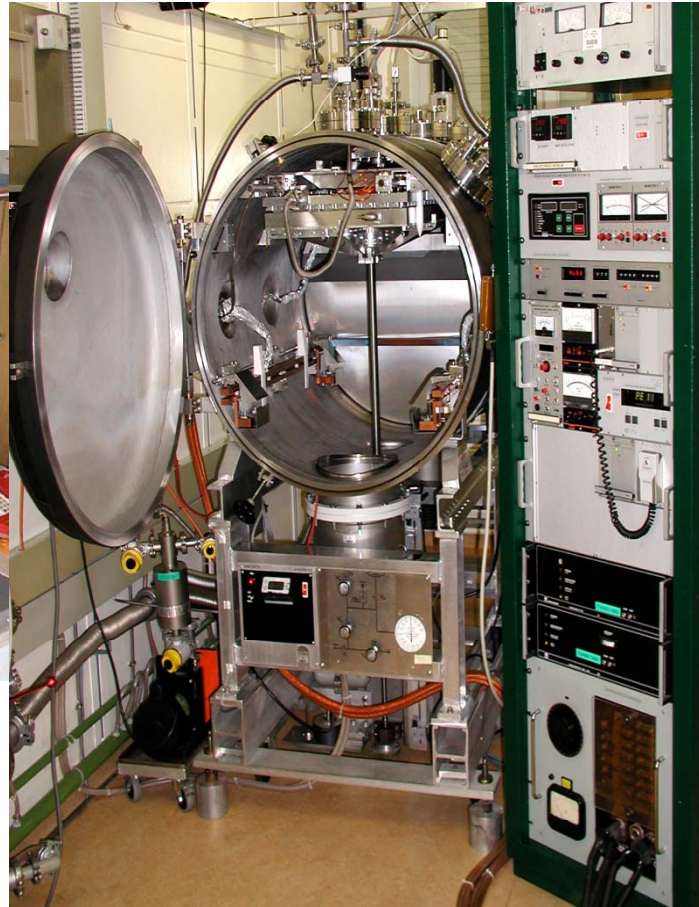
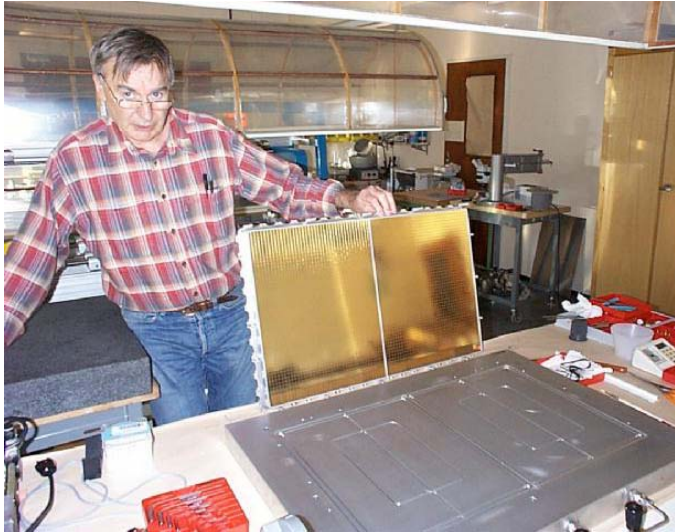


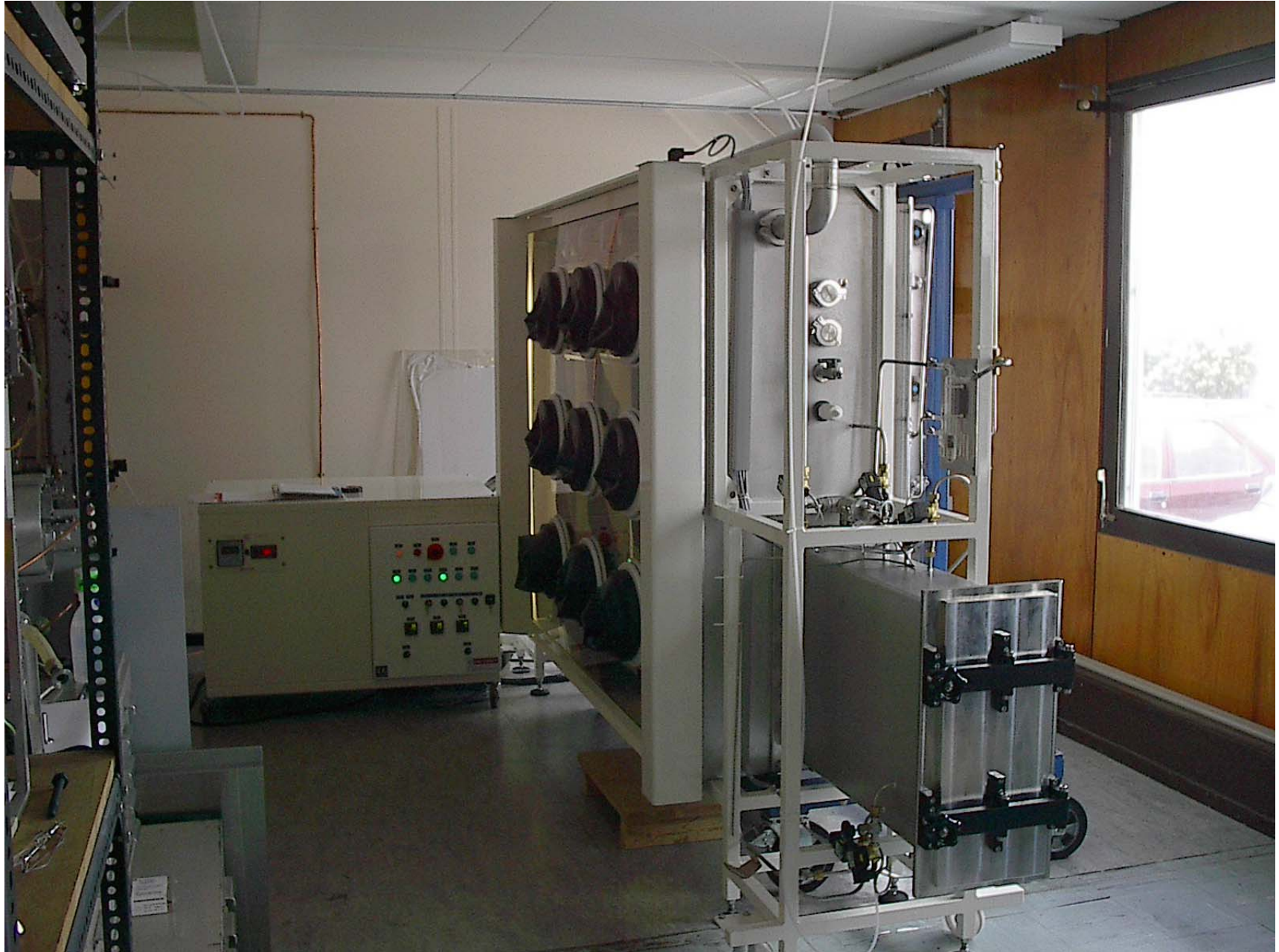
Substrate for the CsI photocathode (PC)

double layer
Cu clad PCB
coated with
Ni, Au





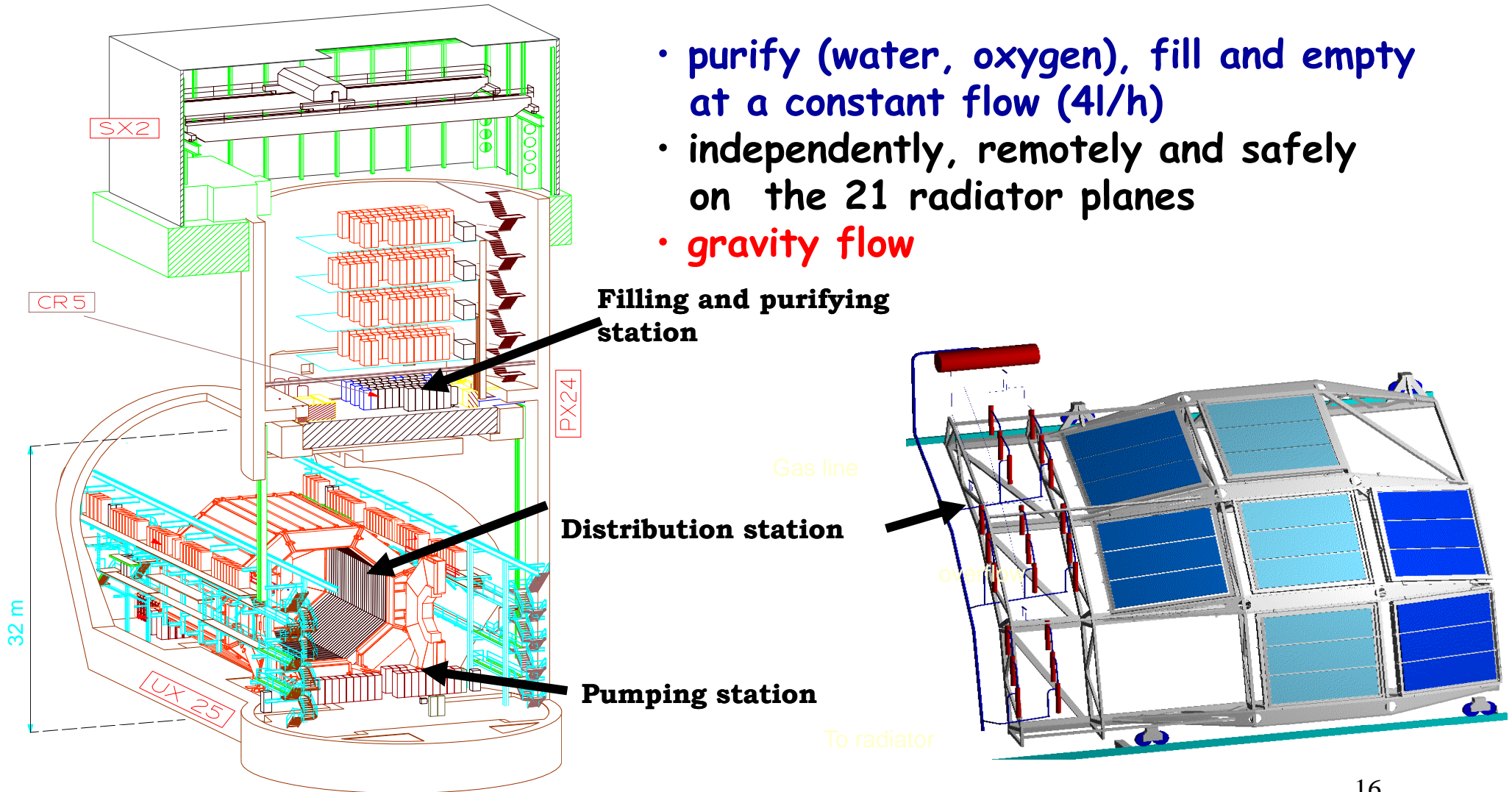


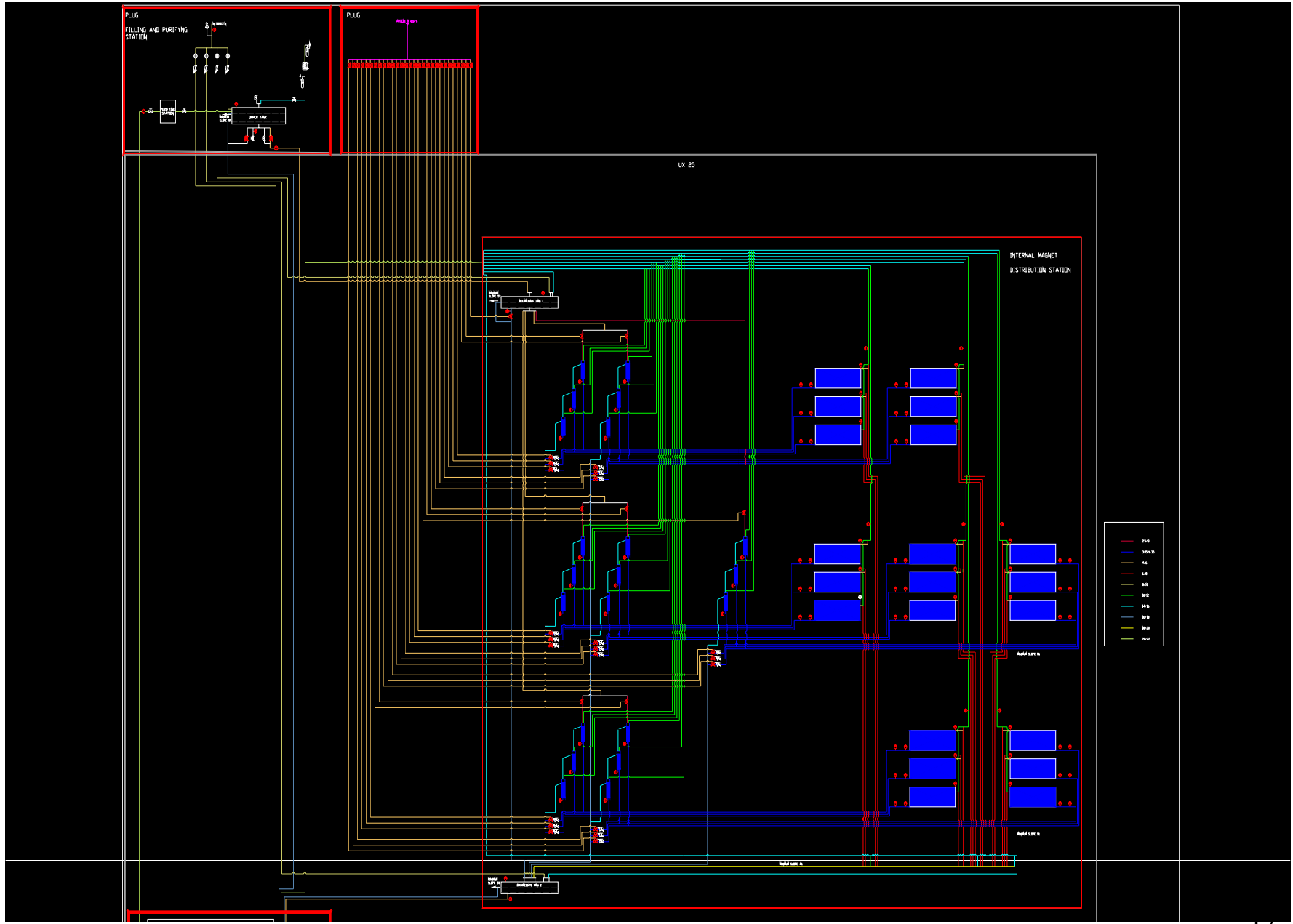


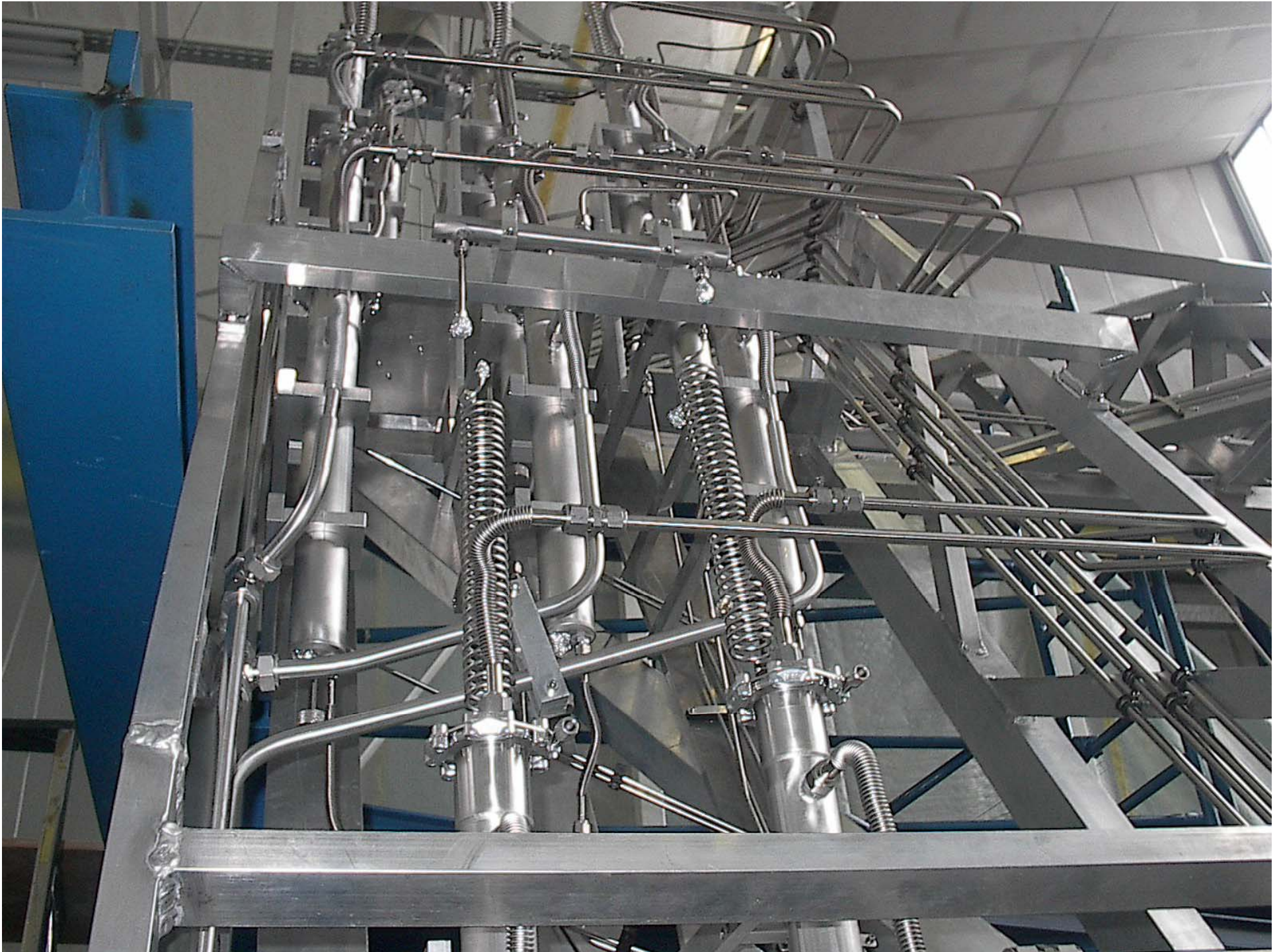


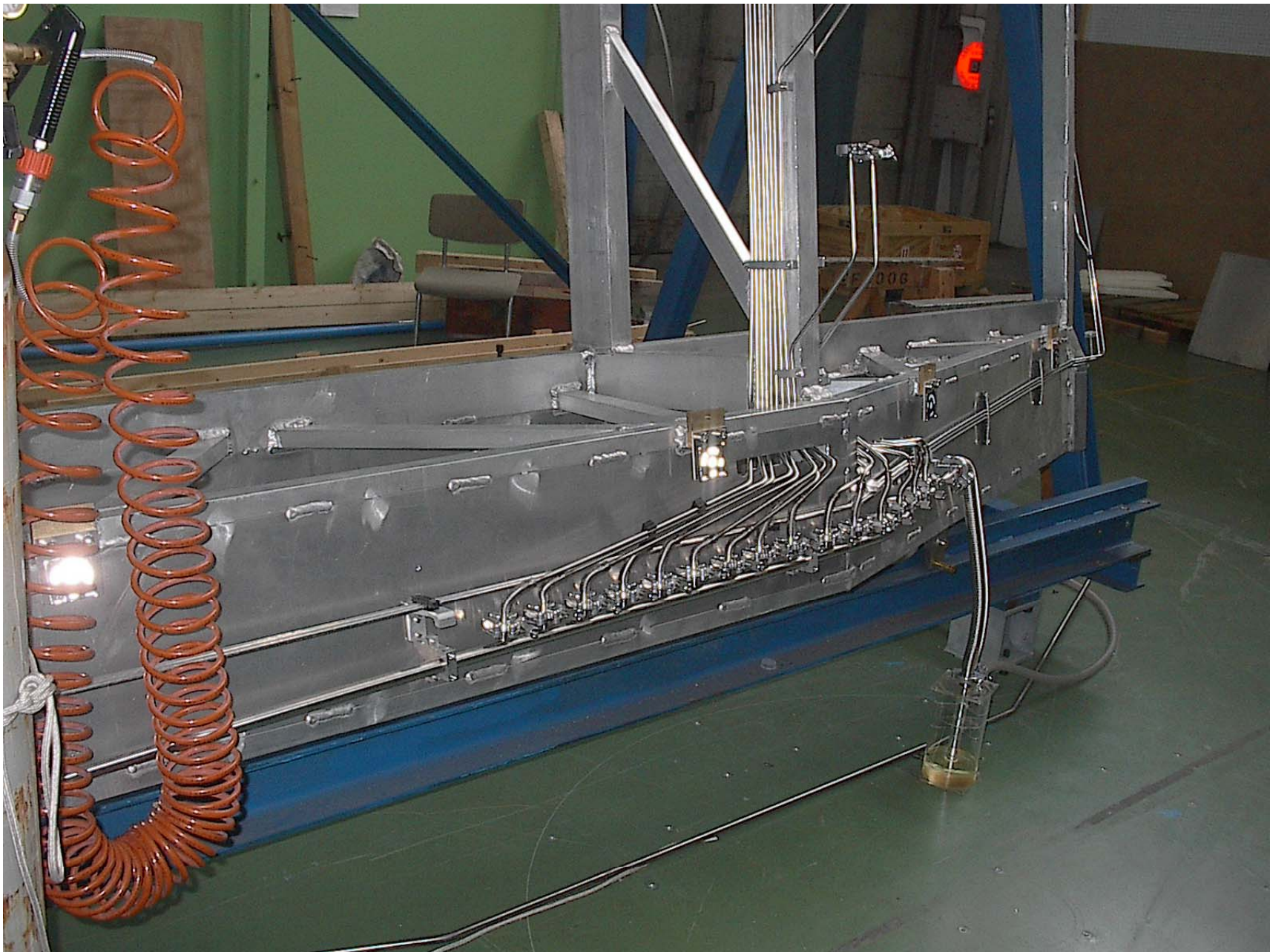
The C_6F_{14} circulation system

- purify (water, oxygen), fill and empty at a constant flow (4l/h)
- independently, remotely and safely on the 21 radiator planes
- **gravity flow**









Cold trap



Pumping station



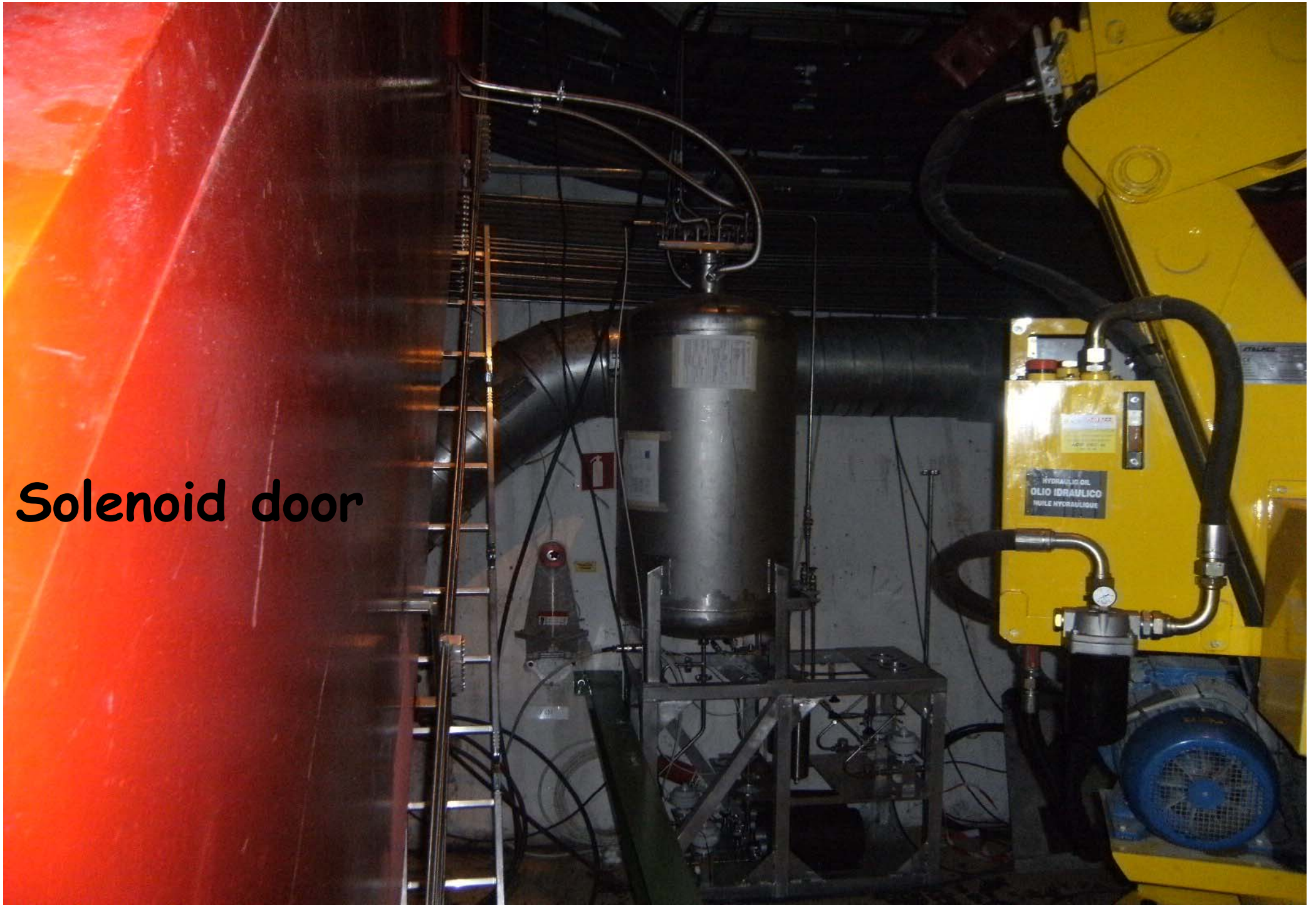
Filling station



CR5

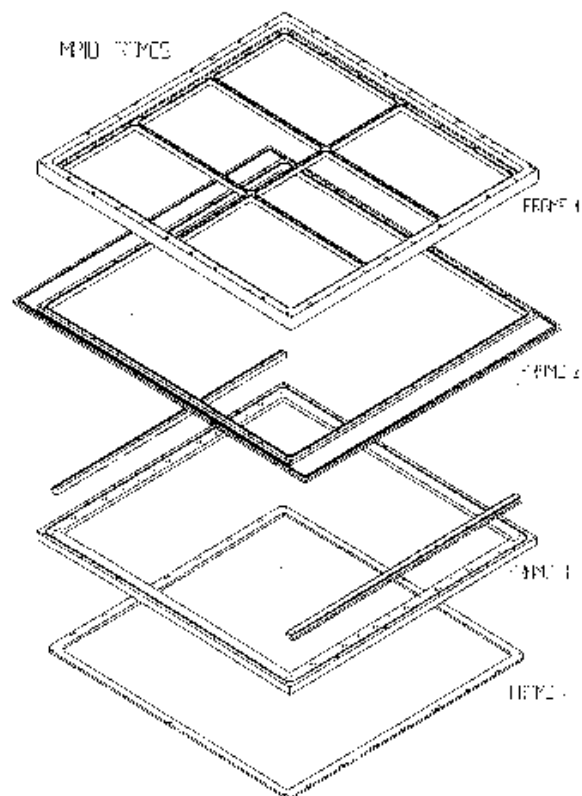


Solenoid door

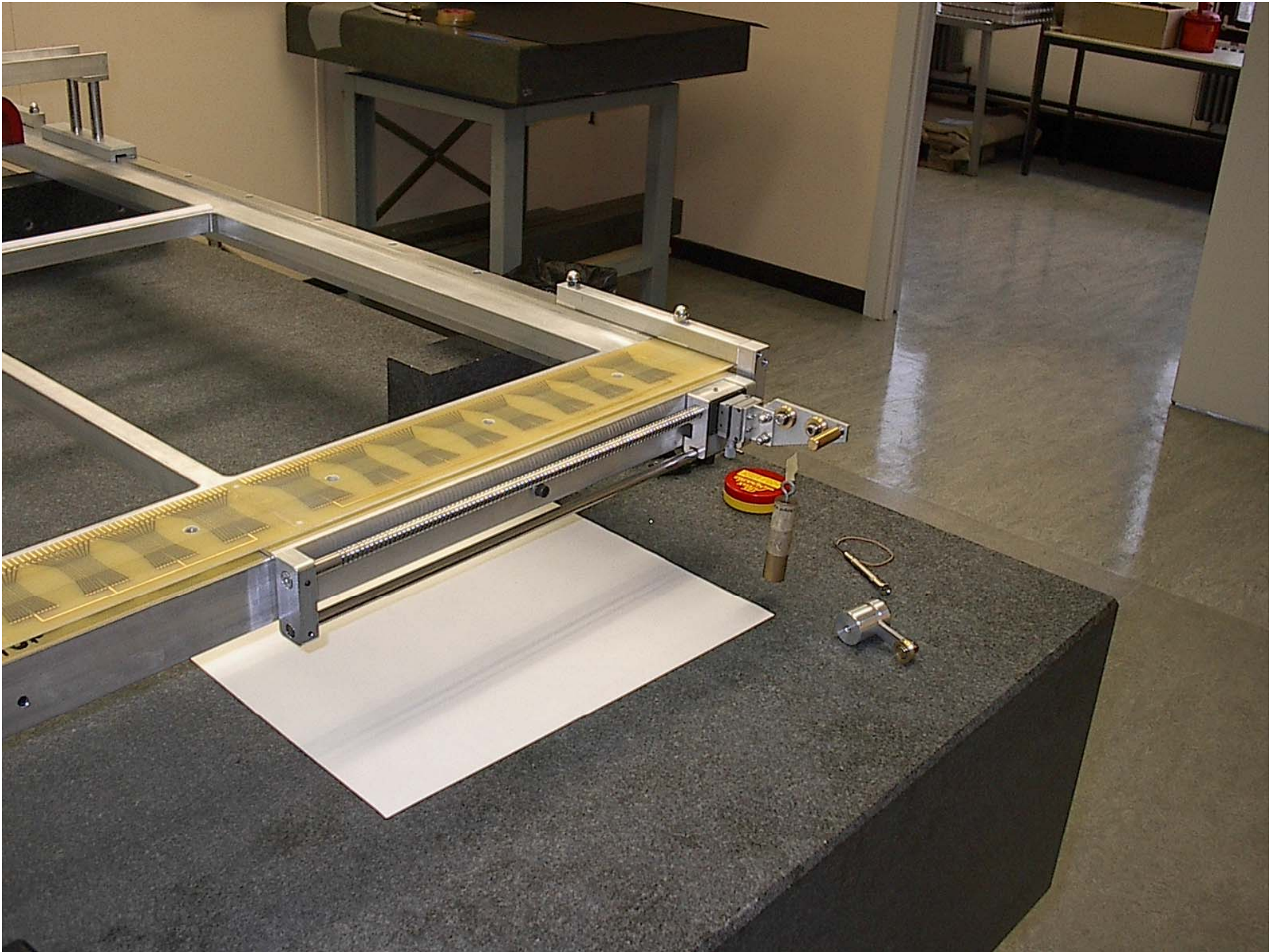




2- Description of the HMPID Detector Frames







**Anode wires
median support
MACOR bars**



**Anode wires
PCB with
positioning
marks**

