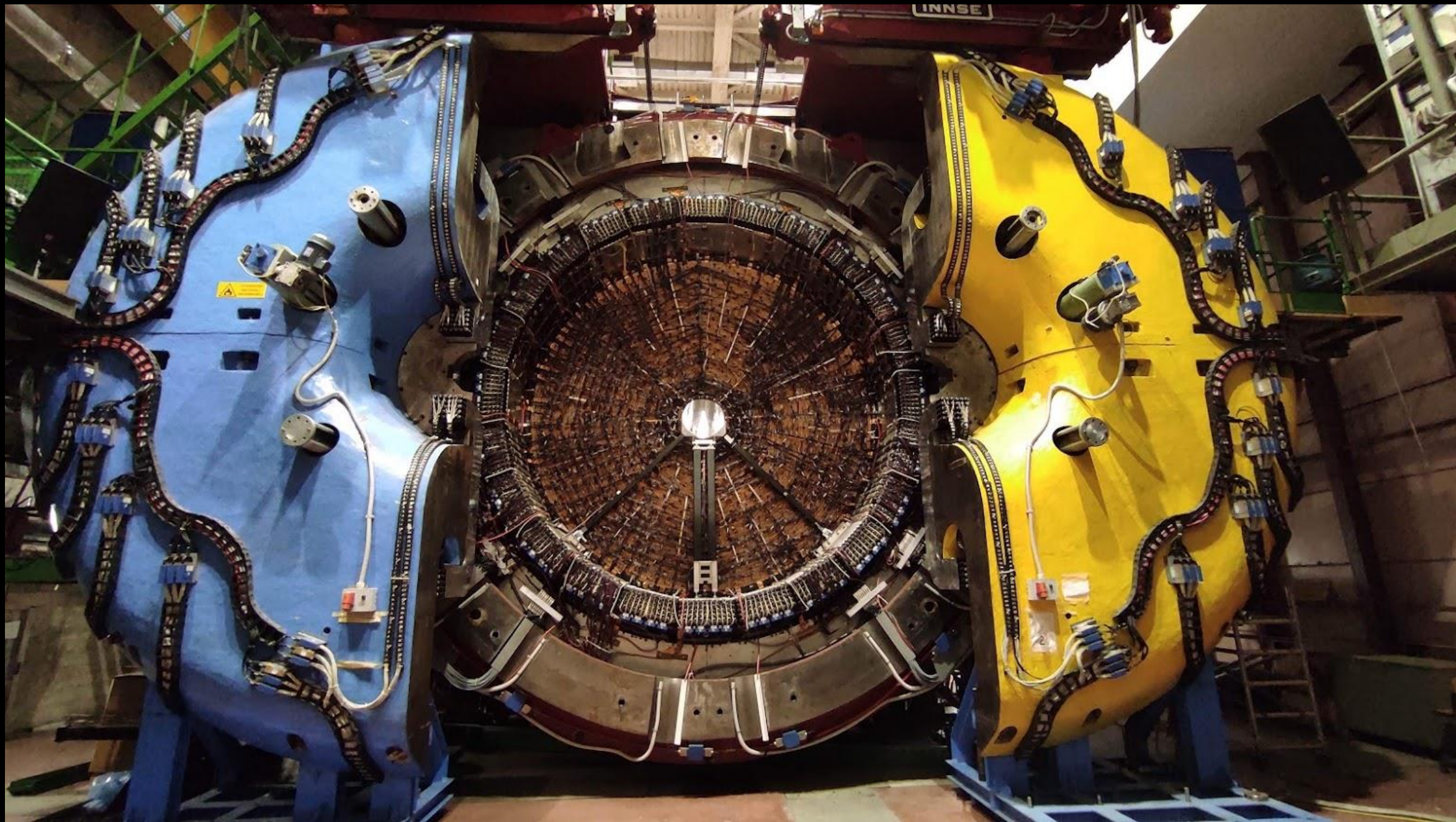
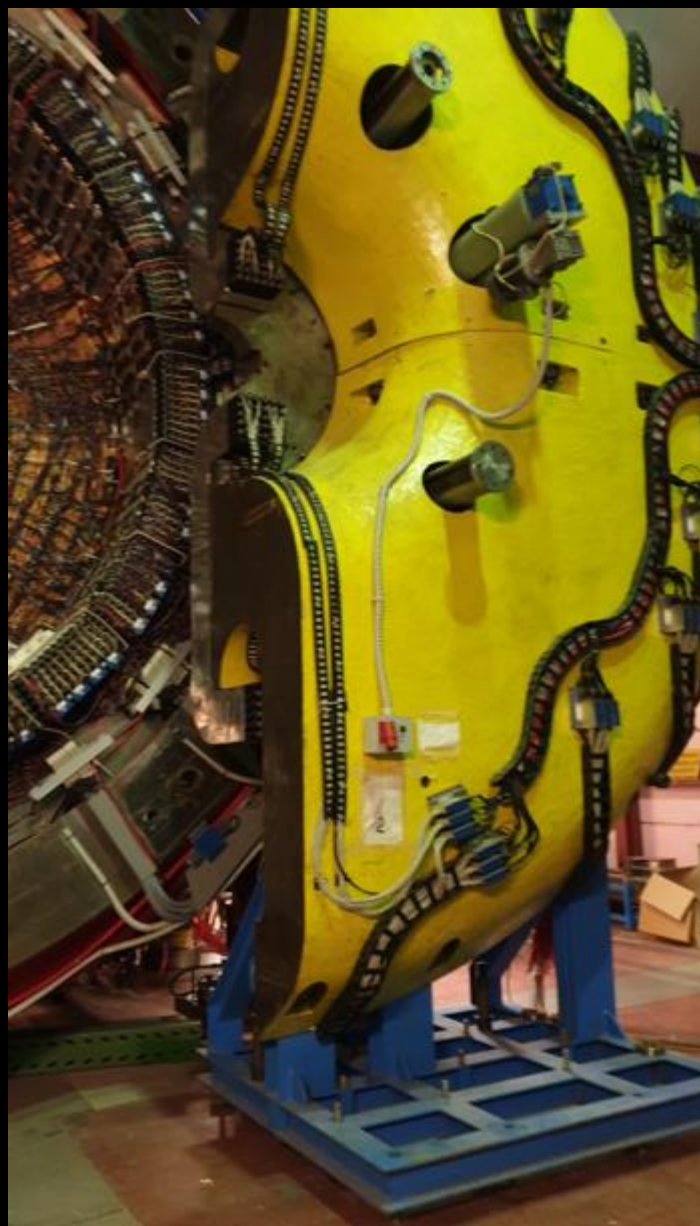


ECAL overview and operations at LNF

Antonio Di Domenico - INFN-Roma1

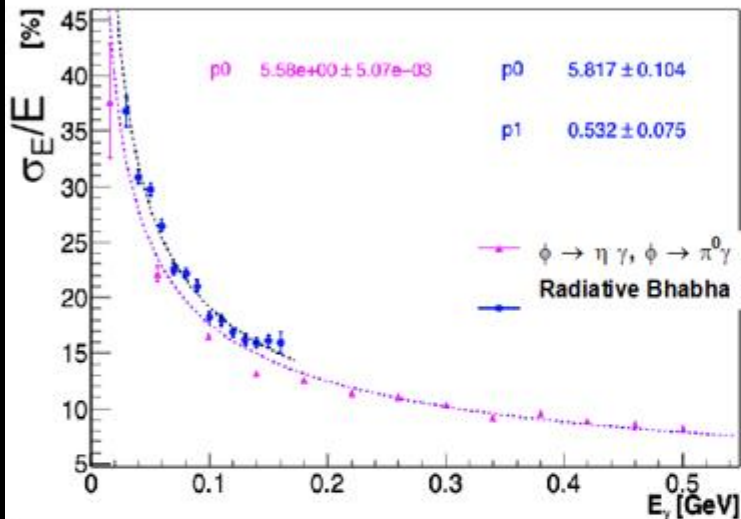
Danilo Domenici - LNF-INFN





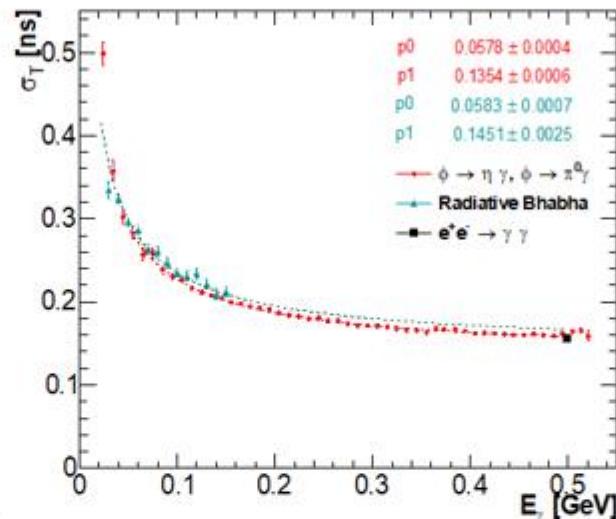
Check e.m. calorimeter performance

during KLOE-2 data taking (2015-2018):
compatible with known performance.



$$\sigma_E/E \cong 5.6\% / \sqrt{E(\text{GeV})}$$

$$\sigma_T \cong 58 \text{ ps} / \sqrt{E(\text{GeV})} \oplus 135 \text{ ps}$$

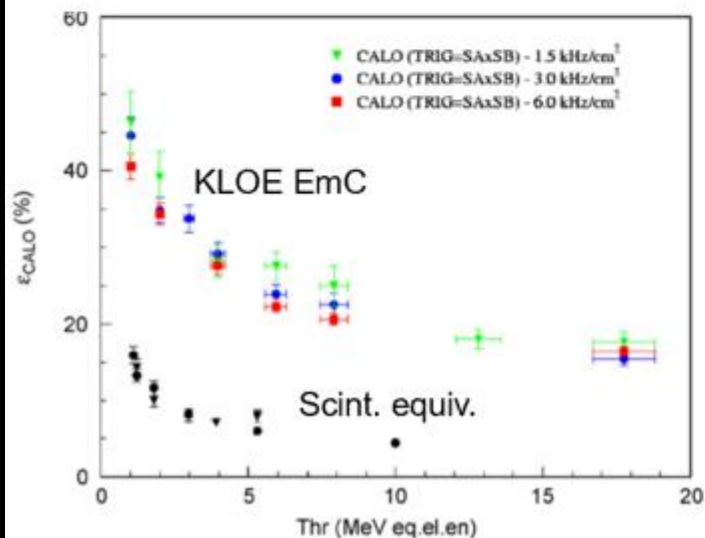


KLOE Calorimeter

Lead/scintillating fibers
Read-out 4880 PMTs
98% coverage of solid angle

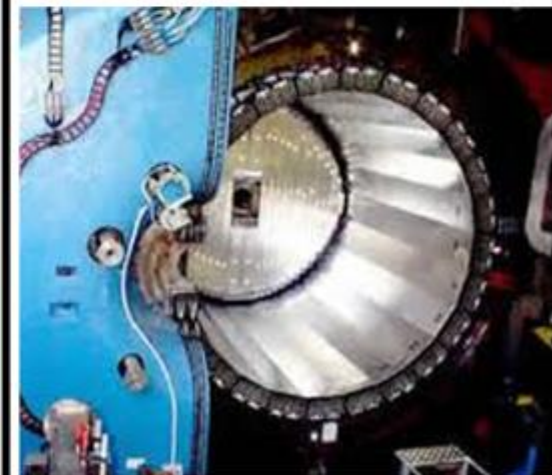
24 Barrel modules
64 C-shaped End-Cap modules

M. Adinolfi et al.,
"The KLOE electromagnetic calorimeter",
NIM A 482 (2002) 364



Measurement of the neutron response of the KLOE EmC

- M. Anelli et al., "Measurement and simulation of the neutron response and detection efficiency of a Pb-scintillating fiber calorimeter", NIM A581 (2007) 368
- M. Anelli et al., "Measurement of the neutron detection efficiency of a 80% absorber-20% scintillating fibers calorimeter", NIM A626 (2011) 67 (Gauzzi corresponding author)



Activity on ECAL: first steps

- Survey of existing mechanical tools and drawings → see Raffaelli talk
- Order done for support of 5 person-months for dismantling from same external company participating in mounting in 1997 (we can hire also a retired expert technician from Rome1)



ECAL refurbishment: Photomultipliers



1. Hamamatsu fine mesh PMT R5946-02 designed for KLOE there are 4880 PMTs in total.
2. After KLOE-2 run spare PMTs needed for day-1 and long term SAND operations;
3. Hamamatsu production line dismissed. Hamamatsu can reopen for us the production line using the residual stock of components (fine-mesh).
4. Last opportunity to get a bunch of these PMTs from Hamamatsu (with improved QE) => 150 PMTs ordered at Hamamatsu.
Basic PMT performance tests within ~ 1 year from now.
5. No conflict with possible upgrade of ECAL read-out, which could be ready after day-1, and involve only a part of ECAL modules.

ECAL refurbishment: PS & RO

- HV to be replaced: informal quotation from CAEN order 100k€/channel

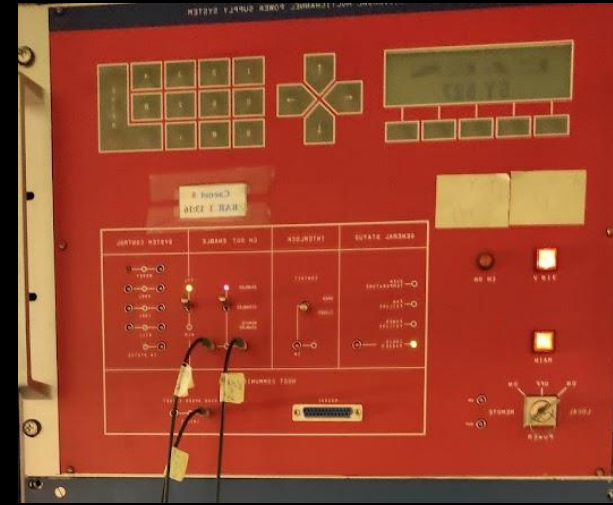
WA7030PXAAA4 A 7030P - SYx527 H.V. channels +3 KV 1 mA (1.5 W) - Multipin Conn. common floating (48 ch)
WSY4527BSCXA SY 4527B - Universal Multichannel Power Supply System - BASIC 600W

WA4533D1200X A 4533 - SY4527 Optional Double Power Supply Unit 1200W (for 16 boards A7030AP in a sistem SY4527 additional power supply needed 1200W)

n° 102 + 10 spare board A7030P

n° 7 +2 spare Sistems SY4527B

n° 7 +2 spare Additional power supply A4533



- LV were LNF custom. We have drawings to build spares.
- Readout: TDC and ADC to be changed.

TDC & ADC

we can keep SDS custom
Splitter/Shaper/CFD
trigger?

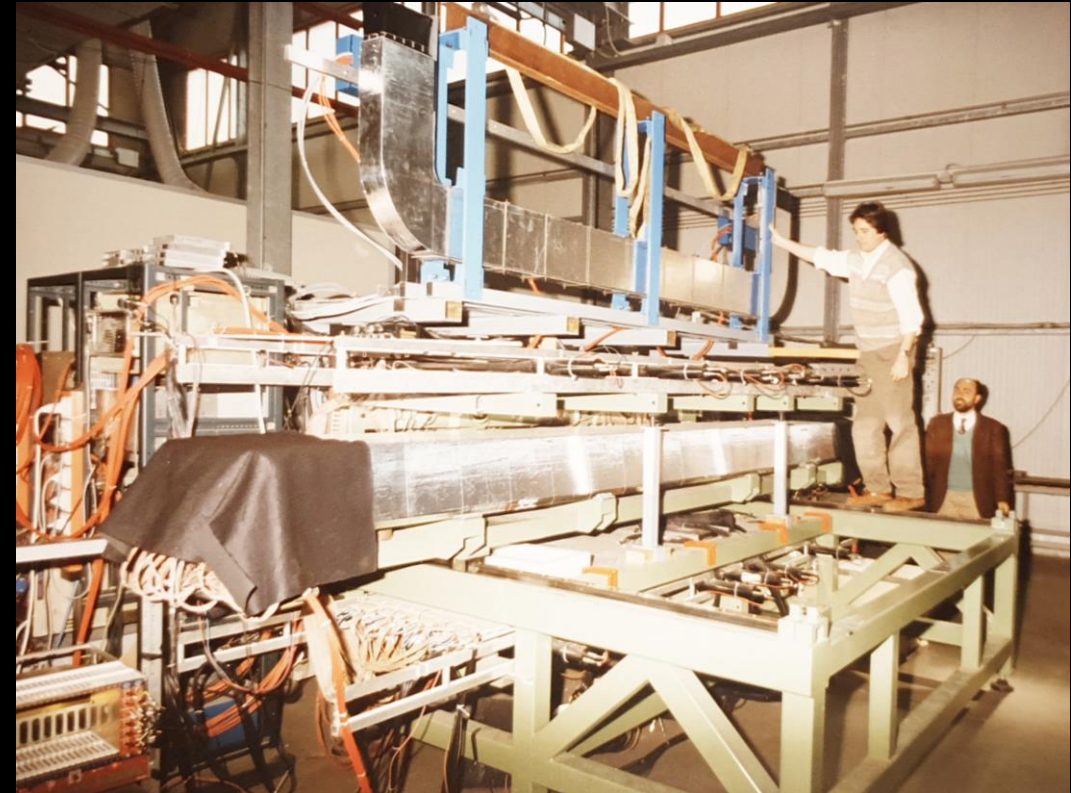
Digitizer

in 2023 CAEN should produce a
5GS/s 12bit 32ch VME module

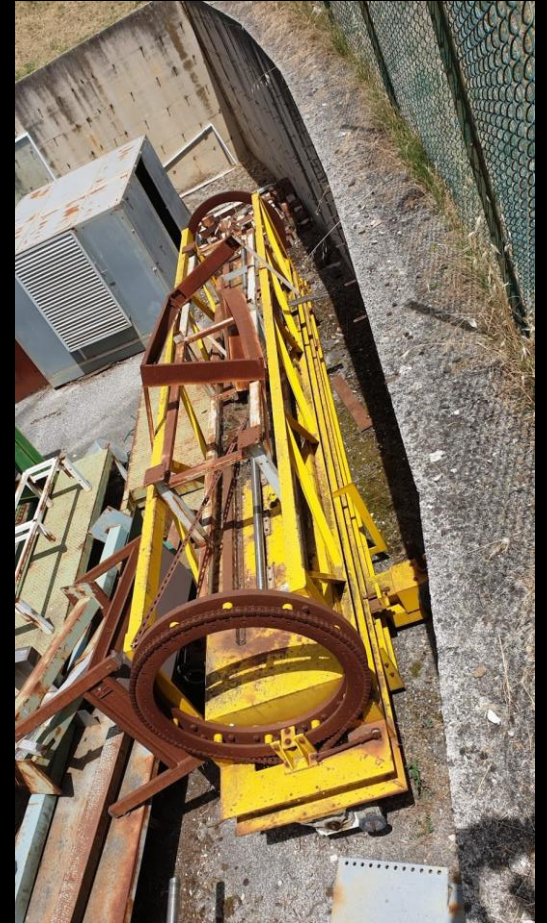
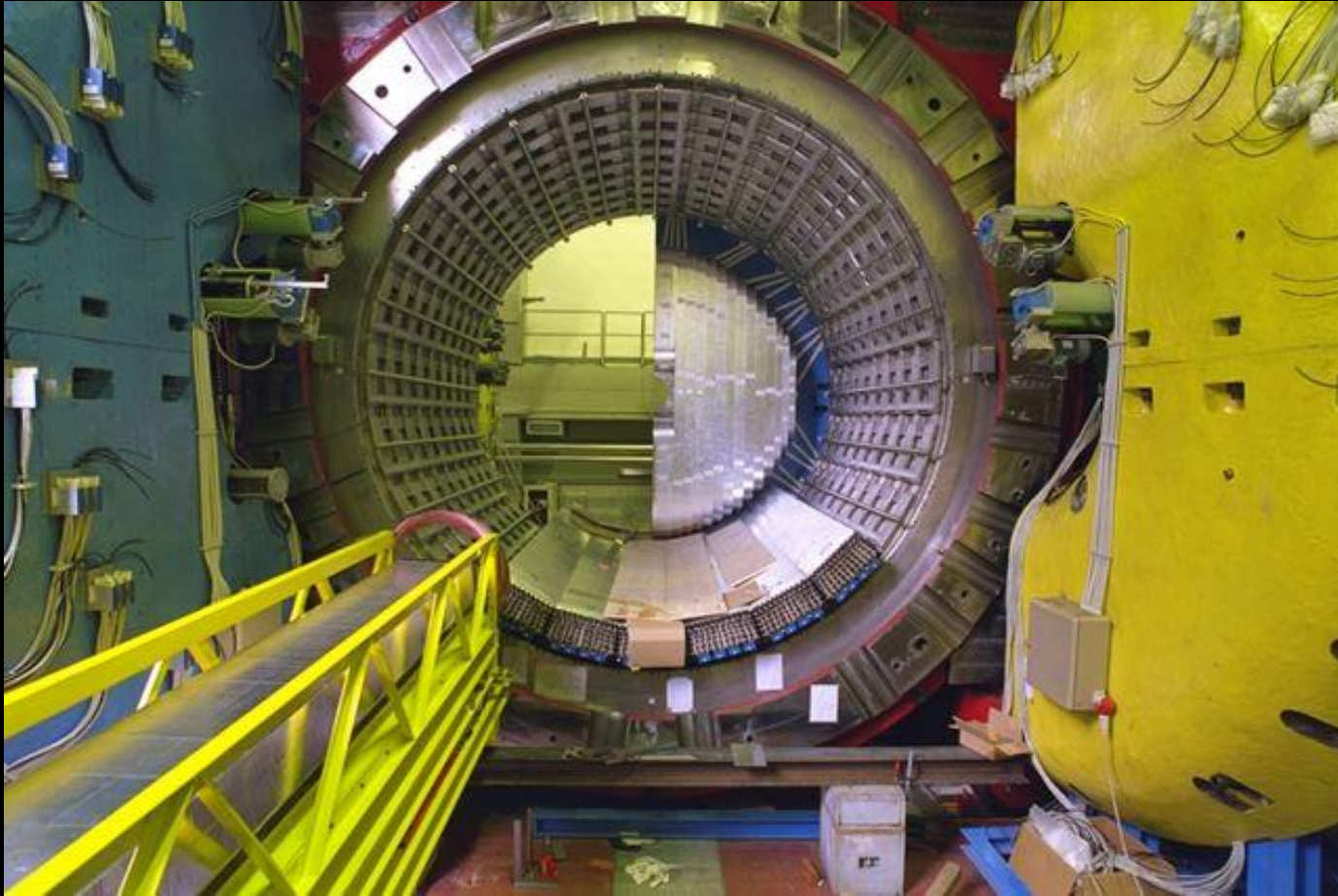


ECAL refurbishment: FE & Light tightness

- ECAL refurbishment: PMT bases with divider and preamplifier.
 - Some spares available at LNF; more can be prepared from spare components still available.
 - Question: Max energy deposit in a single ECAL cell from Physics events in SAND ? (cell position dependence?) Refine/set PMT gain working point.
- Light tightness
 - After dismounting light tightness has to be checked
 - Protection adhesive 3M tape to be changed
 - possibility to test basic performance with cosmics

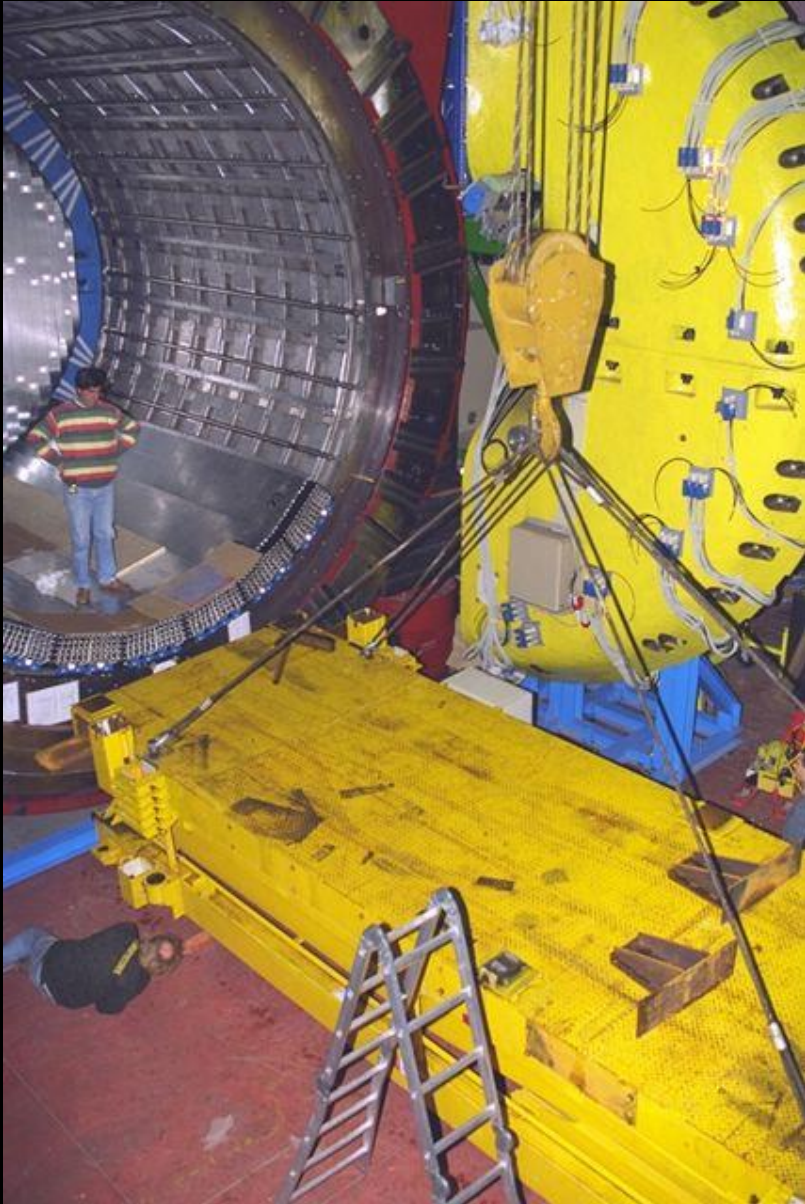


Survey of Mounting Tools: insertion



barrell insertion tool (see F.Raffaelli talk)

Survey of Mounting Tools: platform



5 ton platform by Aleph
(still available?)

backup solution:
build moving floor assembling
1x1x1 m³ concrete blocks
(many available at LNF)

Survey of Mounting Tools: supports



quotations asked for barrell
modules racks
(and transportation boxes)

to be asked for endcap legs



original endcap
handling frame still
existing.
to be refurbished

Tentative ECAL dismounting list

- cleaning of assembly room
- dismounting of gas control platform
- uncabling (keeping ECAL HV and Signal)
- extraction of Drift Chamber
- extraction of 24 barrel modules
- dismounting of endcaps
- extraction of coil
- dismounting of iron yoke

