# KLOE to SAND Progress Report

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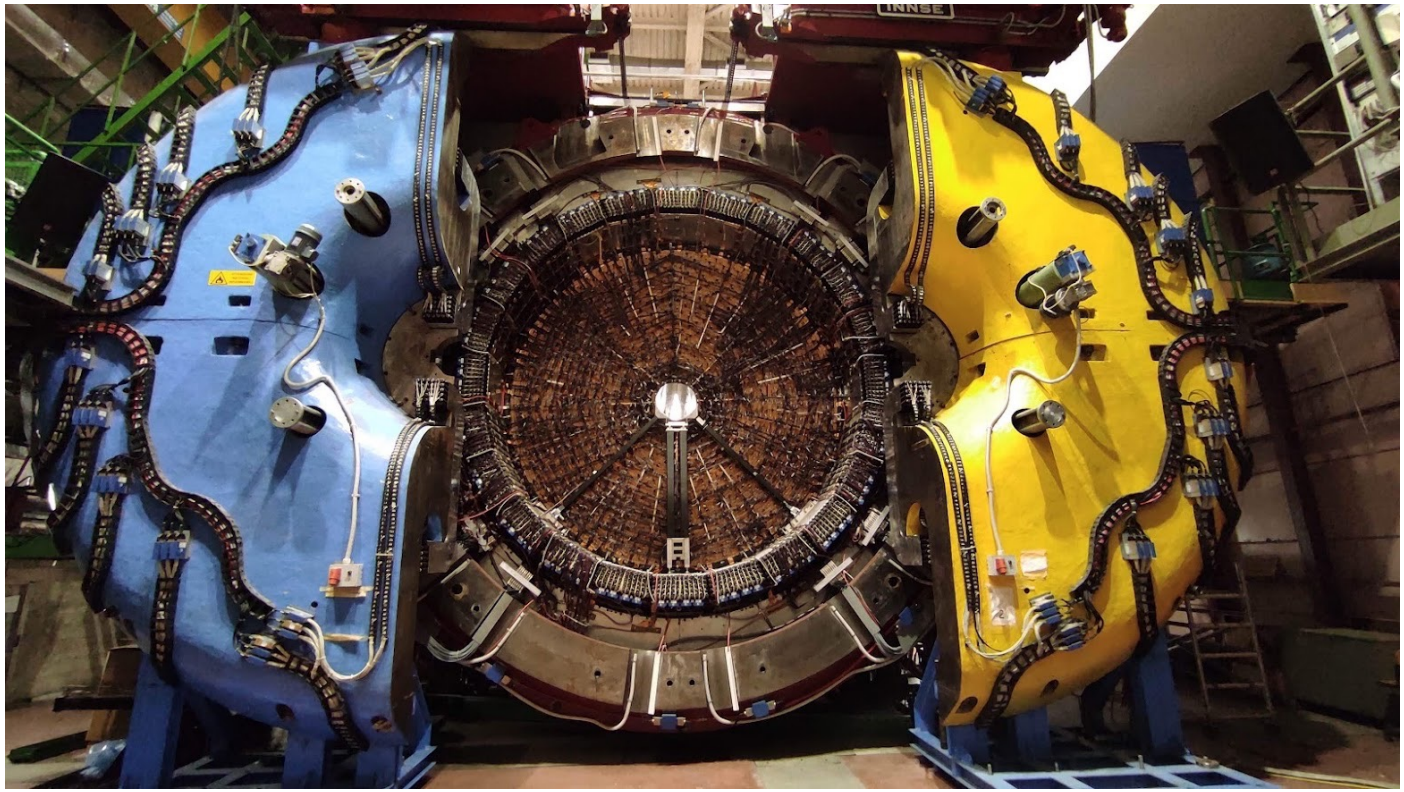
on behalf of the SAND-ECAL and SAND-Magnet WGs



DUNE CM – CERN – 24 January 2023

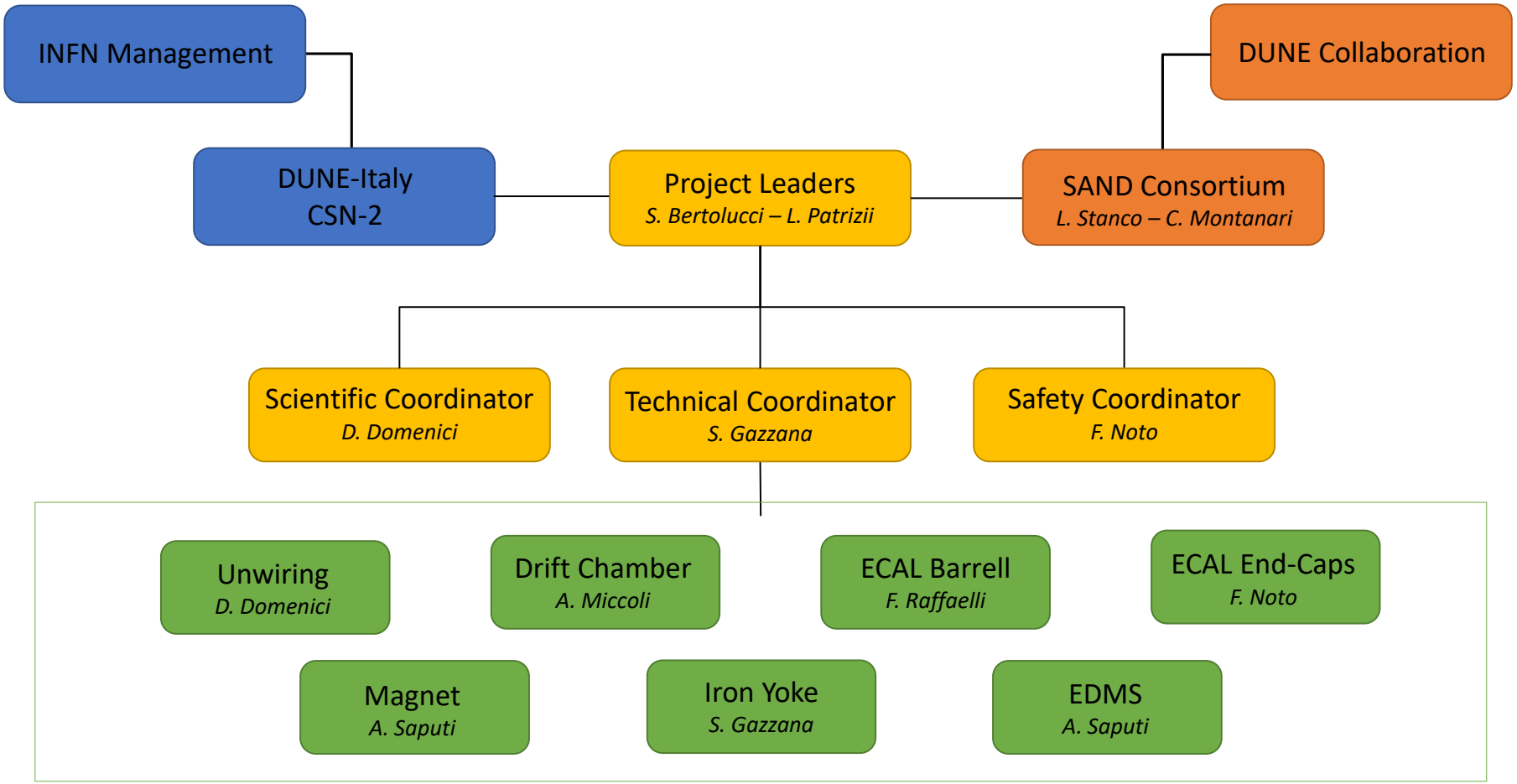
# KLOE-to-SAND: dismounting of KLOE

List of operations:

1. survey, revision and design of mechanical tools
2. unplugging and cables removal, FEE removal
3. extraction of KLOE Drift Chamber
4. extraction of ECAL barrel modules
5. dismounting of ECAL endcaps
6. magnet test
7. extraction of coil
8. dismounting of iron yoke

# KLOE-to-SAND: dismounting of KLOE

## Organizational structure



# KLOE-to-SAND: dismounting of KLOE

## SAND-ECAL working group

- The activities at LNF of the whole KLOE-to-SAND project are followed and discussed inside the ECAL WG, including the SAND-MAGNET WG activities.
  SAND-ECAL WG conv.: A.D.D. , D. Domenici
  KLOE-to-SAND technical coordinator: S. Gazzana
  SAND-Magnet: G. Delle Monache (cryogenics), R. Ricci (PS)

## Manpower

- huge efforts from 8 participating INFN institutions BO, FE, LE, LNF, LNS, PD, PI, RM1 in terms of technicians, and engineers.
- Constant presence at LNF of a specialized company personnel

## Unplugging and cables removal, FEE removal

- 32 racks, 150 crates, 3000 boards have been removed from the detector platforms
- All cables removed

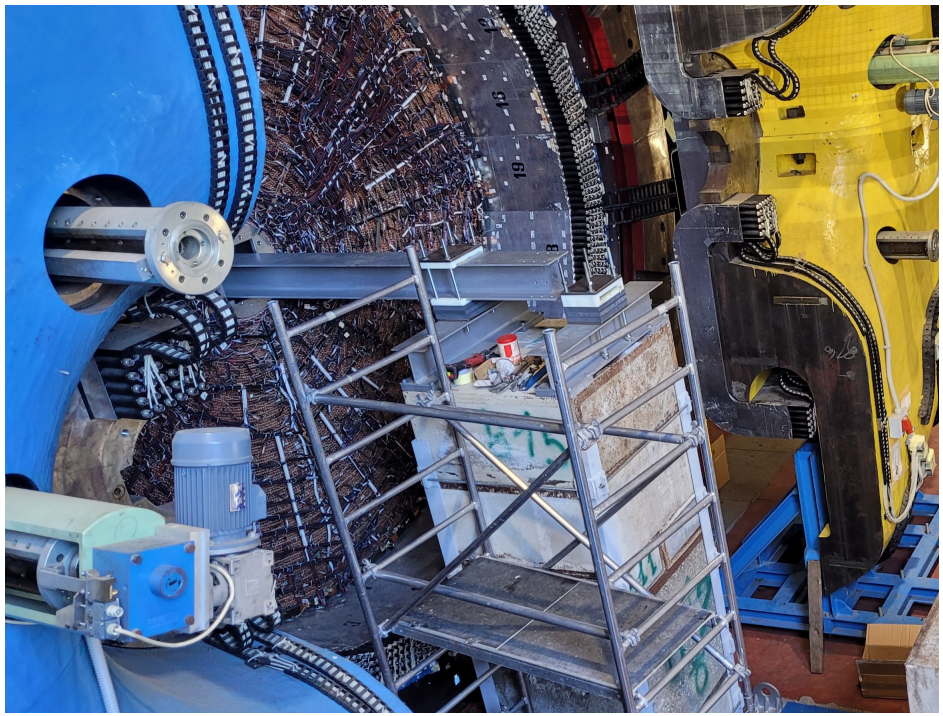
- ECAL signal+HV cables 15+15 m long in 12 storage boxes (to be re-used)

# KLOE DC extraction: preparation

## Extraction of KLOE Drift Chamber

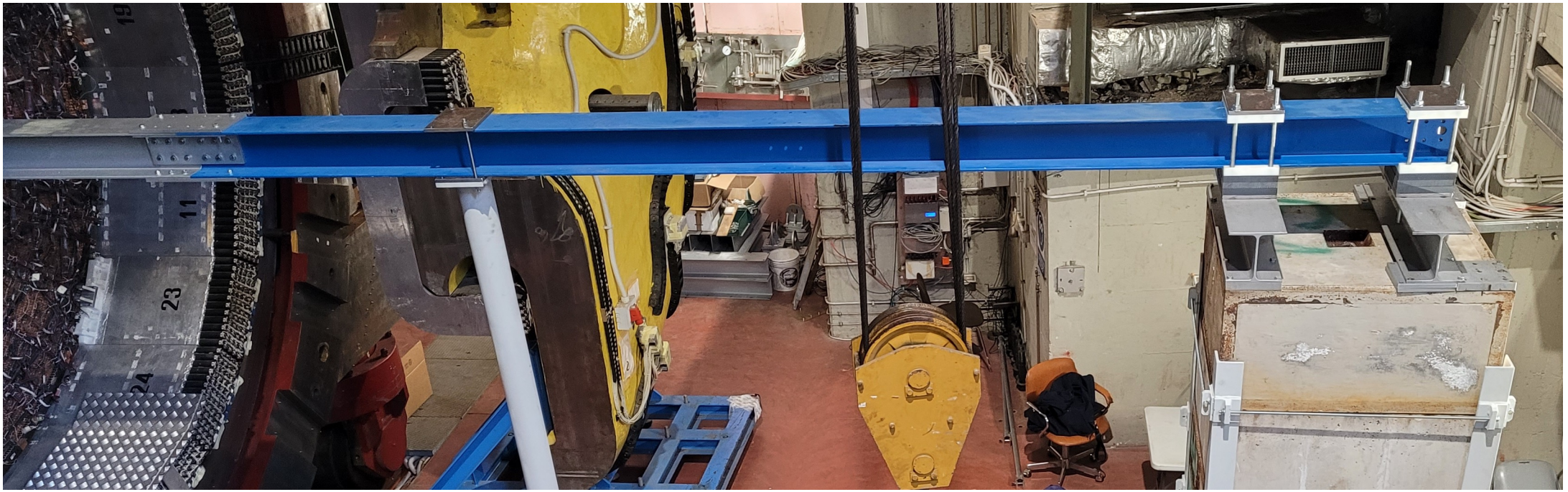
- Resp. A. Miccoli (INFN-Lecce)



Supports mounted on the concrete blocks columns
Long beam inserted in the KLOE DC

# KLOE DC extraction: preparation

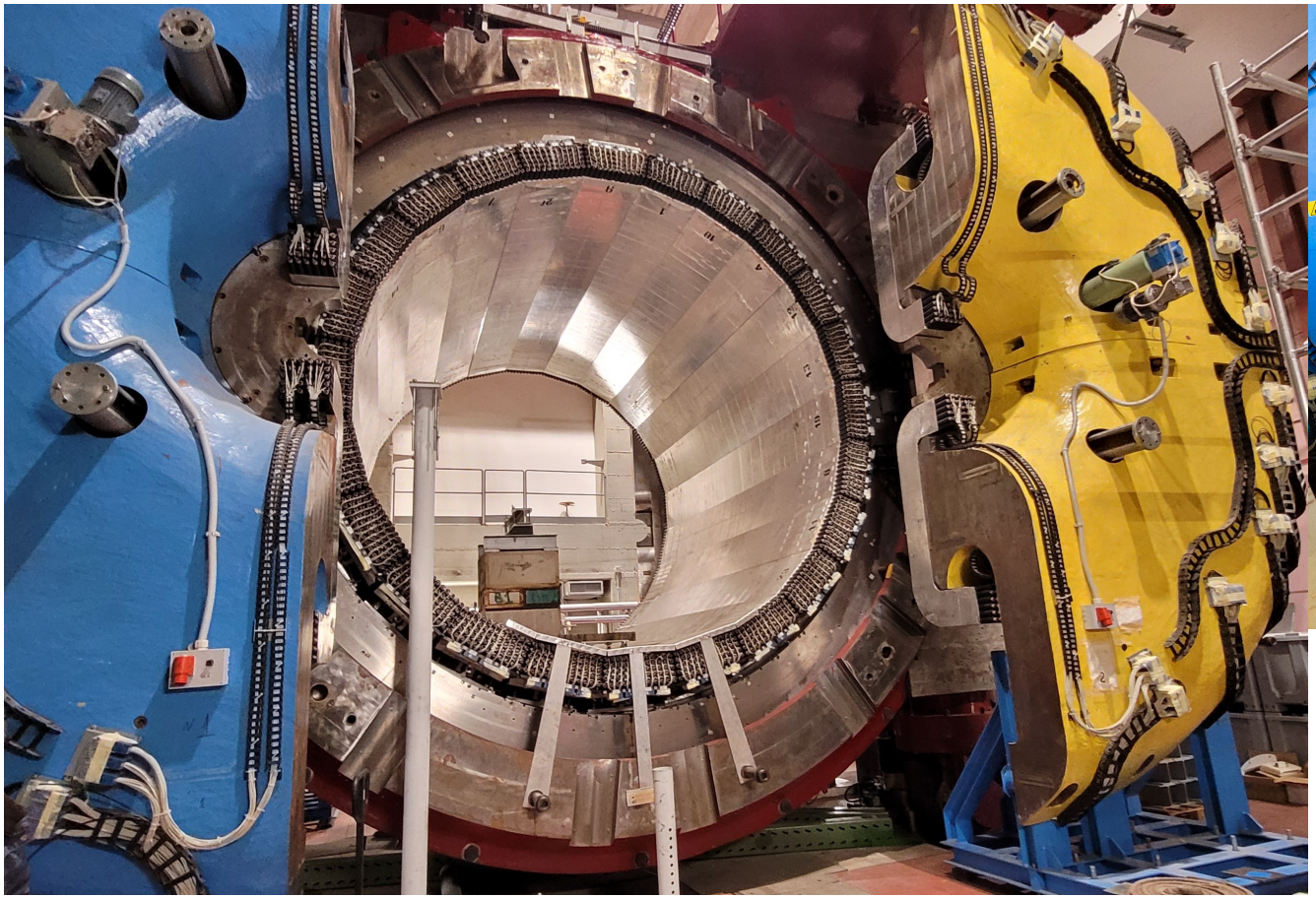


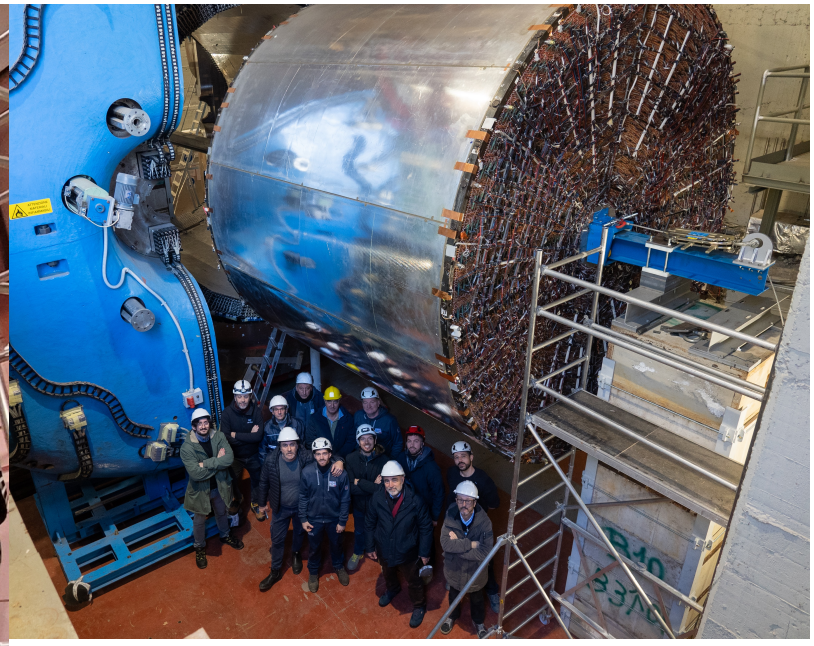
Beam extension mounted,
concrete block column removed
Alignment and positioning
Test of the rail system

# KLOE DC extraction

video

# KLOE DC extraction





Long beam at the center of ECAL removed
KLOE DC outside KLOE Hall
(it will be on exhibition in a dedicated site at LNF).

# ECAL barrel modules

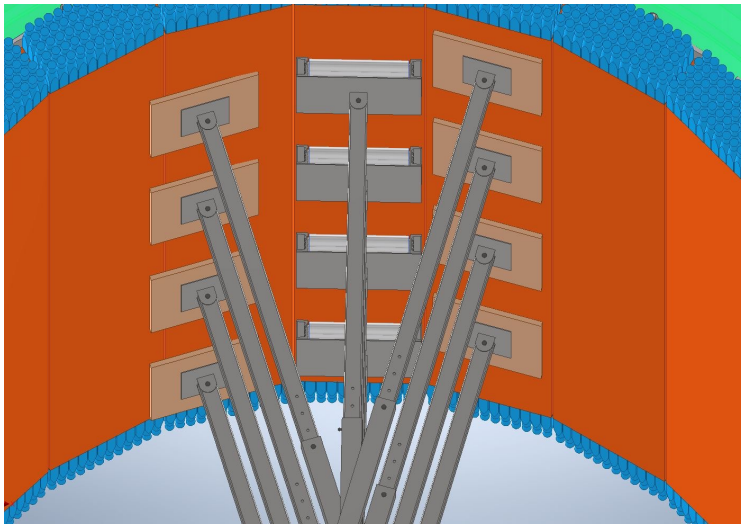
## Extraction of ECAL barrel modules

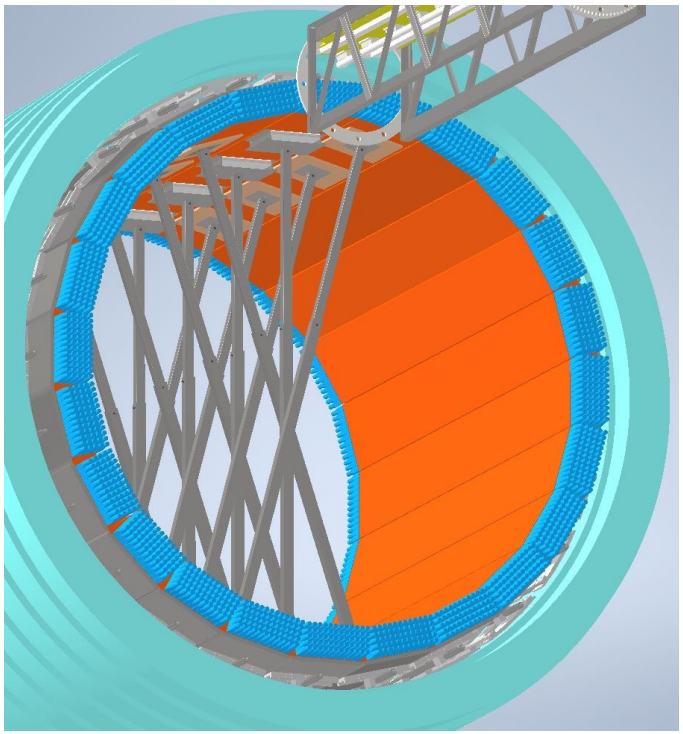
- Resp.  F. Raffaelli (INFN-Pisa)

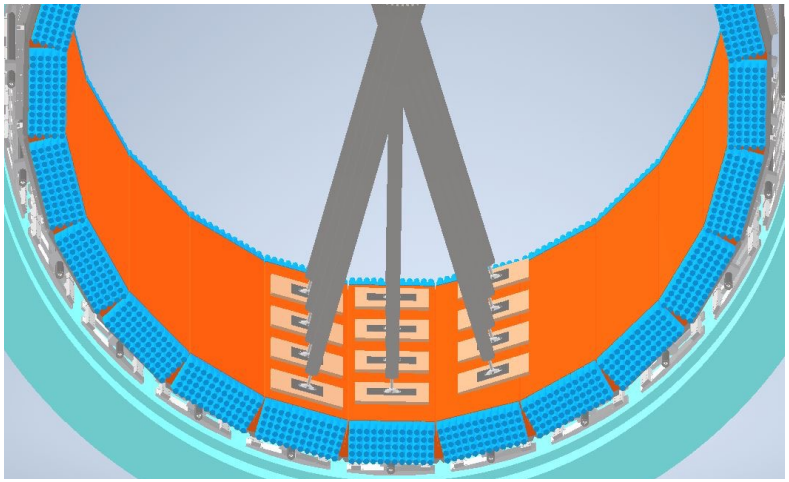
Refurbishment of the insertion/extraction tool: equipment completely disassembled, all recovered parts sanblasted and painted, some components replaced.



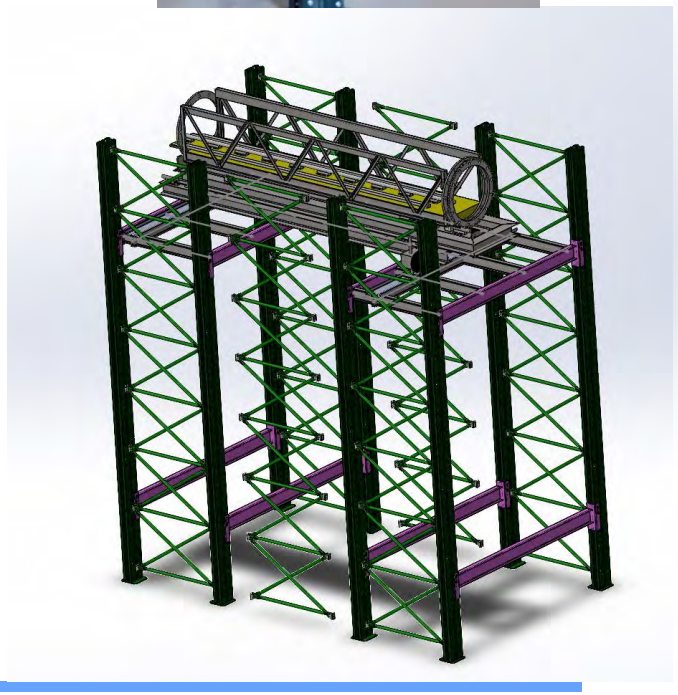
# ECAL barrel modules







Ancillary supports and platforms for ECAL extraction/insertion
Supports: design ready, being built.
Platform: commercial solution, being purchased



# ECAL End-cap modules

EndCap Module Fixing
and Rotation tool
(to be revamped)

Extraction of ECAL end-caps modules

- Resp. F. Noto (INFN-LNS)

Tools are being revamped (structural analysis done), some parts replaced
Design of supports for handling and transportation of each End-cap quarter in progress

# ECAL refurbishment and test

Before shipping ECAL modules to FNAL we plan to:

- replace thin protective adesive tape of the barrel modules
- check light tightness
- test basic performance with cosmics rays


CAEN

N.5 A7030P boards 48 Channel 3 kV/1 mA

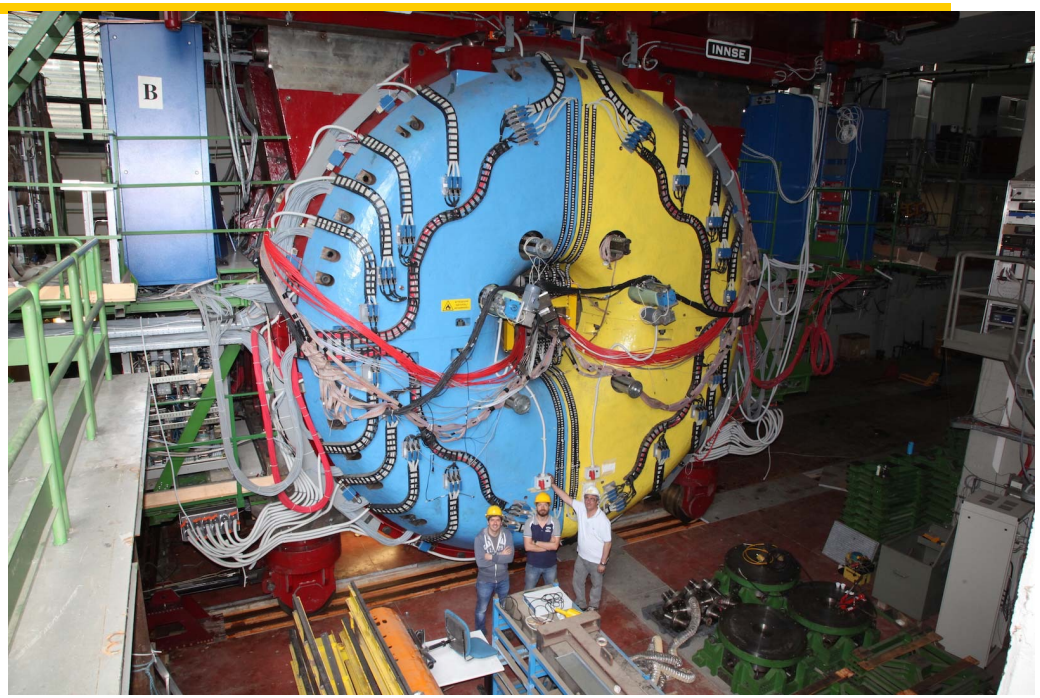
N.1 SY4527B mainframe

already purchased as part of the final ECAL HV system

- 150 spare PMTs (Hamamatsu fine mesh R5946-02 designed for KLOE) ordered at Hamamatsu, already delivered at FNAL

# Magnet test

Agreement with ASG superconductors
to refurbish and revamp the KLOE magnet:
new power supply system, magnet controls,
DAQ etc..




Superconductive Coil test with ASG support:

An operational test at low current (800-1000A)
is foreseen at LNF (2024)
before shipping the magnet to FNAL with the
new power supply, the test will be repeated at
FNAL before final installation

cooling down with cryogenic liquids:
25kl of LN2 cool down from 300K to 100K
6kl of LHe to cool down from 100K to 4.4K

~8 weeks for test (vacuum pump, cool down,
switch on)

# Coil extraction and transportation

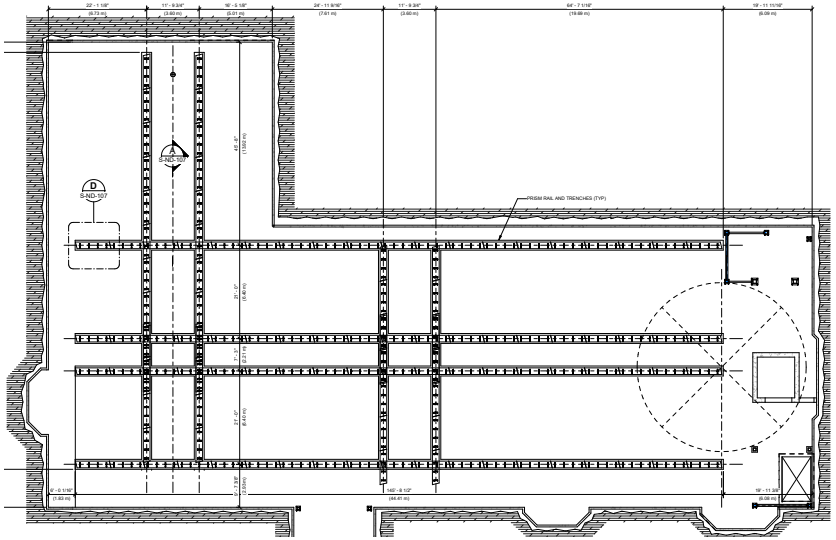
Extraction of coil

- Resp.  A. Saputi (INFN-Ferrara)

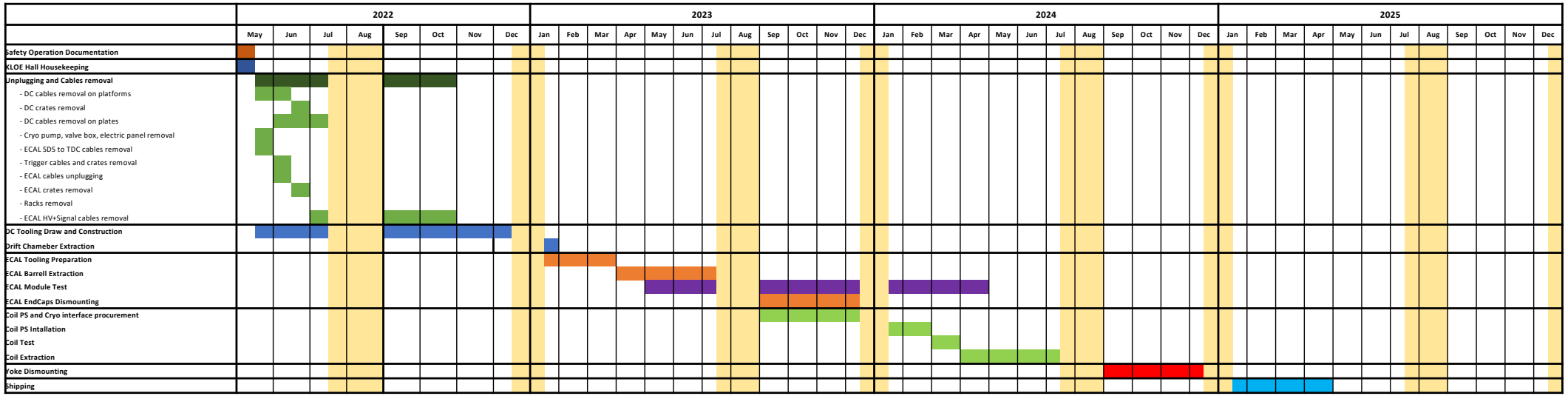
Reverse engineering of vessel
Design and construction of handling and transportation tools
Extraction
Certification and safety procedures
Shipping at FNAL

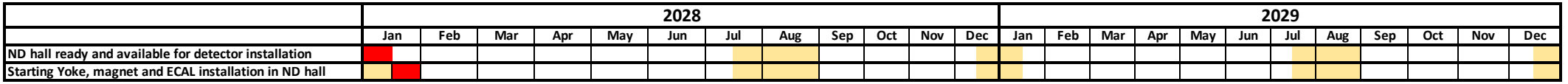
# SAND detetctor: test of the push-pull system

Test of the push-pull system of the SAND/KLOE detector
Gathering information (piston stroke length, bolt pattern etc..) => minor modifications needed for use in the ND Hall rail system

# KLOE-to-SAND time schedule



Spare slides

# KLOE DC extraction: preparation


## Extraction of KLOE Drift Chamber

- Resp. A. Miccoli (INFN-Lecce)


Supports mounted on the concrete blocks columns