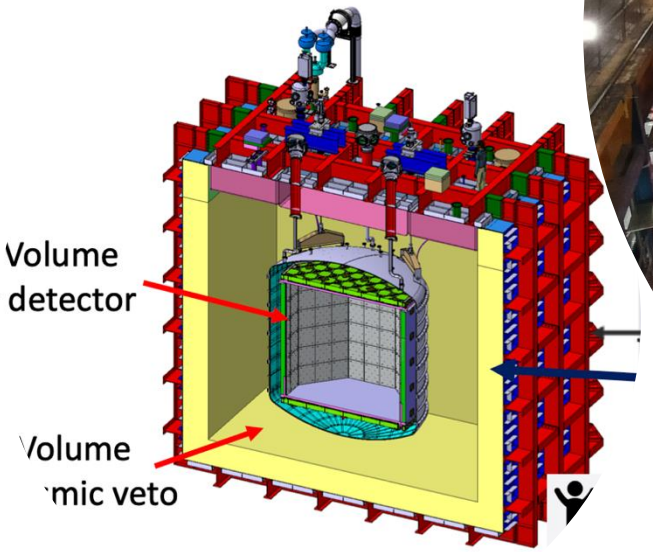
Esperimento: Dark Side 20k

Responsabile Locale: Saverio D'Auria

- Direct search for signals of Dark matter in LAr. Detector al LNGS: 100 t of isotopically pure Underground Argon in 700 t Atmospheric Argon shield.
- Time projection chamber, dual phase
- Optical readout: 26 m^2 of SiPM in 680 modules (PDU) top bottom optical planes + inner veto + outer veto

INFN: Bo, Ca, Ct, Ge, GSGT, LNGS, LNL, **Mi**, Na, Pi, RM, (RM3), TIFPA, To



Status

In construction: ~50% of SiPM modules (PDU) assembled and tested. Outer cryostat completed, TPC parts being machined. Preparing optical plane assembly, data challenge.

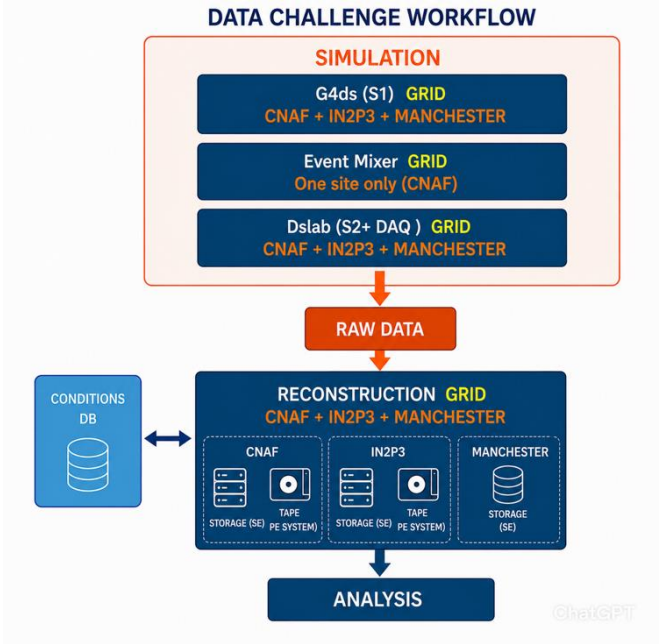
- INFN Milano has key roles in construction coordination and physics simulation
- hardware contribution: all data and power cables to PDU custom radiopure cables and connectors
- Considerable contribution to SiMP assembly

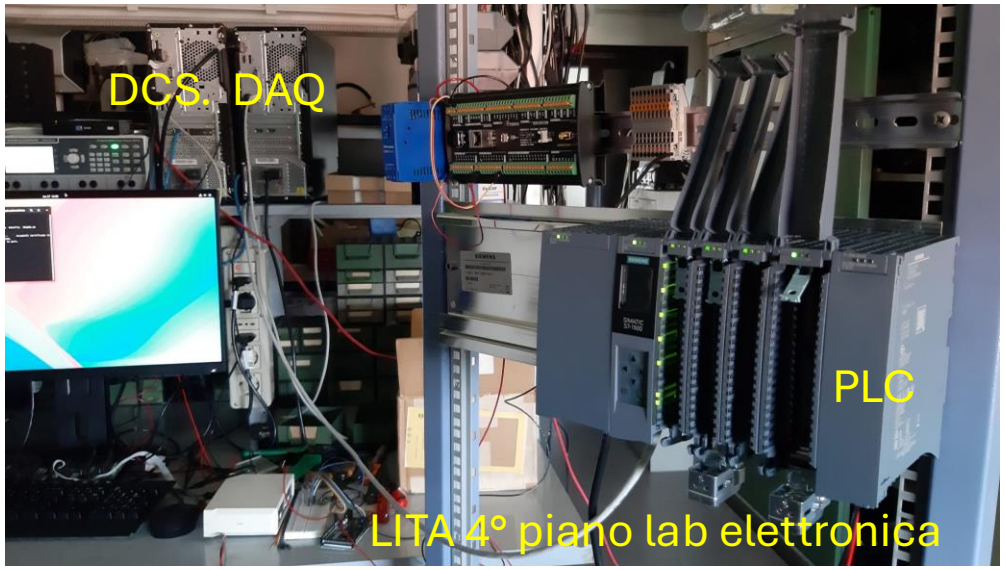
Highlights of activities in Milano

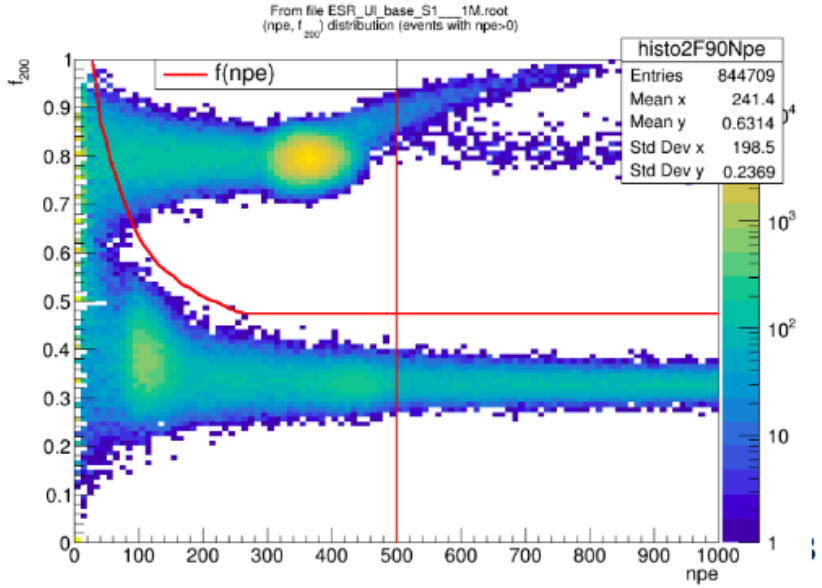
Preparation to Data Challenge (S. Resconi. L. Lippolis)
including all key components: simulation, event mixing, reconstruction, user analysis, tape and conditions DB systems
[S. Resconi distributed computing manager]

Simulation of Alpha Background from TPC surface walls due to radioactive impurities ^{238}U, ^{232}T. (LL, SR, SDA)

Communication between DCS (WinCC-OA) and DAQ (MIDAS)
Templates of Detector Control System panels and controls (LL, FR, SDA)







Nome	Afferenza	FTE
S. D'Auria	UniMi / INFN	0.3
L. Lippolis	UniMi (PhD st.)	1.0
F. Ragusa	UniMi	0
S. Resconi	INFN	0.3
A. Zani	INFN	0.8

Nome	Afferenza	FTE
G. De Guido	PoliMi	0.2
S. Moioli	PoliMi	0.2
L.A. Pellegrini	PoliMi	0.2
A.M. Gargantini	UniBg	0.2
S. Bonfanti	UniBg	0.2
R. Ardito	PoliMi	0.2
A.F. Ghisi	PoliMi	0.2

Activities in Milan

- Technical coordination (A.Zani) deputy construction director: in charge of the construction of the whole detector.
- Detector control system (S. D'Auria) project leader coordinating process control and supervision sw of the detector. Cryostat control system
- Online/offline technical board (S. Resconi) technical coordinator of interfaces between DAQ, offline, data quality, analysis software and DCS

Hardware: 8km of radiopure custom cables made of Siltem, being assembled in a class 7/8 clean environment in Liscate (SAMI) (FR, MC, SD'A) Assembling SiPM tiles (FS)

Support activity:

- Isotopic distillation at ARIA (G.D.G., S.M., L.A.P.) PoliMi DCMIC
- Structural Design and engineering (RA,AFG,FP) PoliMi DICA
- Software Infrastructure Engineering (AG,SB,AB) UniBg

Richieste per il 2027

Missioni:

210 giorni/p operativo + 14 g/p turni + 60 g/p meeting (Template CSN2) *A. Zani Technical coordination	89 k€
Consumi/inventario: analizzatore hand-held di verifica di quadri elettrici 2k Analizzatore cavi 3k Estensione PLC 2k Materiale di consumo 4k	11 k€
Trasporti: trasporto 50 % cavi e camera pulita “soft” per connettorizzazione	10 k€
Calcolo: Licenza TIA portal (upgrade) e WinCC devel (annual) *Potremmo chiedere per tutte le sezioni coinvolte in DCS (+ 10k)*	4 k€
Totale:	114 k€

SERVIZI

Servizio di elettronica
- Test di connettorizzazione
- Test di *tile* a LNGS al NOA
- Montaggio rack di DCS
- **5 mesi/persona**

Servizio officina meccanica
- Supporto generico per piccoli lavori
- Supporto per installazione clean room criostato a LNGS (TC):
- **2 mesi/persona**

Servizio calcolo
- Supporto generico
- Consulenze per SCADA , networking e gestione licenze
- [Calcolo e simulazione al CNAF]