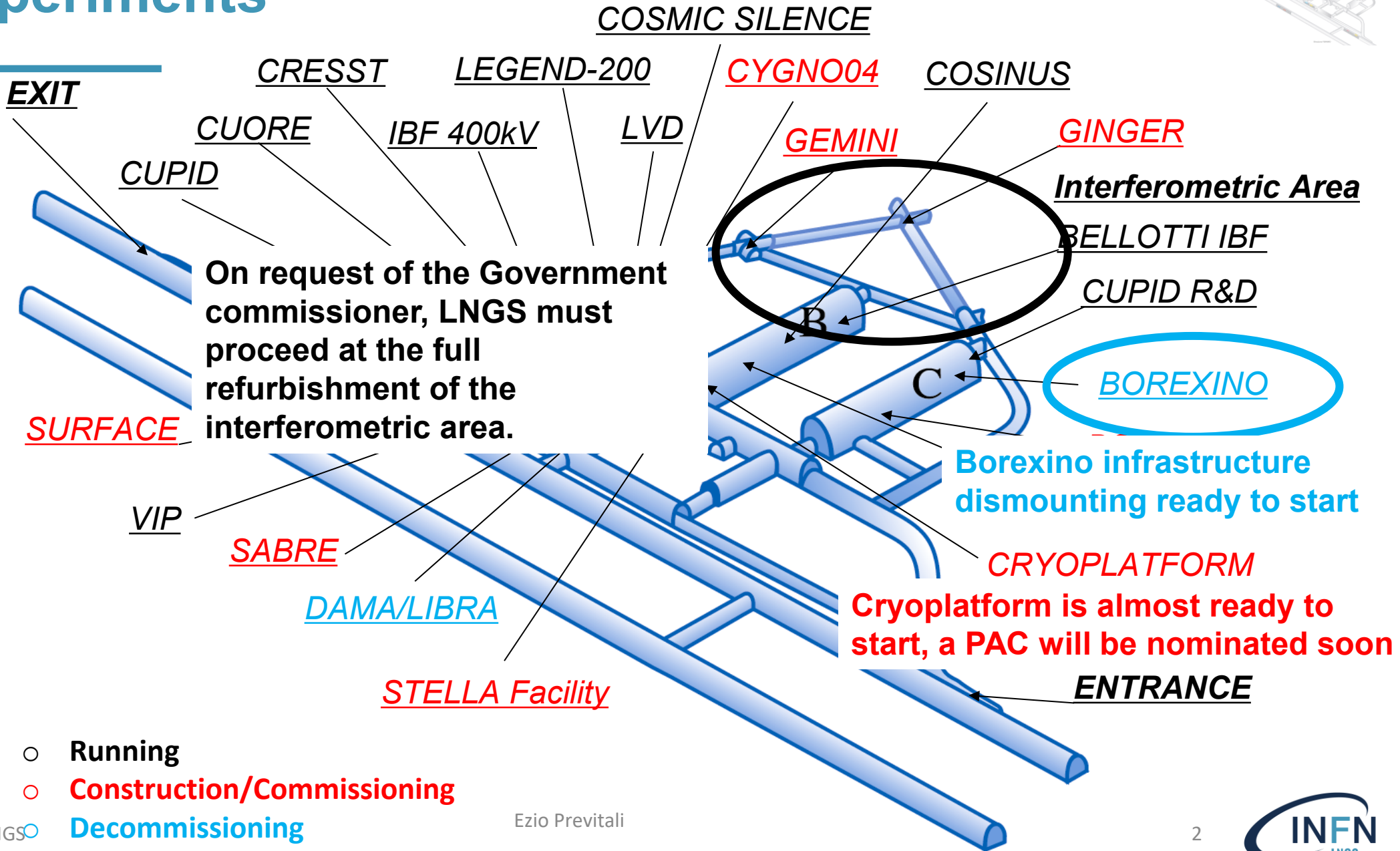


# Gran Sasso National Laboratory



# LNGS Experiments



- Running
- Construction/Commissioning
- Decommissioning

# LNGS People

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**130** staff personnel

Researchers: **18**

Engineers: **41**

Technical : **42**

**12** post doc

Direct connection with LNGS for associated members:



University of L'Aquila



Gran Sasso Science  
Institutes (doctorate school)



LNGS involved people: **292**  
(130 staff + 162 associated)

# International Community of LNGS

## LNGS scientific users

Total: 768 (~1619\*)

Italian: 380 (~528\*)

Foreign: 388 (~1090\*)

\* Data of 2025

During 2020/24 period

~1000 scientific publications

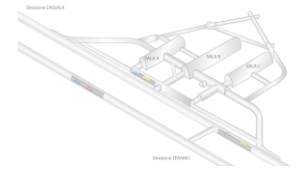
signed by scientist from

**75 countries**

20/04/2026 CS LNGS



# LNGS-Future infrastructures (1)



Extension and upgrading of **electrical distribution network** of underground laboratories.

- **2 MW** each side (AQ-TE)
- **28 UPSs** 540 kW underground
- **6 Diesel Generator** (250 to 1500 kVA)

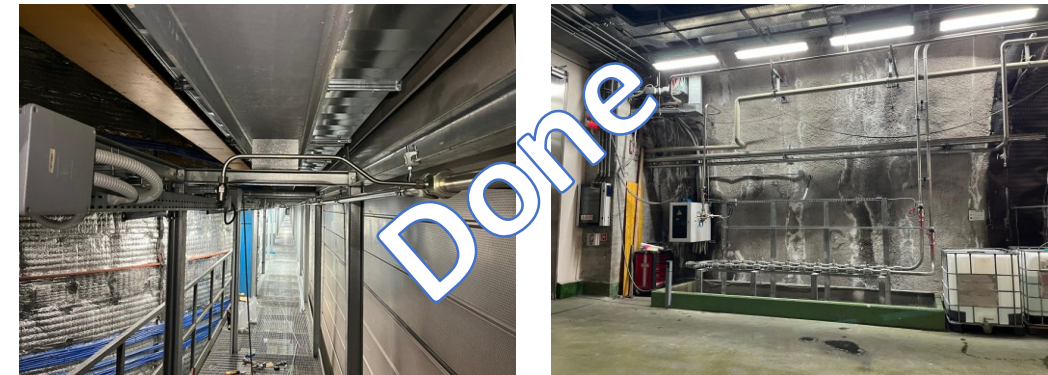
**Fire extinguishing system for the underground Labs**

- **Water mist system**
- «Niagara» on entrance gates
- «Red Devil» in Hall B

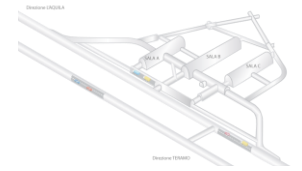


Upgrade and expansion of **safety systems** for the underground labs

- **New gas sensors**
- **New fire detection systems** (Laser Scanner, Smoke System, ...)
- Revamping of **sound diffusion, fire alarm and evacuation system**
- **Smoke detection system** in main Halls, Hall F, Casale S. Nicola and Assergi



# LNGS-Future infrastructures (2)

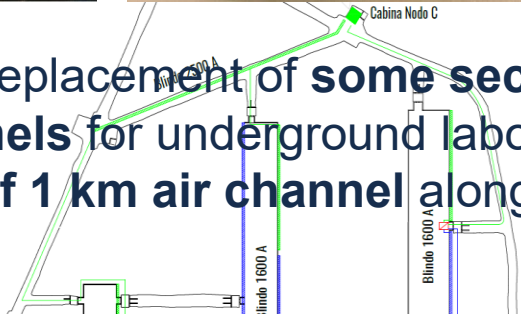


## Upgrade Ventilation System

- **Two air cabinet** in each side of highway (TE and AQ side)
- Each cabin operable for air **inlet and extraction**
- Air flow increased from 60.000 to **80.000 m<sup>3</sup>/h**
- Air distribution by means of **4 UTA**

Maintenance and replacement of **some sections of the ventilation channels** for underground laboratories

- **Replacement of 1 km air channel** along the highway



## Upgrade and expansion of **cooling systems** of the LNGS underground laboratories

- Total **power** cooling **1.1 MW**
- **Primary** circuit flow rate **90 l/s**
- **Secondary** circuit flow rate **~20 l/s**
- Water **temperature** in secondary circuit **9-12 °C**
- **Redundancy** of the circulating pumps

# LNGS-Future infrastructures (3)

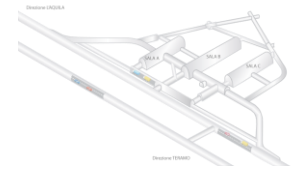


- Upgrade of **Lab2 Building**
- Requalification **Hall di Montaggio Building**
- Upgrade of the **3D Laboratory**
- New lab for **Space Application**
- Completion of the **new CED**

**Upgrade** of the **Fermi Auditorium** with modern audio-visual equipment and high-speed network can guarantee a high quality of on-site and online events



# LNGS-Future - Cryogenics



## CryoPlatform

- New lab for ultra low temperatures
- 2 new dilution fridges available
  - A standard one for cryogenic test
  - A special one for pilot experiments
- Construction completed for end of 2025
- PAC will be nominated soon
- Applications could be send to LNGS



Almost Done

## New Helium Liquefier

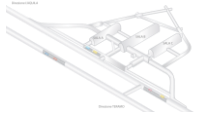
- Production started in July 2025
- 20 l/h production capacity



In Operation

# DBD experiments @ LNGS

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LNGS is involved in supporting two experiments

## CUPID

- The reconfiguration of the CUORE infrastructure **is ongoing**
- The definition of the transition from CUORE to CUPID **defined**
- New CRYOPlatform facility of LNGS **ready to start**
- Definition on funding profile **awaiting indication from INFN**

## LEGEND-1000

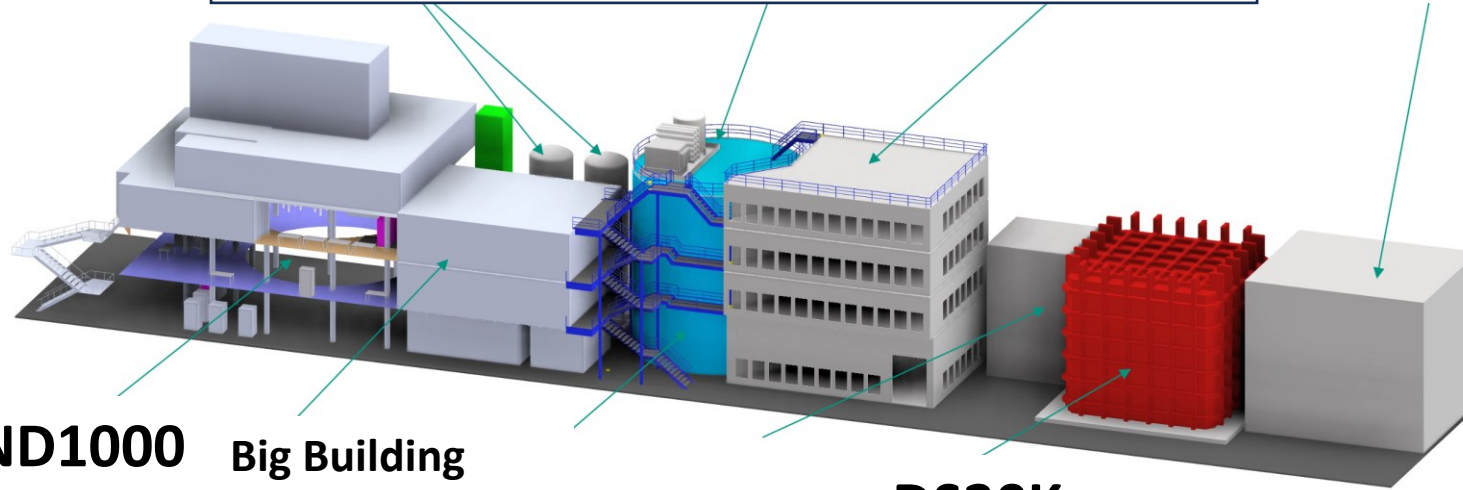
- LEGEND-1000 is part of “**Current shortlist of prioritized research infrastructures in Germany**”
- LNGS hosted the **BMBFR review committee last week**
- **DOE/SC CD-1 Review of the LEGEND-1000 Project** (ORNL), done in November 18-20, 2025
- **LEGEND-1000 Technical Design Report Part 1: Infrastructures and facilities** discussed with LNGS
- LNGS funds to support the Legend1000 infrastructures **under finalization with local authorities**

# Possible Future Layout of Hall C



**XLZD site selection ongoing**

**DS20K  
Cryogenics**



**LEGEND1000** Big Building  
WT and Cryostat West

**DS20K  
Cryostat**

LNGS is working to reconfigure the available space to allocate all experimental infrastructures

- Implementation of all the Hall C services and safety aspects is ongoing
- General design of available space and infrastructures for each experiment is well advanced
- Radon free air plant was refurbished and available for new installation
- Clean rooms in Hall C underground area and availability of assembly space under and above ground
- Material screening (STELLA and Chemical labs), mech. workshop, electronic lab, .....

# “Enrico Bellotti” Ion Beam Facility



## Proposal for beam time schedule 2026

### Remaining backlog (from 2<sup>nd</sup> Call (2024))

- ~~70 BTU (7 weeks) -- 1<sup>st</sup> Call (2023)~~
- ~~215 210 BTU (25 weeks)~~

### New requests (from 3<sup>rd</sup> Call (2025))

- 74 BTU  $^4\text{He}^+$  beam & 460 BTU  $^{12}\text{C}^{2+}$

### Assignment of Backlog

#### **2 weeks installation time**

anti-Compton shielding for  $^{12}\text{C}+^{12}\text{C}$  project at beam line 1

Removal of Shades detector infrastructure from beam line 2

#### **16 weeks “semi-unattended” $^{12}\text{C}^{2+}$ beam**

195 BTU -- to be provided in 4 slot à 4 weeks

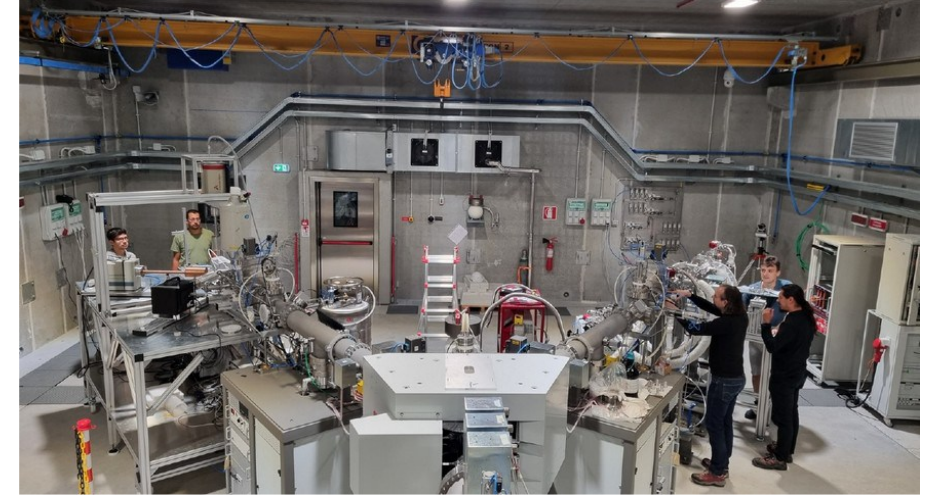
#### **3 weeks attended $\alpha$ beam plus 1 week installation time**

15 BTU - EASy (Phase 1) - to be provided in 1 slot à 4 weeks.

### Assignment proposal for 2026

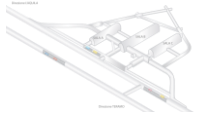
#### **8 weeks “semi-unattended” $\alpha$ beam**

74 BTU from 3<sup>rd</sup> call “EASy” - to be provided in 2 slots à 4 weeks.



# Requests for new experiments @ LNGS

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During the last few years LNGS received many requests for new activities:

- RESNOVA
- BULLKIDs
- D2R2
- GINGER
- GEMINI
- OPOSSUM
- SURFACE
- .....
- **RADIO\_AXION**
- **GAIA**

Many of them are EU grants, some proposed by foreign institutions, few from CSN2

**It is important to maintain the requested access compliant with LNGS rules**

All these projects **requested a support from LNGS**: sometime light sometime strong.....

In this framework is mandatory to **coordinate the strategy** to optimize the available resources



## Actual Composition of LNGS SC

- **Nigel S. LOCKYER** (chairman)
- Dave Newbold
- Giacomo CUTTONE (IBF PAC Chair)
- Michelle DOLINSKI
- Monica Sisti
- Laura Covi
- Silvia PASCOLI
- Fairouz HAMMACHE (IBF PAC)
- Jordi JOSÉ (IBF PAC)

## Two new members join the SC

- **Daniela Bortoleto** (University of Oxford).
- **Maria Luisa Sarsa** (University of Zaragoza)

I would like to thank Daniela and Maria Luisa for their willingness to join the SC of LNGS

# INFN LNGS

