



2nd Workshop on Onubb search in Xe - next generation experiment, Manchester

Laboratorio Subterráneo de Canfranc (w/o NEXT-100, discussed in various talks)

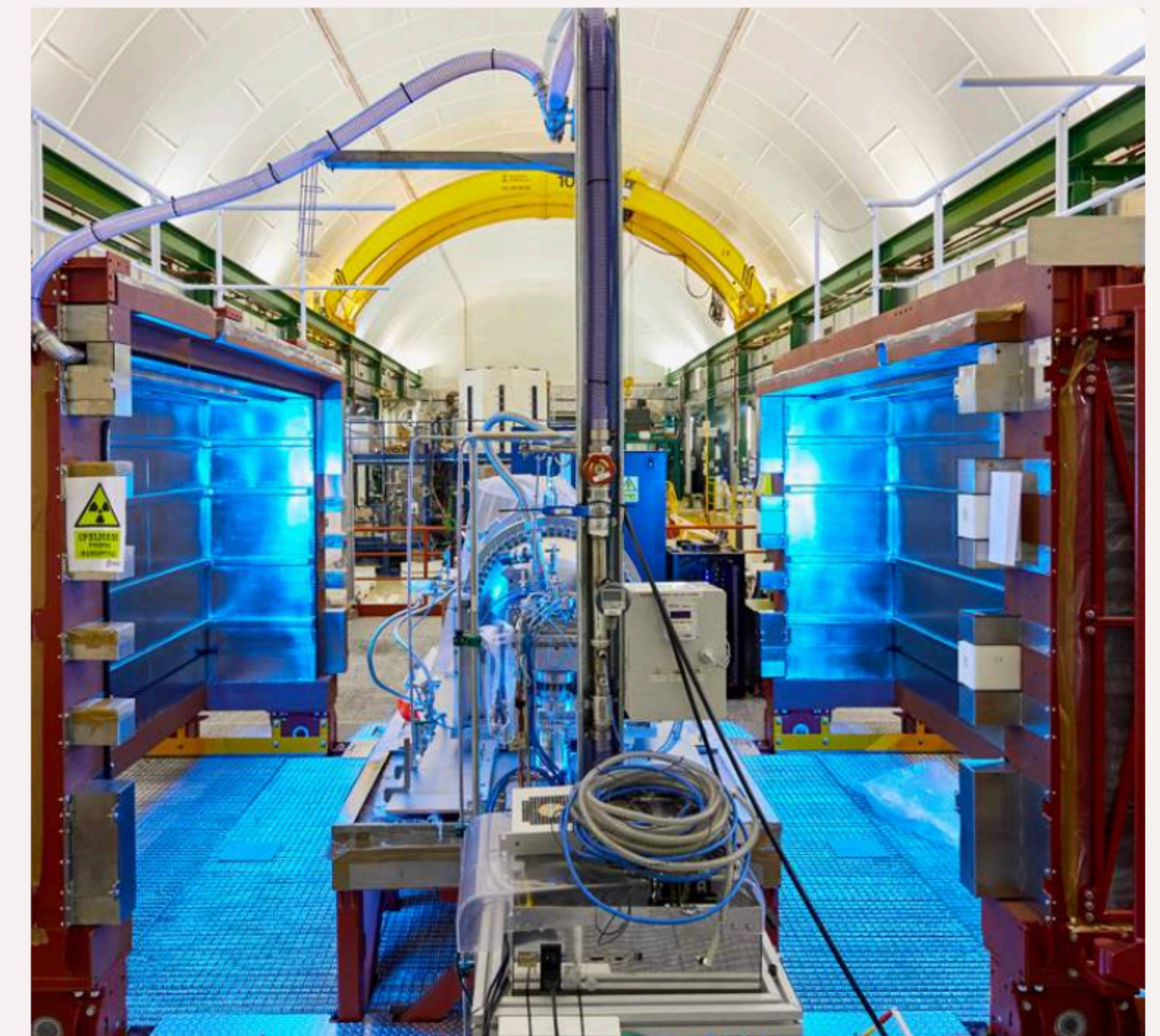
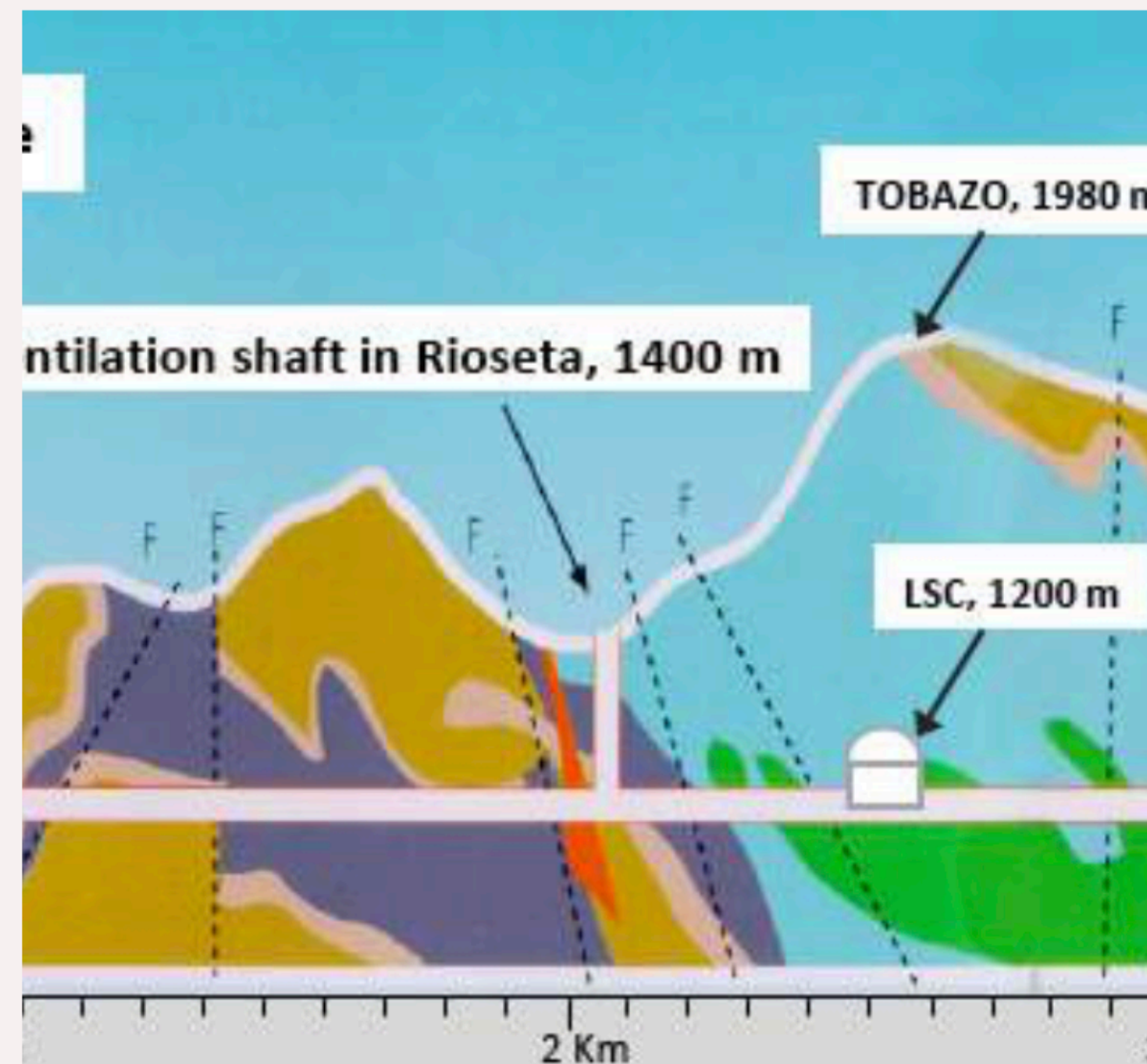
Laboratorio Subterráneo de Canfranc

Located in Spanish-French Pyrenees border. Two-way access tunnels: abandoned train tunnel and operative road tunnel.

First experiments (IGEX, ...) since 1986. Modern lab, 1600 m², operative since 2010. 350 scientists from 50 institutions.

800 meters (v) of rock - muon flux is $5 \times 10^{-7} \text{ cm}^{-2}\text{s}^{-1}$; neutron flux ($E < 10 \text{ MeV}$) is $3.5 \times 10^{-6} \text{ cm}^{-2}\text{s}^{-1}$; gamma flux is $2 \text{ cm}^{-2}\text{s}^{-1}$

Radon abatement system: 220 m³/h radon-reduced air at 1 mBq/m³



A. LSC People

22 LSC members in May 2026: Administration (3+2), Safety&Maintenance (2+0), Technical+Scientific area (4+6), Senior researchers (5).

8 contracts finished in June 2026.

New posts:

- Specialized Scientist in Electronics: finalized (Scientific).
- Two positions associated to projects: finalized (Scientific).
- Two Tech positions: finalized (Technical).
- Mechanical Technician (Hiring!)
- Specialized Scientist in sub-Kelvin technologies. (Hiring!)
- Searching for Specialized Scientist in low background (Hiring!)

B. Strategic Plan: Open and Competitive Access



Acceso Instalaciones Subterráneas



ACCEDER



Acceso a Plataforma de Biología



ACCEDER

Outstanding Facilities: Underground Laboratory and Biology Platform.

B. Strategic Plan: Current experiments and New proposals

- ANAIS-112 (Exp-01-2008)

First phase decommissioning completed.

Full decommissioning in 2026.

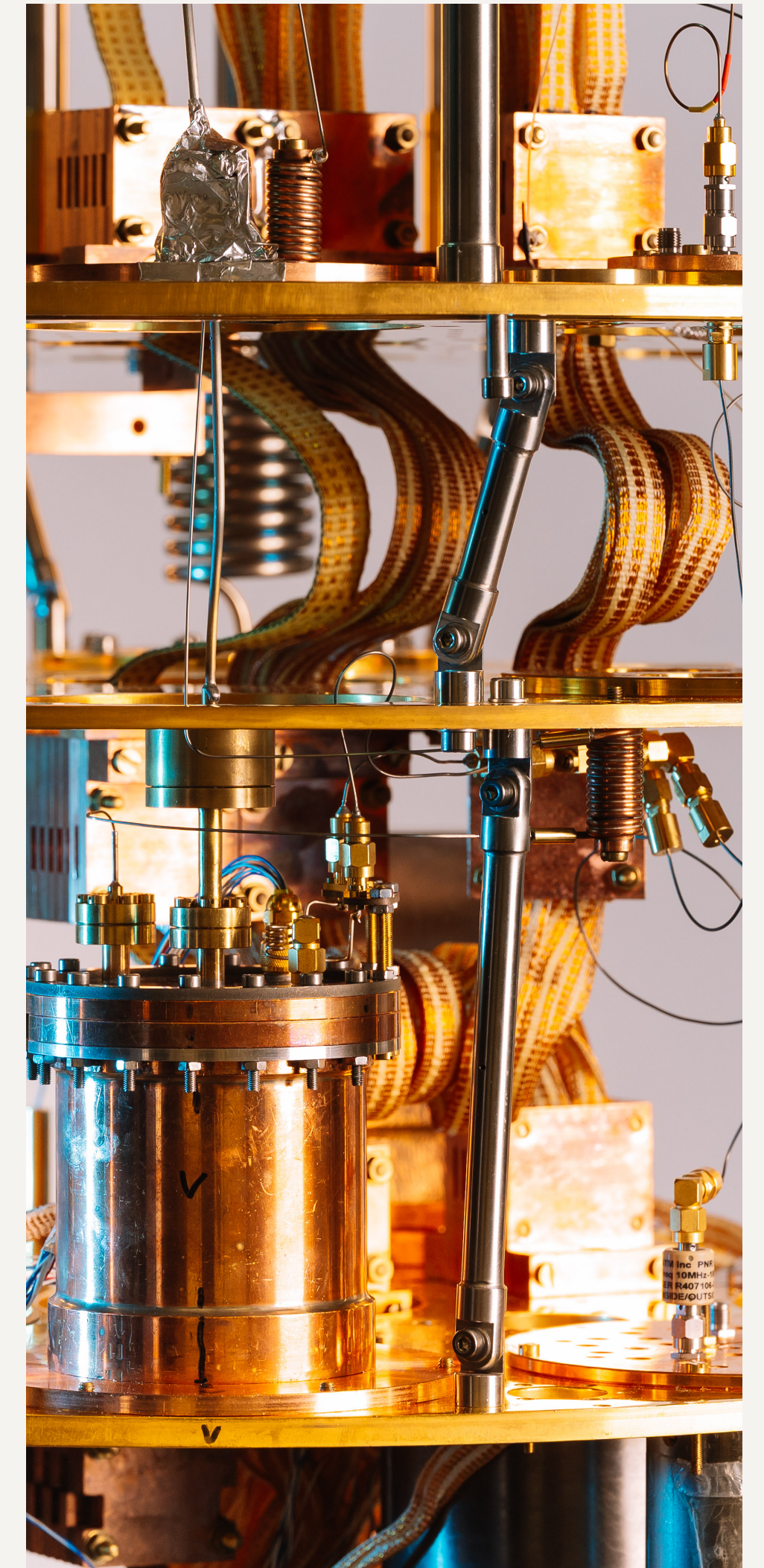


- New EoI: The DELight experiment (low mass dark matter).

(Awarded 6 M€ by DFG - six groups @ Heidelberg-Freiburg-KIT)

Ongoing work:

- Review Tech. plan & timeline of DartinArDM (Exp-13-2019).
- Review science goals & timeline of CROSS (Exp-12-2017).
- Discussions and funding requests on ~ 50 ton size LS detector.



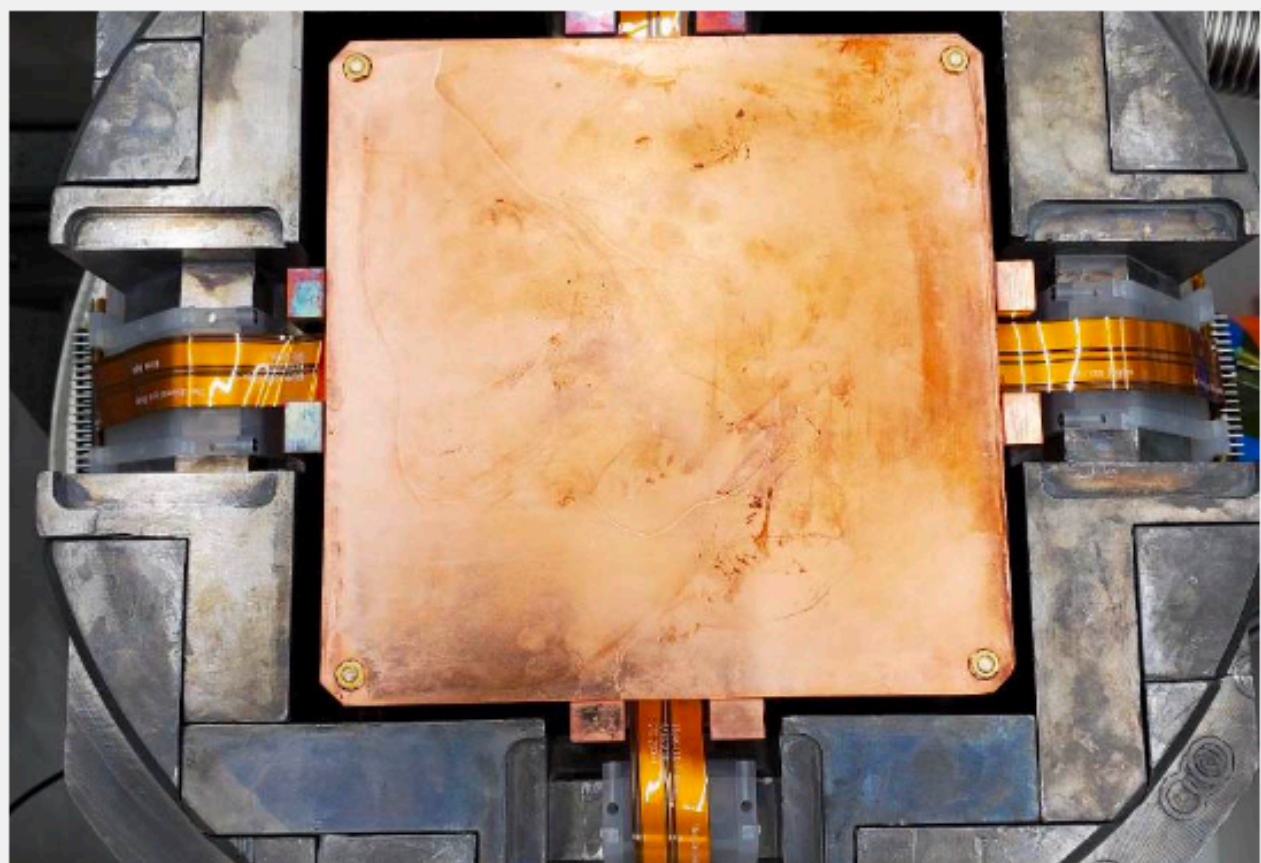
C. Low Radiactivity Techniques



HPGe detector GeRysy
 $\mu\text{Bq/kg}$ sensitivity



ICPMS-QQQ underground
2 ppq sensitivity in Uranium



EFCu: DAMIC lids
Inside clean room underground

Detector	M_{act} [kg]	V_{cham} [L]	Lab	Counting rates in the full energy range [cts/d/kg] and for various peaks [cts/yr/kg]						
				40 - 2700 keV	609 keV [^{226}Ra]	662 keV [^{137}Cs]	583 keV [^{228}Th]	1332 keV [^{60}Co]	1461 keV [^{40}K]	2614 keV [^{228}Th]
GeRysy	2.27	15	LSC	50 $\pm$ 1	74 $\pm$ 19	< 27	27 $\pm$ 17	< 37	60 $\pm$ 16	25 $\pm$ 9
GeMPI	2.21	15	LNGS	66 $\pm$ 1	< 30	57 $\pm$ 27	< 21	35 $\pm$ 8	86 $\pm$ 12	18 $\pm$ 5
GATOR	2.20	15	LNGS	103 $\pm$ 1*	99 $\pm$ 33	50 $\pm$ 17	--	83 $\pm$ 17	83 $\pm$ 17	33 $\pm$ 16
GeOroel	2.31	40	LSC	142	190	--	182	91	66	--

* (100 – 2700) keV

Table 2: Parameters and counting rates (full energy range and for selected lines) for the GeRysy and other most sensitive HPGe spectrometers: GeMPI and GATOR at LNGS and Oroel at LSC. For the full energy range (40 – 2700 keV) the counting rate is given in cts/day/kg and for the lines in cts/yr/kg.

C. Status of GeRysy family



		Detection limits: [mBq] / [mBq/kg]				
		²²⁶ Ra	²²⁸ Th	¹³⁷ Cs	⁶⁰ Co	⁴⁰ K
Well	Low density	0.02	0.03	0.005	0.005	0.15
		1.0	1.7	0.2	0.2	7.3
	High density	0.03	0.04	0.005	0.006	0.18
		0.14	0.23	0.03	0.03	1.0
Detector chamber	Low density	0.3	0.5	0.08	0.08	2.4
		0.02	0.03	0.005	0.005	0.16
	High density	1.4	2.4	0.3	0.2	5.1
		0.01	0.02	0.002	0.002	0.04

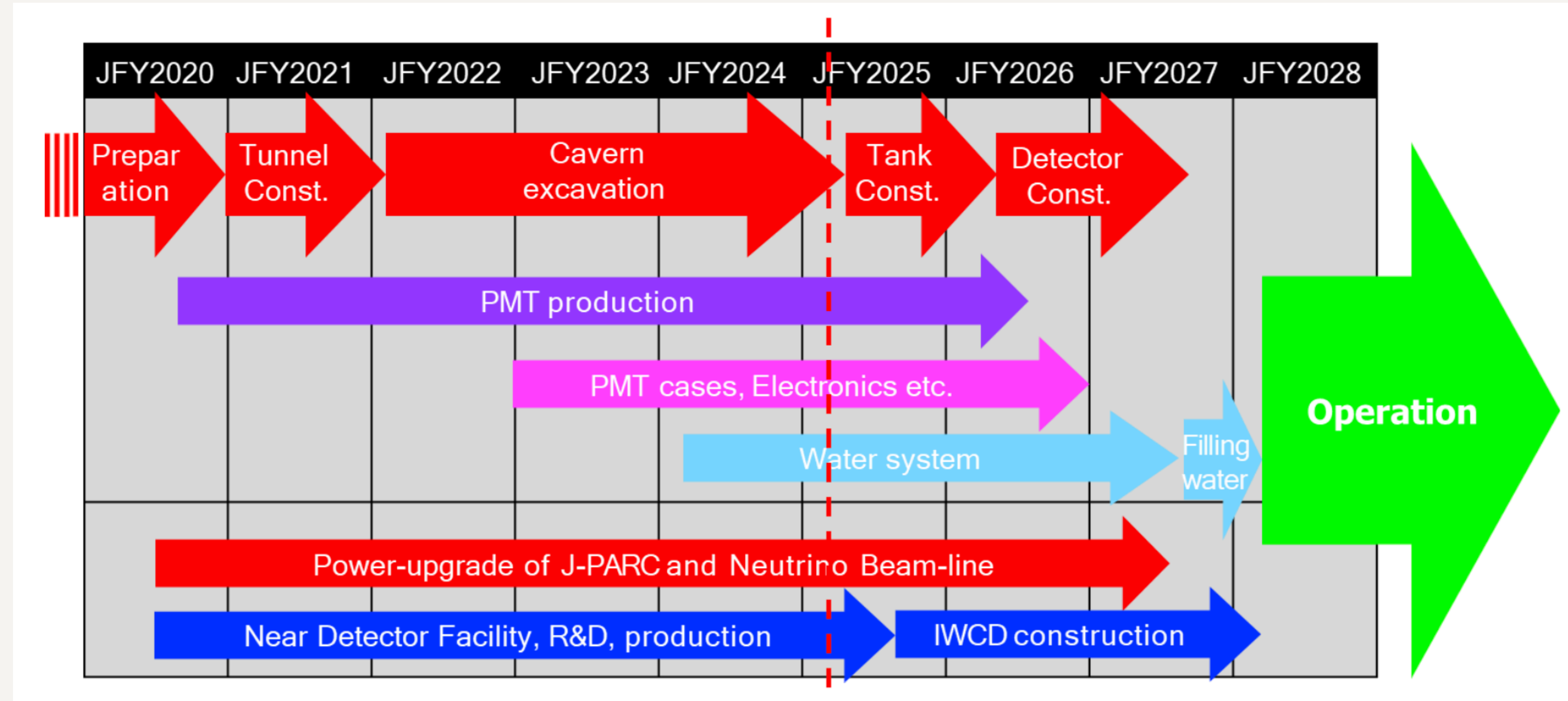
Table 3: Detection limits for absolute activities (first number in the row) and specific activities (second number in the row) of low (1 g/cm³) and high density (9 g/cm³) samples placed in the detector well (20 cm³ volume) or in the chamber (15 L volume).

GeRysy-1 screening: stainless steel (LEGEND, DS-20k), ULTEM insulator (LEGEND), WLS Fibers (LEGEND), 3D Printed Dental Resin Sample (LEGEND), Ph-Br (LEGEND), ESR Film (DS-20k), SMD Resistors (DS-20k), TX-100 Liquid Scintillator (DS-20k), Optical Gel (NEXT-100), Peek screws (NEXT-100), Teflon screws (NEXT-100).

Gerysy-2: arrived at LSC. Copper blocks produced by the KGHM Polska Miedź Company (from fresh and selected cathodes) in 2025. Cast Cu blocks (100 cm x 100 cm x 20 cm) hot-forged, cut into smaller blocks (20 cm x 20 cm x 800 cm) and stored underground (1.3 ppt U, 0.2 ppt Th). Gamma counting is in preparation, ²¹⁰Pb determination is ongoing. Cu for fabrication of detector cryostat delivered to Canberra/Mirion. Machining of shield parts ongoing in Kraków.

Gerysy-3: Copper electroforming elements in preparation for GeRysy-3.

X1. Hyper-Kamiokande



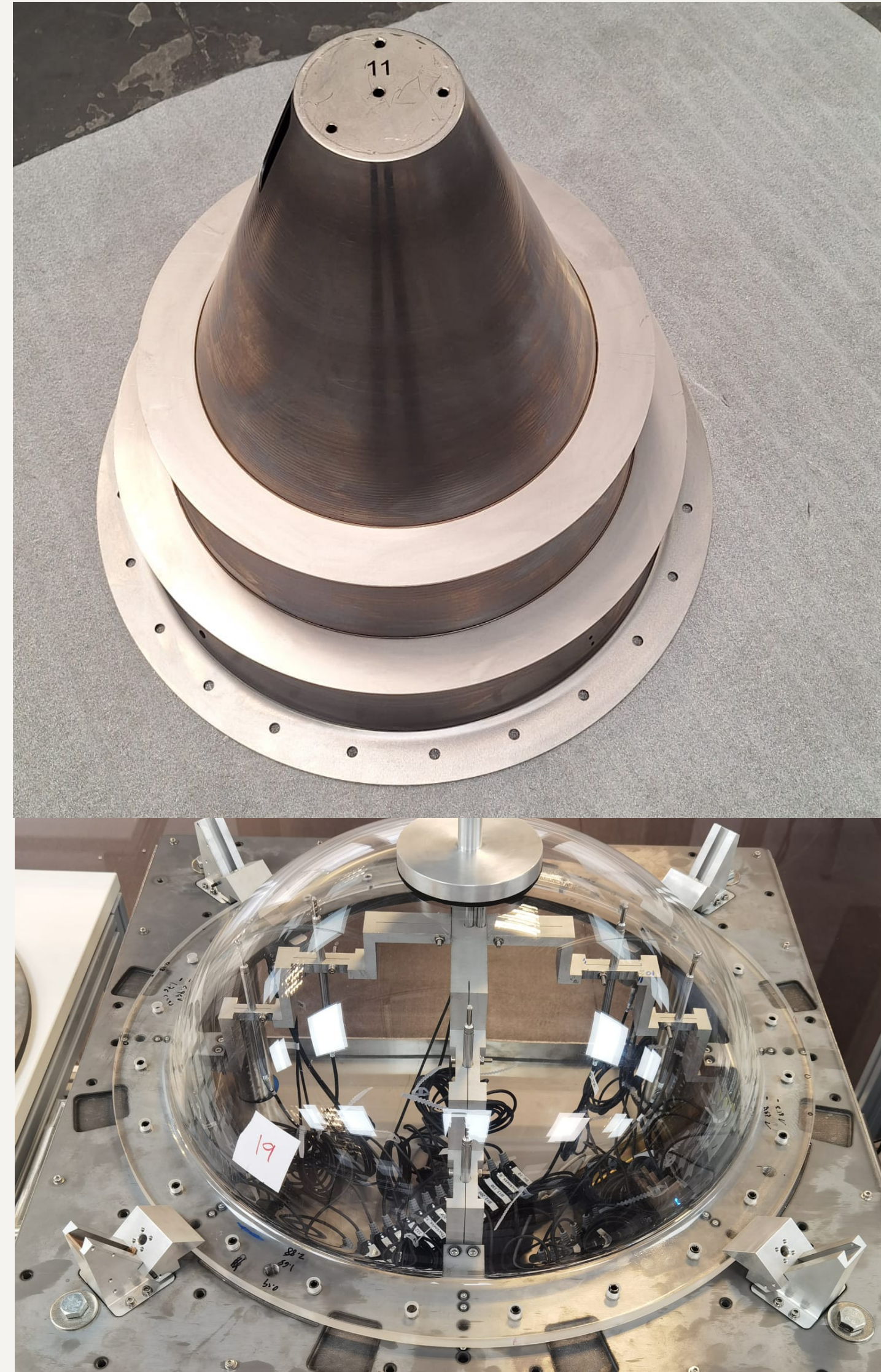
Spanish Contribution to the Construction of HK:

PRTR project completed (2021-26): R&D in various areas (LSC with DIPC, UdG, UO, UPV, USC), procurement of power supplies and partial fabrication of covers.

2024 & 2025 MICIU HKK funds: full fabrication of covers, shared procurement of DPBs and electronics cabling, Geomagnetic compensation coil.

2026 MICIU HKK funds (discussion in progress): installation of geomagnetic compensation and ventilation systems, cleaning of covers, logistics and storage.

X1. Fabrication & QA of HK covers (PMMA domes, metal bodies, A&A)



X2. Biology Platform @LSC: Impactful in DUL biosciences



Canfranc biology platform: exploring life in cosmic silence

Rebecca Hernández-Antolín, Laura Cid-Barrio* and Carlos Peña-Garay

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RESEARCH ARTICLE
Month YYYY Volume XX Issue XX e03580-25
<https://doi.org/10.1128/spectrum.03580-25>

Reduced gravity and muon flux absence affect *Caenorhabditis elegans* life history traits and viral infection

Ana Villena-Giménez ¹, Victoria G. Castiglioni ¹, Juan C. Muñoz-Sánchez ^{1,2}, Esmeralda G. Legarda ¹, Rubén González ³, Santiago F. Elena ^{1,4}

Aging and Disease
www.aginganddisease.org

Early access date: May 18, 2026
<http://dx.doi.org/10.14336/AD.2026.0025>

Original Article

Cellular Senescence in the Absence of Galactic Cosmic-Ray Muons

Àngela Llop-Hernández^{1,2#}, Júlia López^{1,2#,a}, Sara Verdura^{1,2}, Rebecca Hernández-Antolín³, Laura Cid-Barrio³, Carlos Peña-Garay^{3,4}, Tomás Alarcón^{5,6,7*}, Elisabet Cuyàs^{1,2*}, Javier A. Menendez^{1,2*}

Metagenomic analysis of heavy water-terrestrial bacterial communities

Rivas-Santisteban^{1*}, José M. Martínez², Cristina Escudero³, Rebeca Sánchez⁵, Esteban Domingo², Carlos Sánchez⁶, Francisco Sobrino^{2,*} and

survive and thrive in unusual and extreme environments, such as highly pure, deleterious heavy water (>99% D₂O), in a natural supply. Deep DNA sequencing analyses have been performed with *Pseudomonadota* and *Bacteroidota*. These bacteria use costly amino acids compared to the related species. Sulfur and modification were notably abundant, particularly in the



Cosmic silence and viral noise: transcriptomic crosstalk in *Caenorhabditis elegans* under simulated space conditions

Ana Villena-Giménez ^{1†}, Esmeralda G. Legarda ^{1†}, Rubén González ², Victoria G. Castiglioni ^{1,3} and Santiago F. Elena ^{1,4*}

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DULIA-BIO - Deep Underground Laboratories in Bio-Sciences

9–10 de noviembre de 2026
Europe/Madrid zona horaria

Introduzca su término de búsqueda

Vista general
Inscripción
Lista de participantes
Practical Information
Travel Information
Accommodation Options
How to get to the venue?

DULIA-bio is a series of workshops focussing on Biology and Bio-science related research undertaken in the world's deep underground science facilities. This 4rd edition of DULIA-bio will be held at the Canfranc Underground Lab Headquarters, in Canfranc (Spain).

The purpose of this workshop is to showcase, review and discuss ongoing and future Bio-science related research in underground laboratories. It also aims to facilitate discussion of future plans for improved inter/intra subject collaboration and communication, and to explore requirements for future infrastructures to best support underground Bio-science research.

Topics

- Life in extreme environments
- Astrobiology and Planetary Exploration

X2. Biology Platform: Novel major result!

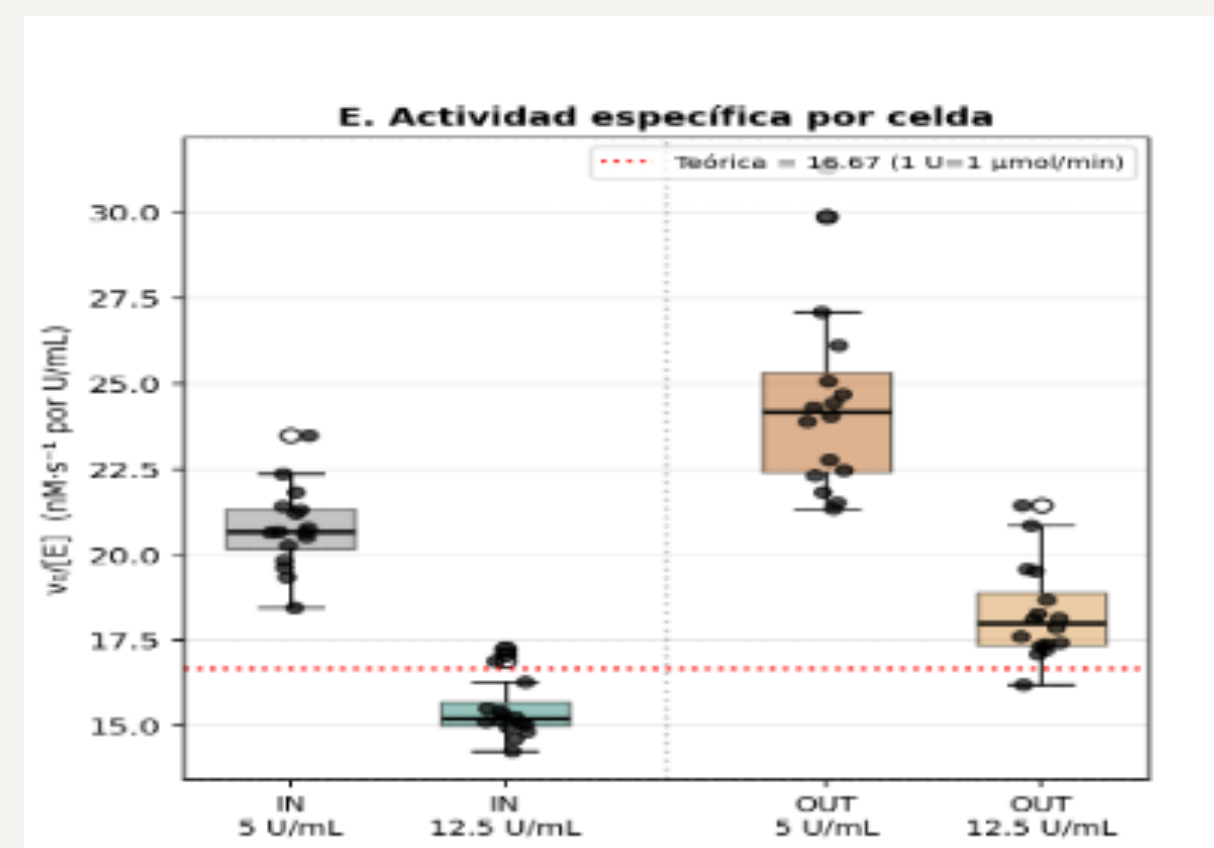
Renewed open access protocols following rules applicable to all Outstanding Facilities in the ICTS: 4 proposals to access the LSC BioPlat in next semester.

Experiments led by LSC (in collaboration with USC, CRM, CMAM): 1. Antioxidant enzymatic reaction speed reduced in cosmic silence. 2. Exploring the impact of solar flares and CME cosmic rays on life in space.

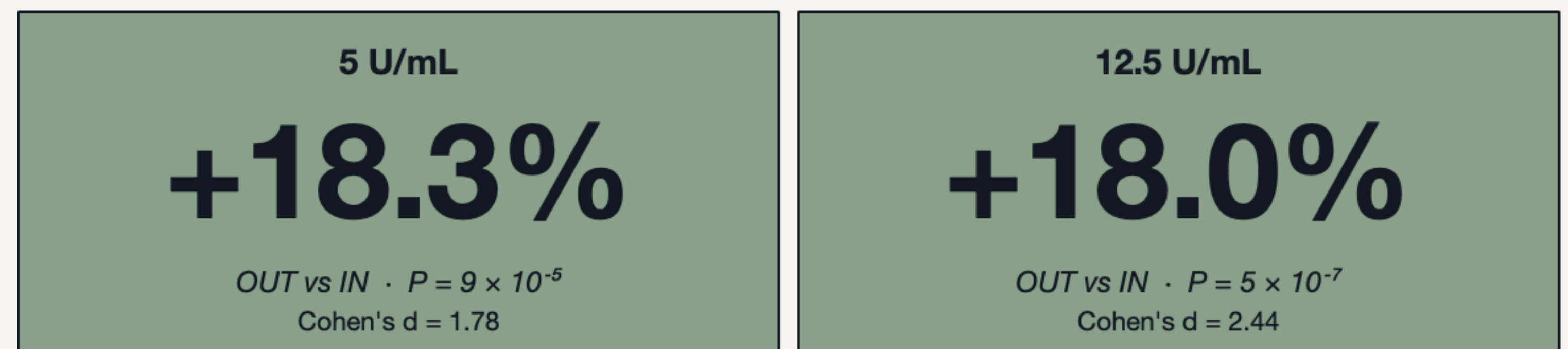
Results on the activity of glutathione peroxidase (GPx), an essential antioxidant enzyme,: Indirect measurement approach, in which GPx catalyses the conversion of reduced glutathione (GSH) into its oxidised form (GSSG). This reaction is coupled to a secondary process, where glutathione reductase (GR) and β -Nicotinamide Adenine Dinucleotide Phosphate Reduced (NADPH) regenerate GSH from GSSG. Because GPx activity determines the overall reaction rate, its kinetics can be inferred from the decline in NADPH absorbance at 340 nm as NADPH is oxidised to NADP+.



200+ enzymatic reactions tested on surface and underground biology labs, with careful control of verify systematics (C. Buades and R. Hernández, with support of A. Bayo and E. Roig):



Key finding · multiplicative scaling of reaction speed by muons





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