



# **ISOLDE Collaboration Committee Collaboration Matters 6th November 2024**

Sean J Freeman



## The plan for this section:

- LS3 Planning.
- MOU Updates.
- Processes for new initiatives.
- ESPP.
- DRD.
- AGATA.
- Other matters.

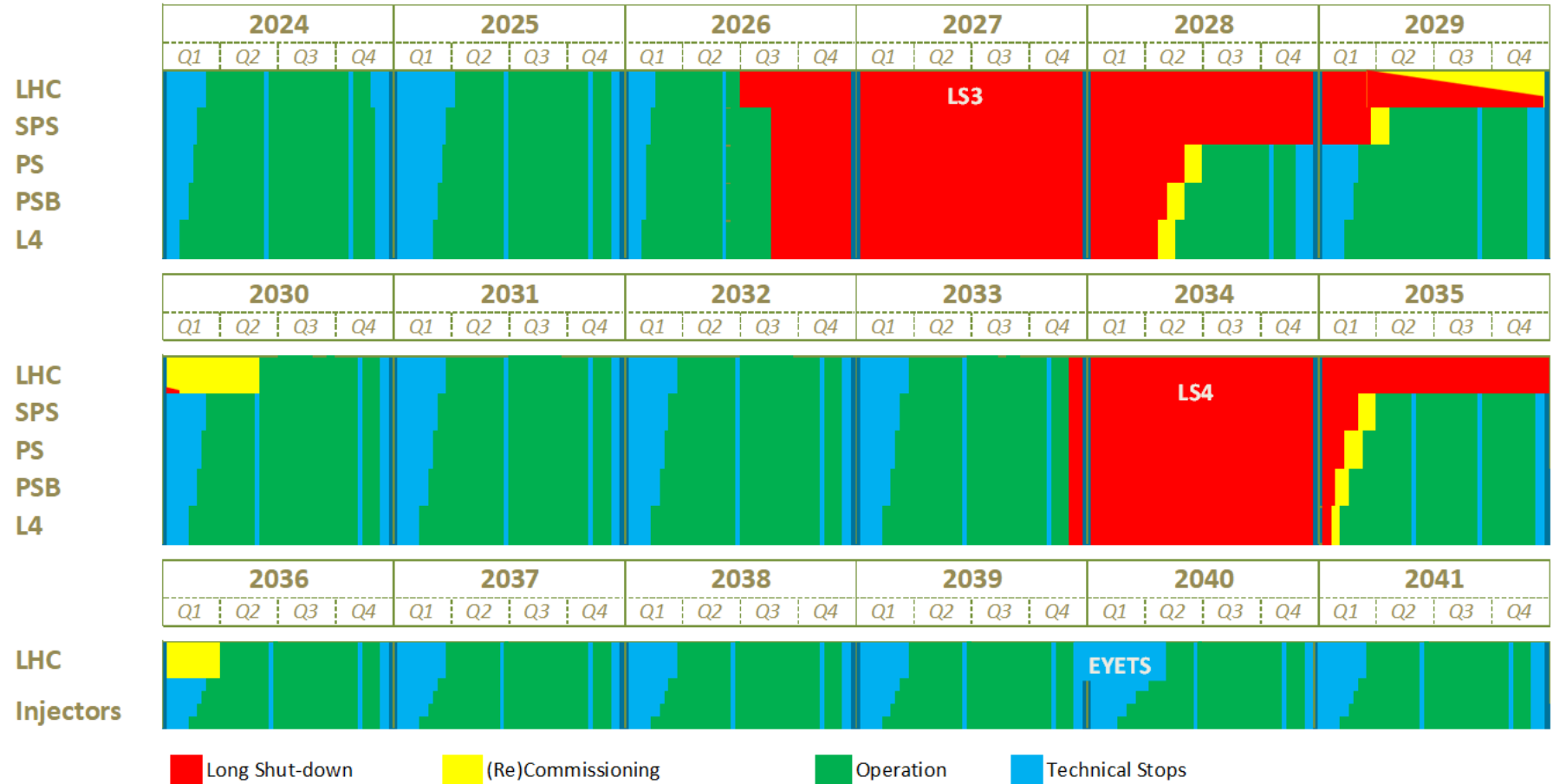
*Where I need input from ISCC is in purple!*

*Follow up actions in green!*

# Long-term schedule for accelerator complex (version 5th Nov 2024)

Improved from 2028 since October, PSB start shifted from July to mid Q2!

Still needs final approval!



**PSB down:**  
1st Sept 2026 to Q2 2028

**Beam Dump Replacement:**  
two years

Align two periods at start or at end?  
Matters because HIE-ISOLDE running only in second half of calendar year.

# ISOLDE LS3 Planning:

Uncertainties at start of November:

- Cryoplant operation in YETS 25/26 (*shift sig intervention to 24/25 and avoid cooling water shutdown need confirming, carry power outage risk*).
- CM1 refurb in 2026. (*manpower TBC and financing part of MTP bid*).

Comes down to:

- maximise physics – but carry CM issues forwards without clear solution.

Or:

- compromise a bit on physics – but allow CM1 refurbishment and help other technical risks (BTY, dumps).

*Comments or questions to understand scenarios?*

*Suggestion how to move forward on next slide.*

	Months of beam time available with protons (+ winter physics)					Pros	Cons	Comments
	2026		2027	2028				
	Low energy	High energy		Low energy	High energy			
1: Run with protons until September 2026	6	2.5	0	0	0		Worst beam availability for both low and high energy.	Only 2.5 months available for HIE-ISOLDE in three years - so unacceptable. No running until 2029. Unlikely that CM1 refurb can be done in LS3 and difficult to do in a YETS. This is the scenario most users will have in their head after the recent announcement.
2: Run a normal year for low and high energy physics in 2026	8	4.5	0	0	0	Operation is routine	Requires UNAC4 and PSB beyond Sept 26	Impossible within the high-level planning for the injectors
3: Run with protons until Sept 26 followed by a period of "winter physics" for low and high energy experiments until Nov 26.	6+2	2.5+2	0	0	0	Sufficient "winter physics" on the books to cover this period - some may run in 2024/5 but physics demand unlikely to be an issue	Requires hall services for winter physics	ISOLDE Hall Services in Sept/Oct 26 will be too limited to support this due to high level planning for LS3
4: Keep the linac cold over the YETS 25/26 and bring HIE-ISOLDE back asap to run low and high energy physics until Sept 26.	6	6	0	0	0	Maximises HIE-ISOLDE running	Requires very short YETS intervention for cryoplant. No natural point to refurbish CM1.	Difficult in a normal year. Initial reaction was that significant intervention is required in YETS 25/26 that cannot be delayed or brought forward - but this will be looked at again before the ISOC meeting.
5: Cease ISOLDE running in Dec 2025 to facilitate early beam dump replacement. Be ready to take beam for both low and high energy physics in mid-2028.	0+17	0	0	6	5.5	HIE-ISOLDE running only marginally less than Case 4. Misalignment in time with main LS3 schedule could liberate technical resources, e.g. to facilitate refurbishment of CM1 and BTY line to 2 GeV. Eases some aspects of beam dump project.	Carries risk from delays in beam dumps. Carries risk that physics of some proposals might be scooped; ISOLDE expts usually unique but physics could be addressed in other ways. Needs expectation management due to users assumptions after the publication of LS3 timescales about 2026; may "reintroduce" pressures for certain user activities.	Describe as "least worst" scenario but preserves HIE-ISOLDE running. Needs confirmation of: (i) restart date of protons from PSB in June 28; (ii) possibility of refurbishing CM1 in 2026. Investigating the possibility of limited "winter physics" during February 2026.

# Suggestion for ISCC to endorse?

- *Plan A: Prioritise Scenario 5 (stop in end 2025 to allow CM refurb, back Q2 2028 with protons).*
- *Plan B: Scenario 4 (cryoplant cold, run LE/HE from early 2026 and end Aug, back in 2029)*
- *Avoid: Scenario 1 (normal year 2026, end of Aug, back 2029)*

ATS management are supportive of this approach.

Any remaining uncertainties we will need to carry as risk.

Final schedules need confirming with ATS management in mid-November.

SJF to update by email as needed – but may need to react to a fast-changing local context and may need to act on your behalf quickly within these priorities!

# MOU Annex Updates:

- As circulated but with some late corrections:
  - For IN2P2 in Annex 2: *R. Pain → C. Roy.*
  - Added as Spanish contributions in Annex 7.3
    - SAND (Small Array of Neutron Detectors) 150 kCHF*
    - GLORIA silicon detector system (50 kCHF)*
- Biggest change is to delete Greece from the MOU: letters were sent concerning the MOU commitments concerning notice period for leaving, but clearly these will not be honoured.  
*Suggest that ISCC recommends to FRC that these debts are written off.*
- *How does the ISCC feel about just using the reference to the Greybook in Annex 4? It saves us a lot of time not doing it – but would lose a small number of people who do not come on site so are not registered CERN users, mainly theorists – or use Greybook with a list of theorists??*

*Would ISCC endorse MOU Annex Updates and to write off Greek debts?*

SJF will make a final clean copy and forward to the Director for Research and Computing



# Process for New Initiatives / Large Changes:

Zeroth draft circulated – will need to engage with CERN stakeholders, iterate and return to ISCC.

*Comments or questions now?*

Email any substantive comments/changes/suggestions to SJF after meeting

Need to add other relevant CERN ATS groups where needed

**Rationale:** There is a need to better understand the consequences, requirements and resources for new initiatives and large changes to existing installations to enable better project management, better space management and better use of resources. Whilst experience doesn't seem to have led to any disasters, there have been difficulties in planning and implementation. It would be better to have adopted a clear set of the steps needed to improve how we deploy new initiatives or make large changes in the hall.

The draft below is just the first step and, as there are many stakeholders, it will take some iterations to conclude.

The ISCC is asked to make initial comments to inform conversations internally at CERN and will be asked at later meetings to review later drafts.

**DRAFT: APPROVAL PROCESS FOR NEW INITIATIVES OR LARGE CHANGES IN THE ISOLDE HALL.**

**Scope:** New instruments, large changes in volume or floor space, permanent changes with significant impacts, requests for significant change in services.

*Initial Stage:* Informal discussion with colleagues in relevant roles, as needed, to assess feasibility of technical, operational, safety and collaboration aspects:

- Collaboration spokesperson and ISCC chair.
- ISOLDE Technical Coordinator.
- Target-ion source group.
- Operations group.
- EP-Safety.

*Collaboration Support and Scientific Approval:* Formal discussion to seek collaboration support and scientific approval before detailed local analysis

- Seek agreement in-principle from ISCC by outlining high-level scientific objectives, methodologies, instruments, space and resource needs, potential funding, other impact or requests.
- Seek approval by INTC/Research Board via letter of intent or proposal, as appropriate.

*Engineering Change Request Process:* a general CERN tool for managing changes by informing stakeholders and assessing the detailed impact of the change, including safety implications.

- Produce document summarising the requested changes, potential impact, funding sources etc.
- Checked by members of the ISOLDE technical coordination meetings, relevant local contact people for neighbouring instruments, DSO, EXSO, TSO, BE-OPS.
- Approved by ISCC, ISOLDE Collaboration Spokesperson, ISOLDE Technical Coordinator, and IEF (if needed).

# European Strategy for Particle Physics:

Zeroth draft circulated – based on NuPECC LRP submission and not finished!

We would need to submit something by March 2025.

Document needs modifying to reflect the current situation on the approved improvements, add some comments about possible improvements in LS4 and sketch out a longer-term future.

i.e. mid-term strategy to exploit improvements done during LS3, plan new improvements on timescale of LS4 and secure a longer term for radioactive ion beams at CERN.

Also needs some careful comments about future impact in the light of new facilities (e.g. FRIB, FAIR, RAON etc.)

*Comments or questions now? Clearly document not ready for detailed comments!*

*What two or three major points would ISCC want to highlight in the Executive Summary?*

*E.g. (i) scientific impact and future opportunities*

*(ii) exploitation/development strategy*

*(iii) range and reach of science*

*(iv) competitiveness*

**SJF to develop current document and circulate for details comments asap.**



# CERN Detector R&D Initiatives.

Briefing circulated.  
*Comments or questions?*

## Context

The 2020 Update of the European Particle Physics Strategy highlighted the need for a global roadmap for detector R&D. This led to the creation of the **Detector Research and Development (DRD)** initiatives, with the intention that they replaced and expanded the mandate of previous CERN R&D collaborations, and filled the technology gap until next-generation HEP facilities.

While the focus is mainly on particle physics detector technologies, obviously they permeate to other fields such as astroparticle physics and nuclear physics. This has been recognized by NuPECC, APECC and ECFA through their joint activities<sup>1</sup>. The structure and scope of the DRDs, see below, is pretty ambitious, with some of the subjects moving well beyond particle physics. Some of these are relevant for the ISOLDE facility and the ISOLDE collaboration.

DRDs are set up as a HEP experimental collaborations, with a Collaboration Board overseeing the program and a Resource Review Board representing funding agencies. The ECFA Detector Panel<sup>2</sup> maintains a leading role in the process. Several DRDs seek to bring together research communities that have traditionally not collaborated closely. DRD collaborations encompass very different groups and wide interests. There is an inherent risk that some areas or technologies are underrepresented, or not led by expert groups.

Collaborations are encouraged to define key R&D deliverables, timelines, resource needs, and participating institutions. Regarding funding it is stressed that support should be sought at the national and European level, not directly from CERN. The collaborations are expected to demonstrate "resource allocation and alignment with future strategic programs".

## The CERN DRDC

CERN has recently revived the DRDC, the **Detector R&D Committee** (<https://committees.web.cern.ch/drdc>) and established it at the same level as the other committees (INTC, LHCC, SPSC and REC). The DRDC receives proposals for new "detector R&D experiments", evaluates them and those recommended for approval are submitted to the Research Board.

## Structure of the DRDs

Eight international DRDs are being formed, each with the focus on a key technological area.

### DRD1: Gas Detectors

Collaboration dealing with gas detectors such as Time Projection Chambers (TPC) and Micro-Pattern Gas Detectors (MPGD) like GEM and Micromegas. Focus is on improving time and spatial resolution, long-term stability, energy loss and count rate capabilities, environmental sustainability, and high sensitivity in low and high-pressure TPCs.

### DRD2: Liquid Detectors for Rare Event Searches and Neutrino Experiments

This collaboration aims to develop liquid detectors that use noble liquids, water Cherenkov detectors, or liquid scintillators. The research focus includes doping and purification of targets, radioactivity of detector components, and background noise mitigation.

### DRD3: Semiconductor Detectors

Continuation of RD50, RD42, and RD53 collaborations. Main focus is on monolithic CMOS pixel sensors and 3D integration for future *lepton* colliders. Key subjects are hybrid sensors for 4D tracking, sensors for extremely high fluxes, and wide bandgap materials.

<sup>1</sup> <https://www.appec.org/news/joint-ecfa-nupecc-appec-activities-jenaai/>

<sup>2</sup> [https://ecfa-dp.desy.de/edp\\_mandate](https://ecfa-dp.desy.de/edp_mandate)

### DRD4: Photon Detectors and Particle Identification Devices

Collaboration aimed at the integration of small and medium size research groups working in the field, with emphasis on photon detectors such as MCP-PMT, SiPM, and vacuum and gas photon detectors. High-energy physics applications for Ring Imaging Cherenkov detectors (RICH), Time of Flight measurements, and Transition Radiation Detectors, but many others are related to dark matter searches, nuclear physics, astroparticle physics.

### DRD5: Quantum Sensors and Emerging Technologies

Exploration of the potential of quantum technologies in particle physics, including testing fundamental symmetries, enhancing quantum measurements, and developing new types of detectors. Seeking to create a community around quantum sensor research.

### DRD6: Calorimetry

The collaboration focuses on future experiments, in order to enhance energy and time resolution, granularity, rate capabilities and radiation tolerance. Work packages are defined for the integration of electronics, noble gas liquefied calorimeters, photomultiplier readout systems for scintillators, and front-end ASIC development.

### DRD7: Electronics and Processing in the Detector

This collaboration is working in areas such as data density and energy efficiency, radiation-tolerant System-on-Chip ASICs, high-performance TDC and ADC blocks, electronics for extreme environments, DAQ platforms, and strategic R&D in electronics in general.

### DRD8: Large-Scale Detector Systems - Infrastructure

Still in its initial phase. Focused on the integration of large-scale detectors, including aspects such as mechanics, cooling, magnet development, and monitoring of beams, radiation, and the environment.

## References

- CERN DRD Committee, <https://committees.web.cern.ch/drdc>. Minutes available for the first meetings.
- Thomas Bergauer, "The European strategy and detector R&D program" Nuclear Instruments and Methods in Physics Research A 1069 (2024) 169949, <https://doi.org/10.1016/j.nima.2024.169949>.
- The 2021 ECFA detector research and development roadmap, <https://cds.cern.ch/record/2784893>.

# AGATA: For information only.

*AGATA Collaboration Meeting Sept 24:*

AGATA officially at LNL until end of 2026 – presentations and discussions for five years after this 2027-2031. Two concrete bids were made for hosting from LNL and GANIL, followed by public and private discussion.

From the minutes:

*“To summarize, during the ACC discussion it clearly emerged a certain pressure to make the zero-degree campaign at LNL, which would require an extension of about 1.5 year of AGATA at LNL. After this period, a GANIL campaign mainly focused on SPIRAL1 beams can be considered, leaving open the scheduling after 2030, which depends on the availability of validated beams at SPES and FAIR, and/or other options from host laboratories.*”

*This summary will be given as the AGATA Collaboration input for the AGATA Steering Committee discussion planned for October 1st and 2nd.”*

## Other Items: For information only.

### Safety

- There were three incidents associated with Cd collections in June.
- Collectively (and following incidents with two previous Cd collections in the past few years) raised management concerns. GLM/GHM collections were paused.
- Incident analysis showed several improvements around sample tracking and transport, more specific procedures for each experiment and need to raise awareness with users of GLM/GHM.
- Working on implementation and report is being written for EP Management to enable collections in the next running period.
- HSE review has started – should complete end of year

**FCC:** Four topical groups are being formed to look at different areas of science applications at the FCC-ee, including *"Neutron science (based on the injector e- linac) and radionuclide production (exploiting the collider beamstrahlung) coordinated by Marco Calviani (SY-STI)"*. Meeting to be held that clashes with ISOLDE Workshop – all very exploratory at the moment and keeping in touch with Marco. 100 MeV to few GeV photons.

**COLLAPS/CRIS/ISOLTRAP:** Looking at a rationalisation of that area of the low-energy part of the hall for improvements in experiments, space use, safety etc. Will require careful integration studies and should follow the process for new initiatives and large changes. Try to schedule a presentation for Feb.



# **ISOLDE Collaboration Committee News from the EP-SME-IS Section 6th November 2024**

Sean J Freeman

## Research Fellows = “Research Fellowship Experimental Physics (Cat 1)”

Simon Lechner (Nov 2022 – Oct 2024, Nov 2024, CERN)	MIRACLS
Jessica Warbinek (Jan 2024 – Dec 2026, CERN)	CRIS
Monika Piersa-Siłkowska (Feb 2022 – Jan 2024*, Feb – July 24, Aug 24 – Jan 25, various funding)	VITO
Peter Plattner (November 2024 – December 2026, CERN)	COLLAPS

## Applied Fellows = “Research Fellowship In Applied Physics And Engineering (Cat 2)”

Carlotta Porzio (March 2024 – Feb 2026, EP-SME-IS)	MINIBALL, HIE-ISOLDE
Patrick Macgregor (Nov 2022 – Oct 2025, EP-SME-IS)	ISS, HIE-ISOLDE
Michael Pesek (Nov 2022 – Oct 2024, Nov 25, various funding)	VITO + medical imaging
Lukas Nies (Sept 2023 – Aug 2025, Euro-Labs OH)	MR-TOFs/PUMA
Nikolay Azaryan (Dec 2023 – Nov 2025, ERC/ATLAS)	VITO/ATLAS

## QUEST Fellows = “like an Applied Fellow hired directly to a specific project in advert”.

Amy Sparks (May 2023 – Nov 2024, Dec 25, ERC Proof of concept/CERN KT)	VITO + medical imaging
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Next deadline fellows and associates is March – advertised Jan (TBC).

## CERN Doctoral Students:

**Ilaria Michelon** (April 2023 – Feb 2026) VITO EU+EP Quota (Geneva)

**Daniel Paulitsch** (Aug 2023 – July 2026) VITO Austrian programme (Innsbruck)

**Edward Matthews** (Dec 2023 - Nov 2026?) COLLAPS (TU Darmstadt)

**Anu Nagpal** (April 24 – Sept 25?) VITO (York University)

\* = Special extension due to COVID up to six months – “no longer available”!!



**Scientific Associates:** Joakim Cederkäll Oct 24 – Sept 25

**Corresponding Associates:** ☹️ ☹️

**Project Associates:** Deyan Yordanov (COLLAPS )

### **User Support:**

Jenny Weterings (2002 - ) Oslo University via collaboration + CERN

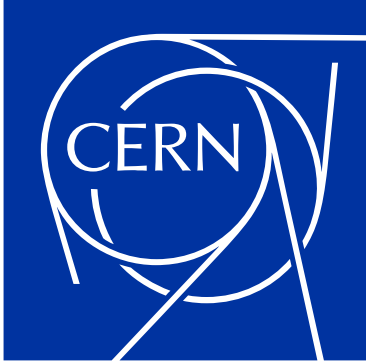
### **CERN Staff:**

SJF, Section Leader and Collaboration Spokesperson LD (Aug 2021 – July 2025) EP-SME-IS

Magdalena Kowalska, Senior Research Physicist IC (Jan 2020 – ) EP-SME-IS

Hanne Heylen, Physics Coordinator LD (Sept 2023 – Aug 2026) EP-SME-IS

Mark Bissell, Research Physicist LD (Sept 2022 – Aug 2025) ERC



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