

2025/04/29

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Welcome to SNOLAB





Welcome to SNOLAB



Land Acknowledgement

SNOLAB is located on the traditional territory of the Robinson-Huron Treaty of 1850, shared by the Indigenous people of the surrounding Atikameksheng Anishnawbek First Nation as part of the larger Anishinabek Nation. We acknowledge those who came before us and honour those who are the caretakers of the land and the waters.



What is the purpose of this workshop?

- Part of our long-term planning process is to review the underground community needs every two years.
- Engage with collaborations who have an interest in deploying experiments at SNOLAB.
- This year we will also be seeking input to our 15-year plan for laboratory operations.
- Presentation at this workshop does not guarantee space in the lab.
 If you want to deploy an experiment, contact SNOLAB Director of Research, Jeter Hall for information on the intake and lifecycle processes.





15 Year Plan: Why Now?

- New decision-making framework was introduced in the 2024 Canadian federal budget to support Canadian Major Research Infrastructures. - Six research facilities introduced including SNOLAB
- Central Pillar Lifecycle funding for designated facilities
 - Requires CFI to assess long-term capital and operational needs of each MRF to make a request to the Government of Canada.
- SNOLAB has been asked to provide detailed and reliable budget estimates for the next 15 years under three budget scenarios.
- As part of this process, SNOLAB will also be required to provide a facility condition assessment and asset management plan under these three scenarios.







15 Year Plan:

- Three budget scenarios by September 15, 2025.
 - 1. Maintaining current levels of operation
 - Fully supporting the needs of the Canadian research community 2.
 - Increasing global competitiveness 3.
- Hired additional temporary staff and contractors to help ensure delivery. \bullet
- Engagement with SNOLAB staff occurred in Dec and Jan.
- Ongoing: Roth consulting on asset management plan and JLR & EXP consulting on architectural estimates.
- Various engagements with SNOLAB community are planned. •
 - February 4th SEF meeting
 - Future Projects Workshop at SNOLAB, Apr 29 May 1 —
 - Special session at CAP June 13
 - Presentation of findings at the MI meeting, Aug 6 8



Community Engagement

15 Year Plan

> Staff Engagement





SNOLAB Layout



Area	Dimensions	Area
SNO Cavern	24m (dia) x 30m(h)	250m ²
Ladder Labs	32m(l)x6m(w)x5.5m(h)	190m ²
	23m(l)x7.5m(w)x7.6m(h)	170m ²
Cube Hall	18.3m(l)x15m(w) x 19.7m(h)	280m ²
Cryopit	15m(dia) x 19.7m(h)	180m ²









SNOLAB – **Facilities**

Plants UPW, Scintillator, Te Diol, TeA



Low Background Lab HPGe assay/screening, XRF, Radon Boards, FLAME XIA, CTBT Dual HPGe

2023/10/26 EAC Meeting

Current Experiments Future Experiments Laboratory Facilities Experiment Areas

5000 m² of class 2000 cleanroom underground. <2000 particles >0.5 μ m in diameter per ft³









SNOLAB – **Large Cavity Status** Cube Hall

DEAP-3600, PICO500, NEWS-G

potential for large project after 2028

SNO Cavern

SNO+, SNO+ Te Potential for large project after 2035

Cryopit

Next generation experiment 0vββ decay or dark matter

Current Experiments Future Experiments Laboratory Facilities Experiment Areas

5000 m² of class 2000 cleanroom underground. <2000 particles >0.5 μ m in diameter per ft³











SNOLAB -**Small Cavity Status**

HaloStub

HALO

potential breakthrough for

future expansion

Ladder Labs

PICO40, SBC, CUTE, SuperCDMS



Low Background Lab HPGe assay/screening, XRF, Radon Boards, FLAME XIA, CTBT Dual HPGe, IceCube DOM Testing

Current Experiments Future Experiments Laboratory Facilities Experiment Areas



5000 m² of class 2000 cleanroom underground. <2000 particles >0.5 μ m in diameter per ft³







SNOLAB – At a Glance

Cube Hall

DEAP-3600, PICO500, NEWS-G

potential for large project after 2026

Halo Stub

HALO

potential breakthrough for

future expansion

Ladder Labs

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Plants

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SNO Cavern

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5000 m² of class 2000 cleanroom underground. <2000 particles >0.5 μ m in diameter per ft³





Three Scenarios: Current Working Definitions (subject to revision)

Maintaining current levels of operation

- Current laboratory at 100% occupancy
- New modest surface building offsite: "Lively Campus".

Fully supporting the needs of the Canadian research community

- for space and capabilities.
- New larger surface building offsite: "Lively Campus".

Increasing global competitiveness

- Expanded underground laboratory with new ladder labs and large cavern to dark matter experiment, or something else
- New "Lively Campus" with expanded facilities (hostel, cafeteria, ...?)



- Expand underground laboratory with new ladder labs to meet increased demands

potentially host a beyond tonne-scale $0v\beta\beta$ beta decay, a beyond 3rd generation

Current & Forecasted Lab Space Allocation



Current Allocation





Lab Expansion









New Lively Campus

New surface building key features:



Remodel of existing surface building to include additional "drys".





Facilities and Capabilities

Facility Improvements:

- Storage areas and laydown space both on surface and underground
- Four new surface laboratories: Chemistry lab, cryolab, material science/chem lab, and multipurpose lab
- Assembly space
- Expanded drys
- Increased machine shop capabilities
- More areas w/ reduced radon air
- More underground cryogenic facilities for hosting small devices and quantum technologies and/or computing

Capabilities:

- Underground materials fabrication
- Increased LN production
- Underground argon storage





- Increased capacity and greater sensitivity of instrumentation for assay and material characterization

How Can You Help?

Formal Feedback via Workshop Report

Report will be submitted to the arXiv by the corresponding author from our community.

If you wish to contribute, you will need access to the Overleaf document where this is being written. **Please email Stephen Sekula** *<stephen.sekula@snolab.ca>* to request access. The Workshop Report document is linked from the menu on the left side of the Indico main page.



- 1-2 paragraphs summarizing the key ideas, concepts, and themes from the material presented. - About five bullets summarizing the key take-aways from the presentation and any important items that arose during discussions (either during dedicated discussion time or during breaks/lunches).



Brainstorming: This afternoon...

- What do you see SNOLAB's role for the community to be in the next 15 years? Are there 1. capabilities that you believe SNOLAB will need to host, with accessibility, for the wider *community?*
- 2. How do you see your project fitting into the field's landscape on that timescale?
- What is the anticipated footprint of your project and what is the most plausible timeline on 3. needs in the following three areas: on-site (surface), on-site (underground), and off-site (nearby SNOLAB)?
- What are the anticipated on-site personnel levels (separately, in terms of students vs. 4. professionals) during (1) the construction and (2) the steady-state operation phases of the project?

See Email from Erica Brunelle for link!





which you expect to be most active in construction and then operation? What are the space



Thank you! Questions?

