

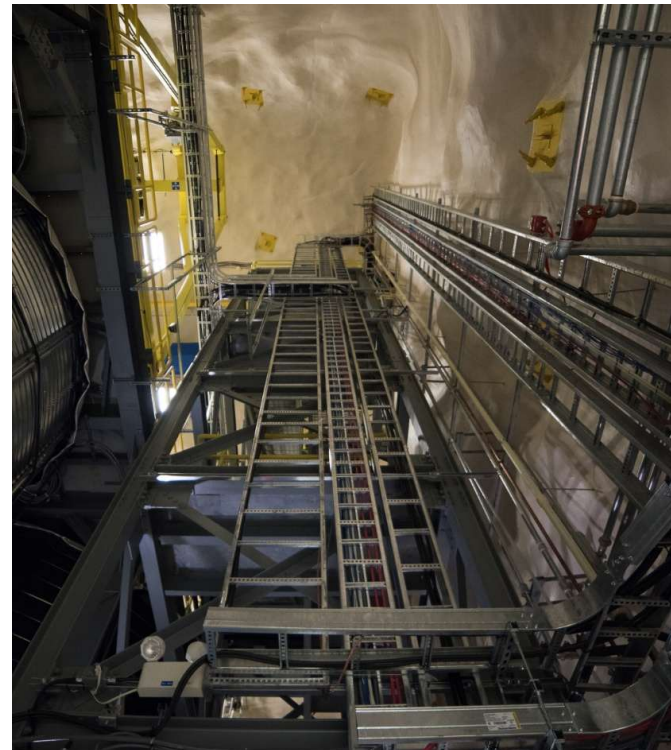
2026/10/14

SNOLAB

Overview for the Mainz LLSD Workshop

Dr. Richard Ford (he/him)

Director of Operations



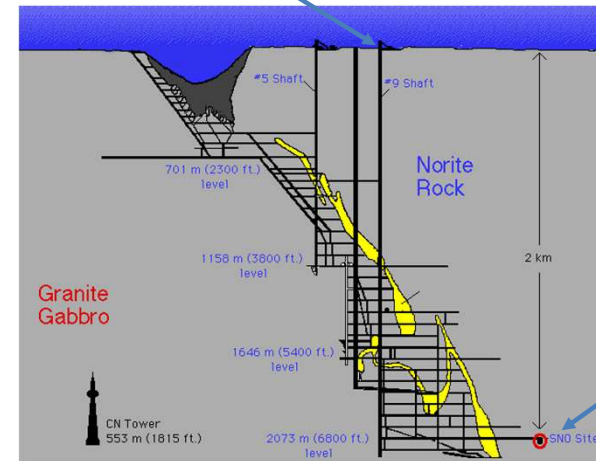
SNOLAB at Creighton Mine (Lively, Ontario, Canada)

- Sudbury population 190,000, many hotels
- Large industrial base due to mining
- Local airport (45 min drive)
- 4-hr drive (400km) from Toronto airport

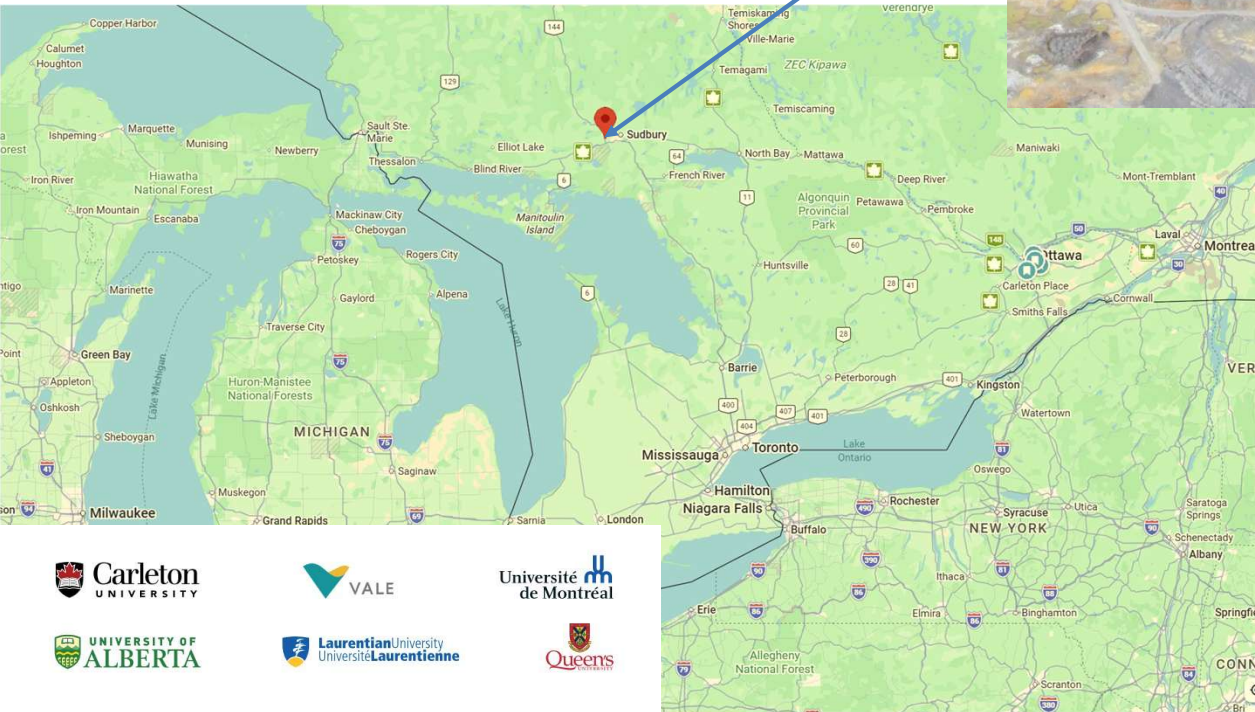


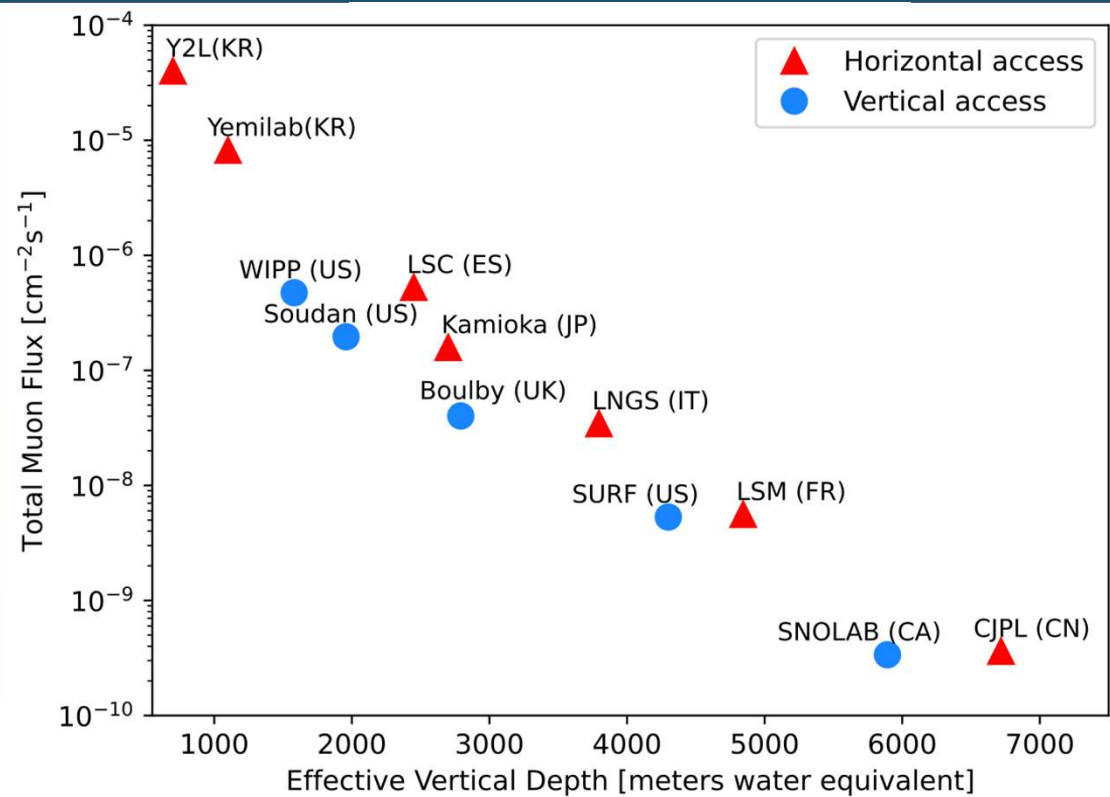
#9 Shaft
Mine
Headframe

SNOLAB
Surface
Building



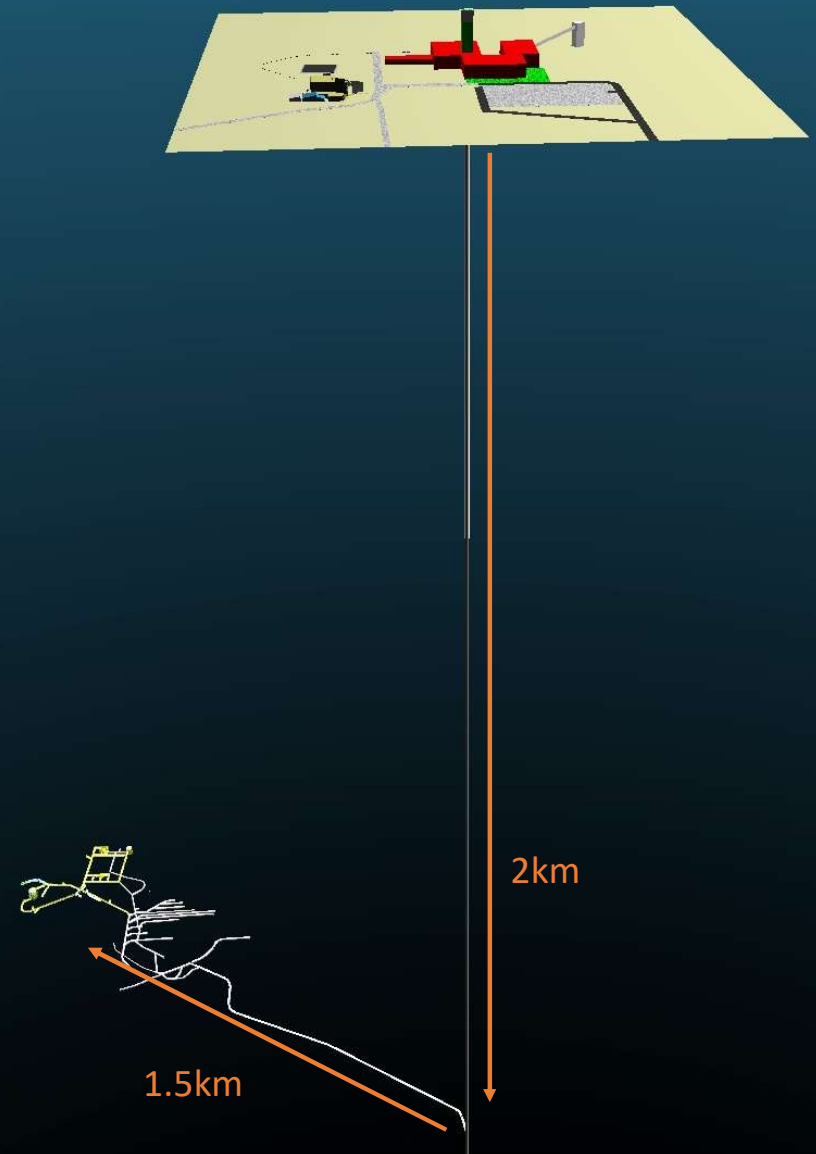
SNOLAB
6800L





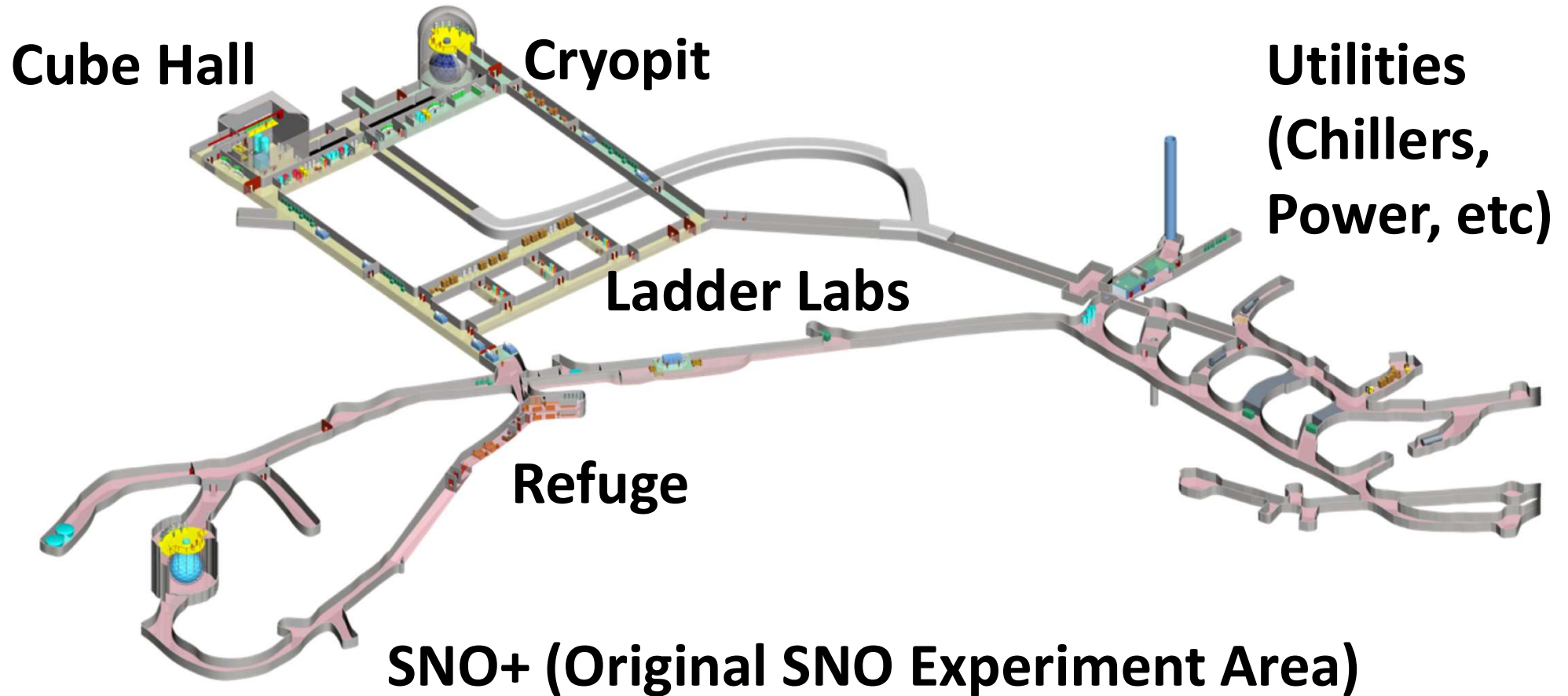
adapted from [Chin. Phys. C 45.2 \(2021\)](#)

Muon Flux = $0.27/\text{m}^2/\text{day}$



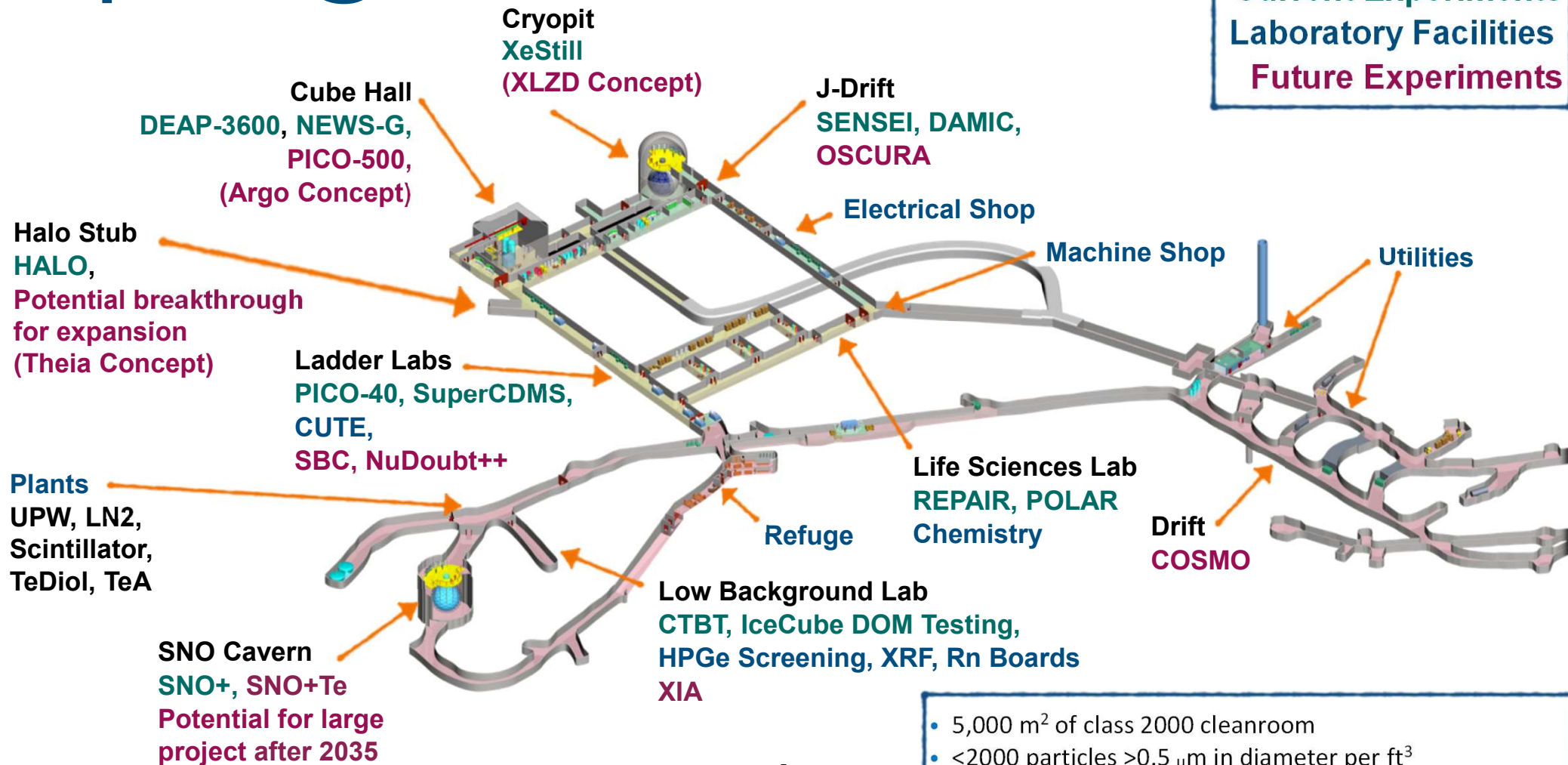
SNOLAB Underground Campus at 6800-foot Level

(5000 m² of Class 200 Cleanroom space)



Spaces @ SNOLAB

Experiment Areas
Current Experiments
Laboratory Facilities
Future Experiments



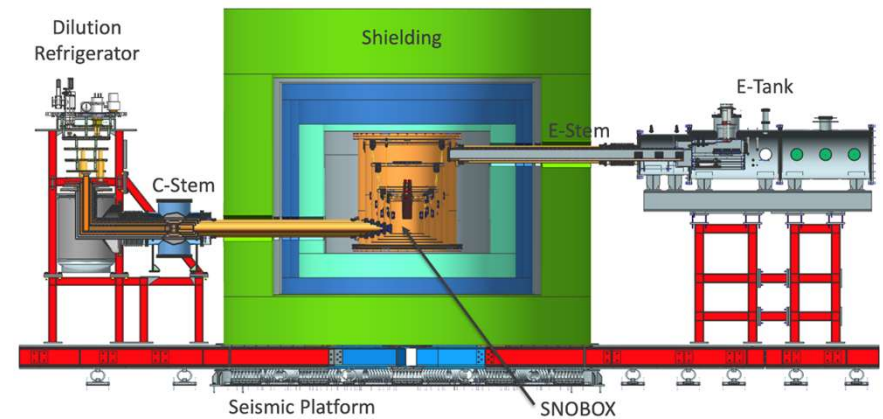
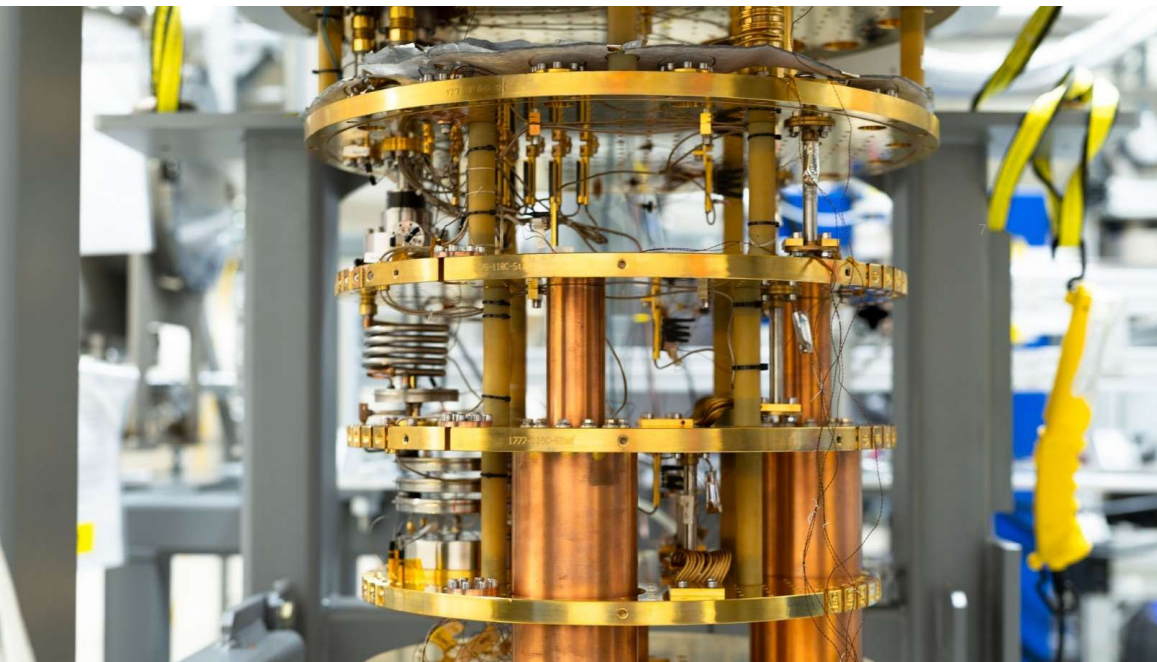
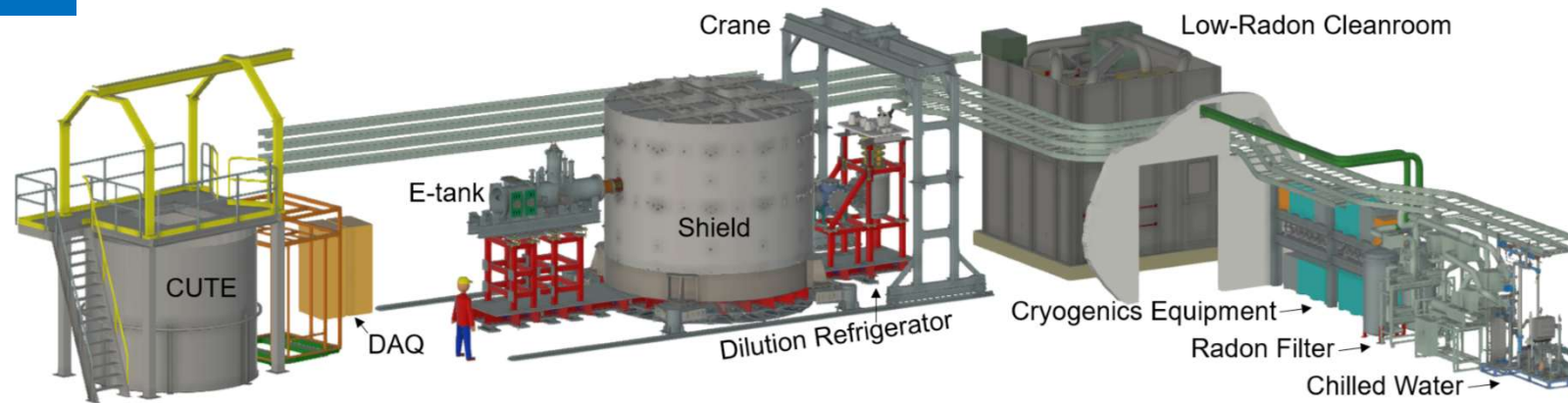
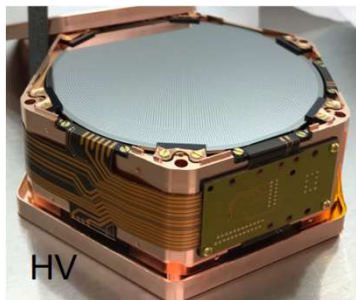


DEAP-3600 experiment



PICO-500 experiment

SuperCDMS



SNO+ $0\nu\beta\beta$ Decay



SNO Detector



SNO+ 780 tonnes Liquid scintillator

0.5% (1.3 tonnes) ^{130}Te at
34% natural abundance 3.9T



Telluric acid plant

Chemistry Challenge:
load tonnes of tellurium into
oil-based liquid scintillator

NIM A, Volume 1051, 2023, 168204



Te-Diol plant



Cryopit



The cage

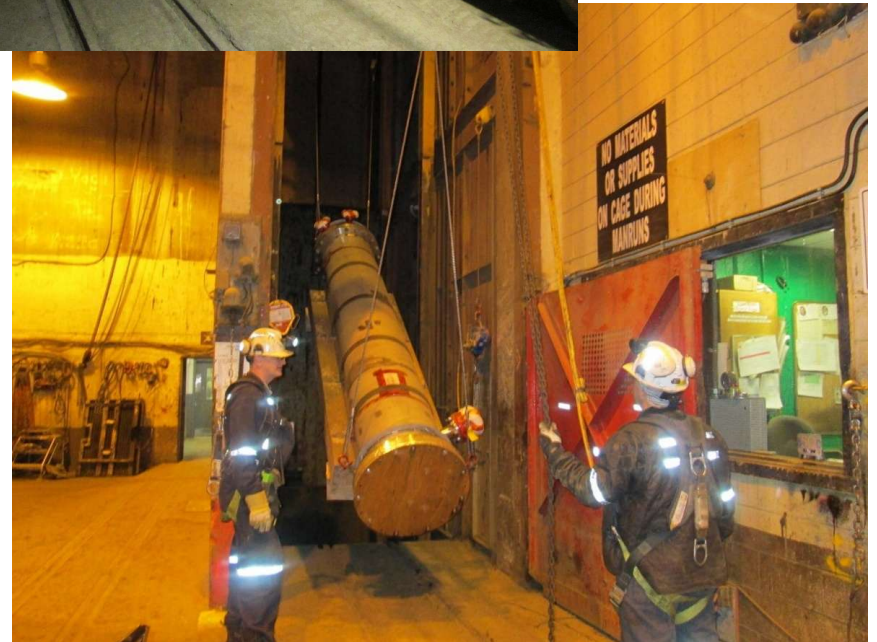
Mining term for industrial elevator!



Logistics



- Vertical access – double deck cage
- Cage 1.45m(W), 3.94m(L), 2.9m(H) (or 6m L)
- Can sling larger items under cage (2m W)
- Drift travel by rail, forklift, stone boat



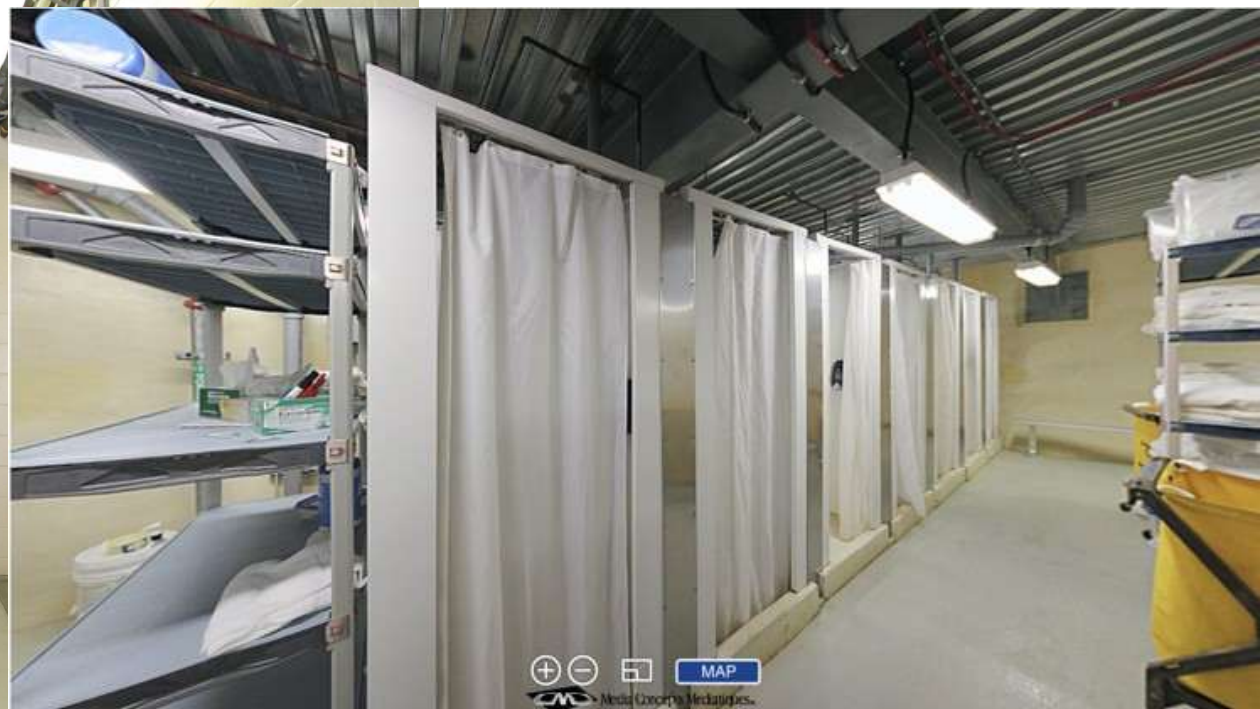


Underground entrance to SNOLAB

SNOLAB Refuge



Carwash and Showers





**12 Air handling Units
delivering HEPA filtered air**

Electrical Power – Life blood of operations



- Large capacity power system fed from 13.8 kV feed.
- Two 1500 kVA (1.5MW) MPCs to supply 600V-3P.
- Currently about 50% loaded.
- Alternate feed circuit available.
- Generators on surface provide 3 MW for full backup



Backup Power – 3 MW



- Automatic start and transfer (about 1 minute)



Remote operated breakers



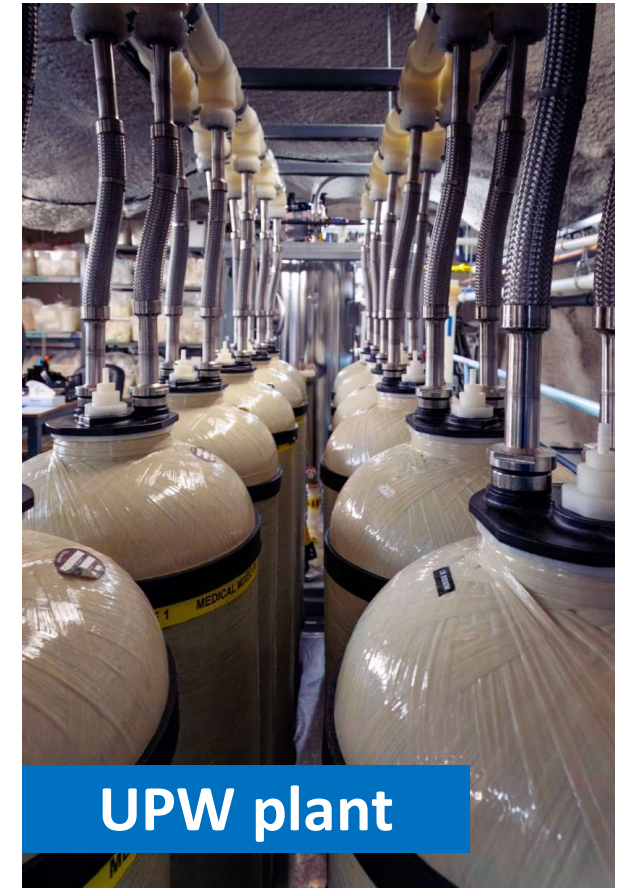
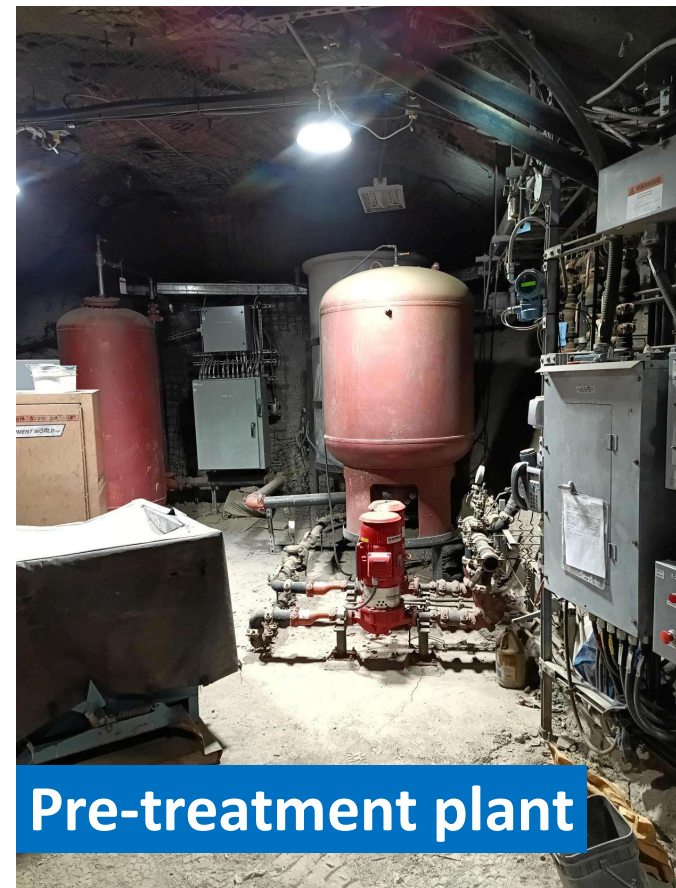
Controls



SNOLAB generators on surface

Water and Ultra-pure Water

- High-capacity UPW plant can produce about 120 LPM
- Includes Rn stripping



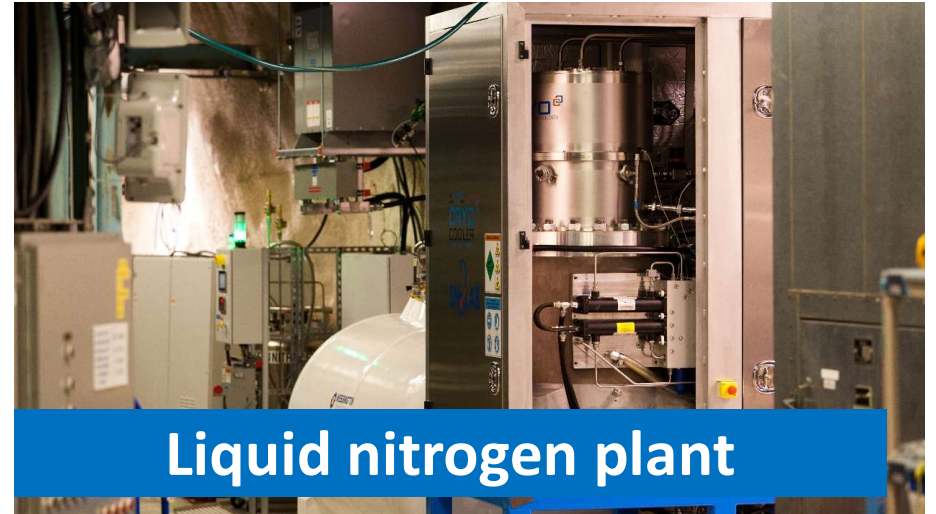
Chillers and Chilled Water System

300 tonnes chiller capacity (about 1-MW)

Uses 120,000 cfm airflow for cooling



Experiment plant systems



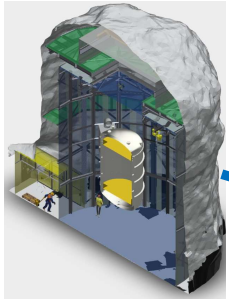
Liquid nitrogen plant



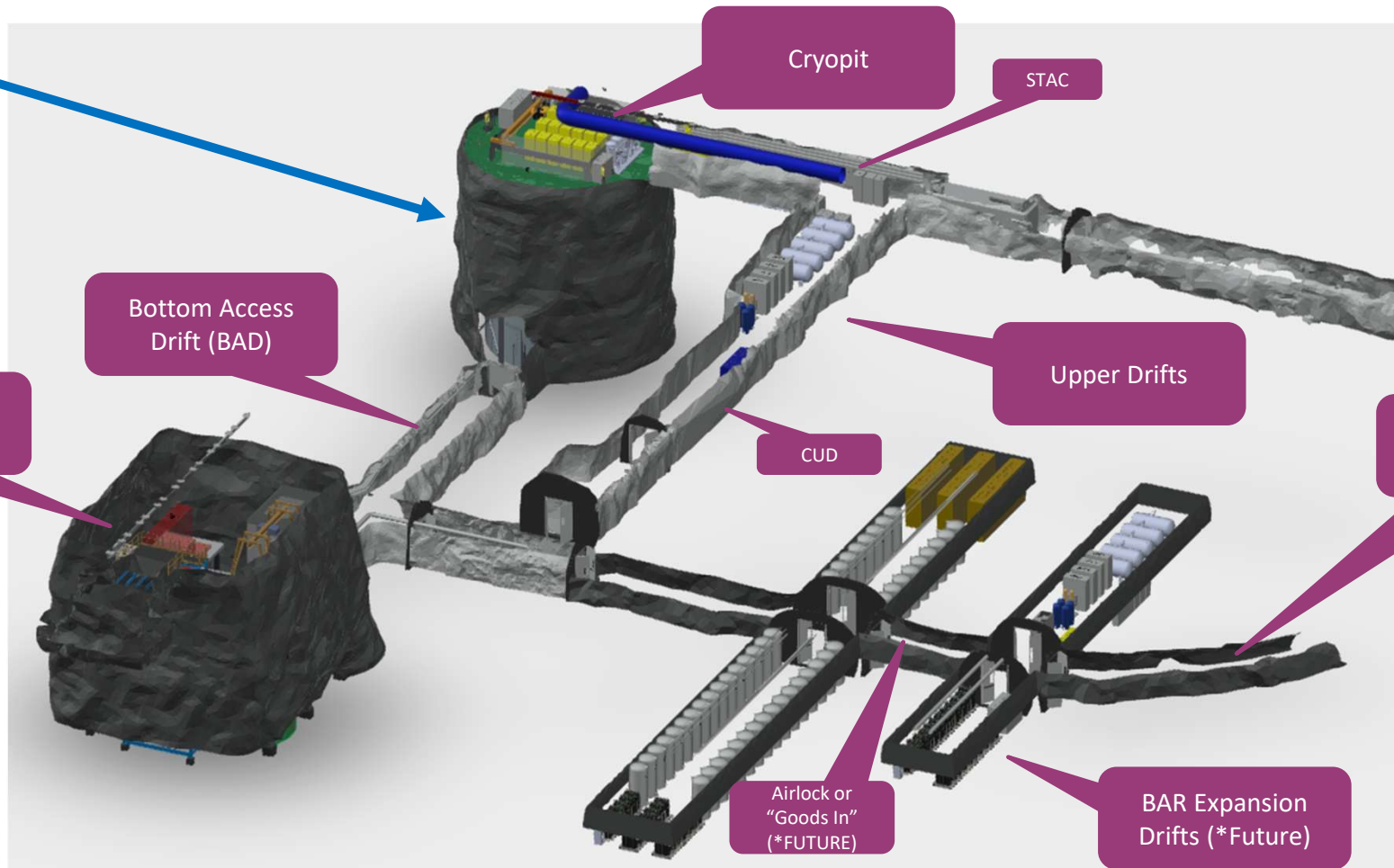
Scintillator plant monitoring



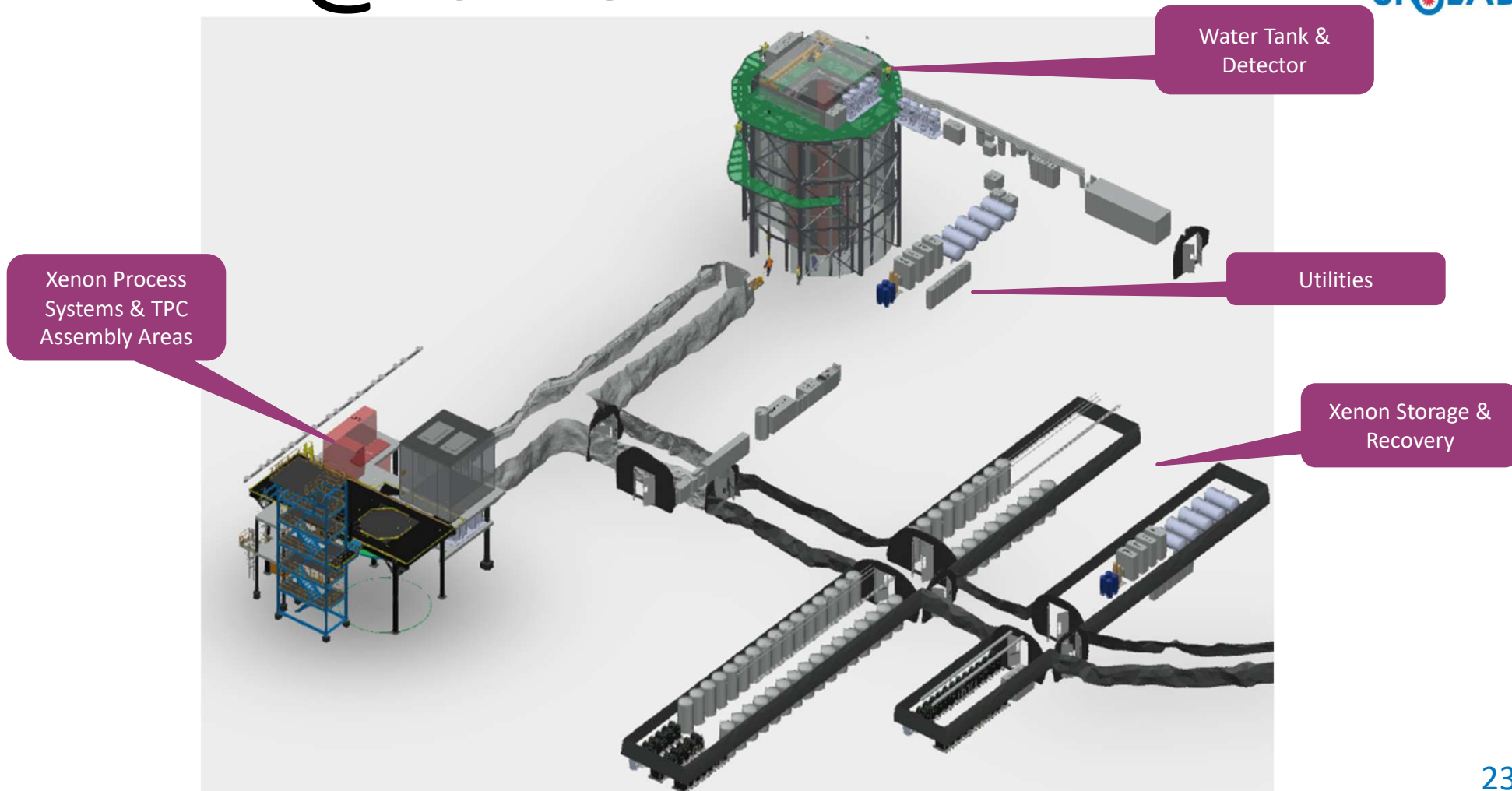
Liquid Scintillator Plant



XLZD



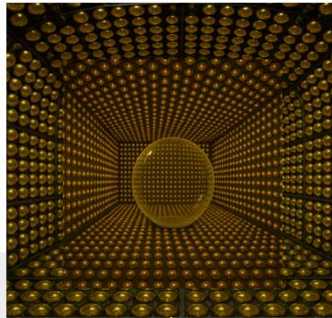
XLZD @ SNOLAB



Expansion Concept Proposal – Potential THEIA Cavern

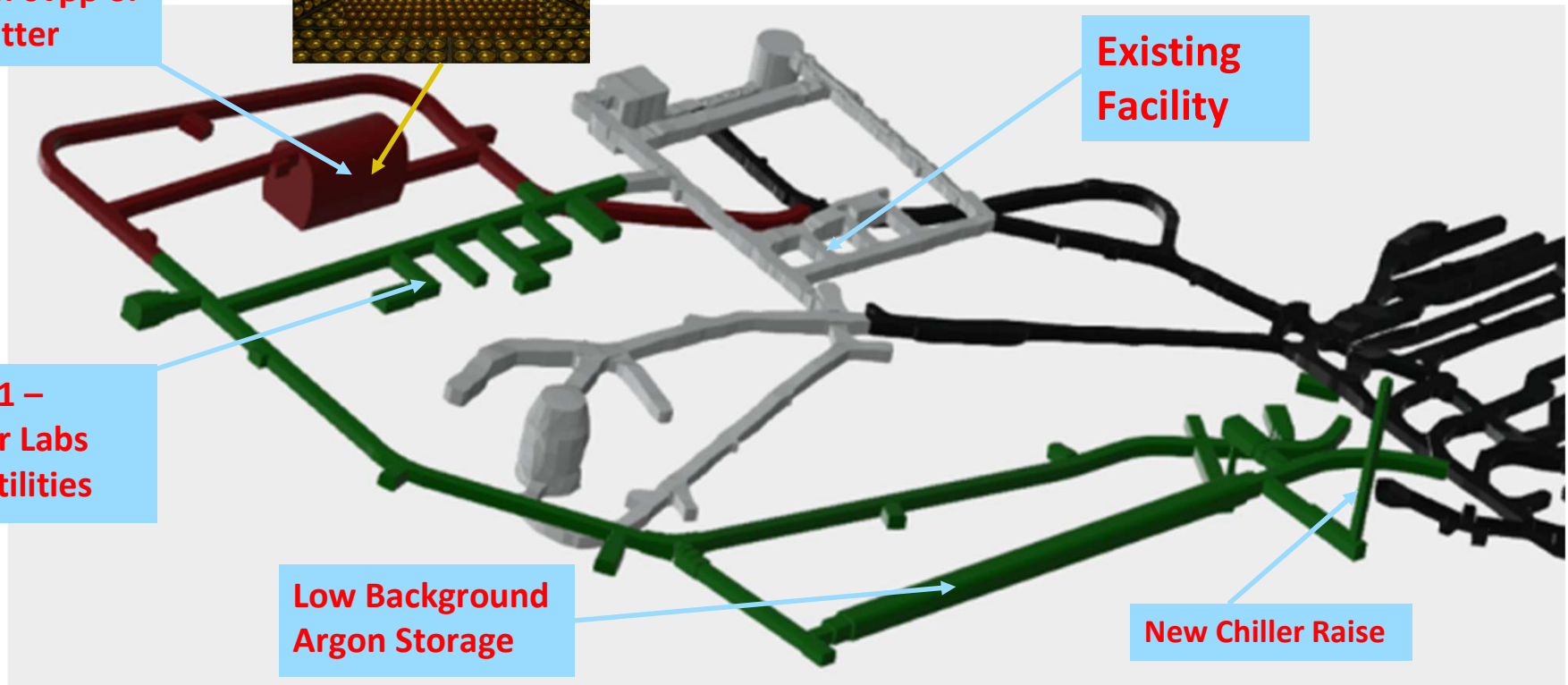


Phase 2 – New Large Cavity for Next Gen $0\nu\beta\beta$ or Dark Matter



- New cavern:
- 80m x 20m x 25m (preliminary)
 - Auxiliary plant areas

- Timeline from funding:
- Design, tender, mobilize (2yr)
 - Excavation (5yr)
 - Outfitting (2yr)



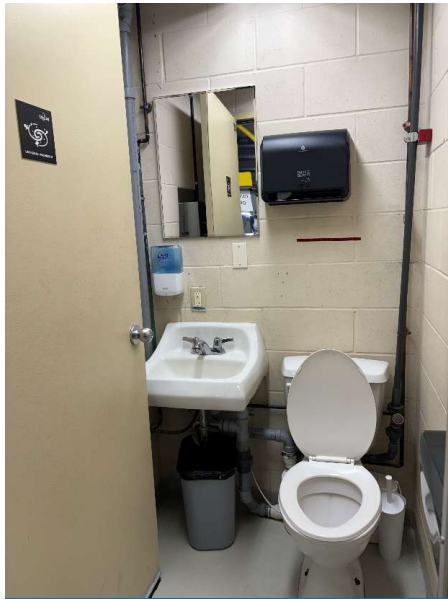


Thank you!
Questions?

Expansion schedule

Project Milestone Schedule	2032				2033				2034				2035				2036				2037				2038				2039				2040				2041			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Early Works																																								
Engineering, contract, and mobilize																																								
Phase 1 - Lateral development																																								
Phase 1 - Construction																																								
Phase 2 - Lateral development																																								
Phase 2 - Construction																																								

.... and the Sewage



**Toilets –
in the refuge!**



Sewage Treatment Plant



Membrane Bio-reactor