

Professor Virginia Kilborn
Deputy Chair SUPL Ltd

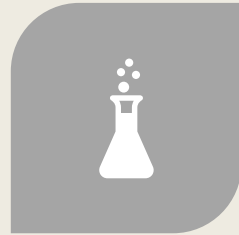
Chief Scientist,
Swinburne University
Of Technology



Why an underground Lab in Australia?



LOW-RADIATION EXPERIMENTS



STABLE EXPERIMENTAL BASE



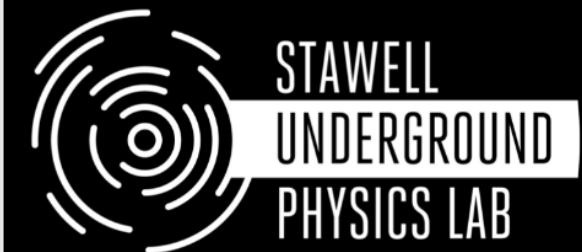
FUNDAMENTAL SCIENCE AND
PHYSICS EXPERIMENTS INCL.
PARTICLE, QUANTUM AND
NUCLEAR



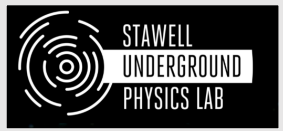
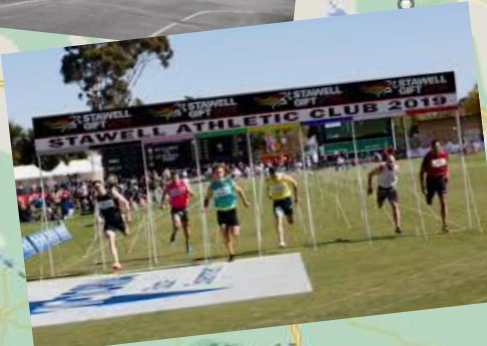
POTENTIAL COMMERCIAL
APPLICATIONS



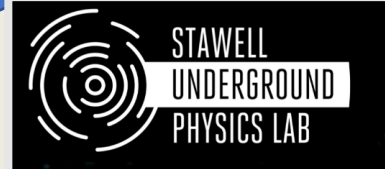
SOUTHERN HEMISPHERE
FACILITY



Stawell, Victoria



Stawell Gold Mine



Construction of SUPL



- Starting with an unused tunnel in a no longer active part of the mine, SGM excavated main SUPL experimental cavern out of solid rock.
- 1 km underground, access via 8km road tunnel.
- Ongoing operation (of mine and SUPL) depends on the price of gold.

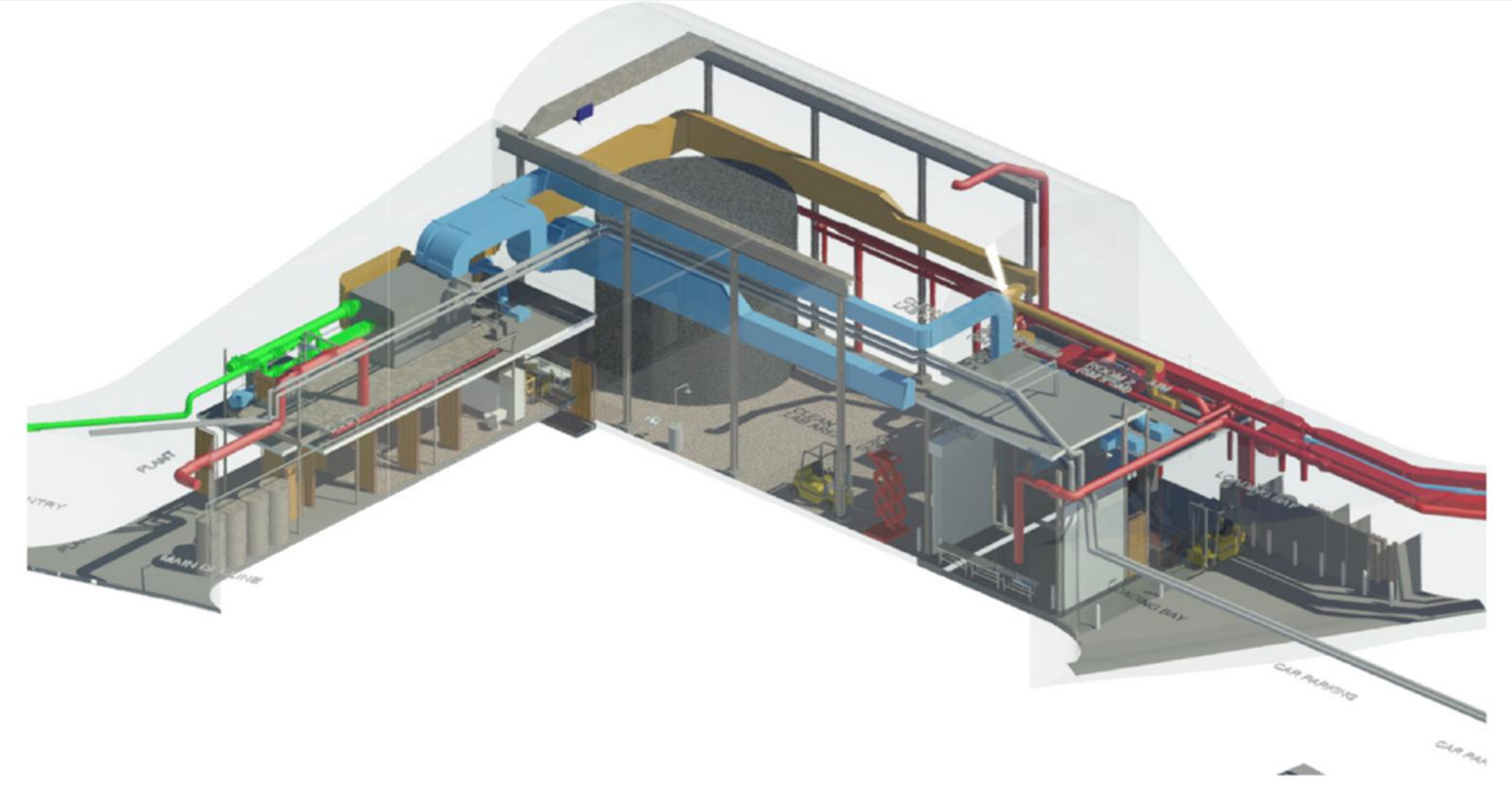
50 tonnes rock = 1-2 tsp gold
→ 20 kg gold bar = \$1.2 million







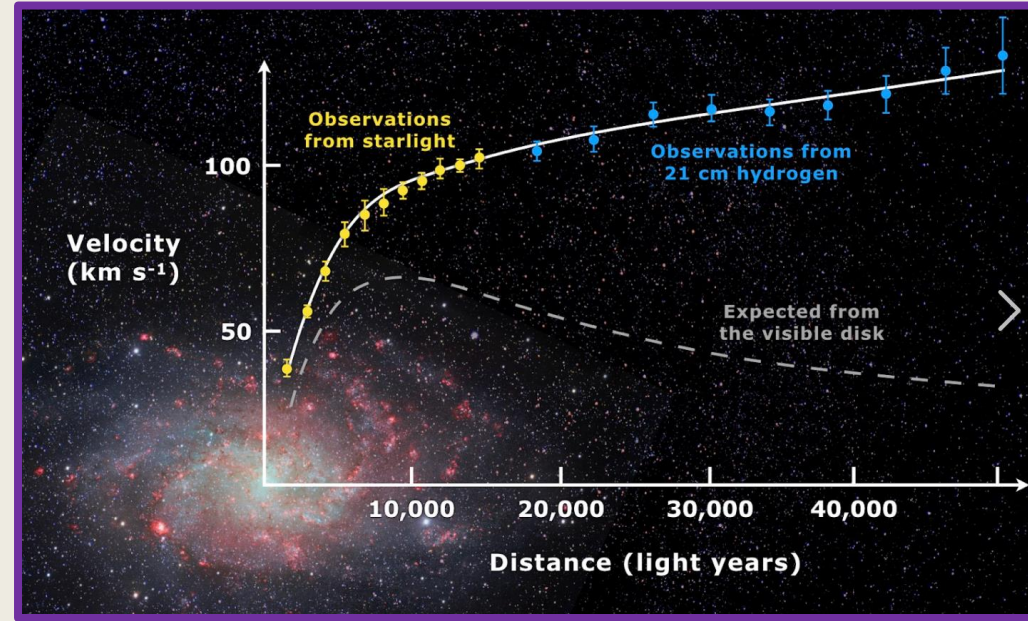
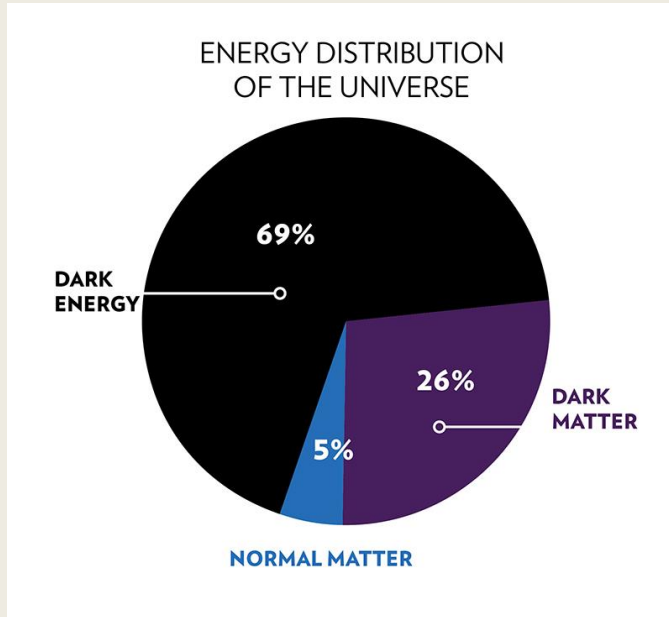
SUPL Schematic



SUPL Foundational Experiment:

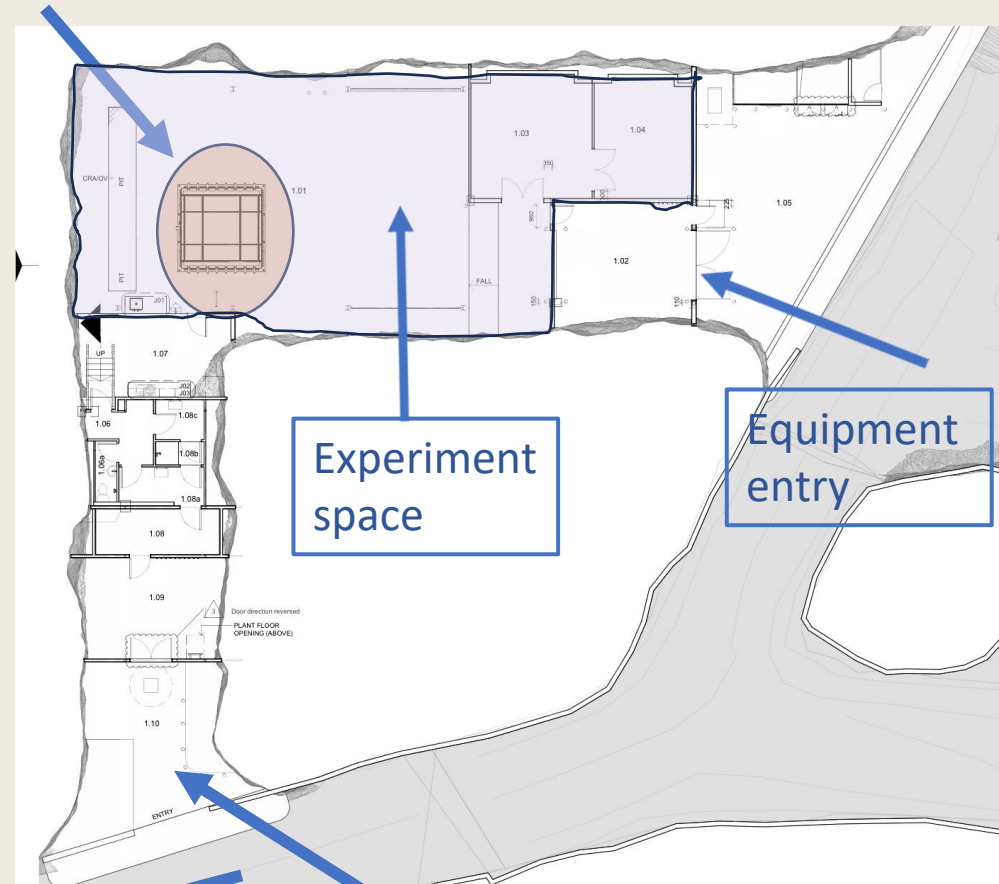
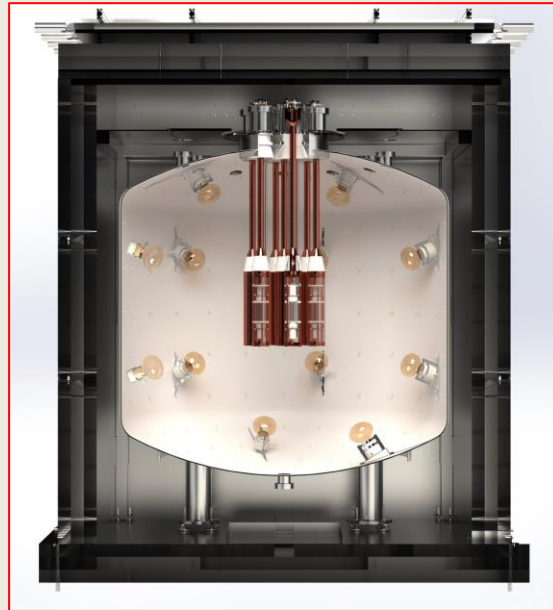
SABRE - Dark Matter detection

Sodium Iodide with Active Background Rejection Experiment



- ❖ WIMPs (Weakly interacting Particles) are one of the possibilities for dark matter
- ❖ SABRE south is aiming to confirm (or otherwise!) the Northern potential detection of WIMPS at the Gran Sasso Underground lab

SABRE layout at SUPL



Towards surface
(8km by tunnel
road)

Personnel entry

Underground lab experiments

Dark Matter

Defence?

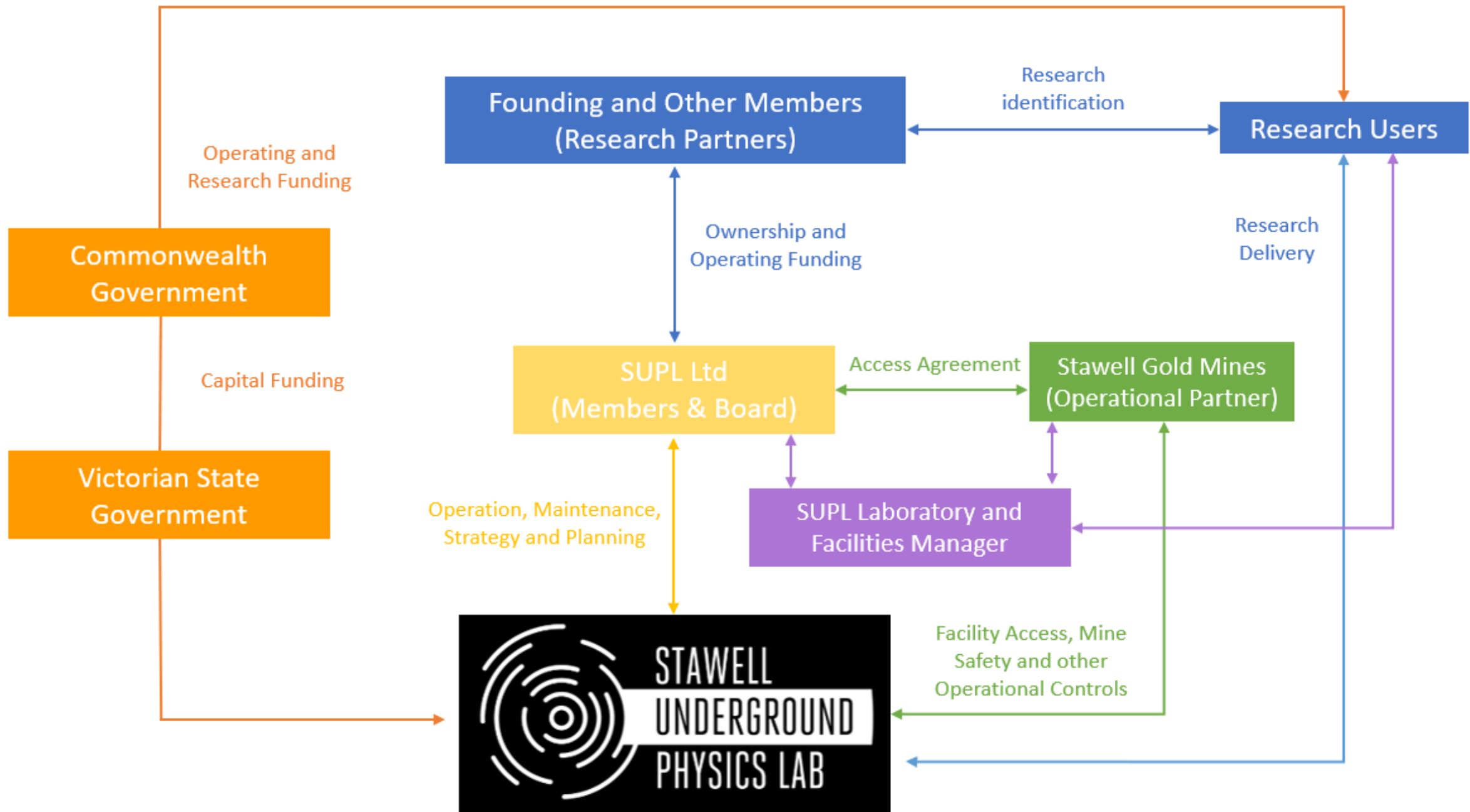
Geological

Biological

Quantum

**<Insert
Ideas here!>**





Working with SUPL Ltd ...

CAPITAL FUNDING



Australian Government
Department of Education



RESEARCH PARTNERS



SUPPORTERS & HOST



LABORATORI NAZIONALI DEL GRAN SASSO



(INITIAL) MEMBERS



Australian
National
University



... apply here

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COMPANY SECRETARY



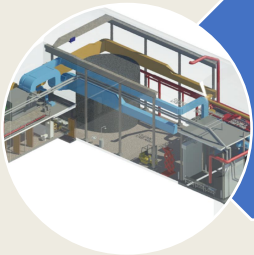
MS KIM MINTERN-LANE
SUPL FACILITY & LABORATORY MANAGER

SUPL Challenges and Opportunities



Highly valued by SGM and local community

- Investment in regional Victoria
- Demonstrate sustainable re-use of mining infrastructure → “101 Things to do with a hole in the ground”
- Proposal for state of the art STEM/SUPL Outreach Centre in Stawell



Unique infrastructure

- Drawcard for collaboration and innovative experimentation at cutting edge of science, nationally & internationally
- From challenging standard model of physics to technological innovation
- Opportunities across and between all areas of science



Agreement between SGM and SUPL Ltd to oversight access, operation and compliance

- Highly regulated and safety conscious working environment, strict induction and access procedures



Operational funding – initial 5 years (almost) covered by Members’ Agreement, but require ongoing government support as national/international research facility

Contact

[SUPL: Stawell Underground Physics Laboratory](https://www.supl.org.au)

<https://www.supl.org.au>

Sue Barrell: sue.barrell@barrellacumen.com

Virginia Kilborn: vkilborn@swin.edu.au

Resources

[SUPL: Stawell Underground Physics Laboratory](https://www.supl.org.au) : <https://www.supl.org.au>

[Stawell Underground Physics Lab Launch - YouTube](#)

[ARC Centre of Excellence for Dark Matter Particle Physics \(centredarkmatter.org\)](http://centredarkmatter.org)

[The Absurd Search For Dark Matter — Veritasium](#)

[The epic experiment at the bottom of a gold mine - ABC News](#)

