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The SABRE South Experiment at the Stawell Underground Physics Laboratory

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SABRE is an international collaboration that will operate similar particle detectors in the Northern (SABRE North) and Southern Hemispheres (SABRE South). This innovative approach aims to distinguish potential dark matter signals from seasonal backgrounds: a pioneering strategy only feasible with a Southern Hemisphere experiment. SABRE South is located at the Stawell Underground Physics Laboratory (SUPL), in regional Victoria, Australia.

SUPL is a newly constructed facility situated 1024 metres underground (~2900 metres water equivalent) within the Stawell Gold Mine. Its construction was completed in 2023.

SABRE South employs ultra-high purity NaI(Tl) crystals immersed in a linear alkyl benzene (LAB)-based liquid scintillator veto, surrounded by passive steel and polyethylene shielding, and topped with a plastic scintillator muon veto.

Significant progress has been made in the procurement, testing, and preparation of equipment for the installation of SABRE South. The assembly of the experiment at SUPL will take place throughout 2025. The SABRE South muon detector and data acquisition systems are already operational and actively collecting data at SUPL, and full commissioning of SABRE South is planned for the first quarter of 2026.

This presentation will provide an update on the overall progress of the SABRE South construction, its anticipated performance, and its potential physics reach.

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