

# Seeking Dark Matter in the Southern Hemisphere with PAUL

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The Paarl Africa Underground Laboratory (PAUL) feasibility study has been launched in 2024. It will be the first dedicated and permanent underground laboratory in Africa, and only the second one in the southern hemisphere. Under 800 metres of rock forming the Du Toitskloof mountain in the western Cape region, it would not be the world's deepest or biggest underground lab, but would offer physics researchers in southern Africa the chance to participate in the global search for dark matter. At high dark matter masses, only detectors using noble liquids can reach the required sensitivity. This implies larger volumes and, as a consequence, wide footprints to host all subsystems. While the underground site for those experiments is not yet defined, a novel underground site that does not surpass the existing ones in terms of depth can hardly be a good choice for them. At small dark matter masses, however, there are many new opportunities to which a novel underground laboratory can contribute. One of the most interesting facts about having the possibility to perform an experiment of direct dark matter detection in an underground laboratory located in the Southern Hemisphere is to compare the modulation with respect to the same detector in the Northern Hemisphere. The strong synergy between the astrophysical (indirect) probes and Paarl Africa Underground Laboratory (direct probe) can jointly measure and constrain dark matter effect, which may shed lights on new physics. A progress report and the prospects of the initiative will be presented.

**Primary author:** MALEK, Fairouz (LPSC, CNRS and UGA, Grenoble, France; Stellenbosch University, South Africa)

**Presenter:** MESSINA, Marcello (Istituto Nazionale di Fisica Nucleare)

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