

Status of the NUCLEUS experiment

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The first detection of coherent elastic neutrino nucleus scattering (CEvNS) at a nuclear reactor remains to be achieved, especially because the corresponding nuclear recoils lie in the $O(100 \text{ eV})$ energy regime which is difficult to measure with conventional detection technologies, and also because of the unfavorable background conditions nuclear power plant environments generally offer. To overcome these obstacles, the NUCLEUS experiment aims to develop an innovative detection system using a 10 g cryogenic detector setup made of CaWO_4 and Al_2O_3 crystals capable of reaching $O(10 \text{ eV})$ energy thresholds. These target detectors will be surrounded by a twofold system of instrumented cryogenic vetoes, an external passive shielding and a muon veto to improve the identification and discrimination of backgrounds.

At present, the experiment is under commissioning in the shallow underground laboratory at the Technical University of Munich (TUM), preparing for the relocation to the Chooz-B nuclear power plant in the French Ardennes later in 2024.

In this talk, I will provide an overview of the experiment's current status, focusing on the latest developments and milestones achieved.

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