JOINT EUROPEAN MASTER IN NUCLEAR PHYSICS
Academic Year 2025/2026

MASTER THESIS PROPOSAL

TITLE: Characterization of YAP:Ce detectors for precise beta shape measurements.

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UNIVERSITY/RESEARCH CENTER: LPCCaen

ABSTRACT
(just few lines 5-10 explaining briefly the idea of the proposed work and the place where it will be developed).

Context
The search for new physics beyond the Standard Model is one of the most exciting frontiers in fundamental physics. Precision measurements of beta decay spectra shapes offer a highly sensitive and complementary approach to high-energy collider experiments. The bSTILED project focuses on the beta decay of 6He, aiming to set stringent constraints on exotic tensor contributions to the weak interaction with a precision goal competitive with results from the LHC.
This level of precision requires a perfect understanding of the detection system's response function, only achievable through offline calibration using dedicated sources, including conversion electron emitters (207Bi, 137Cs, 133Ba, 57Co) and beta emitters (114In, 106Ru/106Rh, 90Sr/90Y). These sources are currently under development by collaborators at the LNHB laboratory.
Objectives
If the schedule permits, contribute to detector preparation at LPCCaen and, participate in calibration measurements at LNHB.
Analyze offline data acquired at LNHB, comparing experimental results with Geant4 simulations to validate and refine the detector response model.
Preparation for future analysis of 6He data, with the possibility of continuing the work in a PhD thesis starting in fall 2026.