

XLZD: A Next-Generation Liquid Xenon Observatory for Dark Matter & Neutrino Physics

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Liquid xenon time projection chambers are nowadays recognized as the leading technology for dark matter direct detection. The XENON and LUX/LZ projects have been exploring the parameter space for WIMPs and other rare events for decades.

In this talk, we will present the forthcoming phase of the project: XLZD, which from the merging of the two currently leading experiments XENONnT and LZ, aims to designing and building the ultimate liquid xenon dark matter detector.

XLZD will feature a 60-ton active mass, with reduced Rn and neutron backgrounds, leaving neutrinos as the main background. It will explore the entire WIMP parameter space down to the neutrino fog limit and, at the same time, it will also present good sensitivity to neutrino-less double-beta decay of ^{136}Xe , and the possibility to study solar neutrinos with unprecedented sensitivity.

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