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First Results from the LUX-ZEPLIN Dark Matter Experiment

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The LUX-ZEPLIN (LZ) experiment is a multi-tonne dark matter direct detection experiment operating 4850 feet underground at the Sanford Underground Research Facility in Lead, South Dakota. At the heart of LZ is a liquid xenon time projection chamber (TPC) with an active mass of 7 tonnes that will search for the low energy signatures from interactions with WIMP dark matter in our galactic halo and other rare physics processes. It includes an active veto system consisting of an optically separated and instrumented xenon skin layer and a surrounding external liquid scintillator outer detector to provide rejection and characterisation of gamma-rays and neutrons from internal sources. An extensive materials screening campaign and in-house purification of the liquid xenon has ensured that LZ meets the strict radioactivity constraints needed to explore new parameter space in the search for Dark Matter. In this talk, I will present dark matter search results from the first science run of LZ between December 2021 and May 2022, report on the experiment's status and discuss the next steps towards a global LXe rare-event search observatory.

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