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Probing Dark Matter with Liquid Xenon Detectors

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The fundamental nature of dark matter remains one of the central open questions in physics. A leading hypothesis is that dark matter consists of new elementary particles, whose masses and interaction cross sections span a vast parameter space. Among the various detection technologies, liquid xenon detectors have emerged as the most sensitive for dark matter particles with masses above a few GeV, offering unprecedented discovery potential. In this talk, I will present recent results from the latest generation of multi-tonne liquid xenon detectors currently operating deep underground. I will also highlight advances in detector technology, ongoing R&D efforts, and the prospects for next-generation experiments to further expand our reach in the search for dark matter.

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