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【12】Looking into the heart of darkness - two-phase xenon time projection chambers for direct dark matter detection

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The fundamental nature of dark or invisible matter remains one of the great mysteries of our time. A leading hypothesis is that dark matter is made of new elementary particles, with proposed masses and interaction cross sections spanning an enormous range. Amongst the technologies developed to search for dark matter particles, two-phase (liquid and gas) xenon time projection chambers are currently leading the field, providing unprecedented sensitivities and a large discovery potential. I will present the development of these detectors from their earliest stages, with focus on the XENON programme. I will show results from XENON1T, the status of XENONnT which is currently taking data deep underground, and discuss the ongoing the R&D towards the next-generation DARWIN experiment.

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