

The presence of a cold, neutral and non-relativistic dark matter has been confirmed by several cosmological observation techniques such as studies of the velocity curves of spinning galaxies, gravitational lensing, cosmic microwave background, and galactic cluster collisions. Weakly interactive massive particles (WIMPs) are one of the most promising candidates for dark matter and are strongly motivated by theories of supersymmetry and extra dimensions. While several WIMP search experiments were conducted over the last decade using different strategies and techniques, direct WIMP searches using ultra-low background liquid xenon dual-phase time projection chambers (TPCs) have been leading on setting the best limits for the spin-independent WIMP-nucleus cross sections. Following its parent XENON100 experiment, XENON1T experiment is currently taking data and is expected to improve the current sensitivity limits by at least an order of magnitude. The concept and challenges behind direct dark matter search experiments is presented with emphasize on the design and structure of the XENON1T experiment.