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Towards the Final Word on Neutralino Dark Matter

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We present a complete phenomenological prospectus for thermal relic neutralinos. Including Sommerfeld enhancements to relic abundance and halo annihilation calculations, we obtain direct, indirect, and collider discovery prospects for all neutralinos with mass parameters M_1 , M_2 , $|\mu| < 4$ TeV, which freeze out to the observed dark matter abundance, with scalar superpartners decoupled. Much of the relic neutralino sector will be uncovered by the direct detection experiments Xenon1T and LZ, as well as indirect detection with Cerenkov Telescope Array. We emphasize that thermal relic Higgsinos will be found by next-generation direct detection experiments, so long as $M_{1,2} < 4$ TeV. Charged tracks at a 100 TeV hadron collider complement indirect searches for relic winos. Thermal relic bino-winos still evade all planned experiments, including disappearing charged-track searches. However, they can be discovered by compressed electroweakino searches at a 100 TeV collider, completing the full coverage of the relic neutralino surface.

Summary

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