

Thermal Relic Dark Matter in the Modern Era

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Thermal relic of massive stable particles, which are often called Weakly Interacting Massive Particles (WIMPs), has been one of the most fascinating candidates for cosmological dark matter (DM). WIMP DM can be tested directly and indirectly at terrestrial experiments, namely high-energy colliders, direct detection with elastic DM-nucleon scattering and indirect detection with extra cosmic-ray flux from present DM annihilation or decay. In the meantime, the sensitivity of the direct detection experiments has grown a lot in recent years, albeit without any affirmative signals thus far, and the resulting cross section limits start to exclude many well-motivated WIMP DM models. This tendency motivates us to take a new direction in DM model building.

In this presentation, I will talk about a recent effort in model building of thermal relic WIMP DM by presenting some example models where DM-nucleon scattering is naturally suppressed while the DM abundance is thermally produced.

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