

# Feebly Interacting Dark Matter through the Kinetic Mixing Portal

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The precise nature of Dark Matter still eludes us and tremendous experimental, theoretical efforts have been made in order to answer this open question. The most studied scenario consists of a massive particle, dubbed WIMP, which can naturally reproduce the correct relic abundance if it has weak scale interactions with the Standard Model. As the same interactions give rise to its experimental signatures, WIMPs are an attractive target to be searched for.

In this talk, I will speak about a less studied, but as well motivated, alternative production mechanism known as freeze-in. In this scenario, the Dark Matter-Standard Model couplings are required to be very small – orders of magnitude below typical electroweak figures – and one can wonder if we will ever be able to test this production mechanism experimentally. I will show that freeze-in is indeed already being tested by the direct detection experiment XENON1T today. I will then further explore the phenomenology of freeze-in and present new Dark Matter production mechanisms related to it.