

# Dark Matter Freeze-out via Catalyzed Annihilation

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We present a novel paradigm of dark matter freeze-out in the early universe, named “catalyzed freeze-out”, in which the freeze-out of dark matter is controlled by catalyzed reactions. We discuss in detail the regime that the depletion of dark matter proceeds via  $2\chi \rightarrow 2A'$  and  $3A' \rightarrow 2\chi$  processes, in which  $\chi$  and  $A'$  denote dark matter and the catalyst respectively.

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