

Light from darkness : history of a hot dark sector

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In this talk, I will present a study of a scenario in which the universe was initially dominated by a hot hidden sector. By this I mean that $T' \gg T$, with T' the temperature of the hidden sector and T that of the visible sector. As an extra rule, I will assume that dark matter belong to the hidden sector and that its abundance is set by standard thermal freeze-out. One of the key issues I will discuss is the various ways in which the entropy of the hidden sector may be transferred to the visible sector before big bang nucleosynthesis and the implication for the dark matter phenomenology. In such scenario, the mass of the dark matter particle could be as large as 10^{10} GeV or so. This will be discussed in the framework of dark QED, with dark fermions forming the dark matter and dark photons as mediator between the hidden sector and the visible sector.

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