APR14-2014-000172

Abstract for an Invited Paper
for the APR14 Meeting of
the American Physical Society

keV-mass dark matter candidates and constraints

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The cold dark matter cosmological model has been extremely successful in explaining cosmic structure on large scales, but has ongoing challenges from observations that probe small-scale structures. Warm dark matter (WDM) provides a compelling alternative that help resolve such issues whilst maintaing the successes on large scales. After overviewing motivations for going beyond WIMP-based dark matter, I will review candidates of keV-mass WDM particles and their production mechanisms in the early Universe. I will then discuss their cosmological implications and explore the variety of constraints coming from structure as well as X-ray observations.