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Dark matter ultracompact minihalos and the small-scale early Universe

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In this talk I will discuss recent efforts to detect dark matter 'ultracompact minihalos' (UCMHs), including a novel utilisation of gravitational time-delay lensing with pulsars. Recently proposed as a type of small-scale dark matter structure, UCMHs are formed from large overdensities in the very early Universe. They have been shown to be able to persist through to the present day, providing a unique opportunity to investigate the conditions of the Universe at early times. I will present recent results constraining the number of UCMHs within the Milky Way, and discuss their implied limits on three processes that lead to their formation: increased primordial power on small scales, primordial non-Gaussianity, and the presence of high-tension cosmic string loops.

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