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Testing LCDM on small scales with cluster lenses

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The key elusive cosmic constituents - dark matter, dark energy and black holes - play a fundamental role in shaping the visible universe. In this talk, I will discuss the current status of our understanding of the distribution of dark matter on small-scales in LCDM and the key open questions. Gravitational lensing by clusters of galaxies offers a powerful way to map dark matter and the high quality of current data permits detailed comparison with simulations of structure formation. Deep Hubble Space Telescope data in combination with ground-based follow-up spectroscopy permit the construction of high-resolution lensing derived maps of dark matter that can be used to stress-test the LCDM model. I present results from recent work that reveal tensions between the predictions of the standard cold dark matter theory and observations of cluster lenses.

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