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Measuring the mass function of dark matter subhalos with ALMA observations of strong gravitational lenses

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The number of observed dwarf satellites of the Milky Way is orders of magnitude lower than the predictions of cold dark matter (CDM) simulations, an issue known as the "Missing Satellite Problem". In this talk, I will discuss how in strong lensing systems we can detect low-mass dark matter subhalos in the lens galaxies by measuring the gravitationally-induced distortions that subhalos induce in the lensed images of background sources. Measuring the abundance of dark matter subhalos with strong lensing allows us to determine their mass function and to compare it with the predictions of CDM and other dark matter models. I will present our current constraints on the abundance of subhalos using ALMA data and provide a brief overview of our ongoing observational campaign to place stronger constraints at lower masses.