

Title: JWST lensed quasar dark matter survey III: WDM constraints from warm dust flux ratios for 31 lenses

In this talk, I will present recent constraints on the DM free-streaming length from JWST observations of quadruply lensed quasars. Characterizing the population of low-mass dark matter halos, both in terms of their abundances and concentrations allows us to connect to the underlying particle physics of dark matter. The magnifications of strongly lensed quasars provide a probe of the abundance of small-scale structure since the relative brightnesses of the images can be perturbed by low-mass halos both in the lens and along the line-of-sight. In this talk, I will present measurements of the relative magnifications of the strongly lensed compact warm dust emission, which is sensitive to perturbations by populations of halos down to masses $\sim 10^6 M_\odot$, in a sample of 31 systems measured with JWST MIRI multi-band imaging, which are used to constrain the half-mode mass of the halo mass function. The warm dust region is compact and sensitive to perturbations by populations of halos down to masses $\sim 10^6 M_\odot$. This is the first science result for the full sample of the JWST GO-2046 program. These results represent the most stringent constraint on DM free streaming and the DM particle mass to date.

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