

Searching for dark matter self-interactions in tidally formed ultra-diffuse galaxies and cluster substructures

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Cold dark matter can be interacting rather frequently at dense regions of galaxies. It has been shown that these interactions could provide explanations for several small-scale anomalies. In recent years, small-scale observations continue to challenge our understanding of the nature of dark matter: two ultra-diffuse galaxies DF2 and DF4, are found to be deficient in dark matter, and the number of small-scale lenses seems to be excess in number in massive clusters. In this talk, we present some of our works related to these observations. We show that self-interacting dark matter can be consistent with these very different observations, and in some cases, provide more natural explanations. Its interesting interplay with other aspects of galaxy evolution is worthy of further exploration.

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Dark matter

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