

Strong lensing signals from self-interacting dark matter clusters

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I will present the first simulated galaxy clusters ($M_{200} > 10^{14} M_{\text{sun}}$) with both self-interacting dark matter (SIDM) and baryonic physics. They exhibit a greater diversity in both dark matter and stellar density profiles than their collisionless (CDM) counterparts, which is generated by the complex interplay between dark matter self-interactions and baryonic physics. I will show that gravitational lensing by galaxy clusters can constrain the nature of dark matter. This is because SIDM can lower the central density of dark matter in a cluster (though not always) and also makes haloes more spherical. These changes impact the statistics of strong lensing arcs, as well as the number and distribution of multiple images.